

PROGRAM



gulf coast
conference

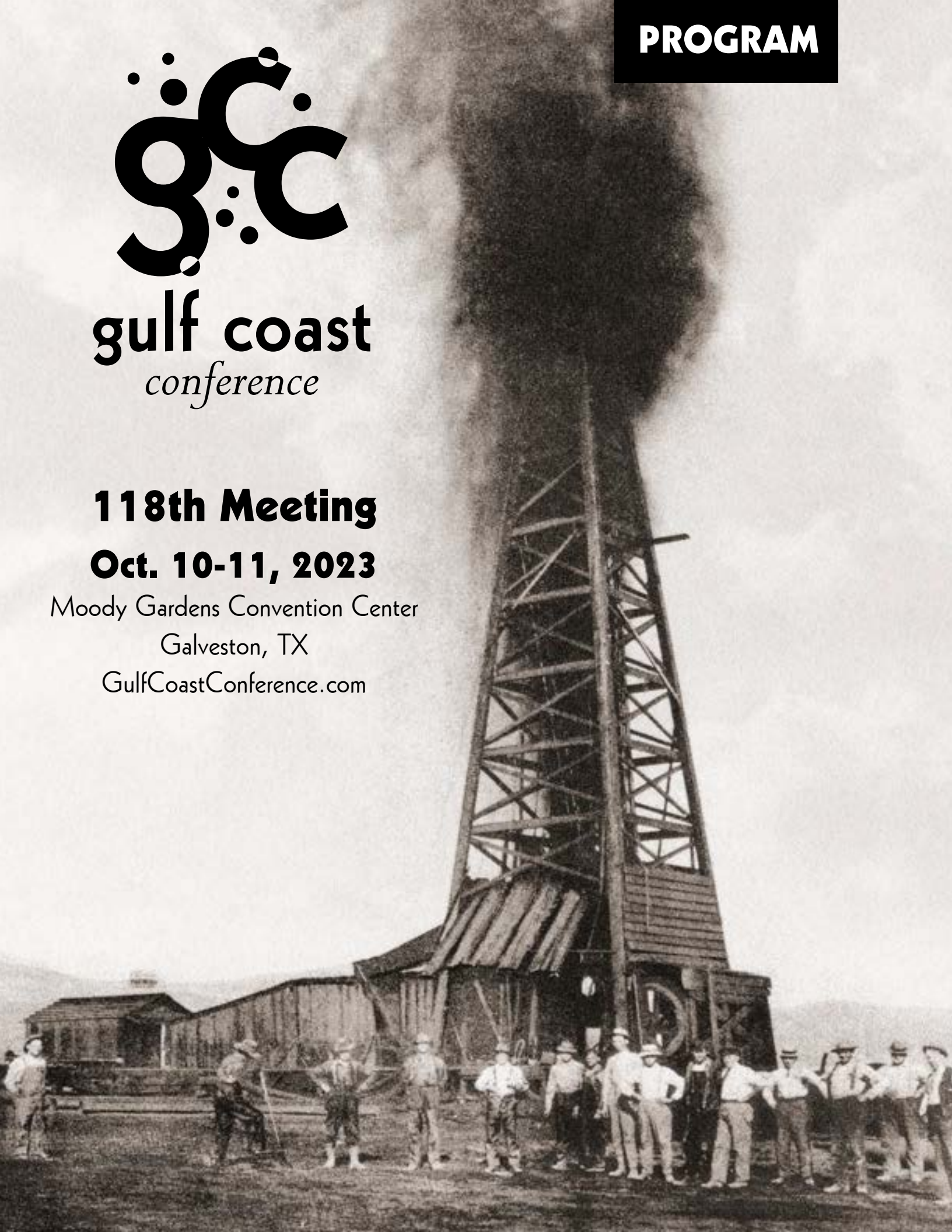
118th Meeting

Oct. 10-11, 2023

Moody Gardens Convention Center

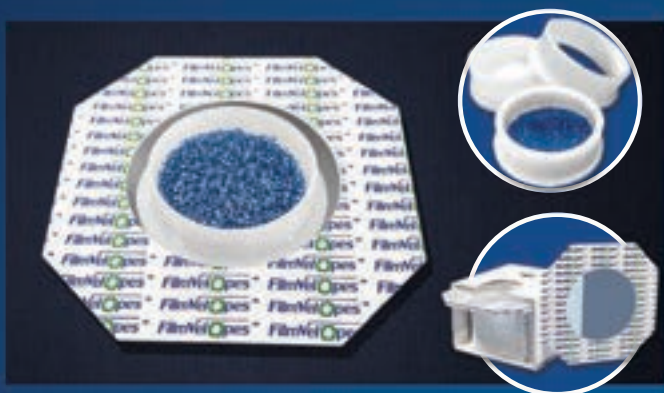
Galveston, TX

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Attend an in-booth session focusing on the R Series: Leslie McHenry, Applications Scientist and former XOS customer, will showcase a few of her favorite R Series features.

- Tuesday: 11:30 am and 2:30 pm
- Wednesday: 11:00 am

Scan to learn more about the R Series today!



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Gulf Coast Conference
Oct 10-11, 2023
Venue: Moody Gardens Convention Center
One Hope Blvd
Galveston, Texas, 77554

2023 Conference Schedule

Monday, October 9, 2023

8:00 AM – 5:00 PM – ASTM Course #100
11:00 AM Gulf Golf (Lunch & Registration)
12:00 PM Gulf Golf Shotgun Start
7:00 PM – 10:00 PM – Golf Awards Banquet
Moody Gardens Moody Ballroom

Wednesday, October 11, 2023

8:00 AM – 5:00 PM - Technical Sessions & Posters
9:00 AM – 5:00 PM – Exhibits
3:00 PM – 5:00 PM – Wed Social (Exhibit Hall Lounge)
9:00 PM – 5:00 PM - New Product Showcase

Mixer: Tuesday & Wednesday’s Mixer on the Exposition Floor with Refreshments and Hors D’oeuvres 3:00 PM – 5:00 PM

Food Trucks: Located Outside South Lobby

Tuesday, October 10, 2023

8:00 AM – 5:00 PM - Technical Sessions & Posters
9:00 AM – 5:00 PM – Exhibits
3:30 PM – 5:00 PM - Tuesday’s Social (Exhibit Hall Lounge)
9:00 PM – 5:00 PM - New Product Showcase

Thursday, October 12, 2023

9:00 AM – 4:00 PM – Training Course Abstract #114

Recharge Station: Recharging Station Located on the Exhibit Floor in the Lounge Area

Mobile Lab: Located Outside South Lobby

GCC 2023 Technical Advisory Committee

- **Chairperson**
- **Jean-Francois Borny, Lummus Technology**
- Frank Di Sanzo ExxonMobil (Retired)
- Poulami Dutta – Dow Chemical
- George Gonzalez, Agilent Technologies
- Rudy Haas, HORIBA Instruments, Inc.
- Jamie Nossal, BV Inspectorate America
- Jonathan Richter, Baytek International
- Raj Shah, Koehler Instruments
- Bill Winniford, Dow Chemical (Retired)
- Frank Xinwei Yan, City of Houston

GCC Mission Statement

The Gulf Coast Conference is a non-profit organization oriented toward the education and advancement of knowledge of Chemical Analysis Technology associated with the Petrochemical, Refining, and Environmental fields, and will forward this goal through annual technical meetings, regular communications, and training courses focused on these fields.

Gulf Coast Conference, 13921 Hwy 105 W, #163, Conroe, TX 77304
Ph: 281-256-8807

www.GulfCoastConference.com

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Notes from the rollout.....

Innovation, relevance, and dedication; three words that describe the Gulf Coast Conference 75-year history. From a humble beginning in the 1950s with a handful of dedicated scientists to one of the premiere global conferences, GCC strives to bring that same innovation, relevance, and dedication today. GCC 2022 gathered close to 2,000 scientists, encompassing 175 technical presentations and posters, and spent the two-day conference renewing friendships and creating new partnerships.

GCC 2023 promises to be better and more dedicated to the advancement of technology and analytical science. On Monday, ASTM will offer their excellent *Understanding Test Method Precision, Bias, ILS Design, Statistical Quality Control Charts* class, taught by master quality assurance guru and statistician, Alex Lau. Alex has over 40 years' experience in the Petroleum Refining Industry and specializes in statistical techniques for quality assurance and process improvement, development, and implementation of industry standards. Even though this topic can be intimidating, Alex knows how to make statistics an exciting and interesting course for both veteran and newcomer scientists.

The highlight of most conferences are the technical presentations with the innovation that they feature and how we can apply that to our own fields. Our keynote speakers do just that as think-leaders in their field. On Tuesday, Scott Fenwick, Technical Director of Clean Fuels Alliance America, Chair of ASTM D02, and board member of ASTM will bring his thoughts on the changing fuels landscape. He will enlighten us with insight from a dedicated professional that has lived through many facets of the industry.

Another favorite at GCC are the symposia, bringing focused technical expertise from many aspects of the analytical fields; chromatography, spectroscopy, software, environmental and many others. In addition, GCC continues to expand to a more dynamic conference. We will reintroduce the Speaker of the Year award and will add Poster of the Year award.

The Speaker of the Year honor will be presented to one of the speakers that has consistently contributed to the excellence of the conference over the last few years. To find out who this will be, come and join us on the exhibit floor on Wednesday at 3PM! For The Poster of the Year, the conference attendees will vote for the outstanding poster of the conference. This will also be awarded on Wednesday afternoon.

The 18th annual New Product Showcase will provide a central location in the center of the exhibit hall for selected vendors to show off and demonstrate their latest and newest advances in products, software, and methods. On Tuesday and Wednesday of the meeting, attendees are asked to stop by this special exhibit area and review the innovation presented there. Last year's winner was Pollution Analytical Equipment. We will have a drawing at the close of the show and one voting participant will receive a prize. Good luck to all that take part in selecting this year's winner.

On Thursday, after the conference has been closed and all our goodbyes have been said, there is one more opportunity to advance your career. GCC will present *Basic Analytical Chemistry - Bridging the gap between chemists and engineers* class once again. This course includes a complete tour of the analytical laboratory for the petroleum industry and helps bridge the gap that some chemists experience while discussing the process engineers' needs.

Attending GCC will also provide the opportunity to evaluate and compare instrumentation and services and see all the latest analytical innovations, firsthand, from nearly 200 exhibiting companies. The exhibition hall gives a forum to discuss with technical experts regarding solutions to real laboratory issues and creates an environment for networking and developing professional connections. GCC 2023 will be another exceptional conference, bringing together old friends and colleagues, and creating new relationships that will last for decades. Come join us at the Moody Gardens convention center, where the weather is nice, the food is fresh, and the outlook is relaxing!

See you In October,

Jean-Francois Borny, Lummus Technology
Gulf Coast Conference
Technical Advisory Committee Chairperson

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BOOTH #411



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Keynote Speaker



Scott Fenwick

Technical Director
Clean Fuels Alliance America

Understanding the Changing Fuels Landscape

Tuesday, October 10th

10:00 AM - 11:00 AM

Exhibit Hall A4

Scott is the Technical Director for Clean Fuels Alliance America, the trade association representing biodiesel, renewable diesel, and sustainable aviation fuel stakeholders within North America. Scott leads the advancement of core member services for technical, quality assurance and operations support issues. He provides key support for technical aspects needed by renewable fuel stakeholders to effectively position the industry, educates key decision makers, and helps build industry credibility; along with overseeing the BQ-9000 quality programs. In addition to coordinating the OEM and fuel quality programs, he also provides leadership for the ASTM standards' efforts for fuels and lubricants, and coordination of other international fuel activities as Chairman of the ASTM D02 Committee, while also serving on their Board of Directors.



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- LED Lighting Scheme Based on Operating Condition



	TUESDAY'S PRESENTATIONS (By Time)	Start	Room
128	New Revolutionary Process GC with Capillary Chromatography	08:00 AM	Daffodil
173	Converting 8355 SCD Carrier Gas from Helium to Hydrogen	08:00 AM	Floral Hall A1
222	Pyrolysis Oil: Analysis of Halogens, Sulfur, Nitrogen and Carbon	08:00 AM	Rose
137	Pushing boundaries: How magnetic resonance mass spectrometry and petroleomics tools are changing the petrochemical landscape?	08:15 AM	Bluebonnet
160	Analysis of plastic waste pyrolysis oil (PWPO) and renewable fuels	08:15 AM	Wisteria
133	Optimizing Gas Chromatography	08:30 AM	Daffodil
154	A Technical Exploration of SCD - Sensitivity, Linearity, and Equimolarity	08:30 AM	Floral Hall A1
126	Monitoring Total Organic Carbon (TOC) and Volatile Organic Carbon (VOC) in Refinery Wastewater	08:30 AM	Iris
226	A review of FT-NIR analyzers as applied in Refinery for both laboratory and process measurement	08:30 AM	Rose
236	How to Prevent and Solve the Most Common Problems in ICP-OES and ICPMS Analyses	09:00 AM	Bluebonnet
145	Analyzing Recycled Polymers using Pyrolysis-GC/MS	09:00 AM	Daffodil
152	Agilent 8355 Sulfur Chemiluminescence Detector Best Practices	09:00 AM	Floral Hall A1
249	GC Carrier Gases: Finding the best option for your lab	09:00 AM	Floral Hall A2
258	FTIR/Raman Theory and Sample Handling	09:00 AM	Hibiscus
144	Development of a Pyrolysis Gas Chromatography Mass Spectrometry (py-GCMS) Technique for Total Organic Fluorine Measurements.	09:00 AM	Iris
209	Good Karl Fischer Titration Practice & Chemistry	09:00 AM	Wisteria
165	ASTM Crude Oil Proficiency Testing Program: ICP (D5708B) vs. XRF (D8252) for Ni and V	09:15 AM	Rose
162	Detailed chemical characterisation of pyrolysis oils from mixed plastic waste using GC×GC–TOF MS	09:20 AM	Daffodil
253	Improved Fuel Cell Analysis using the Shimadzu Barrier discharge Ionization Detector (BID)	09:30 AM	Floral Hall A2
191	Ambient Air Monitoring for Environmental, Health, and Safety Using Mass Spectrometry	09:30 AM	Iris
212	Good Titration Practice Petrochemical Industry	09:30 AM	Wisteria
217	A comparison of measuring organic chlorides by combustion coupled with microcolourimetry and combustion coupled with Ion Chromatogra *KEYNOTE SPEAKER*	09:35 AM	Rose
101	Understanding the Changing Fuels Landscape	10:00 AM	Exhibit Hall A4
245	Maintaining and Troubleshooting the TOC-L	11:00 AM	Floral Hall A2
243	FTIR and Raman Microscopy: Techniques and Applications	11:00 AM	Hibiscus
166	Moisture Analysis Reimagined: Instant NIR Measurements for Quality Control & Process Upgrades	11:00 AM	Tulip

TUESDAY'S PRESENTATIONS (By Time)		Start	Room
244	Instrumental Analysis of Total Nitrogen Content in Aqueous Samples using the Shimadzu TOC-L/TOC-4200 with Total Nitrogen Module	11:30 AM	Floral Hall A2
136	FTIR spectroscopy for in-service lubricant analysis	11:45 AM	Hibiscus
138	Portable Fuel Property Analyzer	12:30 PM	Bluebonnet
206	PFAS – An affair of the forever kind	12:30 PM	Iris
230	Finding the Money in Fuels Blending	12:30 PM	Rose
159	Save Time and Increase Throughput with Rapid Small Scale Oxidation Testing	12:45 PM	Wisteria
147	Integrating Real Time Property Measurements to LP, Advanced Process Control, and Real Time Optimization, Yields Invaluable Returns	12:55 PM	Bluebonnet
102	Monitoring Water Scale-Biofilm Potentials of Legionella pneumophila via Advanced Spectrometer	12:55 PM	Iris
200	On-Demand Carrier Gas Selection: Agilent GC and Method Configuration to Allow Carrier Gas Selection and Control	01:00 PM	Daffodil
247	Shimadzu's Analytical Solutions for the Hydrocarbon Processing Industry and Customer Case Studies	01:00 PM	Floral Hall A2
140	Practical Techniques for Infrared Spectral Interpretation	01:00 PM	Hibiscus
169	Keep it Simple: Useful Techniques for Accurate & Reliable Karl Fischer Analysis	01:00 PM	Tulip
232	Analysis of Silicon and Metals in Pyrolysis Oil	01:15 PM	Rose
235	Understanding the Role of Expansion-Type Vapor Pressure Methods in Gasoline Production and Certification	01:15 PM	Wisteria
210	Characterization and Quantitative Hydrocarbon Group-Type Analysis of Plastic-Derived Pyrolysis Oils by GCxGC-TOFMS/FID	01:30 PM	Daffodil
150	Analysis of Trace Permanent Gas Impurities in Fuel Cell Hydrogen by GC/PDHID	01:30 PM	Floral Hall A1
251	Trace Sulfur Analysis in Hydrogen Fuel using the Shimadzu SCD-2030	01:30 PM	Floral Hall A2
240	On-asset monitoring solution for Production Chemistry and Flow Assurance challenges	01:35 PM	Iris
189	Two New Systems for Sample Preparation: Automated Gravimetric Dilution and Automated Volumetric Preparation	01:40 PM	Bluebonnet
233	Determination of Aromatics, Saturates, and Olefins in Pyrolysis Oil Using Supercritical Fluid Chromatography and UV- Detection.	01:40 PM	Rose
211	Application of a Novel Reverse-Fill-Flush Modulator and Splitter for Simultaneous GCxGC-TOFMS/FID Analysis of Synthetic Aviation F	01:50 PM	Daffodil
155	GC Column Selection: Choosing the "Right" Column	02:00 PM	Floral Hall A1
250	Total Petroleum Hydrocarbons Analysis: Unveiling the Future with new Brevis GC-2050	02:00 PM	Floral Hall A2
237	A 'Total Workflow' Approach to Elemental Sample Prep For The Petrochemical Industry	02:00 PM	Rose
172	Standardized Test Methods Using Combustion Ion Chromatography for Petrochemical Analysis	02:00 PM	Tulip
220	A fully autonomous GC/FID system for the continuous monitoring of ambient air	02:00 PM	Wisteria
113	The Growing Importance of On-Site Clean Hydrogen and the Significance of On-Site Testing	02:05 PM	Iris

TUESDAY'S PRESENTATIONS (By Time)		Start	Room
201	Comparison of Sulfur Analysis with Total Sulfur Analysis (TSA) and Inductively Coupled Plasma (ICP)	02:10 PM	Bluebonnet
131	Omic Software Tutorial for IR/NIR/Raman Spectroscopy	02:10 PM	Hibiscus
241	Ongoing QC Testing with Sulfur Analysis in Performance-based Measurement Systems using Excimer UV Fluorescence	02:25 PM	Iris
205	Transforming Pollution into Potential: The Promise of Waste Plastic Pyrolysis Oil and Its Analytical Challenges	02:30 PM	Bluebonnet
242	Analysis of Formic Acid using the Brevis GC-2050 with Flame Ionization Detector and In-jet Methanizer	02:30 PM	Floral Hall A2
221	An automated, high-throughput approach for comprehensive analysis of biodiesel (B100) in compliance with EN and ASTM methods	02:30 PM	Wisteria
161	New Liquid Chromatography Test Method for Determination of Asphaltene Content in Crude Oil and Petroleum Products	02:45 PM	Floral Hall A1
171	Improved Corrosion Monitoring of Amines Using Ion Chromatography	02:45 PM	Tulip
117	Thermal Analysis of Polymers using a Multi-function Pyrolyzer with Gas Chromatography	02:50 PM	Wisteria
252	Incorporating ARC Jetanizer and Polyarc on the Shimadzu GC-2030 for Improved GC Analysis	03:00 PM	Floral Hall A2
246	Improved anions analysis – impact of newer technologies in older contaminants.	03:30 PM	Floral Hall A2
WEDNESDAY'S PRESENTATIONS (By Time)		Start	Room
216	Good HPLC Sample & Standard Preparation Practice with Manual, Automated and Robotic Solutions	08:00 AM	Bluebonnet
116	Using a LIMS to Streamline Your Quality Management System (QMS)	08:00 AM	Daffodil
148	Measuring Regulator Performance	08:00 AM	Iris
141	Determination of chloride and sulfate in saturated lithium carbonate and lithium hydroxide solutions	08:00 AM	Rose
107	A step-by-step analytical protocol for detecting and identifying minor differences in like materials and polymers Using Pyrolysis	08:00 AM	Wisteria
158	Unlocking Laboratory Productivity: Recent Advances in Wet Chemistry Automation for Industrial Process Water and Wastewater Testing	08:10 AM	Hibiscus
176	Digestion of Petroleum Samples for Element Analysis with ICP	08:20 AM	Rose
134	Structure Analysis of Unknown Compounds using GC/HR-TOFMS and a Predicted EI Mass Spectral Database Compiled by Machine Learning	08:20 AM	Wisteria
193	Practical Integration Strategies Between Your LIMS and Your Business Operations	08:25 AM	Daffodil
195	Analysis of Elemental Impurities in Polymer Products by XRF	08:30 AM	Bluebonnet
213	ASTM color measurements – APHA	08:40 AM	Hibiscus
190	Fast, Flexible Gas Analysis using Standalone Mass Spectrometers for R&D, Pilot Production, and Full-Scale Production	08:40 AM	Wisteria
229	Gain Command Over Non-Conformances with a CAPA Solution Seamlessly Integrated with Your LIMS and SQC Software	08:45 AM	Iris
219	Applications of Ion Chromatography for the analysis of Anionic Contaminants in Brines, Solvents and Bases	08:50 AM	Rose
196	Fast and Reliable Nickel and Vanadium Monitoring in Refinery Processes by XRF Spectrometry.	08:55 AM	Bluebonnet

	WEDNESDAY'S PRESENTATIONS (By Time)	Start	Room
192	Convert Your Lab Bench Into an Electronic Workspace	08:55 AM	Daffodil
149	Pushing Your ICP-MS to Lower Limits on Light and Middle Distillates	09:00 AM	Floral Hall A1
188	Lube Oil Monitoring via Raman Spectroscopy	09:10 AM	Hibiscus
194	Evaluation of Different Chromatographic Mass Spectrometer Detection Methods for Diagnosing Oil Production	09:10 AM	Wisteria
228	Simplifying Laboratory Statistical Quality Control With QC/EZ™	09:15 AM	Iris
184	Increasing Productivity Using Automatic Single Sample Handling for Density and Viscosity	09:20 AM	Bluebonnet
156	Optimizing Analysis of Oils and Organic Solvents by Smart ICP-OES	09:30 AM	Floral Hall A1
238	Comparison of Diesel Samples Measured by Using GCxGC-HRTOFMS	09:30 AM	Wisteria
132	Streamlining the Use of AI/Machine Learning in the Chemical Industry: Chemometrics	09:35 AM	Hibiscus
215	Prediction of Gas Phase Vacuum Ultraviolet Spectra using Machine Learning.	09:40 AM	Daffodil
157	Optimizing Your Karl Fischer Titration for Refining and Petrochemical Samples	09:45 AM	Iris
178	Increase Accuracy and Efficiency with Multiparameter Measurements	09:50 AM	Bluebonnet
142	Rapid compositional analysis of Natural Gas at wellhead sites using a mobile Raman Analyzer	10:05 AM	Hibiscus
197	Analysis of plastic waste pyrolysis oils via two-dimensional supercritical fluid chromatography and gas chromatography - VUV/MS	10:10 AM	Daffodil
153	Direct Elemental Analysis of Gasoline using the Agilent ICP-OES and IsoMist Temperature Controlled Spray Chamber	10:15 AM	Floral Hall A1
186	Increasing Density and Viscosity Throughput with Difficult Samples	10:20 AM	Bluebonnet
231	How Effective Management of Instrument SQC and Out of Control Events can drive New Instrument Purchase Justification	10:25 AM	Iris
254	Analysis of Hydrocarbons in Waste Plastic Process Oils using ASTM D8519	10:30 AM	Daffodil
198	Remodelling FFA and Magnesium after Feedstock Change	10:30 AM	Hibiscus
170	Comprehensive Karl Fischer Analysis of Petroleum Products	10:30 AM	Tulip
151	Ten Ways to Streamline Your Workflow with OpenLab CDS	10:45 AM	Floral Hall A1
224	How to utilize X-ray Fluorescence for accurate inorganic quantitative and semi-quantitative analysis for industrial applications	10:50 AM	Bluebonnet
255	Analysis of EPA-Monitored Volatile Organic Compounds using GC-LUMA	10:50 AM	Daffodil
130	Use of Quant Region Adjustment and "Picket fencing" to reduce interference for quantifying trace analytes in FTIR	11:00 AM	Hibiscus
256	Application of GCVUV Techniques to Petroleum Specifications and Regulations	11:10 AM	Daffodil
214	The ASTM Advantage Tools and Resources to Maximize Your Competitive Advantage in the Laboratory	12:30 PM	Rose
108	The Pyrolysis Workshop	12:30 PM	Wisteria
179	D86 Distillation Optimization: What does it mean and how does it affect results?	01:00 PM	Bluebonnet
257	Pyrolysis Oil – The Good, The Bad, The Ugly	01:00 PM	Daffodil

WEDNESDAY'S PRESENTATIONS (By Time)

		Start	Room
129	Analysis of Trace Impurities in Hydrogen Using Optically Enhanced Fourier Transform Infrared Spectroscopy	01:00 PM	Hibiscus
218	Screening for PFAS in Water by Determining Adsorbable Organic Fluorine (AOF) using Combustion Ion Chromatography (CIC)	01:15 PM	Floral Hall A1
143	Breakthroughs in Material Compatibility of Inert Coatings for Sampling and Analytical Systems	01:15 PM	Rose
260	Water in Denatured Fuel Ethanol and Ethanol Blended Gasoline by GC-VUV	01:20 PM	Daffodil
125	Is There Life Beyond the Bench?	01:25 PM	Iris
199	ASTM D1159 Bromine Number – Proposed Back Titration	01:30 PM	Bluebonnet
177	Automating Petroleum Wax Penetration Testing	01:35 PM	Rose
261	Gasoline Compositional Analysis for Particulate Matter Index	01:40 PM	Daffodil
225	High-throughput analysis of PFAS in ambient air using TD-GC-MS/MS	02:00 PM	Floral Hall A1
167	Spectroscopy in Petrochemicals: Elevating Quality, Boosting Efficiency, and Driving Profits	02:00 PM	Tulip
180	Improved Productivity with Automated Flashpoint	02:05 PM	Rose
174	Introduction to Combustion Ion Chromatography: Key Concepts and Applications for Corrosion Monitoring	02:30 PM	Tulip
185	Move beyond D445 with the Simplicity of D7042	02:35 PM	Rose
135	Summary of Non-Targeted Workflow for Testing Environmental Samples for Over 10,000 PFAS Compounds at Once	02:45 PM	Floral Hall A1
175	Measuring Corrosion Inhibitors in Oil Pipelines and Refineries	03:30 PM	Tulip

THURSDAY CLASS (By Time)

		Start	Room
114	Basic Analytical Chemistry - Bridging the gap between chemists and engineers	09:00 AM	Ivy 2

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TUESDAY TOPICS & SEMINARS

Agilent Seminar

Floral Hall A1

173	Converting 8355 SCD Carrier Gas from Helium to Hydrogen	08:00 AM	08:30 AM
154	A Technical Exploration of SCD - Sensitivity, Linearity, and Equimolarity	08:30 AM	09:00 AM
152	Agilent 8355 Sulfur Chemiluminescence Detector Best Practices	09:00 AM	09:45 AM
150	Analysis of Trace Permanent Gas Impurities in Fuel Cell Hydrogen by GC/PDHID	01:30 PM	02:00 PM
155	GC Column Selection: Choosing the "Right" Column	02:00 PM	02:45 PM
161	New Liquid Chromatography Test Method for Determination of Asphaltene Content in Crude Oil and Petroleum Products	02:45 PM	03:30 PM

Metrohm Seminar

Tulip

166	Moisture Analysis Reimagined: Instant NIR Measurements for Quality Control & Process Upgrades	11:00 AM	11:45 AM
169	Keep it Simple: Useful Techniques for Accurate & Reliable Karl Fischer Analysis Standardized Test Methods Using Combustion Ion Chromatography for Petrochemical Analysis	01:00 PM	01:45 PM
172	Improved Corrosion Monitoring of Amines Using Ion Chromatography	02:00 PM	02:45 PM
171		02:45 PM	03:15 PM

Shimadzu Scientific Seminar

Floral Hall A2

249	GC Carrier Gases: Finding the best option for your lab	09:00 AM	09:30 AM
253	Improved Fuel Cell Analysis using the Shimadzu Barrier discharge Ionization Detector (BID)	09:30 AM	10:00 AM
245	Maintaining and Troubleshooting the TOC-L	11:00 AM	11:30 AM
244	Instrumental Analysis of Total Nitrogen Content in Aqueous Samples using the Shimadzu TOC-L/TOC-4200 with Total Nitrogen Module	11:30 AM	12:00 PM
247	Shimadzu's Analytical Solutions for the Hydrocarbon Processing Industry and Customer Case Studies	01:00 PM	01:30 PM
251	Trace Sulfur Analysis in Hydrogen Fuel using the Shimadzu SCD-2030	01:30 PM	02:00 PM
250	Total Petroleum Hydrocarbons Analysis: Unveiling the Future with new Brevis GC-2050	02:00 PM	02:30 PM
242	Analysis of Formic Acid using the Brevis GC-2050 with Flame Ionization Detector and In-jet Methanizer	02:30 PM	03:00 PM
252	Incorporating ARC Jetanizer and Polyarc on the Shimadzu GC-2030 for Improved GC Analysis	03:00 PM	03:30 PM
246	Improved anions analysis – impact of newer technologies in older contaminants.	03:30 PM	04:00 PM

ThermoFisher Scientific Seminar

Hibiscus

258	FTIR/Raman Theory and Sample Handling	09:00 AM	10:00 AM
243	FTIR and Raman Microscopy: Techniques and Applications	11:00 AM	11:45 AM
136	FTIR spectroscopy for in-service lubricant analysis	11:45 AM	12:05 PM
140	Practical Techniques for Infrared Spectral Interpretation	01:00 PM	02:00 PM
131	Omnic Software Tutorial for IR/NIR/Raman Spectroscopy	02:10 PM	03:10 PM

Applications - Petroleum

		Bluebonnet	
137	Pushing boundaries: How magnetic resonance mass spectrometry and petroleomics tools are changing the petrochemical landscape?	08:15 AM	09:00 AM
236	How to Prevent and Solve the Most Common Problems in ICP-OES and ICPMS Analyses	09:00 AM	10:00 AM
138	Portable Fuel Property Analyzer	12:30 PM	12:55 PM
147	Integrating Real Time Property Measurements to LP, Advanced Process Control, and Real Time Optimization, Yields Invaluable Returns	12:55 PM	01:40 PM
189	Two New Systems for Sample Preparation: Automated Gravimetric Dilution and Automated Volumetric Preparation	01:40 PM	02:10 PM
201	Comparison of Sulfur Analysis with Total Sulfur Analysis (TSA) and Inductively Coupled Plasma (ICP)	02:10 PM	02:30 PM
205	Transforming Pollution into Potential: The Promise of Waste Plastic Pyrolysis Oil and Its Analytical Challenges	02:30 PM	02:55 PM

Applications - Petroleum

		Rose	
222	Pyrolysis Oil: Analysis of Halogens, Sulfur, Nitrogen and Carbon	08:00 AM	08:30 AM
226	A review of FT-NIR analyzers as applied in Refinery for both laboratory and process measurement	08:30 AM	09:15 AM
165	ASTM Crude Oil Proficiency Testing Program: ICP (D5708B) vs. XRF (D8252) for Ni and V	09:15 AM	09:35 AM
217	A comparison of measuring organic chlorides by combustion coupled with microcoloumetry and combustion coupled with Ion Chromatogra	09:35 AM	09:55 AM
230	Finding the Money in Fuels Blending	12:30 PM	01:15 PM
232	Analysis of Silicon and Metals in Pyrolysis Oil	01:15 PM	01:40 PM
233	Determination of Aromatics, Saturates, and Olefins in Pyrolysis Oil Using Supercritical Fluid Chromatography and UV- Detection.	01:40 PM	02:00 PM
237	A 'Total Workflow' Approach to Elemental Sample Prep For The Petrochemical Industry	02:00 PM	02:45 PM

Applications - Petroleum

		Wisteria	
160	Analysis of plastic waste pyrolysis oil (PWPO) and renewable fuels	08:15 AM	09:00 AM
209	Good Karl Fischer Titration Practice & Chemistry	09:00 AM	09:30 AM
212	Good Titration Practice Petrochemical Industry	09:30 AM	10:00 AM
159	Save Time and Increase Throughput with Rapid Small Scale Oxidation Testing	12:45 PM	01:15 PM
235	Understanding the Role of Expansion-Type Vapor Pressure Methods in Gasoline Production and Certification	01:15 PM	02:00 PM

Chromatography - Gas Chromatography

		Daffodil	
128	New Revolutionary Process GC with Capillary Chromatography	08:00 AM	08:30 AM
133	Optimizing Gas Chromatography	08:30 AM	09:00 AM
145	Analyzing Recycled Polymers using Pyrolysis-GC/MS	09:00 AM	09:20 AM
162	Detailed chemical characterisation of pyrolysis oils from mixed plastic waste using GC×GC–TOF MS	09:20 AM	09:40 AM
200	On-Demand Carrier Gas Selection: Agilent GC and Method Configuration to Allow Carrier Gas Selection and Control	01:00 PM	01:30 PM

210	Characterization and Quantitative Hydrocarbon Group-Type Analysis of Plastic-Derived Pyrolysis Oils by GCxGC-TOFMS/FID	01:30 PM	01:50 PM
211	Application of a Novel Reverse-Fill-Flush Modulator and Splitter for Simultaneous GCxGC-TOFMS/FID Analysis of Synthetic Aviation F	01:50 PM	02:10 PM

Chromatography - Gas Chromatography

		Wisteria	
220	A fully autonomous GC/FID system for the continuous monitoring of ambient air	02:00 PM	02:30 PM
221	An automated, high-throughput approach for comprehensive analysis of biodiesel (B100) in compliance with EN and ASTM methods	02:30 PM	02:50 PM
117	Thermal Analysis of Polymers using a Multi-function Pyrolyzer with Gas Chromatography	02:50 PM	03:35 PM

Applications - Environmental

		Iris	
126	Monitoring Total Organic Carbon (TOC) and Volatile Organic Carbon (VOC) in Refinery Wastewater	08:30 AM	09:00 AM
144	Development of a Pyrolysis Gas Chromatography Mass Spectrometry (py-GCMS) Technique for Total Organic Fluorine Measurements.	09:00 AM	09:30 AM
191	Ambient Air Monitoring for Environmental, Health, and Safety Using Mass Spectrometry	09:30 AM	10:00 AM
206	PFAS – An affair of the forever kind	12:30 PM	12:55 PM

Applications - Field Analysis

		Iris	
102	Monitoring Water Scale-Biofilm Potentials of Legionella pneumophila via Advanced Spectrometer	12:55 PM	01:35 PM
240	On-asset monitoring solution for Production Chemistry and Flow Assurance challenges	01:35 PM	02:05 PM

Applications - Regulations

		Iris	
113	The Growing Importance of On-Site Clean Hydrogen and the Significance of On-Site Testing	02:05 PM	02:25 PM
241	Ongoing QC Testing with Sulfur Analysis in Performance-based Measurement Systems using Excimer UV Fluorescence	02:25 PM	02:50 PM

WEDNESDAY TOPICS & SEMINARS

Agilent Seminar

		Floral Hall A1	
156	Optimizing Analysis of Oils and Organic Solvents by Smart ICP-OES	09:30 AM	10:00 AM
153	Direct Elemental Analysis of Gasoline using the Agilent ICP-OES and IsoMist	10:15 AM	10:45 AM
151	Temperature Controlled Spray Chamber	10:45 AM	11:30 AM
	Ten Ways to Streamline Your Workflow with OpenLab CDS		

Metrohm Seminar

Tulip

170	Comprehensive Karl Fischer Analysis of Petroleum Products	10:30 AM	12:00 PM
167	Spectroscopy in Petrochemicals: Elevating Quality, Boosting Efficiency, and Driving Profits	02:00 PM	02:30 PM
174	Introduction to Combustion Ion Chromatography: Key Concepts and Applications for Corrosion Monitoring	02:30 PM	03:30 PM
175	Measuring Corrosion Inhibitors in Oil Pipelines and Refineries	03:30 PM	04:00 PM

Thermo Fisher Seminar

Floral Hall A1

Analyzing PFAS/PFOS - Screening, Target Quantitation and Unknown Identification - Getting in Front of the Issue

Our seminar will discuss three areas where our scientists and analytical chemists are working to provide the necessary solutions to support both environmental and industrial efforts. We will explore solutions for rapid screening, targeted analysis of airborne contaminants, and non-target (unknown) analysis and quantitation by LC-MS(HRAM). Following the talks there will be a panel discussion and Q&A session with our experts to discuss in more detail your specific issues and questions.

Our goal is to share our latest work to help you get ahead of this rapidly growing issue.

218	Screening for PFAS in Water by Determining Adsorbable Organic Fluorine (AOF) using Combustion Ion Chromatography (CIC)	01:15 PM	02:00 PM
225	High-throughput analysis of PFAS in ambient air using TD-GC-MS/MS	02:00 PM	02:45 PM
135	Summary of Non-Targeted Workflow for Testing Environmental Samples for Over 10,000 PFAS Compounds at Once	02:45 PM	03:30 PM

VUV Analytics Seminar Chromatography - Gas Chromatography

Daffodil

215	Prediction of Gas Phase Vacuum Ultraviolet Spectra using Machine Learning.	09:40 AM	10:10 AM
197	Analysis of plastic waste pyrolysis oils via two-dimensional supercritical fluid chromatography and gas chromatography - VUV/MS	10:10 AM	10:30 AM
254	Analysis of Hydrocarbons in Waste Plastic Process Oils using ASTM D8519	10:30 AM	10:50 AM
255	Analysis of EPA-Monitored Volatile Organic Compounds using GC-LUMA	10:50 AM	11:10 AM
256	Application of GCVUV Techniques to Petroleum Specifications and Regulations	11:10 AM	11:35 AM
257	Pyrolysis Oil – The Good, The Bad, The Ugly	01:00 PM	01:20 PM
260	Water in Denatured Fuel Ethanol and Ethanol Blended Gasoline by GC-VUV	01:20 PM	01:40 PM
261	Gasoline Compositional Analysis for Particulate Matter Index	01:40 PM	02:00 PM

Physical Measurements

Bluebonnet

184	Increasing Productivity Using Automatic Single Sample Handling for Density and Viscosity	09:20 AM	09:50 AM
178	Increase Accuracy and Efficiency with Multiparameter Measurements	09:50 AM	10:20 AM
186	Increasing Density and Viscosity Throughput with Difficult Samples	10:20 AM	10:50 AM
179	D86 Distillation Optimization: What does it mean and how does it affect results?	01:00 PM	01:30 PM
199	ASTM D1159 Bromine Number – Proposed Back Titration	01:30 PM	02:30 PM

Informatics - LIMS/Software

		Daffodil	
116	Using a LIMS to Streamline Your Quality Management System (QMS)	08:00 AM	08:25 AM
193	Practical Integration Strategies Between Your LIMS and Your Business Operations	08:25 AM	08:55 AM
192	Convert Your Lab Bench Into an Electronic Workspace	08:55 AM	09:25 AM

Spectroscopy

		Bluebonnet	
195	Analysis of Elemental Impurities in Polymer Products by XRF	08:30 AM	08:55 AM
196	Fast and Reliable Nickel and Vanadium Monitoring in Refinery Processes by XRF Spectrometry.	08:55 AM	09:20 AM
224	How to utilize X-ray Fluorescence for accurate inorganic quantitative and semi-quantitative analysis for industrial applications	10:50 AM	11:40 AM

Spectroscopy

		Hibiscus	
158	Unlocking Laboratory Productivity: Recent Advances in Wet Chemistry Automation for Industrial Process Water and Wastewater Testing	08:10 AM	08:40 AM
213	ASTM color measurements – APHA	08:40 AM	09:10 AM
188	Lube Oil Monitoring via Raman Spectroscopy	09:10 AM	09:35 AM
132	Streamlining the Use of AI/Machine Learning in the Chemical Industry: Chemometrics	09:35 AM	10:05 AM
142	Rapid compositional analysis of Natural Gas at wellhead sites using a mobile Raman Analyzer	10:05 AM	10:30 AM
198	Remodelling FFA and Magnesium after Feedstock Change	10:30 AM	11:00 AM
130	Use of Quant Region Adjustment and “Picket fencing” to reduce interference for quantifying trace analytes in FTIR	11:00 AM	12:00 PM
129	Analysis of Trace Impurities in Hydrogen Using Optically Enhanced Fourier Transform Infrared Spectroscopy	01:00 PM	02:00 PM

Quality Control

		Iris	
148	Measuring Regulator Performance	08:00 AM	08:45 AM
229	Gain Command Over Non-Conformances with a CAPA Solution Seamlessly Integrated with Your LIMS and SQC Software	08:45 AM	09:15 AM
228	Simplifying Laboratory Statistical Quality Control With QC/EZ™	09:15 AM	09:45 AM
157	Optimizing Your Karl Fischer Titration for Refining and Petrochemical Samples	09:45 AM	10:25 AM
231	How Effective Management of Instrument SQC and Out of Control Events can drive New Instrument Purchase Justification	10:25 AM	11:10 AM

Chromatography - Liquid Chromatography

		Rose	
141	Determination of chloride and sulfate in saturated lithium carbonate and lithium hydroxide solutions	08:00 AM	08:20 AM
176	Digestion of Petroleum Samples for Element Analysis with ICP	08:20 AM	08:50 AM
219	Applications of Ion Chromatography for the analysis of Anionic Contaminants in Brines, Solvents and Bases	08:50 AM	09:50 AM

Laboratory Functions - Lab Business

Rose

214	The ASTM Advantage Tools and Resources to Maximize Your Competitive Advantage in the Laboratory	12:30 PM	01:15 PM
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Other

Bluebonnet

216	Good HPLC Sample & Standard Preparation Practice with Manual, Automated and Robotic Solutions	08:00 AM	08:30 AM
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125	Is There Life Beyond the Bench?	Iris 01:25 PM	02:05 PM
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Rose

143	Breakthroughs in Material Compatibility of Inert Coatings for Sampling and Analytical Systems	01:15 PM	01:35 PM
177	Automating Petroleum Wax Penetration Testing	01:35 PM	02:05 PM
180	Improved Productivity with Automated Flashpoint	02:05 PM	02:35 PM
185	Move beyond D445 with the Simplicity of D7042	02:35 PM	03:05 PM

Chromatography - Mass Spectrometry

Wisteria

107	A step-by-step analytical protocol for detecting and identifying minor differences in like materials and polymers Using Pyrolysis	08:00 AM	08:20 AM
134	Structure Analysis of Unknown Compounds using GC/HR-TOFMS and a Predicted EI Mass Spectral Database Compiled by Machine Learning	08:20 AM	08:40 AM
190	Fast, Flexible Gas Analysis using Standalone Mass Spectrometers for R&D, Pilot Production, and Full-Scale Production	08:40 AM	09:10 AM
194	Evaluation of Different Chromatographic Mass Spectrometer Detection Methods for Diagnosing Oil Production	09:10 AM	09:30 AM
238	Comparison of Diesel Samples Measured by Using GCxGC-HRTOFMS	09:30 AM	09:50 AM
108	The Pyrolysis Workshop	12:30 PM	02:30 PM

THURSDAY TOPICS

Other

Ivy 2

114	Basic Analytical Chemistry - Bridging the gap between chemists and engineers	9:00 AM	4:00 PM
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Need rapid elemental analysis of sulfur, chlorine, metals, and more?

Visit Booth 102



Benchtop EDXRF & On-line Elemental Analyzers

Applied Rigaku Technologies engineers, manufactures, and distributes Rigaku energy dispersive X-ray fluorescence (EDXRF) products worldwide. We specialize in benchtop and on-line elemental analyzers serving upstream and midstream for in-field use and downstream for refineries and commercial labs.

EDXRF is a well-established technique for the petroleum and petrochemical industries — from quantifying heavy elements in crude oil to sulfur in fuels to various elements in lubricating oils. With multi-element analysis capabilities, Rigaku EDXRF products show versatility for many screening needs and comply with various testing methods and standards. [We hope you will join us at booth 102 to discuss your analytical needs!](#)

- Rapid, non-destructive multi-elemental analysis
- Offer compliance for multiple testing methods and standards
- Solutions for upstream, midstream, and downstream
- Designed for routine and complex applications
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Abstract# 100 - 10/9/2023 08:30 AM - 4:30 PM - Ivy 2

Understanding Test Method Precision, Bias, ILS Design, Statistical Quality Control Charts

Alex Lau - ASTM International

This seminar will present an overview on test method precision, bias, ILS design, and statistical control charts. ASTM repeatability, reproducibility, intermediate precision, and bias will be discussed, along with ASTM D6300 ILS design requirements to establish r , R , and critical success factors. Test method "in-statistical-control" concept will be discussed along with control chart work process and tools per ASTM D6299.

Abstract# 101 - 10/10/2023 10:00 AM - 11:00 AM - Exhibit Hall A4

KEYNOTE SPEAKER Understanding the Changing Fuels Landscape

Scott Fenwick - Clean Fuels Alliance America

Learn more about the driving forces behind renewable fuels and the impacts they will have moving forward for different market applications. National standards, regional regulations and specific decarbonization efforts will have a lasting affect in the global fuels marketplace beyond just the current administration.

Abstract# 102 - 10/10/2023 12:55 PM - 1:35 PM - Iris

Monitoring Water Scale-Biofilm Potentials of Legionella pneumophila via Advanced Spectrometer

L. Keith McLeroy - Ecolyse Labs

Analyzing the scaling/corrosivity chemistries of industrial process water systems (i.e.:cooling towers) is a key factor in confirming that preventive protocols are adequate and being sustained. As well as ensuring the health of employees maintaining and exposed to those systems. Water, having a scaling factor, can lead to mineral layer formation and corrosion pitting. Those layers and pits can become a breeding point for the bacterium Legionella pneumophila through the process of biofilm formation. EPA and Centers for Disease Control regulatory agencies are focused on reducing the risk of Legionella outbreaks from all sectors of industrial and manufacturing water use activities. The role of an advanced transportable spectrometer can provide onsite water chemistry results for the monitoring of various industrial and production water matrices. Having the capability of attaining accurate results on location can allow for improved decisions on potential water quality concerns and impart scale-biofilm awareness. This advanced spectrometer analyzes the chemistry constituents of scaling/corrosion and employs a pioneering software that calculates the Puckorius, Langelier and Ryznar Scale Indices, as well as water aggressive index (AI). This presentation will introduce the advanced spectrometer and describe how the final reports can be utilized for predicting and balancing water chemistry scaling tendencies in ultra-pure water treatment, wastewater processes, boilers, heat exchangers and cooling towers. Thus, aid in preventing biofilm formation that can possibly harbor Legionella pneumophila. Additionally, the spectrometer results can inhibit and predict scale/corrosion related problems that can become physically and monetarily detrimental to the water processes' infrastructure.

Abstract# 107 - 10/11/2023 08:00 AM - 8:20 AM - Wisteria

A step-by-step analytical protocol for detecting and identifying minor differences in like materials and polymers Using Pyrolysis

Athena Nguyen - Frontier Labs Americas, Rojin Belganeh - Frontier Lab Americas

The differences in the chemical composition of three polystyrene samples are revealed in this presentation providing a step-by-step analytical protocol for detecting and identifying minor differences in like materials and polymers. The technique used is, Pyrolysis-Gas chromatography/Mass spectroscopy, an easy solid sample introduction technique that expands the application areas of gas chromatography and mass spectrometry. The Multi-Mode Micro-furnace pyrolyzer is directly interfaced with the GC injector preventing any potential of cold spot, carryover, and cross-contamination. The multi-mode pyrolyzer with different modes of operations including Evolve gas analysis (EGA), Flash pyrolysis, Thermal desorption, and Heart-cutting can be operated in the same system. The method requires very little sample preparation. EGA is the first step that provides information about the thermal temperature behaviors of the sample. The following is the flash pyrolysis mode of operation in which the resulting pyrograms include volatiles, additives, and polymer information. By utilizing Thermal desorption (TD-

GC/MS), the additives compounds between the three samples show differences.

Abstract# 108 - 10/11/2023 12:30 PM - 2:30 PM - Wisteria

The Pyrolysis Workshop

Rojin Belganeh - Frontier Labs Americas, Athena Nguyen - Frontier Labs Americas

Pyrolysis performed correctly is a valuable and easy-to-use sample introduction technique for GC and GC/MS. It allows the user to characterize any solid or viscous organic materials that otherwise could not be analyzed by GC. Learn when to use Evolved Gas Analysis, Thermal Desorption, Heart-Cutting, or Pyrolysis; all with the same system. Potential, new, and existing users of Frontier Labs' Multi-functional Pyrolyzer products are encouraged to attend. No prior experience is needed

Abstract# 113 - 10/10/2023 02:05 PM - 2:25 PM - Iris

The Growing Importance of On-Site Clean Hydrogen and the Significance of On-Site Testing

Kristen Levin - Texas OilTech Laboratories

This white paper explores the increasing importance of on-site clean hydrogen production as a key component in the global transition to a sustainable energy future. As the world seeks to reduce greenhouse gas emissions and mitigate climate change, hydrogen has emerged as a promising clean energy carrier. On-site clean hydrogen production offers numerous advantages, including enhanced energy efficiency, reduced carbon footprint, and decreased dependency on fossil fuels. However, ensuring the purity and safety of on-site hydrogen production is crucial. This paper highlights the importance of on-site testing for hydrogen, discussing its role in verifying quality, addressing potential contaminants, ensuring operational safety, and promoting the widespread adoption of clean hydrogen technologies.

Abstract# 114 - 10/12/2023 09:00 AM - 4:00 PM - Ivy 2

Basic Analytical Chemistry - Bridging the gap between chemists and engineers

Jean-Francois Borny - BASIC

This course will include a complete tour of the analytical laboratory for the petroleum industry. We will discuss many analytical instruments and their basic function and technology. This will include GCs, ICP, ICP-MS, XRD, XRF, elemental analyzers, titrators and more. This course will also bridge the gap that some chemist experience while discussing the engineer needs including reading P&ID, block flow diagram, online analyzers, sampling, and sampling system. And finally, we will discuss the different standardized methodologies including ASTM, UOP, IFF, GPA methods and dive into QA/QC including repeatability and reproducibility. The course will be heavily supported by real world examples and as an open forum for questions and answers throughout the day.

The Fee for this course is \$150.00 & includes lunch, please register at Register To Attend and select Registration Type + Thursday Session from the drop down.

Abstract# 116 - 10/11/2023 08:00 AM - 8:25 AM - Daffodil

Using a LIMS to Streamline Your Quality Management System (QMS)

Steve Wesson - Accelerated Technology Laboratories

For most laboratories, the Quality Management System (QMS) creates efficient processes, helps to meet regulatory and quality program requirements, and ensures customer satisfaction. A modern LIMS should be the backbone of a laboratory's QMS. This presentation will focus on how to optimize the use of a LIMS to support the organization's QMS and will cover the following: ISO 17025 and TNI requirements: Using these quality standards with LIMS to ensure QMS success Key organizational benefits from LIMS and QMS alignment How your QMS and document handling can be affected by using a LIMS

Abstract# 117 - 10/10/2023 02:50 PM - 3:35 PM - Wisteria

Thermal Analysis of Polymers using a Multi-function Pyrolyzer with Gas Chromatography

Karen Sam - CDS Analytical

With complex non-volatile organic material analysis, gas chromatography (GC-) may not be the obvious choice, until the analyst adds pyrolyzer. Additionally, a pyrolyzer which is versatile in thermal introduction techniques can further increase GC-MS functionality. This training course will discuss the use of a pyrolyzer as a thermal sample introduction instrument with GC-MS to increase analytical throughput. Learn about the capability of the instrument under various configurations, using specific case studies as examples. These case studies include quantification of residual monomer or oligomer in a polymer, competitive and failure analysis of finished products, and accelerated photodegradation studies of rubber. Capabilities include evolved gas analysis, flash pyrolysis, multi-step pyrolysis, thermal desorption, dynamic headspace, reactant gas pyrolysis, catalysis, multi-ramp for VOC focusing, and photochemistry.

Abstract# 125 - 10/11/2023 01:25 PM - 2:05 PM - Iris

Is There Life Beyond the Bench?

Gretchen McAuliffe - Labtopia

Are you looking for a future beyond the bench? Do you have experience in wet chemistry, inorganics (metals), and organics? Do you love chemistry and instrumentation, but also traveling and working from home? In this seminar we will discuss career options for individuals with technical laboratory backgrounds. As an experienced consultant, the presenter is often asked for advice on how to make the transition from the laboratory bench to potential careers in consulting and/or assessment. Attendees will be provided with a roadmap that addresses the practical aspects of launching a consulting career, including degree requirements, necessary skills (instrumentation, writing, interpersonal) and experience, and training requirements. We will also examine the pros and cons of venturing out on your own, with a more specific focus on working for consulting organizations and conducting third-party assessments.

Abstract# 126 - 10/10/2023 08:30 AM - 9:00 AM - Iris

Monitoring Total Organic Carbon (TOC) and Volatile Organic Carbon (VOC) in Refinery Wastewater

Sara Speak - Veolia WTS Analytical Instruments

Refineries consume up to 9-12 gallons of water to one barrel of oil and generate a large amount of wastewater drawn from tank bottom draws to rejected boiler streams and sour water stripping among others. Treating influent wastewater is critical to compliance with local and federal regulations but monitoring effluent is also important to determine the effectiveness of the treatment process. Wastewater is inherently complex, but with refineries, wastewater contains numerous organic and volatile compounds. This session discusses how continuous monitoring of TOC and VOC in refinery wastewater can benefit refineries by ensuring effective treatment and compliance.

Abstract# 128 - 10/10/2023 08:00 AM - 8:30 AM - Daffodil

New Revolutionary Process GC with Capillary Chromatography

John Wasson - Wasson-ECE Instrumentation, Inc.

Chemical processing plants around the world have complex streams that require complex analyses. Another challenge is obtaining real-time, high-quality data about the streams. It is important to the plant's profitability to know the quality of the product that is flowing through their process unit at any given moment. Process gas chromatographs (PGCs) can provide many plants with some of this critical on-line data, but too often plants must also rely on laboratory GC analysis as backups or quality checks to the PGCs. This is because the laboratory GC analysis provides data on more components at higher resolution and higher sensitivity. In other cases, the information that a plant needs can only be achieved by laboratory GC analysis since limitations in technology prevent the analysis from being performed on a PGC at all. What's needed is a PGC that can provide repeatable capillary chromatography with pressure programming and temperature-programmable ovens. It also needs to be built to ATEX specifications so that it can be installed in hazardous rated areas. Wasson-ECE's Eclipse (FID/TCD/PDHD), Neutrino (MSD), and E-VUV (VUV detector) PGCs provide such a solution [1] [2] [3]. These PGCs use convection ovens with precise controls as well as electronic pressure and flow programming to drive the performance and resolving power of capillary

column chromatography. The precision of the temperature and electronic pressure controls was proven to demonstrate highly reproducible retention times and peak areas, results rivaling those obtained on laboratory GCs. Furthermore, an extremely broad range of analytes can be detected because of the detectors that these PGCs offer, most notably the MSD. The Eclipse, Neutrino, and E-VUV PGCs provide single analyzer solutions that deliver results for a diverse range of analytes which would typically require several traditional PGCs and the shelter space to house them.

Abstract# 129 - 10/11/2023 01:00 PM - 2:00 PM - Hibiscus

Analysis of Trace Impurities in Hydrogen Using Optically Enhanced Fourier Transform Infrared Spectroscopy

Brian Barnes - ThermoFisher Scientific

Hydrogen is a cheap, widely available gas that is of critical importance to many industries, especially the petrochemical industry. In the petrochemical industry, it is used as a feedstock in hydrocracking and hydrotreating processes, as well as for control of BTU for fuel and flare gases. Although hydrogen itself cannot be detected by FTIR, trace impurities in hydrogen gas can affect the purity, act as catalyst poisons, or effect the performance of the process. Optically Enhanced FTIR can be used to identify and quantify these impurities down to the low ppb level depending upon the application. This presentation will highlight the use of OE-FTIR for trace analysis of impurities in hydrogen for several applications, including synthesis gas, or syngas, in which hydrogen is a major component.

Abstract# 130 - 10/11/2023 11:00 AM - 12:00 PM - Hibiscus

Use of Quant Region Adjustment and "Picket fencing" to reduce interference for quantifying trace analytes in FTIR

Brian Barnes - ThermoFisher Scientific

FTIR is an excellent technique for quantifying trace analytes in various samples such as plant air, bulk gases, and process gases. A limitation of FTIR is that there is often too much interference from the sample matrix or other sample analytes present that the target trace analytes cannot be accurately quantified. Software for FTIR can allow the user to adjust the quant regions of any analyte in the FTIR spectra. In some cases, the software also allows the user to select which areas of the quant region will be included in the quantification based on the interference with the target analyte. This process is known as "picket fencing" and is a very useful tool for accurately quantifying target, and/or, trace analytes. The presentation will cover these processes, as well as their benefits and limitations, with the software platform.

Abstract# 131 - 10/10/2023 02:10 PM - 3:10 PM - Hibiscus

Omnisc Software Tutorial for IR/NIR/Raman Spectroscopy

Cam Macisaac - ThermoFisher Scientific

This workshop will cover Omnic software, the popular platform for running Thermo Fisher FT-IR, FT-NIR, and Raman spectrometers. A live software demonstration will be given to highlight features of Omnic, which will include collection of data from a working spectrometer. A live demonstration of TQ software will be given illustrating FTIR, FT-NIR and Raman quantitative and qualitative methods. Suggestions will be given on how to diagnose chemometric methods to ensure they accurately predict. Some pitfalls will be covered to avoid improperly modeled methods. In addition, an overview of Macros/Basic automated workflow software will be given. This software is designed to build pre-program quantitative predictions. The Macros language can also automate many other software functions, like basic kinetic routines.

Abstract# 132 - 10/11/2023 09:35 AM - 10:05 AM - Hibiscus

Streamlining the Use of AI/Machine Learning in the Chemical Industry: Chemometrics

Brian Rohrbach - Infometrix, Inc.

Artificial intelligence and machine learning are inevitable results of the work driven by the consumer side of our economy. The question is not whether it will impact refining and chemical plant operation, but how soon and how long it will take for the benefits to outstrip the costs. The goal is to provide practical guidance for making progress in this complicated set of fields. Chemometrics is critical to interpreting output from any type of spectrometer

and improves the flow of information providing a significant leg up for process understanding. The key is to fully automate spectroscopic calibration.

Abstract# 133 - 10/10/2023 08:30 AM - 9:00 AM - Daffodil

Optimizing Gas Chromatography

Brian Rohrback - Infometrix, Inc.

The heartbeat of the process environment is in the data we collect, but we are not always efficient in translating our data streams into actionable information. The richest source of hydrocarbon process information comes from spectrometers and chromatographs and, for many applications, gas chromatography is the cheapest, most adaptable, and most reliable technology available. We can use tech borrowed from other fields to provide more consistent and objective GC results, automate translation of the raw traces into real-time information streams, and create databases that can be used across plant sites or even across industries.

Abstract# 134 - 10/11/2023 08:20 AM - 8:40 AM - Wisteria

Structure Analysis of Unknown Compounds using GC/HR-TOFMS and a Predicted EI Mass Spectral Database Compiled by Machine Learning

Masaaki Ubukata - JEOL Ltd

Electron ionization (EI) is the most popular method used in GC-MS, and compounds are often identified using an EI mass spectral database. Because molecular ions are often weak or absent in EI data, identification of unknowns can be difficult by EI alone. Soft ionization (SI) can be helpful for obtaining the molecular ions when EI cannot. However, structural formulae still had to be determined manually using chemical compositions after the EI and SI data analysis. Recently, we have developed a new automated structure analysis workflow, which uses machine learning to predict EI mass spectra from chemical structures. In this study, we introduce a polymer materials application using this workflow.

Abstract# 135 - 10/11/2023 02:45 PM - 3:30 PM - Floral Hall A1

Summary of Non-Targeted Workflow for Testing Environmental Samples for Over 10,000 PFAS Compounds at Once

Toby Astill - Thermo Fisher

Overview of an integrated non-targeted PFAS analysis workflow coupling molecular networks and conventional techniques. Unlike traditional targets where reference standards are available, less than 200 PFAS standards exist for the more than 10,000 known PFAS, underscoring the need for a non-targeted workflow. Conventional non-targeted PFAS analysis workflows rely on signature fragments, homologous series with progressive retention times (RT) tied to chain length, a negative mass defect (MD), and Kendrick MD. These approaches are individually successful at identifying PFAS, but merging them requires expert knowledge. Here we describe the coupling of molecular networking with conventional and novel PFAS analysis techniques in an integrated workflow. Leveraging negative mode data for landfill waste extracts was acquired in Full MS dd-MS2 on a Thermo Scientific™ Q Exactive™ Plus. Data was analyzed via the PFAS Unknown ID w Database Searches and Molecular Networks workflow in Thermo Scientific™ Compound Discoverer™ software.

Abstract# 136 - 10/10/2023 11:45 AM - 12:05 PM - Hibiscus

FTIR spectroscopy for in-service lubricant analysis

Andrew Schmitz - ThermoFisher Scientific

Over the past 40 years, FTIR methods have been widely used to analyze used lubricants and contaminants therein, allowing users to identify potential lubricant issues or mechanical failures. The ASTM Standard E2412, released almost 20 years ago, has set the industry-standard method for monitoring additive depletion, base stock degradation and contaminant build-up using FTIR spectroscopy. Consequently, FTIR spectroscopy has been a critical tool for predictive maintenance programs across industries. This seminar offers an overview of the current FTIR methods for in-service lubricant analysis. It covers how FTIR results are generated and how mechanical equipment and lubricant condition can be assessed from the results. Furthermore, a new FTIR analysis system for in-service lubricant analysis using Nicolet Summit X FTIR spectrometer and Affirma software is introduced. The new system offers time-efficient analysis with three different sampling options and simplified software that streamlines sample analysis, thereby reducing

operating costs and allowing predictive maintenance decisions to be made more quickly.

Abstract# 137 - 10/10/2023 08:15 AM - 9:00 AM - Bluebonnet

Pushing boundaries: How magnetic resonance mass spectrometry and petroleomics tools are changing the petrochemical landscape?

Gontjo Boniek - Federal University of Goiás, Goiânia, Brazil

The traditional petrochemical analysis, focusing mainly on saturated and aromatic hydrocarbons, often overlooked intricate polar compounds. However, the advent of Magnetic Resonance Mass Spectrometry has pioneered the era of Petroleomics, enabling comprehensive molecular-level characterization of oil, encompassing thousands of compounds. This transformation has rejuvenated various segments of the petroleum industry, from exploration to refining. Enhanced by machine learning, these tools offer over 90% accuracy in oil classification, accuracy in oil classifications, precise property predictions, proactive issue forecasting for field operations, and meticulous product quality evaluations. Essentially, this synergy between advanced mass spectrometry, the Solarix 2XR system, petroleomics, and computational tools is setting new standards for the petrochemical sector.

Abstract# 138 - 10/10/2023 12:30 PM - 12:55 PM - Bluebonnet

Portable Fuel Property Analyzer

William Welch - Spectro-Intelligence LLC, Stuart Farquharson - Real Time Analyzers

The Portable Fuel Property Analyzer (PFPA) provides rapid fuel analysis anywhere it's needed: The plant, port, or field. Analysis is obtained in seconds using only a 2 mL fuel sample. The PFPA uses Near Infrared Spectroscopy combined with Advanced Multivariate Analysis to determine key fuel properties that influence engine performance. The PFPA property determinations were developed and validated according to ASTM D8321 "Standard Practice Validation of the performance of Multivariate Online, At-Line, Field and Laboratory Infrared Spectrophotometers and Raman Spectrometers Based Analyzer Systems" using the property values of a diverse matrix of over 800 fuels from around the world are determined by traditional ASTM methods.

Abstract# 140 - 10/10/2023 01:00 PM - 2:00 PM - Hibiscus

Practical Techniques for Infrared Spectral Interpretation

Andrew Schmitz - ThermoFisher Scientific

Fourier Transform Infrared (FTIR) spectroscopy is utilized to study and analyze molecular vibrations. Depending on characteristics of the molecule such as mass, bonding strength and shape will determine where the FTIR peaks lie in the spectrum. These peaks can determine what functional groups exist along with chemical identification via FTIR spectroscopic libraries. This presentation will give an introduction on FTIR spectral interpretation and using spectroscopic libraries for functional group and chemical identification.

Abstract# 141 - 10/11/2023 08:00 AM - 8:20 AM - Rose

Determination of chloride and sulfate in saturated lithium carbonate and lithium hydroxide solutions

Kirk Chassaniol - ThermoFisher Scientific, Jeffrey Rohrer - Thermo Fisher Scientific

Lithium carbonate and lithium hydroxide are important compounds for industry. They are used in many applications including rechargeable lithium-ion and lithium polymer batteries, which are an increasing part of our daily life as we use more portable electronic devices, including mobile phones. These batteries are also important for the electric car industry. Therefore, it is important that these compounds are low in corrosive strong acid anions that could impact product performance and longevity. This presentation describes the development and validation of two ion chromatography methods desired by both battery recyclers and chemical suppliers: one for the determination of chloride and sulfate in saturated lithium carbonate solution, and one for the determination of the same anions in lithium hydroxide solution. Both methods use an anion-exchange column for anion separation followed by suppressed conductivity detection. The two methods have different instrument configurations and sample preparation steps to address the issues unique to each sample. These methods have low µg/L sensitivities for chloride, sulfate, and other possible contaminating anions.

Abstract# 142 - 10/11/2023 10:05 AM - 10:30 AM - Hibicus

Rapid compositional analysis of Natural Gas at wellhead sites using a mobile Raman Analyzer

John Richmond - MarqMetric

Raman spectroscopy is gaining more traction in the analysis of industrial processes, due to the speed of measurement and the stability of the device. Natural gas is an important energy source, and its accurate analysis is essential to producers. Raman spectroscopy requires no consumables and can analyze C1-C6+, nitrogen and CO2 in seconds. Furthermore, data analysis can be simplified to simple peak integration routines. We will present case studies of the use of a mobile Raman analyzer in a truck bed performing compositional analysis at wellhead sites and a comparison of results between Raman and GC

Abstract# 143 - 10/11/2023 01:15 PM - 1:35 PM - Rose

Breakthroughs in Material Compatibility of Inert Coatings for Sampling and Analytical Systems

Clay Smith - SilcoTek Corporation, Luke Patterson - SilcoTek Corporation

For decades, silicon-based coatings have enabled accurate trace-level quantification of chemicals that otherwise pose analytical challenges to the stainless steel construction of most sampling system flow paths. Engineers now desire similar coating solutions for non-steel materials like aluminum, nickel-copper alloys (Monel®), and more, especially as supply chains for stainless steel parts have become strained. This presentation introduces new advancements in substrate compatibility of CVD coating technology and related performance data in process analyzer applications. Coating capabilities of Monel and aluminum substrates are highlighted, and the analytical performance of CVD-coated tubing is compared to that of electropolished tubing.

Abstract# 144 - 10/10/2023 09:00 AM - 9:30 AM - Iris

Development of a Pyrolysis Gas Chromatography Mass Spectrometry (py-GCMS) Technique for Total Organic Fluorine Measurements.

John Scott - University of Illinois

Standard methods for measurement of per- and polyfluoroalkyl (PFAS) utilize liquid chromatography mass spectrometry (LC-MSMS). This technique is for specific PFAS, very sensitive, and highly accurate. However, it is expensive and time-consuming. Given the diverse range PFAS (>5000), preclude the use of LC-MSMS as a practical first option for analysis. Therefore, there is an urgent need for a universal, rapid, and cost-effective PFAS screening tool. We propose the development of pyrolysis-gas chromatography mass spectrometry tool as a PFAS screening tool. Analysis for organic fluorine through py-GCMS can serve as a reliable marker for fluorinated organic compounds present in environmental samples.

Abstract# 145 - 10/10/2023 09:00 AM - 9:20 AM - Daffodil

Analyzing Recycled Polymers using Pyrolysis-GC/MS

Khadiza Mom - Quantum Analytics

The global economy cannot subsist without plastic, and the petrochemical industry meets demand with millions of tons of plastic produced each year. However, this demand for plastic is equally met with that of managing plastic waste. Facilitating polymer recycling and movement towards a circular plastic economy is an expectation placed upon the petrochemical and consumer products industries. In the laboratory, measuring and qualifying polymer recyclability is crucial, whether that is by assessing differences between recycled and virgin resin, measuring microplastics in the environment, or understanding commercial and industrial waste. In this presentation, we look to Pyrolysis GC/MS for recycled polymer applications. These methods determine the type and amounts of polymers in microplastics and recycled samples, as well as identify contaminants and additives.

Abstract# 147 - 10/10/2023 12:55 PM - 1:40 PM - Bluebonnet

Integrating Real Time Property Measurements to LP, Advanced Process Control, and Real Time Optimization, Yields Invaluable Returns

Shashi Mistry - INTELLIGENT PROCESS & CONTROL CONSULTANTS INC., Paul Giammatteo - 4IR Solutions, Ltd.

Advanced spectroscopic analyzers provide real-time, multi-property measurements from crude feed (blending) through product manufacturing. New technologies continue to move measurements from historical product blending locations, mid-stream and front end process units. Properly placed advanced analyzers at the refinery front end provide robust, real-time analyses for:

- crude oil feed to crude units,
 - heavy oil processing units,
 - mid-stream upgrading units,
- providing direct performance benefits to LP, Advanced Process Control and Real-Time Optimization.

This presentation highlights instrumentation, measurement locations, and integration to LP, APC and Optimization enabling:

- significant increased throughput,
- >99% measurement availability,
- improved safety, reliability, and performance.

Abstract# 148 - 10/11/2023 08:00 AM - 8:45 AM - Iris

Measuring Regulator Performance

Stephen Miller - Airgas, an Air Liquide company

Airgas has developed a methodology - the first of its kind - for quantifying how efficiently regulators of different designs clear themselves of specific contaminants - with surprising and unexpected results! Contaminants and impurities impact analytical results. The overall gas delivery system has been a long time suspect of contributing to unreliable measurement results. The Airgas white paper outlines the test, the results and conclusions of several model designs of regulators. This paper validates the need for specific design element of a gas regulator to ensure accurate and repeatable results. The GCC community depends on accuracy of results to meet production expectations and compliance reporting.

Abstract# 149 - 10/11/2023 09:00 AM - 9:30 AM - Floral Hall A1

Pushing Your ICP-MS to Lower Limits on Light and Middle Distillates

Mark Kelinske - Agilent

Direct analysis of organic solvents by ICP-MS has become a widely adopted technique. However, petroleum derived solvents and distillates introduce unique challenges and interferences, in addition to sample preparation considerations. In this session will we discuss how to improve ICP-MS methods for light and middle distillates, and hardware/software features that assist the analyst in their daily workflow.

Abstract# 150 - 10/10/2023 01:30 PM - 2:00 PM - Floral Hall A1

Analysis of Trace Permanent Gas Impurities in Fuel Cell Hydrogen by GC/PDHID

Shannon Coleman - Agilent

An Agilent 8890 GC fitted with a plug and play pulsed discharge helium ionization detector (PDHID) was used to detect ppb to low-ppm concentration carbon dioxide, carbon monoxide, methane, argon, oxygen, nitrogen, and other impurities in high purity hydrogen. The GC method provided low detection limits, good reproducibility, and excellent linearity, meeting the requirements specified in GB/T 3634.2-2011, GB/T 37244-2018, and ISO 14687-2019.

Abstract# 151 - 10/11/2023 10:45 AM - 11:30 AM - Floral Hall A1

Ten Ways to Streamline Your Workflow with OpenLab CDS

Tom Short & Kathy O'Dea - Agilent

OpenLab CDS includes built-in tools for sample submission, data collection, and data analysis and interpretation all designed to save time and improve sample throughput in busy lab environments. This presentation reviews ten features available in OpenLab CDS that can help you increase efficiency in your lab.

Abstract# 152 - 10/10/2023 09:00 AM - 9:45 AM - Floral Hall A1

Agilent 8355 Sulfur Chemiluminescence Detector Best Practices

Rachel Allen - Agilent, Jamie Wetuski - Agilent

Discussion about the best practices on the Agilent 8355 Sulfur Chemiluminescence Detector.

Abstract# 153 - 10/11/2023 10:15 AM - 10:45 AM - Floral Hall A1

Direct Elemental Analysis of Gasoline using the Agilent ICP-OES and IsoMist Temperature Controlled Spray Chamber

Sima Singha - Agilent

Trace metals in gasoline are not only a major source of environmental pollution they can also cause automotive engine failures. ICP-OES is often used for the elemental analysis in petroleum products due to its reliability, robustness, and sensitivity. However, high volatility of gasoline can affect the stability of signal and lead to carbon build up on the torch that may cause the plasma to extinguish. A programmable temperature-controlled spray chamber (IsoMist) was used to reduce vapor loading of gasoline and oxygen was added to reduce carbon build up in the torch injector, maintaining a stable plasma and a clean sample introduction system.

Abstract# 154 - 10/10/2023 08:30 AM - 9:00 AM - Floral Hall A1

A Technical Exploration of SCD - Sensitivity, Linearity, and Equimolarity

Scott Hoy - Agilent

Sulfur chemiluminescence detection (SCD) is a key technology for the petroleum industry because it is sensitive and selective to sulfur. Most petrochemical QA/QC laboratories utilize multiple GC-SCD instruments for testing sulfur content of flares, process streams, and final products, and yet the SCD's capabilities and limitations are often misunderstood despite decades of deployment. This presentation will cover the fundamentals of the detector response curve, how its features translate into concepts such as "sensitivity" and "linearity", and how those concepts intersect with one of the SCD's most important features – "equimolarity". Understanding what these figures of merit mean, how they're used, and how they impact calibration will help users with both method development and troubleshooting for their GC-SCD systems. Though this topic can be deeply technical, this presentation aims to simplify these abstract concepts and is intended for all laboratory personnel.

Abstract# 155 - 10/10/2023 02:00 PM - 2:45 PM - Floral Hall A1

GC Column Selection: Choosing the "Right" Column

Daron Decker - Agilent

The most common reason the capillary GC column is chosen for a given application is that it was in the GC when the sample showed up. Not a very technical or even logical reason. This presentation will go through the logical choices of stationary phase type, film thickness, internal diameter and length and the pros and cons involved.

Abstract# 156 - 10/11/2023 09:30 AM - 10:00 AM - Floral Hall A1

Optimizing Analysis of Oils and Organic Solvents by Smart ICP-OES

Patrick Simmons - Agilent Technologies

Directly analyzing organic solvents by ICP-OES can be challenging for several reasons ranging from plasma stability, carbon deposition on the injector and torch, and complex spectral background from carbon emission lines. However, the analysis of neat organic solvents in the Petrochemical, Lithium Ion Battery, and Food Market is common as it is an alternative to the time-consuming digestion/ashing methods, which may have significant dilution factors that elevate the detection limits. This talk will discuss how a Smart ICP-OES like the Agilent 5800/5900 instruments can easily overcome these issues through proper hardware selection, optimized plasma instrument parameters, and intelligent background correction techniques.

Abstract# 157 - 10/11/2023 09:45 AM - 10:25 AM - Iris

Optimizing Your Karl Fischer Titration for Refining and Petrochemical Samples

Allison Reiter - Honeywell

Water content is an important specification for most refining and petrochemical products, as off spec material can cause rusting, corrosion, and even bacteria growth issues downstream. Karl Fischer titration is the recommended moisture measurement technique used to reliably and

accurately determine water content. However, this analysis can be challenging for certain oil samples. In this talk, learn how to optimize your reagent system to get accurate water content results in challenging oil samples quickly and repeatably.

Abstract# 158 - 10/11/2023 08:10 AM - 8:40 AM - Hibiscus

Unlocking Laboratory Productivity: Recent Advances in Wet Chemistry Automation for Industrial Process Water and Wastewater Testing

Carl Fisher - Thermo Fisher Scientific

The automation of wet chemistry workflows yields significant benefits in the realms of reliability, reproducibility, and result sensitivity when compared to conventional manual techniques such as titration. Moreover, this automation drives enhanced laboratory productivity by liberating personnel to engage in value-added tasks while analysis continues seamlessly. This presentation delves into the utilization of automated discrete analyzers, alongside regulatory-compliant system methodologies, for the precise determination of crucial parameters including scaling factors, corrosion inhibitors, indicators, and contaminants within the context of industrial process water and wastewater analysis.

Participants will gain insights into the recent technology advances of discrete analysis which enable increased workflow automation, reduced manual workaround, and improved adherence to regulatory standards. By exploring the capabilities of discrete analyzers, laboratories can streamline multi-parameter testing onto a single automation platform, thereby providing a faster, easier, and turnkey solution to traditional wet chemistry techniques. This transition not only enhances productivity but also offers a compelling opportunity for cost reduction.

Abstract# 159 - 10/10/2023 12:45 PM - 1:15 PM - Wisteria

Save Time and Increase Throughput with Rapid Small Scale Oxidation Testing

Will Smythe - Anton Paar

With test times measured in hours, ASTM D525 oxidation stability testing has always been a bottleneck in sample analysis. Now gaining widespread acceptance, Rapid Small Scale Oxidation Testing (RSSOT) is becoming a favorite method for fuel testing (ASTM D7525 & D7545).

The RSSOT features an efficient way to determine the oxidation stability under accelerated conditions according to several sample specific methods. The high temperature range, less than 5 minutes for set up and cleaning, and the fully automatic measurement are major benefits. Test times are generally 12 to 20 times shorter than traditional oxidation stability test methods. Beyond fuels, various further investigation possibilities are opened up with this method to ensure the necessary lifetime of a grease including a standard method ASTM D8206. A new standard method involving catalytically active metal to determine the remaining lifetime is under development.

Abstract# 160 - 10/10/2023 08:15 AM - 9:00 AM - Wisteria

Analysis of plastic waste pyrolysis oil (PWPO) and renewable fuels

Ramazan Oguz Caniaz - Petroleum Analyzer Company, Basudeb Chakraborty - PAC, Rob Strik - PAC

In this presentation PAC will address the emerging use of waste plastic pyrolysis oil as an alternative feedstock in the petrochemicals industry. In a world increasingly focused on sustainable practices & circular economy solutions, our practical approach offers promising alternatives for a greener future. Our research presents a comprehensive framework covering leading methods such as ASTM D5443, D7500, D86, D7345, GC x GC, D4629, D5453, and D5762.

Promising results have been obtained from our studies. By leveraging GC x GC & frontend-Reformulyzer, we successfully achieved olefins separation for heavy fractions. Additionally, our mini distillation offerings, as a quick and efficient technique requiring only 10 mL of sample, facilitated distillation within 10 minutes opening new doors for process engineers to optimize their units. Simulated distillation highlighted intrinsic properties of waste plastic pyrolysis oil (WPPO) samples, revealing high paraffinic content and entrained heavy ends in light cuts enabling researchers for screening studies of various samples. Traditional distillation also successfully performed paving the way to secure product quality in the best efficient way for manufacturers. Elemental analysis were done for a better understanding of the purity of the samples which is one of the biggest challenges of the industry as an impediment

against the dissemination of this emerging technology. These findings contribute to a better understanding of waste plastic pyrolysis oil characteristics, allowing for informed decision-making. Our pursuit of innovation & uptime & efficiency drives these advancements. By harnessing the potential of WPPO and these refined methodologies, the industry can actively contribute to a more responsible future. Join us in shaping a brighter and more efficient path for the petrochemical sector powered by plastic circularity.

Abstract# 161 - 10/10/2023 02:45 PM - 3:30 PM - Floral Hall A1

New Liquid Chromatography Test Method for Determination of Asphaltene Content in Crude Oil and Petroleum Products

George Gonzalez - Agilent Technologies

This presentation will provide a summary of a new liquid chromatography test method used to test for the asphaltene content of crude oil from ppm to percent level concentration capability. This proposed new ASTM test method covers a procedure for the determination of the heptane insoluble asphaltene content of gas oil, diesel fuel, residual fuel oils, lubricating oil, bitumen, and crude petroleum. The test method provides enhanced performance compared to the ASTM D6560 glassware reflux extraction test method. This test method is currently being developed into a proposed ASTM standard test method under work item #87226.

Abstract# 162 - 10/10/2023 09:20 AM - 9:40 AM - Daffodil

Detailed chemical characterisation of pyrolysis oils from mixed plastic waste using GC×GC–TOF MS

Laura McGregor - SepSolve Analytical, Steve Smith - Schauenburg Analytics, Nick Bukowski - SepSolve Analytical, Milos Auersvald - University of Chemistry and Technology Prague

Pyrolysis oils from solid waste plastic are considered a form of renewable energy and can serve as an alternative for fossil fuels in various industrial processes (e.g. power generation) or as a feedstock for the petrochemical industry.

However, their composition may vary depending on the plastic feedstock used and the pyrolysis process. Importantly, the presence of trace impurities, such as sulfur and nitrogen compounds, can affect the quality of the oil and its applicability.

Here, we demonstrate the use of GC×GC–TOF MS for detailed non-target characterisation of pyrolysis oils, to identify possible contaminants and help to refine process design.

Abstract# 165 - 10/10/2023 09:15 AM - 9:35 AM - Rose

ASTM Crude Oil Proficiency Testing Program: ICP (D5708B) vs. XRF (D8252) for Ni and V

Leslie McHenry - XOS, Timothy Ladeairous - XOS

ASTM sends crude oil proficiency testing program (CO PTP) samples out three times a year to be tested at laboratories around the world for many properties, including Ni and V by ASTM D5708 and D8252. D5708 method B, acid decomposition and ICP-OES, is also specified in the NYMEX light sweet crude oil futures contract specifications. This method is complicated and time consuming, and it is not ideal for pipeline terminal laboratories. ASTM D8252, Ni and V by XRF, offers a faster, easier to use solution and is gaining traction in the testing community. Join Leslie McHenry, XOS Applications Supervisor, as she shares the latest CO PTP data and discusses the correlation, precision, and scopes of these two methods for Ni and V.

Abstract# 166 - 10/10/2023 11:00 AM - 11:45 AM - Tulip

Moisture Analysis Reimagined: Instant NIR Measurements for Quality Control & Process Upgrades

Elena Hagemann - Metrohm

Moisture analysis in the petrochemical industry is crucial to quality control and process optimization. Traditionally, moisture is performed by Karl Fischer Titration (KFT) in an offline lab, causing delays between receiving data and process implementation. Online near-infrared (NIR) measurements provide real-time results but usually require significant effort to calibrate, especially at low levels. In this talk, we demonstrate how to eliminate the calibration effort by auto-building prediction models down to ~5 ppm without manual sampling.

One notable advantage is the method transferability, allowing an easy but effective transfer of the initial model to various production environments, and between analyzers.

Abstract# 167 - 10/11/2023 02:00 PM - 2:30 PM - Tulip

Spectroscopy in Petrochemicals: Elevating Quality, Boosting Efficiency, and Driving Profits

Elena Hagemann - Metrohm

Raman and NIR spectroscopy are crucial tools for the petrochemical industry. Raman offers insights into molecular structures, aiding in refining and contamination detection. NIR facilitates real-time monitoring during processes like distillation and catalytic conversion. Both technologies are implemented online to achieve simple, fast, and reliable results. This enables quick adjustments to the process and results in better quality products and higher profitability. This talk will showcase how spectroscopic applications enhance efficiency and improve the performance of products like crude oil, refined petroleum, lubricants, and more. We'll explore benefits such as meeting trade specifications, safeguarding financial value, and reducing operational costs.

Abstract# 169 - 10/10/2023 01:00 PM - 1:45 PM - Tulip

Keep it Simple: Useful Techniques for Accurate & Reliable Karl Fischer Analysis

Eduardo Simões - Metrohm

Is your Karl Fischer titration taking too long? Does poor reproducibility slow down KF method validation? Have you optimized sample preparation to ensure total moisture is titrated? KF titration is a common laboratory measurement used for many different oil and refinery products. Optimizing KF measurements is key to increasing lab productivity and maintaining product quality and process control. While a moisture measurement is straightforward, getting the right result quickly and reliably can be a challenge. Attend this talk to learn the importance of parameter optimization, reagent selection and sample preparation to get reliable and accurate moisture analysis.

Abstract# 170 - 10/11/2023 10:30 AM - 12:00 PM - Tulip

Comprehensive Karl Fischer Analysis of Petroleum Products

Eduardo Simões - Metrohm

Performing accurate Karl Fischer titrations in the petrochemical industry means going beyond the basics. Troubleshooting difficult samples requires an understanding of how sample preparation and special reagent systems can improve your titration results. Issues like solubility, viscosity and side reactions can be alleviated with the right level of know-how. Do you need a solubility promoter? Do you need an oven? Attend this short course to find the answers to these questions and learn how to optimize your sample preparation techniques and your reagent system for your sample types. And yes, we'll still cover the basics!

Abstract# 171 - 10/10/2023 02:45 PM - 3:15 PM - Tulip

Improved Corrosion Monitoring of Amines Using Ion Chromatography

Jay Sheffer - Metrohm

Oil pipelines and refineries require constant monitoring and upkeep to maintain successful operations. To minimize corrosive gases and neutralize hydrogen sulfide vapor, amines are routinely added during the transport of crude oil. However, if too much amine is added, corrosion rates may accelerate. Therefore, it is in the industry's best interest to monitor these compounds at various locations. Cooperation continues between ASTM and industry partners to develop a standard practice for extraction of water-soluble amines in crude oil. This talk addresses the impact of amines on crude refinement and the versatility of ion chromatography to monitor these species.

Abstract# 172 - 10/10/2023 02:00 PM - 2:45 PM - Tulip

Standardized Test Methods Using Combustion Ion Chromatography for Petrochemical Analysis

Jay Sheffer - Metrohm

Combustion Ion chromatography (CIC) is used extensively for monitoring halides and sulfur in petrochemicals. The ability to independently measure

fluorine, chlorine, bromine, and sulfur in a variety of sample matrices by one analysis is unique to CIC, which allows producers and buyers to verify product quality and justify their price. Many standardized test methods (STM's) have been published so that CIC-generated data is reliable and precise across the industry. This talk describes three such methods to analyze petroleum distillates, liquified petroleum gas (LPG), and organic solvents and includes real-world examples.

Abstract# 173 - 10/10/2023 08:00 AM - 8:30 AM - Floral Hall A1

Converting 8355 SCD Carrier Gas from Helium to Hydrogen

Felipe Chagas - Agilent Technologies, Jamie Wetuski - Agilent Technologies, Rachel Allen - Agilent Technologies

Concerns regarding the cost and availability of helium have resulted in many GC users considering conversion to hydrogen as the carrier gas. After several tests with 8355 SCD using hydrogen, this presentation will discuss the steps required in this conversion and some of the limitations to be expected when use it as a carrier gas.

Abstract# 174 - 10/11/2023 02:30 PM - 3:30 PM - Tulip

Introduction to Combustion Ion Chromatography: Key Concepts and Applications for Corrosion Monitoring

Jay Sheffer - Metrohm

Use of combustion ion chromatography (CIC) instruments for monitoring corrosion inhibitors in petrochemical laboratories continues to grow. While modern CIC instruments are more fully automated, users can still be somewhat intimidated by their complexity. Understanding of the basic concepts of their operation paired with some basic troubleshooting skills can go a long way to instill operator confidence. This training session will review the concepts behind CIC operation and introduce practical application of the technique to measure halides and sulfur in different petrochemical materials. The session will also cover a few basic troubleshooting tips to keep your CIC in top shape.

Abstract# 175 - 10/11/2023 03:30 PM - 4:00 PM - Tulip

Measuring Corrosion Inhibitors in Oil Pipelines and Refineries

Jay Sheffer - Metrohm

Corrosion monitoring is key to maintaining successful operation of oil pipelines and refineries. Amines are routinely added to neutralize hydrogen sulfide vapor for transport of crude oil and are typically used to strip hydrogen sulfide, carbon dioxide, and other acidic gases in the refining process. However, too much amine present in a particular location can increase corrosion rates. Therefore, monitoring these corrosion sources is in the industry's best interest. With participation from producers and instrument vendors, work continues at ASTM to develop a standard practice for extraction of water-soluble amines in crude oil. This presentation will address the impact of amines in crude transport and refinement and the application of ion chromatography to measure these compounds.

Abstract# 176 - 10/11/2023 08:20 AM - 8:50 AM - Rose

Digestion of Petroleum Samples for Element Analysis with ICP

Yenier Leyva - Anton Paar

Sample preparation for ICP is a very important part of analysis. Specifically, petroleum samples have some intricacies that can be benefited best with microwave digestions. Join us to see a sample before and after digestion and discuss some benefits a microwave adds to sample preparation and how to best utilize this technology to save you time, effort and costs.

Abstract# 177 - 10/11/2023 01:35 PM - 2:05 PM - Rose

Automating Petroleum Wax Penetration Testing

Paige Clark - Anton Paar

Are you still using doing a manual penetration test for petroleum waxes? This presentation will discuss how save time and increase reproducibility by upgrading to an automated penetration testing device. Automation guarantees consistent and precise measurements, minimizing human-induced variability and enhancing overall reliability. Learn how to save time and increase reproducibility with automated penetration testing.

Abstract# 178 - 10/11/2023 09:50 AM - 10:20 AM - Bluebonnet

Increase Accuracy and Efficiency with Multiparameter Measurements

Natalie Merino - Anton Paar

Complex samples often require multiple measurements and time-consuming analysis to understand. The automatic combination of density, viscosity, refractive index, sound velocity and/or optical rotation can quickly and repeatably determine even low concentration components. This presentation will highlight how you can save time and increase the quality of data by using multiparameter measurement systems with automatic data processing. Learn how to configure these systems so that you insert your sample and export data - no more manual calculation or measurements on multiple instruments. We will discuss several example cases including aqueous sulfuric acid, nitric acid, and even carbon type composition.

Abstract# 179 - 10/11/2023 01:00 PM - 1:30 PM - Bluebonnet

D86 Distillation Optimization: What does it mean and how does it affect results?

Afzal Hossain - Anton Paar

This presentation will review techniques for optimization of D86 distillation. Optimization is important for consistent distillation analysis of unique or contaminated samples. This session will highlight automated optimization parameters and discuss the applicability and outcomes of applying each technique. With a better understanding of how method optimization affects distillation results, attendees will leave with confidence in knowing when to use automated or manual optimization and. The discussion will also include which parameters can be optimized while still complying with D86 requirements and best practices for difficult samples. Attendees will gain insights into leveraging optimization strategies to elevate the overall performance of automated D86 distillation processes in petroleum testing.

Abstract# 180 - 10/11/2023 02:05 PM - 2:35 PM - Rose

Improved Productivity with Automated Flashpoint

Kenji Yamamoto - Anton Paar Provetec GMBH

The presentation highlights the advantages of an automated flash point tester over manual testing methods.

Discussion will focus on how automation can increase precision and consistency in flash point measurements by minimizing human error while also enhancing safety and reducing risk in the lab. Automated measurements also enable automatic data handling and even remote monitoring of results. By ensuring repeatable adherence to published standards, automated flashpoint testers can eliminate human errors which lead to costly mistakes in reported values. This presentation will provide detail on unique aspects of automated flashpoint testing such as alternate ignition techniques, automated fire detection and suppression as well as options for increased workflow productivity.

Abstract# 184 - 10/11/2023 09:20 AM - 9:50 AM - Bluebonnet

Increasing Productivity Using Automatic Single Sample Handling for Density and Viscosity

Afzal Hossain - Anton Paar

This presentation highlights the benefits of single-sample automation in density and viscosity measurements.

Many labs are stuck between having too many samples for manual injection and not having enough value to invest in a multi-sample automation solution. This presentation will highlight the potential benefits of using a single sample automation solution. Attendees will learn how to increase efficiency by automating cleaning and greatly reducing the amount of interaction with the instrument that a technician must have for each measurement.

Other potential specialty systems will also be discussed for difficult samples which may be highly viscous or require elevated temperature for sample injection.

Attendees can expect to leave with a better understanding of the continuum of sample automation and how to better choose the solution that will fit their lab's unique challenges.

Abstract# 185 - 10/11/2023 02:35 PM - 3:05 PM - Rose

Move beyond D445 with the Simplicity of D7042

Robb Watson - Anton Paar

Are you tired of waiting for D445 measurements to be complete? Spending too much time cleaning capillaries? Worried about the risk and expense of broken glass?

This presentation will discuss the widely accepted viscosity method D7042 and how it relates to D445 in major standards such as fuels or lubricants. Leave the troubles of D445 behind with the simplicity and accuracy of D7042.

Abstract# 186 - 10/11/2023 10:20 AM - 10:50 AM - Bluebonnet

Increasing Density and Viscosity Throughput with Difficult Samples

Daniel Wolbrecht - Anton Paar

In the fast-paced landscape of petroleum analysis, optimizing laboratory throughput while maintaining accuracy is paramount. This presentation will highlight the potential of heated autosampler units to significantly enhance laboratory efficiency in density and viscosity measurements of challenging petroleum samples. By addressing the unique challenges posed by dense and viscous petroleum products, this time-tested solution offers an effective approach to streamline analysis processes.

This presentation will specifically address common samples including heavy crude oils, fuel oils, and petroleum waxes.

Abstract# 188 - 10/11/2023 09:10 AM - 9:35 AM - Hibiscus

Lube Oil Monitoring via Raman Spectroscopy

Giancarlo Aguirre - Process Instruments, Inc., Rory Uibel - Process Instruments, Inc., Lee Smith - Process Instruments, Inc.

Raman spectroscopy, a scattering technique, employs a laser source of predetermined wavelength, typically 785 nm, to induce molecular vibrations. This leads to the emission of scattered photons, that generate Raman spectra which when matched to key stream property analysis results can be used to build quantitative models. However due to fluorescence in refining applications, this methodology is most suitable for process samples no heavier than Light Gas Oils. Fluorescence is many orders of magnitude stronger than Raman and can potentially swamp the Raman spectrum. To overcome this issue Process Instruments Inc. has worked on an analyzer better suited for longer chained samples, using 1064 nm excitation to circumvent the impact of fluorescence and still be able to obtain reliable Raman vibrational data. The spectra collected from various refinery samples will show that while fluorescence can still be detected, its intensity is much lower, allowing for Raman peaks to be clearly captured. Such an application can be found in the Lube Oils plant, where data sets of finished oils collected for a period of 10 weeks exhibit strong correlation, low predictive error, and minimal fluorescence interference.

Abstract# 189 - 10/10/2023 01:40 PM - 2:10 PM - Bluebonnet

Two New Systems for Sample Preparation: Automated Gravimetric Dilution and Automated Volumetric Preparation

Scott Neihardt - Elemental Scientific, Inc.

Sample preparation presents many challenges in laboratories ranging from hours of dedicated lab personnel time to issues with accuracy and precision across multiple complicated sample preparation methods. Automating sample preparation significantly reduces prep time and eliminates human errors to increase the accuracy and precision of prepared samples. Elemental Scientific has developed two new automated systems. One system gravimetrically dilutes samples and the other handles any volumetric preparation needs including dilution, acidification, and more. These highly flexible systems allow for customized methods to function for all types of labs all while providing improved results in less time.

Abstract# 190 - 10/11/2023 08:40 AM - 9:10 AM - Wisteria

Fast, Flexible Gas Analysis using Standalone Mass Spectrometers for R&D, Pilot Production, and Full-Scale Production

Monique Mahoney-Ashberry - Process Insights, Jenee Johnston - Process Insights, Haley Welsh - Process Insights, Chris Williams - Process Insights, Chuck DeCarlo - Process Insights

Fast analysis is critical for process optimization. While GC-MS or LC-MS may help distinguish what chemical species are present in a sample composition, these techniques take several minutes to complete an analysis and are not designed for fast process monitoring. An online, stand-alone

mass spectrometer allows operations to cut costs, increase production, and maintain a safe working environment through the continuous, automated monitoring of multiple stages of production. As a flexible gas analysis technique, stand-alone mass spectrometers are also used to optimize manufacturing processes by providing the data necessary for R&D and methods that easily transfer directly from pilot production to full scale. Live readings of process composition enable real-time process adjustments and "on the fly" optimizations to maximize up-time and on-spec product gas yields. This presentation will discuss the performance capabilities of the Process Insights Mass Spectrometers as well as their flexibility for multiple applications.

Abstract# 191 - 10/10/2023 09:30 AM - 10:00 AM - Iris

Ambient Air Monitoring for Environmental, Health, and Safety Using Mass Spectrometry

Monique Mahoney-Ashberry - Process Insights

Ambient air monitoring has come to the forefront of discussions relating to environmental, health, and worker safety in several industries including hydrocarbon processing, polymer production, and semiconductor fabrication facilities. While single point monitors are considered industry standard, they are often expensive and maintenance intensive. A mass spectrometer offers a single point analyzer for multiple components, flexibility for additional species that may need to be monitored in the future, and a centralized maintenance point. The Process Insights Extrel™ Max300 series offers analytical flexibility with minimal downtime in general purpose and classified areas. With lower detection limits that often outperform OSHA requirements, the mass spectrometer also offers linearity in the event of an excursion or chemical release. This presentation will discuss the performance capabilities of the Process Insights Extrel™ Max300 series on various chemicals of interest across different industries and the benefits of utilizing mass spectrometry in life safety applications.

Abstract# 192 - 10/11/2023 08:55 AM - 9:25 AM - Daffodil

Convert Your Lab Bench Into an Electronic Workspace

Nymisha Medicharla - LIMS Wizards

Oil & Gas and Chemical development labs are busy places that create new molecules, formulations, and products that boost the organization's bottom line, but are these labs as efficient as they should be? There is an urgent need for digital optimization within the lab to move beyond legacy systems and stay ahead of the competition. In this presentation, learn about SampleVision and LabTwin, two products that optimize all stages of experiments—from a remote sample capture portal, through bench prep for analysis, hands-free documentation, and test results retrieval from anywhere within the facility using a mobile device.

Abstract# 193 - 10/11/2023 08:25 AM - 8:55 AM - Daffodil

Practical Integration Strategies Between Your LIMS and Your Business Operations

Robert Jackson - CSols Inc.

There are many internal and external integration points across the laboratory, for example, links from instruments to a LIMS, links to an MES, and links to an ERP. This talk will examine the best-in-class setups we have seen and provide practical strategies for connecting multiple lab and business systems together to optimize and automate data flows inside and outside the laboratory.

Abstract# 194 - 10/11/2023 09:10 AM - 9:30 AM - Wisteria

Evaluation of Different Chromatographic Mass Spectrometer Detection Methods for Diagnosing Oil Production

Blake McElmurry - CONSCI, LTD., Christina Kelly - LECO Corporation, David Alonso - LECO Corporation, Bill Geiger - CONSCI, LTD.

Diagnosing stimulation and quality of hydraulic fracking is a tool frequently used to evaluate the production of oil from reservoirs. Quantitative analysis of the produced oil using diagnostic chemicals is one method to evaluate the mechanisms of production rates of the treated reservoirs. Although challenging it has become an achievable task based on new analytical techniques. The two main difficulties are of course specificity and sensitivity. In this study, analytical strategies based on different detection techniques

using Mass Spectrometry and ICP-MS are evaluated using twenty four halogenated aromatics. Advantages and disadvantages of each will be discussed.

Abstract# 195 - 10/11/2023 08:30 AM - 8:55 AM - Bluebonnet

Analysis of Elemental Impurities in Polymer Products by XRF

Daniel Pecard - Bruker AXS LLC, Dr. Adrian Fiege - Bruker AXS GmbH

X-ray fluorescence (XRF) is a non-destructive analytical technique for the determination of additives and trace element contaminants in polymers. It helps improving polymer production processes, facilitates final product quality control, and ensures compliance with regulatory standards. This presentation will focus on the use of XRF for the analysis of elemental impurities. Such impurities can significantly affect the properties, performance, and toxicity of polymer products. Production residues that require monitoring down to the low-ppm level include Mg, Ti, Cr and several more. We will show typical use cases of Wavelength-Dispersive XRF and discuss when Energy Dispersive XRF can do the job.

Abstract# 196 - 10/11/2023 08:55 AM - 9:20 AM - Bluebonnet

Fast and Reliable Nickel and Vanadium Monitoring in Refinery Processes by XRF Spectrometry.

Daniel Pecard - Bruker AXS LLC, Frank Portala - Bruker AXS GmbH

The ASTM D8252 standard provides guidelines for analyzing the elemental composition of crude and residual oil, focusing on low concentration levels of Nickel and Vanadium. These elements have gained importance due to the exploitation of new crude oil sources. Nickel and Vanadium can have a negative impact on the catalysts used in the Fluid Catalytic Cracker and hydrotreater units during the refining process. Therefore, it is crucial to monitor the levels of these elements. The focus of this presentation is on the use of polarized Energy-Dispersive XRF for analyzing low levels of Ni and V in accordance with ASTM D8252.

Abstract# 197 - 10/11/2023 10:10 AM - 10:30 AM - Daffodil

Analysis of plastic waste pyrolysis oils via two-dimensional supercritical fluid chromatography and gas chromatography - VUV/MS

Alexander Kaplitz - The University of Texas at Arlington, Shane Marshall - The University of Texas at Arlington, Niray Bhakta - The University of Texas at Arlington, Jean-François Borny - Lummus Technology, Kevin Schug - The University of Texas at Arlington

As the concerns over fossil fuels increase, interest in alternative fuels such as pyrolysis oil have increased. Understanding the chemical composition of these oils is required to process the oils into workable fuels and feedstocks. This study uses an offline two-dimensional technique with supercritical fluid chromatography as the first dimension and gas chromatography – vacuum ultraviolet spectroscopy/mass spectrometry as the second dimension. Various supercritical fluid chromatography column chemistries were evaluated for separation prior to fractionation. These chemistries along with the UV/VUV/ and MS spectral data, provided insight into these plastic waste pyrolysis oils.

Abstract# 198 - 10/11/2023 10:30 AM - 11:00 AM - Hibiscus

Remodelling FFA and Magnesium after Feedstock Change

Richard Salliss - Keit Industrial Analytics

Globally there is a growing focus on moving away from the use of traditional petrochemical and fossil fuel-based energy sources due to their unsustainable, environmentally damaging and non-renewable nature. A more sustainable alternative that is gaining traction is renewable diesel, which is produced from agricultural triglycerides including fats, oils and greases. Typically, these feedstocks are hydrotreated to form mixtures of paraffinic hydrocarbons in the diesel boiling range. Due to the variety of feedstocks used to produce renewable diesel, a pre-treatment step is essential to remove various contaminants responsible for the fouling of equipment and the deactivation of valuable catalysts in downstream operations. This usually involves various degumming and bleaching processes to remove these impurities. Monitoring the pre-treatment process is therefore paramount to ensuring the process runs efficiently. Some of the impurities measured at this stage are phosphorus (P), water (H₂O), free fatty acids (FFA) and various metals. Traditionally, these are measured off-line using titrations and

inductively coupled plasma techniques which can be slow and laborious. Continually monitoring these impurities online can result in a better understanding of the process, enabling real time analysis and effective process control. Here we present the use of a static-optics inline FTIR instrument to calibrate for contaminants in renewable diesel feedstocks. We show that the calibration models are independent of feedstock, making them ideal for renewable diesel production where feedstock types tend to vary.

Abstract# 199 - 10/11/2023 01:30 PM - 2:30 PM - Bluebonnet

ASTM D1159 Bromine Number – Proposed Back Titration

Alan Cummings - Lummus Technology, Tore Fossum - Tor Systems

Bromine number is used to measure the aliphatic unsaturation in petroleum samples up to 315°C distillation temperature. It measures the amount of bromine that reacts with the olefinic double bonds in a hydrocarbon sample under specific acidic condition and is reported as mg of bromine per 100 grams of sample. Olefin saturation is an undesirable side reaction during the hydrogen desulfurization process. It increases the exothermic reaction, consumes more hydrogen and reduces octane rating. Thus reporting accurate bromine numbers are vital to unit design and operations. Repeatability (r) and reproducibility (R) is unsatisfactory for the current ASTM D1159 forward titration. This has prompted investigation into the feasibility of a back titration method to ensure all olefinic compounds are reacted with bromine.

The current method measures the amount of bromine uptake to a diminishing rate at the end point. The measurement of this point is influenced by the geometry of the platinum electrode, by the applied voltametric current and by the steric hindrance of the olefin. Results can be variable.

Thus, the proposed rewrite of ASTM D1159 adds a known excess of bromine reagent to the titration vessel, allows the reaction to happen, and then back titrates the remaining bromine by a redox reaction to an inflection. The result is compared to a blank titration of bromate in the solvent to give the actual bromine number. Studies have been completed by Lummus Technology, Mettler Toledo, Metrohm and Tor Systems on a variety of hydrocarbon samples and the results are promising. A discussion will follow with plans for an ILS. Interested participants are encouraged to attend.

Abstract# 200 - 10/10/2023 01:00 PM - 1:30 PM - Daffodil

On-Demand Carrier Gas Selection: Agilent GC and Method Configuration to Allow Carrier Gas Selection and Control

David Strobel - Lummus Technology

Due to significant cost increases in recent years, helium conservation in gas chromatography has gained attention in many labs. Lab managers and chemists need alternatives to control costs, ensure method consistency, analytical quality, and provide real-time flexibility in carrier gas choices. This presentation discusses recent work to configure an Agilent GC with available hardware and allow carrier gas selection using the GC method. This instrument level control allows the chemist to choose a preferred carrier gas for calibration or sample runs and then select a less expensive carrier gas for idle time.

Abstract# 201 - 10/10/2023 02:10 PM - 2:30 PM - Bluebonnet

Comparison of Sulfur Analysis with Total Sulfur Analysis (TSA) and Inductively Coupled Plasma (ICP)

eric tang - Lummus Technology

Total sulfur analysis (TSA) is crucial in the petrochemical industry to monitor sulfur as a poison and environmental pollutant. Due to its accuracy and ease of use, TSA is the preferred method. ICP has had challenges to analyze sulfur, yet it is a powerful technique that yields valuable information for metal analysis. This study compares TSA with ICP analysis on the same samples to evaluate accuracy and linearity of the ICP. Using different techniques to cross-check data is a valuable practice in ensuring reliable results.

Abstract# 205 - 10/10/2023 02:30 PM - 2:55 PM - Bluebonnet

Transforming Pollution into Potential: The Promise of Waste Plastic Pyrolysis Oil and Its Analytical Challenges

Jean-Francois Borny - Lummus Tech

Waste plastic pyrolysis is a thermal degradation process of controlled heating of plastic waste in the absence of oxygen to break it down into various

products, including pyrolysis oil and pyrolysis gas. The challenge is the characterization, testing, and application of pyrolysis oil to offer vital insights to researchers, industry professionals, and policymakers seeking to harness the full potential of this promising fuel. While waste plastic pyrolysis oil (WPPO) holds significant promise, there are challenges that need to be addressed: Quality and Consistency, Upgrading, Environmental Impact, Regulation and Standardization. As the waste plastic pyrolysis technology continues to improve to address its challenges, we must continually innovate the analytical efforts and develop methodology for characterizing the properties of pyrolysis oil, including its chemical composition, physical properties, stability, and impurities. Standardized characterization techniques will enable effective quality control and facilitate comparisons across different sources and production processes. ASTM D02.P Recycle Product subcommittee is proposing a guide for WPPO to establish an industry standard for the basic analytical needed. This presentation will showcase the different analytical methodologies specified in the ASTM Guide and discuss the challenges of the techniques.

Abstract# 206 - 10/10/2023 12:30 PM - 12:55 PM - Iris

PFAS – An affair of the forever kind

Jean-Francois Borny - Lummus Tech

The first fluoropolymer was patented in 1934, creating an industry that has taken off in the last 90 years to produce a wide array of consumable products from firefighting foams to non-stick pots and pans to water-repellent clothing and much more. The number of products has risen to several thousands, ranging from volatile, hydrophilic, branched and many other configurations. In March of 2023, the US EPA proposed six PFAS to be regulated under the National Primary Drinking Water Regulation (NPDWR). And this is only the beginning. As the modern analytical lab continues to push the lower detection limits to the part per quadrillion, the regulation will continue to increase. There are many ways to absorb and remove the PFAS from water, but their destruction is a lot more challenging. This presentation will explore technology that can destroy the PFAS by breaking the larger molecules into smaller molecules until the water is PFAS-free. The monitoring of the journey of the PFAS needs to include non-targeted analysis in order to identify what constitutes as contamination. The Zimpro® Electro-Oxidation (ZEO) has been proven to destroy the per- and polyfluoroalkyl substances to inorganic fluoride that no longer poses an environmental problem. We will explore the PFAS molecule journey, the treatment results, and the potential to use this technology to deal with the forever chemical problem into a never again solution.

Abstract# 209 - 10/10/2023 09:00 AM - 9:30 AM - Wisteria

Good Karl Fischer Titration Practice & Chemistry

Mark Gavin - Mettler Toledo

Since its introduction, Karl Fischer titrators, sampling apparatus and chemistry are ever evolving. Learn the basic chemistry, side reactions (and how to avoid them), and science of Karl Fischer titration as well as recent product innovations to aid your analysis. Optimization and good troubleshooting practices, specifically for the Petrochemical business, will also be explained.

Abstract# 210 - 10/10/2023 01:30 PM - 1:50 PM - Daffodil

Characterization and Quantitative Hydrocarbon Group-Type Analysis of Plastic-Derived Pyrolysis Oils by GCxGC-TOFMS/FID

Christina Kelly - LECO Corporation, Joe Binkley - LECO Corporation, John Hayes - LECO Corporation, David Borton - LECO Corporation

An increase in the desire for waste plastics converted to pyrolysis oils to be used as fuel has led to the development of processes that create potential feedstocks with chemical characteristics very different from traditional geochemical sources. A deeper, detailed understanding of their chemical composition is necessary to avoid problems at refineries because these nontraditional materials carry higher risks of poisoning catalysts or otherwise reducing efficiency, even though they may possess similar physical properties to traditional petroleum products. This presentation focuses on full characterization of plastic-derived pyrolysis oils throughout different stages of the production process using comprehensive two-dimensional gas chromatography (GCxGC) coupled to time-of-flight mass spectrometry (TOFMS) and simultaneous flame ionization detection (FID). For the

chromatographic separation of these pyrolysis oils, GCxGC not only provides improved chromatographic resolution that leads to cleaner spectral information for identification by the full mass range TOFMS, but also structured chromatograms that reveal clusters of compound classes not typically seen in traditional petroleum fuels, such as multi-branched paraffins and heteroatom-containing species that would otherwise not be resolved by single-dimension GC separation. A novel splitter design ensures that a constant ratio of analytes is sent to each detector throughout the analysis, eliminating boiling-point temperature-biased hydrocarbon group-type results from the FID while maintaining the integrity of the GCxGC separation for an analytical method that concurrently provides rich qualitative and quantitative information.

Abstract# 211 - 10/10/2023 01:50 PM - 2:10 PM - Daffodil

Application of a Novel Reverse-Fill-Flush Modulator and Splitter for Simultaneous GCxGC-TOFMS/FID Analysis of Synthetic Aviation F

John Hayes - LECO Corporation

The push for sustainable aviation fuels has led to the development of many pathways for production of synthetic aviation fuels, each currently requiring varying levels of physical and chemical testing to gain regulatory approval for use in commercial aviation equipment. Comprehensive characterization using two-dimensional gas chromatography (GCxGC) for group-type analysis has widely been accepted as a valuable means of providing detailed compositional information for not only hydrocarbons, but also polar oxygenated and aromatic compounds in these new synthetic aviation fuels. In recent years, splitter technology that allows the coupling of low-cost, flow-modulated GCxGC with dual detection from time-of-flight mass spectrometry (TOFMS) and flame ionization detection (FID) has been developed and refined to provide simultaneous identification of compounds and hydrocarbon group-type quantitation. In this presentation, a back-pressure regulated reverse fill-flush (RFF) flow modulator is used with built-in software controls to ensure full transfer of analytes from the primary to secondary GC column, an important consideration when any type of flow modulation is used. This separation technique is coupled with a novel splitter that eliminates the quantitative bias which occurs because flows to vacuum versus atmospheric pressure outlets on the different detectors change as temperatures increase during the chromatographic separation. A variety of chemical standards and both traditional and synthetic fuel samples are used to demonstrate optimal method parameters that provide both full transfer conditions and proper splitting for accurate characterization of aviation fuels.

Abstract# 212 - 10/10/2023 09:30 AM - 10:00 AM - Wisteria

Good Titration Practice Petrochemical Industry

Mark Gavin - Mettler Toledo

From the ground to the engine of a vehicle, the quality control of petrochemicals is critical in every stage of the process. Water sensitivity of petrochemicals as well as their non-aqueous solubility requires special handling of the samples and specific sensors and solvents used in their analysis. This Good Titration Practice of Petrochemicals offers knowledge and tips to assist you in optimizing your oil and fuel analysis regarding TAN, TBN, and Mercaptan.

Abstract# 213 - 10/11/2023 08:40 AM - 9:10 AM - Hibiscus

ASTM color measurements – APHA

Alexandra Hellberg - Mettler Toledo

Mettler Toledo manufacturers UV/Vis spectrophotometers along with Titration, Density, Refractometers, melting point, dropping point, balances and pH/ISE/conductivity meters. This seminar will show how and why the APHA color scale is used to measure the quality and purity of products such as fuels, lubricants and solvents.

Abstract# 214 - 10/11/2023 12:30 PM - 1:15 PM - Rose

The ASTM Advantage Tools and Resources to Maximize Your Competitive Advantage in the Laboratory

Angelique Fontenot - ASTM International

THE ASTM ADVANTAGE

An overview of ASTM International Services with a focus on the current and future of our Laboratory Services service offerings. ASTM Laboratory



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Services products assist laboratory professionals to help improve overall laboratory quality administration and remain competitive in the everchanging laboratory landscape.

Abstract# 215 - 10/11/2023 09:40 AM - 10:10 AM - Daffodil

Prediction of Gas Phase Vacuum Ultraviolet Spectra using Machine Learning.

Kevin Schug - The University of Texas at Arlington

Vacuum ultraviolet/ultraviolet (VUV/UV) absorption measurements have become a useful detection modality for gas chromatography. It has been especially useful for the characterization of fuels and other complex mixtures. The ability to predict absorption spectra for molecules is useful when pure standards are not available. Here is presented an advancement over previous quantum chemical methods for spectral prediction using machine learning and molecular feature generation.

Abstract# 216 - 10/11/2023 08:00 AM - 8:30 AM - Bluebonnet

Good HPLC Sample & Standard Preparation Practice with Manual, Automated and Robotic Solutions

Paula Heimler - Mettler Toledo

Become the Lab of the Future with METTLER TOLEDO and Say Hello to Consistent Accuracy with easier and faster HPLC Analysis. Accurate sample & standard preparation for HPLC analyses is crucial to the quality of your analytical results. So, getting it right-the-first time is important for accuracy, and accurate results minimize rework and save material and costs. The right technology will help support this accuracy and make sure your lab runs smoothly now and in the future.

Abstract# 217 - 10/10/2023 09:35 AM - 9:55 AM - Rose

A comparison of measuring organic chlorides by combustion coupled with microcoulometry and combustion coupled with Ion Chromatogra

Gabriel Villarreal - Lummus Technology

Organic chlorides can have adverse effects on production processes, catalyst viability and final product quality in the petrochemical industry. The measurement of organic chlorides is of utmost importance even at the lowest possible levels. A comparison of analytical techniques represented by ASTM D5808 (organic chlorides by combustion microcoulometry) and ASTM D8247 (organic chlorides by combustion Ion Chromatography) will be the topic of this discussion. The reliability and accuracy of both methods will be compared on samples such as pyrolysis oil. Studies such as these help to provide further insight into techniques while possibly providing impetus to explore expansion, evolution or improvement.

Abstract# 218 - 10/11/2023 01:15 PM - 2:00 PM - Floral Hall A1

Screening for PFAS in Water by Determining Adsorbable Organic Fluorine (AOF) using Combustion Ion Chromatography (CIC)

Carl Fisher - Thermo Fisher Scientific, Terri Christison - Thermo Fisher Scientific, Neil Rumachik - Thermo Fisher Scientific

Per- and polyfluoroalkyl substances (PFAS) have unique chemical properties that have led to a wide variety of uses in consumer products. Unfortunately, their durability and persistence make them an environmental concern and regulatory target due to their toxicity and bioaccumulation. U.S. EPA draft method 1621 has recently been developed that uses capture onto carbon and subsequent analysis with Combustion Ion Chromatography (CIC) to determine as many PFAS compounds as possible within one analytical workflow. The work presented here will describe the determination of Adsorbable Organic Fluorine (AOF) in surface and wastewater samples using CIC, providing guidance on achieving optimal results.

Abstract# 219 - 10/11/2023 08:50 AM - 9:50 AM - Rose

Applications of Ion Chromatography for the analysis of Anionic Contaminants in Brines, Solvents and Bases

Kirk Chassaniol - Thermofisher Scientific

Ion Chromatography methods used for the analysis of high ionic strength and water miscible organic solvent samples involves sample preparation before injection to obtain meaningful results and/or avoid fouling of the separation column and suppressor. In this talk we will review techniques for the

successful determination of anionic contaminants in high ionic strength brines, organic solvents, and basic chemicals. We will discuss factors to consider for both "in-line" and "off-line" sample preparation for anion analysis including the type of suppression recommended.

Abstract# 220 - 10/10/2023 02:00 PM - 2:30 PM - Wisteria

A fully autonomous GC/FID system for the continuous monitoring of ambient air

Jean Philippe AMIET - Chromatotec Inc., Mathilde Mascles - Chromatotec, Damien Bazin - Chromatotec

The quality of ambient air (indoor and outdoor) is of growing interest these past few decades as poor air quality has been linked to multiple illness such as asthma or lung cancer. Chromatotec airmozone is a fully autonomous system specifically designed for continuous monitoring of ambient air. The performances of the airmozone have been certified in China with the CCEP certification, in Europe (EN 14662-3:2015) and have been tested by the USEPA. We will present the tests realized by the USEPA for the characterization and validation of the system.

Abstract# 221 - 10/10/2023 02:30 PM - 2:50 PM - Wisteria

An automated, high-throughput approach for comprehensive analysis of biodiesel (B100) in compliance with EN and ASTM methods

James Pachhofer - Thermo Fisher Scientific, Giulia Riccardino - Thermo Fisher Scientific, Milan, Italy, Daniela Cavagnino - Thermo Fisher Scientific, Milan, Italy

Biodiesel quality is critical for commercialization and market acceptance. It is important that reaction conversion yield, removal of glycerol, absence of poly unsaturated fatty acids (PUFA), removal of alcohol, and absence of free fatty acids are monitored.

This presentation will highlight an automated approach to the analysis of biodiesel according to ASTM method D6584 (determination of free and total glycerol and mono-, di-, triglyceride contents), as well as EN methods 14110 (residual methanol) and 14103 (total FAMES (Fatty Acid Methyl Esters) and Linolenic Methyl Ester (C18:3)).

Abstract# 222 - 10/10/2023 08:00 AM - 8:30 AM - Rose

Pyrolysis Oil: Analysis of Halogens, Sulfur, Nitrogen and Carbon

Angela Groebel - Analytik Jena GmbH + Co. KG

The composition of pyrolysis oil can vary significantly depending on the processed plastic waste. This makes it even more crucial to monitor the levels of heteroatoms before introducing pyoil into refineries and steam crackers. The quantification of halogens, S, N, and C is done using combustion elemental analyzers. This session discusses how pyoil, which is very reactive, can nonetheless be combusted completely and soot-free and most importantly without the operator having to optimize the combustion process in a lengthy trial and error fashion. Furthermore, we present a way of conducting halogen analysis that reliably prevents any backflow of sulfuric acid.

Abstract# 224 - 10/11/2023 10:50 AM - 11:40 AM - Bluebonnet

How to utilize X-ray Fluorescence for accurate inorganic quantitative and semi-quantitative analysis for industrial applications

Poulami Dutta - Dow

X-ray Fluorescence Spectroscopy (XRF) is an elemental analysis technique widely used across industries due to its fast and easy sample preparation and non-destructive multi-elemental analytical capability. It is widely used in industry for different quantitative and qualitative analysis needs including catalyst supports and promoters, additives and residual metals in polymers and contaminants in different matrices. Different categories of XRF instruments include high-end wavelength dispersive (WD) floor models to simple but rugged energy dispersive (ED) bench-top units. With recent advances in instrumentation and affordability, it is now possible to implement robust, accurate and precise EDXRF quantification methods in manufacturing laboratories that would traditionally require use of WD instruments available at a R&D lab only allowing on-site data acquisition for process control. It is also possible to use simple ED units to extract location-specific elemental distribution using benchtop Micro XRF (M-XRF) instruments that can produce X-ray spot sizes of 20-30 μm . This technique is highly desirable for analyzing

small, inhomogeneous samples and inclusions and can provide chemical maps to determine elemental distribution of major and trace elements which cannot be achieved with bulk XRF analysis. Aside from instrumentation, sample preparation is critical for achieving high quality XRF spectral data and accurate quantification. In this presentation, multiple examples of solving challenging and critical industrial problems using a combination of ED, WD and M-XRF will be shared. This work will highlight importance of choosing the right sample preparation protocol to achieve homogeneous samples and present studies developed to quantify accurately and precisely a wide range of elements in a variety of matrices at trace levels. Additionally, cases where semi-quant analysis can be used to quantitate unknown samples accurately without preparing matrix-matched standards will also be presented.

Abstract# 225 - 10/11/2023 02:00 PM - 2:45 PM - Floral Hall A1

High-throughput analysis of PFAS in ambient air using TD-GC-MS/MS

Andy Fornadel - Thermo Fisher

PFAS originate from various sources and are of concern due to their longevity and health impacts. Recently, effort has been made to understand the transport and fate of PFAS in water and soil; however, the analysis of PFAS compounds in air are of growing interest. Detection of airborne PFAS is critical to understanding atmospheric emission, transport, and cycling. Here, we describe the analysis of air using TD-GC-MS/MS method for various PFAS species in a single, 3. The method allowed for targeted and non-targeted screening of the samples.

Abstract# 226 - 10/10/2023 08:30 AM - 9:15 AM - Rose

A review of FT-NIR analyzers as applied in Refinery for both laboratory and process measurement

Allan Rilling - ABB Inc., Kyle Boyer - Exxon Mobil

FT-NIR analyzers for both laboratory and on-line process units have long history and have been field proven to provide measurement and optimization for a range of refinery products (gasoline, diesel, kerosene, jet fuels, etc). A review of FT-NIR analyzer technology in the lab and process will be presented with focus to key aspects to be considered to achieve successful implementation. To be highlighted will be measurement capabilities possible with FT-NIR in the refinery along with presentation of actual performance for final blend gasoline obtained in the lab and transferred to process.

Abstract# 228 - 10/11/2023 09:15 AM - 9:45 AM - Iris

Simplifying Laboratory Statistical Quality Control With QC/EZ™

Josh Burkhalter - Baytek International

Statistical Quality Control (SQC) is crucial for maintaining measurement system performance, but it can be complex to implement and time-consuming to maintain. Baytek has simplified our industry-leading SQC solution with a subscription-based (SaaS) model that can be implemented in hours. With real-time features like chart kiosks, status indicators, and alerts, QC/EZ™ empowers lab professionals to quickly address issues. This talk will showcase how the QC/EZ™ solution can simplify the SQC process, guide users through the full ASTM D6299 workflow, and provide the needed flexibility for various use cases that are overlooked by other software tools. We'll cover: Individuals and Moving-Range Charts, Q-Procedure, 1st/99th Percentile, Custom Defined Limits, Check Standards and CRMs Charting as well as PTP and Round Robin Charting (Z-Score, Z-Prime, Pretreated I&MR, and more). We will also showcase the advanced performance monitoring and audit reporting available with a few mouse clicks.

Abstract# 229 - 10/11/2023 08:45 AM - 9:15 AM - Iris

Gain Command Over Non-Conformances with a CAPA Solution Seamlessly Integrated with Your LIMS and SQC Software

Josh Burkhalter - Baytek International

In every lab, from technicians to directors, recurring issues demand attention. The manual nature of most non-conformances and CAPA systems is labor-intensive and prone to errors. Automate this process by integrating your CAPA solution with Baytek's LIMS or SQC software.

In this session, we'll explore how QC/CAPA™ simplifies event monitoring, historical trend analysis, and key performance indicators. Our user-friendly

workflow interface streamlines CAPA assignment and management, ending with automated reports.

Join us as we delve into the practical benefits of transitioning to proactive quality control with QC/CAPA™.

Abstract# 230 - 10/10/2023 12:30 PM - 1:15 PM - Rose

Finding the Money in Fuels Blending

Alex Lau - Baytek International

Trustworthy and timely data is a fundamental enabler to all aspects of business improvement. This presentation will speak to how having timely access to critical manufacturing process planning, control, optimization, and measurement (lab and field) data integrated with real time statistical analytical tools can help enterprises 'find the money' to drive investment such as new instruments/analyzers and/or other production support infrastructure such as LIMS with integrated analysis tools and connectivity to manufacturing process data. The key concepts will be illustrated using a gasoline blending process.

Abstract# 231 - 10/11/2023 10:25 AM - 11:10 AM - Iris

How Effective Management of Instrument SQC and Out of Control Events can drive New Instrument Purchase Justification

Alex Lau - Baytek International

In today's quality demanding and cost competitive environment, measurement data 'trustworthiness' is a key business driver and an implicit expectation from Customers & Regulatory Entities. To assure measurement data trustworthiness, a de facto industry practice which is mandated by EPA (CFR1090) and ASTM D6792 (Standard Practice for Quality Management Systems in Petroleum Products, Liquid Fuels, and Lubricants Testing Laboratories) is to deploy Statistical Quality Control Charts (SQC) to ensure the testing process is in a state of statistical control. This presentation will speak to what in statistical control means, what an Out of Control (OOC) event means, what the immediate and follow up responses should be, and how learnings from an effective SQC and OOC management program can help fund new instruments and analyzers.

Abstract# 232 - 10/10/2023 01:15 PM - 1:40 PM - Rose

Analysis of Silicon and Metals in Pyrolysis Oil

Jessica Gantt - Analytik Jena

Oil derived from plastic waste typically exceeds the feedstock specifications of steam crackers in terms of Si, Na, Fe, and other metal content. This session discusses how ICP-OES, the technique of choice for monitoring these elements, can best overcome the challenges presented by a highly organic matrix such as pyoil. The high organic load necessitates a robust plasma system to avoid carbon buildup. To access the most sensitive emission lines, spectral interferences stemming from the carbon-rich matrix need to be separated reliably from the signal. Strategies for a significantly reduced Argon consumption will also be presented.

Abstract# 233 - 10/10/2023 01:40 PM - 2:00 PM - Rose

Determination of Aromatics, Saturates, and Olefins in Pyrolysis Oil Using Supercritical Fluid Chromatography and UV- Detection.

Anthony Hobbs - Lummus Technnology

The objective of this analytical technique is to differentiate saturate, olefins and aromatics (mono-, di-, and tri-) in a single sequence using supercritical fluid chromatography and simultaneous UV detection to identify component regions by also confirming carbon numbers. The analysis focuses on pyrolysis process liquids that are capable of being dissolved and filtered using suitable solvents and filters. Aromatics, Saturates and Olefins regions are cross referenced with UV-detector results at different absorption wavelengths to determine the approximate carbon number of the saturates and olefins. The standalone UV-detector also allows for further distinction of the mono-, di-, and tri- aromatic regions by simultaneously overlaying chromatograms and spectra.

Abstract# 235 - 10/10/2023 01:15 PM - 2:00 PM - Wisteria

Understanding the Role of Expansion-Type Vapor Pressure Methods in Gasoline Production and Certification

Jason Nick - Grabner Instruments

The analysis and regulation of gasoline vapor pressure play critical roles in safety, environmental protection, performance, and profit. This workshop covers the fundamentals of vapor pressure theory and expansion-type measurement methodology, relative to gasoline production and certification. Upon completion, attendees can expect to possess a clear understanding of modern vapor pressure analysis, with focus on the relationship between ASTM D5191, ASTM D6378, and ASTM D5188.

Abstract# 236 - 10/10/2023 09:00 AM - 10:00 AM - Bluebonnet

How to Prevent and Solve the Most Common Problems in ICP-OES and ICPMS Analyses

SERGEI LEIKIN - Texas Scientific Products

Every ICP analyst is facing some problems that can be challenging and time consuming regardless of the application, sample type or spectrometer operator experience. Quite often – many of the routine problems can be either prevented by a proper selection of the sample introduction components, choice of correct calibration strategy or addressed rapidly and efficiently by simple adjustment of the ICP running parameters. Practical and detailed guidance on how to solve such common problems will be presented and accompanied by simple demonstrations. Participants are encouraged to bring up their own unique problems for open discussion.

Abstract# 237 - 10/10/2023 02:00 PM - 2:45 PM - Rose

A 'Total Workflow' Approach to Elemental Sample Prep For The Petrochemical Industry

Eric Farrell - Milestone Inc.

As ICP technologies continue to evolve, the sample preparation side of the analytical process must also evolve to keep pace. While digestion plays a central role in sample preparation of petrochemical products, there are several other steps to consider. Comprehensive multielement determinations in crude oil and refined petroleum products have often been a difficult task, resulting in a myriad of developed sample preparation and instrumental analytical methods. Due to the nature of the samples themselves, petrochemical products can be difficult to mineralize and achieve clear, colorless solutions post-digestion. We will discuss a 'total workflow' approach to sample preparation for petrochemical labs that supports the throughput and analytical quality needs of the modern elemental analysis lab.

Abstract# 238 - 10/11/2023 09:30 AM - 9:50 AM - Wisteria

Comparison of Diesel Samples Measured by Using GCxGC-HRTOFMS
A John Dane - JEOL USA, John Moncur - SpectralWorks Limited, Scott Campbell - SpectralWorks Limited, Kirk Jensen - JEOL USA, Robert Cody - JEOL USA

Petroleum samples are complex materials that can be difficult to analyze by traditional methods like gas chromatograph-mass spectrometry (GC-MS) that use only electron ionization (EI). Furthermore, given the complexity of this material, it can be difficult to determine differences between samples when measured. In this work, a high-resolution time-of-flight mass spectrometer (HRTOFMS) equipped with a thermal modulator GCxGC system was used to analyze diesel samples by using an electron ionization/field ionization/field desorption (EI/FI/FD) combination ion source. Additionally, new software capabilities were used to compare diesel samples from different vendors. The results for this work will be presented.

Abstract# 240 - 10/10/2023 01:35 PM - 2:05 PM - Iris

On-asset monitoring solution for Production Chemistry and Flow Assurance challenges

Monica Rodriguez - Malvern Panalytical

On-asset solution for Production Chemistry and Flow Assurance challenges. The Epsilon 1 wells is an on-asset monitoring solution that gives you critical production chemistry and flow assurance data within minutes. It maximizes uptime and production by giving you the ability to make data driven decisions about production parameters for scale-squeezes and other interruptions in real time. With the Epsilon 1 Wells you can predict with confidence when a scale-squeeze needs to take place, saving millions of dollars.

Abstract# 241 - 10/10/2023 02:25 PM - 2:50 PM - Iris

Ongoing QC Testing with Sulfur Analysis in Performance-based Measurement Systems using Excimer UV Fluorescence

Franeek Olstowski - Process Insights, Matt Lanning - Linc Sales

Laboratories frequently face challenges to keep sulfur measurement instrumentation compliant with regulatory requirements of EPA 40 CFR Part 1090 Subpart N and ASTM D6299 standard established to demonstrate and monitor the proficiency of analytical measurement systems. These include refinery labs, third-party and any other laboratories measuring certain fuel parameters such as sulfur. Even after qualifying an instrument using the alternate procedure defined by the ASTM D5453 UV fluorescence method, maintaining long-term stability becomes difficult due to the characteristic nature of the measurement itself. These systems rely on an excitation sources that are inherently unstable over time, which subsequently affect analysis results. Excimer UV fluorescence technology offers increased stability thereby reducing required intervention to maintain analytical results within control limits. Science behind the benefits of the technology will be discussed, as well as data showing examples of violations and corrective actions taken.

Abstract# 242 - 10/10/2023 02:30 PM - 3:00 PM - Floral Hall A2

Analysis of Formic Acid using the Brevis GC-2050 with Flame Ionization Detector and In-jet Methanizer

Yuan Lin - Shimadzu Scientific Instruments, Inc

Abstract: While short chain (C2- C7) volatile fatty acids (VFAs) can usually be analyzed in free form, formic acid commonly requires derivatization to methyl formate to be detected by a Flame Ionization Detector (FID). Other detectors such as barrier discharge ionization detector (BID) can be used but requires expensive helium gas for operation. The use of an in-jet methanizer (Jetanizer) allows determination of formic acid in free form with FID. In this application, simultaneous analysis of underivatized formic acid along with other volatile fatty acids, from C2 to C5, in a single injection was demonstrated on the GC-2050 with a Jetanizer for FID detection.

Abstract# 243 - 10/10/2023 11:00 AM - 11:45 AM - Hibiscus

FTIR and Raman Microscopy: Techniques and Applications

King Chambers - Thermo Fisher Scientific

This presentation will highlight the advantages of using Infrared and Raman microscopy techniques in the analysis of micro-scale materials. The presentation will illustrate various applications of both microscopy techniques and the advantages of each based on the type of materials being analyzed.

Abstract# 244 - 10/10/2023 11:30 AM - 12:00 PM - Floral Hall A2

Instrumental Analysis of Total Nitrogen Content in Aqueous Samples using the Shimadzu TOC-L/TOC-4200 with Total Nitrogen Module

Ricky Frnka - Shimadzu Scientific Instruments, Inc

Classical analysis of water samples for nitrogen content is laborious, time consuming and generates hazardous waste. Total Kjeldahl Nitrogen (TKN) measurement does not take into account the contributions of nitrites and nitrates, nor variability in recovery as a result of different salt content of the samples. The current EPA definition for total bound nitrogen (also called bound nitrogen or TNb) is TKN plus nitrite and nitrate nitrogen. Recently published analytical methods now provide for instrumental analysis of TNb which saves time, minimizes waste, increases accuracy, and reduces variability. The Shimadzu bench top TOC-L with TNM-L and the on-line TOC-4200 with TNM can be used to determine total nitrogen (TNb) as well as simultaneous TC or NPOC analysis.

Abstract# 245 - 10/10/2023 11:00 AM - 11:30 AM - Floral Hall A2

Maintaining and Troubleshooting the TOC-L

Ricky Frnka - Shimadzu Scientific Instruments, Inc

Properly maintaining instrumentation and having good troubleshooting skills are vitally important to providing good and timely data. Due to the nature of samples analyzed by Total Organic Carbon analyzers, daily checks and routine maintenance are needed. Tips on diagnosing issues, maintenance items and troubleshooting guidelines will be provided as they are necessary to have reducing downtime.

Abstract# 246 - 10/10/2023 03:30 PM - 4:00 PM - Floral Hall A2

Improved anions analysis – impact of newer technologies in older contaminants.

Quoc-Huy Ho - Shimadzu Scientific Instruments, Inc

Fast and robust analysis of anions in environmental samples is essential for environmental laboratories due to the short turn-around-times required for the analysis of nitrate and nitrite in methods EPA 300 and 300.1. When analyzing samples with diverse and variable composition for nitrate and nitrite together with some of the other targets from these methods (e.g., F-, Cl-, Br-, PO₄-, and SO₄- from EPA 300), laboratories may run into challenges. For example, high concentrations of chloride in the matrix can mask the presence of nitrite, preventing the detection of the later by suppressed conductivity detector required in the method. Hence, two or more injections may be needed for obtaining the required results, resulting in decreased productivity. In this work, we first optimized the method conditions to maximize lab productivity and turn-around-time for the analysis of the seven anions targeted in EPA 300 in a run-to-run time of 4.5 minutes (4.0-minute gradient). In an attempt to further increase the efficacy of the method, we evaluated two approaches to eliminate the need for sample-reruns when results from various anions are outside the calibration range or interferences are present: 1) lowering the injection volume (down to 0.2 µL) to avoid the need for sample dilutions (in- or off-line) and 2) using a conductivity and UV detectors in-line to detect nitrite in the presence of high concentration of chloride. In this presentation we will present the results from the method performance evaluation including but not limited to linearity, sensitivity, and reproducibility.

Abstract# 247 - 10/10/2023 01:00 PM - 1:30 PM - Floral Hall A2

Shimadzu's Analytical Solutions for the Hydrocarbon Processing Industry and Customer Case Studies

Raj Makhmale - Shimadzu Middle East & Africa FZE

Use of Alternative carrier gases for Simulated Distillation ASTM D2887 and D7169 Determining the boiling point distribution characteristics of crude oil and other its fractions is important in the petro-refinery industry for the efficient utilization of feedstocks and regulatory compliance. Simulated distillation (SimDist) methods by gas chromatography (GC) are widely used to simulate the results of the distillation tower, ASTM D7169 for products having boiling point distribution up to 720DegC of and ASTM D2887 up to 538DegC. While helium (He) is the preferred carrier gas for many GC applications, its recent price hike and supply interruption have rejuvenated efforts to explore Nitrogen and Hydrogen carrier as a cost-effective and more accessible alternative. This presentation reviews ASTM D2887 with Nitrogen and ASTM D7169 with Hydrogen carrier and demonstrates similar result as that of using Helium carrier gas.

Abstract# 249 - 10/10/2023 09:00 AM - 9:30 AM - Floral Hall A2

GC Carrier Gases: Finding the best option for your lab

Jeff Werner - Shimadzu Scientific Instruments, Inc

Obtaining helium for use as a carrier gas in GC and GCMS systems remains an ongoing challenge. The scarcity of helium supply is compelling laboratories to reconsider not just their analytical approaches but also the procedures of their instruments. While various substitute carrier gases are applicable to numerous methods, there are situations where helium stands as the sole choice. As operators of these instruments, it becomes imperative for us to grasp the spectrum of possibilities at our disposal. Proficiency in understanding diverse carrier gas alternatives, comprehending the advantages and disadvantages inherent to each gas, and being equipped with strategies for scenarios when helium is the exclusive alternative, all play a pivotal role.

Abstract# 250 - 10/10/2023 02:00 PM - 2:30 PM - Floral Hall A2

Total Petroleum Hydrocarbons Analysis: Unveiling the Future with new Brevis GC-2050

Alan Owens - Shimadzu Scientific Instruments, Inc

Total petroleum hydrocarbons consist of a large list of compounds that traditionally originate from crude oil, which is formed from organic buried material that has been subjected to intense heat and pressure. As a result, the manufacturing of crude oil has raised concerns regarding TPH contamination or presence in the environment such as water and soil ecosystems. With ever growing knowledge of the potential environmental

contamination as well as health concerns, an established GC-FID method allows for accurate quantitation of total TPH. In this application, a fast and robust method was created using Shimadzu's newest GC, the Brevis GC2050. The compact GC -2050 (230 V) was used to enable rapid heating, and hydrogen was used as the carrier gas to analyze TPH reducing overall runtime. Linearity and area ratio of C40 to C20 were also maintained in compliance with ISO 9377 -2 -2000.

Abstract# 251 - 10/10/2023 01:30 PM - 2:00 PM - Floral Hall A2

Trace Sulfur Analysis in Hydrogen Fuel using the Shimadzu SCD-2030

Allison Mason - Shimadzu Scientific Instruments, Inc

Hydrogen has become increasingly more desirable as an alternative fuel as energy companies strive to become "Carbon Neutral". Hydrogen fuel must be high purity and have virtually no sulfur impurities to be used in catalytic reactors. The required limits of sulfur for hydrogen fuel pushes the limits of most currently available off the shelf sulfur detection systems. Shimadzu has developed solution for quantifying trace sulfur in high purity hydrogen fuels repeatedly

Abstract# 252 - 10/10/2023 03:00 PM - 3:30 PM - Floral Hall A2

Incorporating ARC Jetanizer and Polyarc on the Shimadzu GC-2030 for Improved GC Analysis

Ian Shaffer - Shimadzu Scientific Instruments, Inc

The Flame Ionization Detector, FID, is staple detector in hydrocarbon processing. Recent innovations have provided improved robustness and efficacy for detection of non-responding or low responding carbon containing analytes. Activated Research Company's Jetanizer has been demonstrated to allow for the quantitation of CO and CO₂. The PolyARC reactor builds off this catalyst technology for the analysis of oxygenates. In depth performance evaluation and application development of these products are assessed on the Shimadzu GC-2030.

Abstract# 253 - 10/10/2023 09:30 AM - 10:00 AM - Floral Hall A2

Improved Fuel Cell Analysis using the Shimadzu Barrier discharge Ionization Detector (BID)

Allison Mason - Shimadzu Scientific Instruments, Inc

Fuel Cells continue to be of interest as research and development focuses on green energy sources. While CO₂ reduction has long been a focus for green energy, the need for the analysis of trace hydrogen and other fixed gases in these systems has increased. The Shimadzu GC-2030 Fuel Cell Analyzer has been modified to incorporate the Shimadzu Barrier discharge Ionization Detector (BID) for improved sensitivity of inorganic gases.

Abstract# 254 - 10/11/2023 10:30 AM - 10:50 AM - Daffodil

Analysis of Hydrocarbons in Waste Plastic Process Oils using ASTM D8519

Alex Hodgson - VUV Analytics

Plastic waste is recognized as a significant environmental challenge but also an opportunity. Many organizations are actively involved in recycling plastic waste and using pyrolysis technologies to convert it into usable petrochemical feedstocks. The output of this process is challenging to evaluate with analytical approaches used for traditional hydrocarbon streams. This presentation will introduce a new standard method – ASTM D8519 – that utilizes Gas Chromatography-Vacuum Ultraviolet Spectroscopy (GC-VUV) to provide accurate identification and class-based quantification of hydrocarbons in pyrolysis oils over a broad carbon number range.

Abstract# 255 - 10/11/2023 10:50 AM - 11:10 AM - Daffodil

Analysis of EPA-Monitored Volatile Organic Compounds using GC-LUMA

Alex Hodgson - VUV Analytics, Dale Harrison - VUV Analytics, Sirong Lin - NuTech Instruments, Gesheng Dai - NuTech Instruments

Volatile organic compounds (VOCs) emitted from refineries, chemical plants, and other industrial sources must be closely monitored and limited, as they have significant impact on both the environment and human health. Subsets of approximately 100 of these VOCs are measured via EPA methods such as TO-14A and TO-15. While mass spectrometry or a combination of other non-specific detectors can be used to perform these methods, they all suffer from various drawbacks including compound identification, sensitivity, and ease of

use. A new approach to VOC analysis utilizing GC-LUMA brings a selective, sensitive, and simple alternative to currently used setups.

Abstract# 256 - 10/11/2023 11:10 AM - 11:35 AM - Daffodil

Application of GCVUV Techniques to Petroleum Specifications and Regulations

Dan Wispinski - VUV Analytics

The adoption of GC-VUV technology depends on the promulgation of GC-VUV standard test methods within international standard writing organizations (SWO's), such as ASTM and the European Committee for Standardization (CEN). Standards and specifications for refined fuels provide guidelines for fuel properties, test methods, and quality assurance. They facilitate global trade and harmonization of fuel specifications. Regulators and government bodies rely on specifications and test methods to enforce compliance with fuel quality, safety and environmental standards. The current specification and regulatory status of five GCVUV standard methods will be reviewed. The applicability and versatility of these methods to future world-wide regulations will also be elucidated. The results of a new reference material for ASTM D8071 with EPA accepted qualification criteria will be presented.

Abstract# 257 - 10/11/2023 01:00 PM - 1:20 PM - Daffodil

Pyrolysis Oil – The Good, The Bad, The Ugly

Dion Boddie - Lummus Technology Inc

The emphasis on circular economy is here to stay. Analyzing py oil samples that are processed from a variety of plastic feedstock can be challenging. The most difficult part is achieving good component characterization. We will compare the good, the bad, and the ugly. Good samples have a light tea color appearance, are easy to analyze and behave similarly to gasoline. The bad samples are heavier, dark molasses in color and harder to analyze. The ugly samples, we do not analyze! This presentation will explore what we have learned by using GC-VUV and DHA (ASTM 6730) as analysis methods.

Abstract# 258 - 10/10/2023 09:00 AM - 10:00 AM - Hibiscus

FTIR/Raman Theory and Sample Handling

Dr Andrew Schmitz - ThermoFisher Scientific

Infrared (IR) spectroscopy is a quick, reliable, non-destructive technique that takes advantage of molecular vibrations to identify and study chemicals. Fourier Transform Infrared (FTIR) spectroscopy is the main method in executing IR spectroscopy. With IR spectroscopy a user can identify compounds, functional groups in organic molecules, interaction between a molecule and its local environment, and perform quantitative analysis such as concentration measurements just to name a few. There are several techniques in FTIR spectroscopy such as drifts, attenuated total reflectance and transmission. This presentation will cover the theory of FTIR and Raman spectroscopy along with the different sampling techniques and their applications.

Abstract# 260 - 10/11/2023 01:20 PM - 1:40 PM - Daffodil

Water in Denatured Fuel Ethanol and Ethanol Blended Gasoline by GC-VUV

Ryan Schonert - VUV Analytics, Dan Wispinski - VUV Analytics

The ASTM D4806 denatured fuel ethanol specification limits the water content to a maximum of 1.0% vol. Therefore the final ethanol blended gasoline such as E10 can contain 0.1% water. E15 can contain 0.15% water. Water content is controlled because of the possibility of phase separation if the water level in the blend rises too much or if the temperature of the fuel drops. A bottom layer in a retail or car tank is obviously a problem. Water content is normally determined by Karl Fischer titration. This paper will offer an alternative GCVUV technique to quantify water in denatured fuel ethanol and ethanol-gasoline blends.

Abstract# 261 - 10/11/2023 01:40 PM - 2:00 PM - Daffodil

Gasoline Compositional Analysis for Particulate Matter Index

Peg Broughton - Marathon Petroleum Company, Dan Wispinski - VUV Analytics

The EPA is considering further reductions in particulate matter (PM) emissions from gasoline combustion. Techniques to understand, manage, and mitigate PM are being undertaken by the fuel industry to prevent over-restrictive backend distillation regulations, which could reduce available fuel volumes. This presentation will discuss the particulate matter index (PMI) as a tool to estimate PM emissions from gasoline composition, provide an overview of industry efforts to improve and standardized compositional analysis, and finally share a comparison between traditional detailed hydrocarbon analysis (DHA) and the gas chromatography/vacuum ultraviolet (VUV) detection technique. VUV spectroscopy is versatile and well-suited to aromatic and diaromatic analysis – the compounds that contribute the most to particulates. Importantly, the technique is less laborious and more suited for a production environment than traditional DHA.

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Abstract# 103 - 10/10/2023 09:20 AM

Development of a Standardized Test Method and Advanced Instrumentation for Determining Water and Sediment in Crude Oil.

Raj Shah - Koehler Instrument Company, Inc., Jeff Gao - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc.

Crude oil is used to synthesize fuel, lubricants, and other petroleum products. Determining the volume of water and sediment in these crude oils provides essential information for the production, distribution, and usage of crude oil in the petroleum industry. The net volume of water and sediment in crude oil is used within sales, taxation, exchange, inventories, and custody transfers. If not accurately determined, an excessive quantity of water and sediment may cause corrosion to equipment, problems in processing and transport, and may even violate federal, state, or municipal regulations. Laboratory test methods, such as ASTM D473, method for extraction of sediment in crude oils, and ASTM D4377, method for determination of water in crude oil by Potentiometric Karl Fischer Titration, are used on crude oil, but these methods are limited by their lack of practicality in the field. The ASTM D96 method for determination of water and sediment in crude oil by centrifuge has been used for field testing. Although this test procedure is limited in accuracy compared to other methods, its advantage comes from increased utility as a portable field option. Koehler Instrument Company's K60094 heated oil test centrifuge is designed expressly for petroleum testing applications in the field. The K60094 showcases recent advances made in measuring water and sediment in crude oil. This poster explains the importance of this test procedure and showcases the easy operation of a field oil test centrifuge.

Abstract# 104 - 10/10/2023 09:20 AM

Advances in Instrumentation for Determining Gum Content in Fuels

Raj Shah - Koehler Instrument Company, Inc., Nashita Nawarah - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc.

Gum is the denoted term for when the hydrocarbons present in fuels react with absorbed atmospheric oxygen and with each other forming resinous, polymeric, and non-volatile materials with a high molar mass. Over time, fuels have the tendency to develop gum content. Gum, when dissolved in gasoline or aviation fuel, can affect engine performance of equipment, which can be inconvenient and especially dangerous, specifically in aircrafts. Koehler Instrument Company's newly released K33900 Existent Gum Evaporation Bath determines the gum content in aircraft turbine fuel and motor gasoline according to ASTM D381. This test method specifically covers aviation fuels, motor gasoline, and volatile distillates in their finished form in order to determine the preexistent gum content. The test evaluates the propensity of a fuel to form gum as well as measuring the amount of contaminants, typically ones with high boiling points, within a sample. The new K33900 instrument includes benefits such as a redesigned safety top assembly, digital flowmeters, advanced air flowmeters, built-in pressure regulators, and microprocessor programmable high accuracy temperature control. These features allow for smooth and safe testing with few complications. This poster discusses the latest advances in instrumentation for ASTM D381.

Abstract# 105 - 10/10/2023 12:20 PM

Advances in Instrumentation for ASTM D2266 and D2596 (Four-Ball Test Method for Lubricating Greases)

Raj Shah - Koehler Instrument Company, Inc., Gyeongmin Oh - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc.

Lubricants and greases are used to prevent damage to machinery and maximize operational efficiency by decreasing the coefficient of friction on moving parts. In order to accurately evaluate lubricants for friction and wear properties, a variety of tribology testing methods are commonly used.

Tribology testing measures wear prevention, extreme pressure in relation to functionality, and the frictional coefficient of lubricants. The Four-Ball Method utilizes four steel balls, with one steel ball under load rotating upon three stationary steel balls coated in lubricant. The newly designed benchtop Four-Ball model, K93170-PN, by Koehler Instrument Company, holds a major advantage of a reduced size perfect for laboratory environments. In addition, this instrument features integrated data acquisition along with other advanced software functions. This poster explains the importance of this test procedure and showcases the easy operation of the K93170-PN instrument while exploring the use of the Four-Ball method for measuring the wear prevention and extreme pressure properties of lubricating greases according to ASTM D2266 and ASTM D2596. In addition, determining the friction coefficient of lubricating greases using ASTM D5183 will also be discussed alongside relevant laboratory data analysis.

Abstract# 106 - 10/10/2023 12:20 PM

Modified Test Techniques for Greases in Electric Vehicles (Penetration, Dropping Point, EMCOR)

Raj Shah - Koehler Instrument Company, Inc., William Streiber - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc., Stefan Lim - Koehler Instrument Company, Inc.

As the automobile market shifts to electric vehicles (EVs), the demand for proper lubrication is expanding exponentially. Selecting a lubricant for specific qualifications such as noise, efficiency, and compatibility with electrical currents and electromagnetic fields is an ongoing challenge for EVs. Appropriate lubrication is integral to the longevity and sustainability of electric vehicles. Determining characteristics such as corrosion resistance, high temperature operation, consistency, and stiffness are paramount in the classification of a grease to a type and provide valuable insight into potential applications. By using modified test methods such as the determination of corrosion preventive properties (ASTM D6138), as well as dropping point (ASTM D2265) and penetration (ASTM D217) determination, these characteristics can be obtained and interpreted. Replicating conditions that may be experienced in operation, these tests provide additional behavioral information used in the classification of a grease. Without these characteristics and behavioral information, EV noise, efficiency, and productivity of sensors may be less than optimal. This poster highlights testing instrumentation from Koehler Instrument Company to test for the aforementioned test methods.

Abstract# 109 - 10/10/2023 02:00 PM

New Laboratory Methods for Analyzing Copper Corrosion Caused by Petroleum Products

Raj Shah - Koehler Instrument Company, Inc., Jeff Gao - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc.

Corrosion is a natural process that transforms refined metal into a more chemically stable oxide. Copper is a metal that is susceptible to corrosion, and due to its importance in everyday life, several test methods have been developed to study its corrosion properties. Specifically, these test methods focus on the corrosive effects of petroleum products on copper when they come into contact with each other. Tests like ASTM D130, which is a standard test method for corrosiveness to copper from petroleum products by copper strip, provide valuable information on the corrosive properties of various petroleum products. Koehler Instrument Company's Copper Strip Corrosion Bath is an example of an instrument that can perform this test method and has several features that make it a valuable tool in the analysis of petroleum products. Other tests, such as the standard test method for copper strip corrosion by liquefied petroleum (LP) gases, focus on specific types of petroleum products and require specialized equipment such as the LPG Copper Strip Corrosion Test Apparatus. Lastly, the standard test method for detection of copper corrosion from lubricating grease focuses on

the ability of lubricating greases to corrode copper and requires the use of the Copper Strip Corrosion from Lubricating Grease apparatus. In this poster, we will elaborate on these test methods and the instruments used to perform them in detail. The development of more accurate laboratory methods for analyzing copper corrosion caused by petroleum products is essential for ensuring the longevity, efficiency, and safety of copper-based systems.

Abstract# 110 - 10/10/2023 02:00 PM

A Versatile Instrument for the Determination of Reflectance and Color of Distillate Fuels

Raj Shah - Koehler Instrument Company, Inc., Gyeongmin Oh - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc., Stefan Lim - Koehler Instrument Company, Inc.

The widespread use of fuels, such as diesel, necessitates the testing of stored and aged fuel stability to optimize the performance and durability of fuel-powered engines. Gunk and sludge can severely damage the fuel injection system, leading to engine failure. By testing the relative stability of stored and aged fuels at high temperatures, fuel can be efficiently monitored and utilized, resulting in economic benefits from efficient fuel usage. The K30700 Advanced Technology Reflectance Colorimeter is a state-of-the-art device that automatically recognizes colors by analyzing pad filters used in vacuum filtration systems. It has several advantages, including objective results through light reflectance and ease of use, thanks to its state-of-the-art electronics. This poster emphasizes the importance of color classification testing and various applications, specifically investigating the high temperature stability and thermal oxidation stability of middle distillate fuels with ASTM D6468.

Abstract# 111 - 10/10/2023 02:00 PM

An Innovative Adaptable Engine Design for Effectively Conducting Measurements of RON, MON, for Testing Octane Levels.

Raj Shah - Koehler Instrument Company, Inc., Nashita Nawarah - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc.

Detonation is a phenomenon that occurs when the air-fuel mixture in the combustion chamber of an engine ignites prematurely, causing uncontrolled combustion and pressure spikes that can damage the engine and reduce its efficiency. To evaluate a fuel's ability to resist knocking or detonation during combustion, a versatile engine such as Koehler Instrument Company's K90901 Combination Octane Rating Unit Engine can provide precise and reliable measurements. This engine is capable of effectively measuring the Research Octane Number (RON), Motor Octane Number (MON), and other octane testing procedures, in accordance with ASTM D2699 and ASTM D2700. The engine is designed to operate under a variety of conditions, including variable compression ratios, spark timing, and air-to-fuel ratios, which are necessary for testing different fuel formulations and compositions. It is capable of simulating real-world driving conditions, such as different temperatures, altitudes, and driving speeds, in order to accurately measure a fuel's octane rating. The use of this engine can enable researchers and manufacturers to test and develop new fuels and fuel additives that can improve engine performance, reduce emissions, and increase fuel efficiency. This poster will highlight the various types of octane testing methods and describe the operation of the engine itself.

Abstract# 112 - 10/11/2023 09:20 AM

A Detailed Study and Comparison of a Variety of Bench Scale Test Methods for Lubricating Oils

Raj Shah - Koehler Instrument Company, Inc., William Streiber - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc., Stefan Lim - Koehler Instrument Company, Inc.

Property determination of a lubricating oil is imperative to understanding the oil's suitable areas of application. Rust prevention, oxidation, thermal performance, air release and foaming characteristics are all properties integral to the implementation of oils into the appropriate field. These properties fluctuate among oils of different viscosity indices and require standardized testing for their determination. To extend the longevity of the finite oil, these test methods assess the performance of lubricating oils. By testing these properties, the behavior of these oils under specific operation conditions can be determined. These behaviors include oxidation life of inhibited turbine fuels (ASTM D943), oxidation stability of middle distillate fuels (ASTM D2274), and the ability of turbine oils to form sludge during oxidation (ASTM D4310). Additionally, properties such as air release of hydrocarbon-based oils (ASTM D3247), are useful in applications where agitation causes the diffusion of air bubbles in oil, can be determined. To determine sustainability behaviors, rust prevention, and foaming characteristics (ASTM D665 and ASTM D892, respectively) are used. These tests yield insight pertaining to the performance of oil under defined conditions. Koehler Instrument Company Inc. has a wide variety of products to perform these testing procedures. This poster goes in depth on the capabilities of each instrument and the importance of lubricating oil testing.

Abstract# 115 - 10/11/2023 09:20 AM

Resistance of Grease to Water Contamination: Importance and Test Methods

Raj Shah - Koehler Instrument Company, Inc., William Streiber - Dept. Of Chemical Engineering, State Univ. of NY, Stony Brook, Anthony Schevon - Koehler Instrument Company, Inc.

Water contamination in lubricating greases accelerates rust and corrosion, causing changes to the chemical structure of the grease. Water can also initiate advanced oxidation and introduce bubbles, leading to a non-uniform distribution of grease and hydrogen embrittlement. This can cause pressure cracks, leading to system failure and safety hazards. Therefore, determining a grease's resistance to water contamination is crucial for sustainability and safety. ASTM D4049 and ASTM D1264 are two commonly used test methods for assessing a grease's resistance to water. ASTM D4049 involves spraying a water stream at a specific rate and temperature onto a grease plate and analyzing its weight before and after exposure to water. In contrast, ASTM D1264 involves spinning and spraying a bearing at a predetermined rate to test the resistance of greased parts to water permeation. This poster highlights Koehler Instrument Company's test instrumentation to address water contamination in greases, with an in-depth analysis of the procedure and ease of use of the instrumentation. Future research can explore the development of more effective test methods to assess grease resistance to water contamination in service conditions.

Abstract# 119 - 10/11/2023 12:00 PM

Composition and Evolution of Fuel Additives: An In-depth Exploration of Modern Formulations and Future Trends

Raj Shah - Koehler Instrument Company, Inc., William Streiber - Koehler Instrument Company Inc., Stefan Lim - Koehler Instrument Company Inc.

The United States boasts an extensive network of approximately 150,000 gas stations, dispensing an astounding 378 million gallons of gasoline each day. Despite this remarkable consumption rate, a significant proportion of Americans remain unaware of the intricate composition of the fuel they utilize. Contrary to common belief, modern motor gasoline is far more than a mere blend of low-boiling components derived from crude oil refining. It represents a sophisticated formulation encompassing not only low-boiling hydrocarbons but also an array of additives tailored to enhance fuel efficiency, mitigate harmful emissions, and optimize vehicular performance. These additives, encompassing

stabilizers, octane boosters, detergents, anti-freeze agents, and numerous other substances, are meticulously crafted by leading gasoline producers to create their unique and optimal additives package. This research poster endeavors to elucidate the diverse categories of fuel additives and their

transformative evolution over time. By examining the composition and functions of these additives, their contributions to enhancing fuel efficiency, reducing detrimental emissions, and maximizing vehicle functionality will be comprehensively expounded. Additionally, the poster will delve into the prevailing trends within the fuel additives industry, shedding light on the direction it is poised to take in the forthcoming years. Through a systematic analysis of these additives, their impact on gasoline composition and performance will be unveiled, thereby enabling a better understanding of the complex nature of modern motor fuels and their future trajectories.

Abstract# 120 - 10/11/2023 12:00 PM

Mitigating the Adverse Impact of Inorganic Salts in Crude Oil: Assessment and Remediation Strategies

Raj Shah - Koehler Instrument Company, Inc., Vincent Colantuoni - Koehler Instrument Company Inc., William Streiber - Koehler Instrument Company Inc., Anthony Schevon - Koehler Instrument Company Inc.

Crude oil, as a complex amalgamation of diverse hydrocarbons, exhibits considerable variations in visual characteristics, chemical composition, consistency, and color. Its classification relies on factors such as hydrocarbon composition, distillation properties, yield, quality, sulfur content, or API gravity. However, crude oils often harbor numerous compounds and impurities that necessitate removal during the refining process. These impurities include sulfur, nitrogen, and oxygen compounds, trace metals, and inorganic salts. Notably, the presence of inorganic salts in raw crude oil can engender fouling and plugging of pipelines and heat exchangers. Moreover, severe corrosion stemming from the decomposition of chloride salts, resulting in hydrochloric acid and ammonium chloride, can inflict additional damage. The economic repercussions of such complications are substantial, manifesting as heightened capital expenditure for equipment repair or replacement. Furthermore, production downtime during maintenance intervals, alongside energy inefficiencies, can curtail yield and diminish profits. The diverse array of issues attributable to excessive salt content in crude oil underscores the importance of measuring and removing inorganic salts to adhere to industry standards. The recently developed Koehler K23060 Salt in Crude Analyzer offers a timely solution by enabling rapid and reliable determination of salt concentrations in crude oil samples, aligning with the ASTM D3230 method. By leveraging this innovative instrument, complications arising from excessive salt concentrations can be averted, ensuring smooth operations during the refining process while safeguarding equipment integrity and yield. This research poster primarily focuses on elucidating the hazardous implications of inorganic salts in petroleum refining and transportation processes, while showcasing the application of the K23060 Salt in Crude Analyzer as a crucial tool for quantifying excessive salt content during crude oil desalting operations.

Abstract# 121 - 10/11/2023 12:20 PM

Development of Innovative Automatic Instruments for Cloud and Pour Point Testing as Advanced Alternatives to Referee Methods

Raj Shah - Koehler Instrument Company, Inc., Vincent Colantuoni - Koehler Instrument Company Inc., William Streiber - Koehler Instrument Company Inc.

Petroleum products are subjected to various operating temperatures and must demonstrate optimal performance across this temperature range. Achieving superior quality fuels and lubricants is crucial to ensure efficient functionality. The characterization of petroleum products' behavior at low temperatures commonly involves assessing their "cold flow properties." Key properties in this regard include the cloud point, pour point, freezing point, and cold filter plugging point. Operating near or below the cloud and pour points can result in equipment damage, making these properties critical indicators of a product's utility at lower temperatures. Therefore, it is imperative to accurately determine the cloud and pour points to prevent suboptimal conditions during operation.

The test methods employed for determining cloud and pour points have a long-standing history in the industry, with ASTM D97 being initially approved in 1927. Referee test methods, such as ASTM D2500 and D97, are conventionally utilized to determine the cloud and pour points, respectively. However, recent advancements have led to the development of new test methods and instruments for cloud and pour point analysis, harnessing modern technology and offering numerous advantages over referee methods, including automated test procedures. Notably, ASTM D5771 and D5950 represent two such methods, specifically designed to determine the cloud and pour points of petroleum products utilizing optical detection stepped cooling and automatic tilt techniques, respectively. This research poster presents the development of novel instruments compliant with ASTM D5771 and D5950, elucidating the significant advantages these instruments offer in comparison to referee methods for cloud and pour point testing.

Abstract# 122 - 10/11/2023 12:20 PM

Applications of Energy Dispersive X-ray Fluorescence for Compliance with EPA Tier 3 Standards and Key Analytical Determinations

Raj Shah - Koehler Instrument Company, Inc., William Streiber - Koehler Instrument Company Inc., Palaknoor Kaur - Department of Chemistry, Stony Brook University, Stony Brook, NY, Vincent Colantuoni - Koehler Instrument Company Inc.

Energy Dispersive X-ray Fluorescence (EDXRF) represents a rapid, straightforward, and non-destructive elemental analysis technique extensively employed in the petroleum industry for evaluating liquids, powders, and solids. Its applications span various stages of the oil production and refining process, encompassing upstream activities at well sites, mid-stream operations involving pipelines, storage facilities, and blending operations, as well as downstream activities at refineries. In 2017, the United States Environmental Protection Agency (EPA) introduced new regulations pertaining to fuel composition, particularly the reduction of maximum allowable sulfur content from 30 parts per million (ppm) on an annual average basis to 10 ppm. To comply with these more stringent requirements, enhanced tools and technologies are necessary to accurately determine the sulfur content in fuels, including gasoline and diesel. The EDXRF method emerges as an ideal analytical tool for precisely measuring sulfur content in fuel samples, conforming not only to ASTM D7220 standards but also satisfying the EPA Tier 3 program criteria. Moreover, EDXRF holds potential for determining the concentration of additional elements such as manganese, lead, zinc, phosphorus, and calcium. The analysis of manganese and lead content provides insights into the presence of anti-knock agents utilized in motor gasoline and Avgas to enhance octane ratings. Concurrently, the determination of zinc, phosphorus, calcium, and sulfur content offers indications of antioxidant and anti-wear agents in lubricating oils. This research poster elucidates the versatile applications of EDXRF, empowering end-users to effectively obtain accurate results and adhere to international testing standards for their desired analytical objectives.

Abstract# 123 - 10/11/2023 12:20 PM

Precise Determination of Dynamic and Kinematic Viscosity in Industrial Petroleum Products for Machinery Applications

Raj Shah - Koehler Instrument Company, Inc., Vincent Colantuoni - Koehler Instrument Company Inc., Gabriele Gentile - Department of Chemistry, Stony Brook University, Stony Brook, William Streiber - Koehler Instrument Company Inc.

Accurate measurement of dynamic and kinematic viscosity plays a vital role in assessing the quality and suitability of petroleum products intended for a wide range of industrial applications. Capillary viscometers, which exploit the gravitational force acting on fluids, enable the determination of kinematic viscosity by measuring flow time and capillary constant in a U-shaped tube, providing an intrinsic measure of a fluid's viscosity without external forces. In addition, ASTM D445 provides mathematical equations for converting kinematic viscosity values into dynamic viscosity. To ensure the precise and

efficient viscosity testing of industrial petroleum products, the Koehler Instrument Company's K23900 Kinematic Viscosity Bath, in accordance with ASTM D445 and related specifications, is employed. This instrument accommodates seven capillary viscometers within a temperature-controlled bath, enabling reliable and standardized viscosity measurements.

This poster elucidates the methodology for determining viscosity in accordance with industry standards, contributing to the understanding of fluid properties for optimal machinery performance. The capillary viscometer method is employed for kinematic viscosity measurements, particularly suitable for fluids exhibiting Newtonian behavior. However, for non-Newtonian fluids, additional tests are required to determine dynamic viscosity, which can exhibit varying viscosity responses under different shear forces.

By employing the Koehler K23900 Kinematic Viscosity Bath and adhering to industry standards, precise and consistent viscosity measurements can be obtained, facilitating informed decision-making regarding the selection and application of petroleum products in machinery operations.

Abstract# 124 - 10/11/2023 09:30 AM

Analysis of DNPH-derivatized Aldehydes and Ketones using Agilent iQ Single Quadrapole LC MS

Sue Dantonio - Agilent, Robert Dantonio - Texas A and M Corpus Christi, Nikolas Lau - Agilent Technologies, John Wright - Agilent Technologies

Aldehydes and ketones are important compounds in the chemical industry. However, these compounds can be hazardous when released into the environment. Many chemical plants, industrial hygienists and air monitoring agencies perform quantitative analysis on air samples. Typically, this analysis is done by HPLC with DAD detection as all of the compounds have excellent chromophores after derivatization with 310 being the typical uv wavelength. This method works very well, When an unknown peak appears in a run, that peak needs to be identified as a hazardous or non-hazardous compound. Therefore is this set of experiments, our goal was to lower the LOD and LOQ, and use see interferences and unidentified peaks in real world samples. Methods In this set of experiments, we ran n equals 3 replicates of standard, TO11/IP-6A Aldehyde/Ketone-DNPH Mix from 1 ppb to 1000 ppm to create large calibration curves. The chromatography removed the acetone for the solvent Acetonitrile and added formic acid to add ionization. We also were given an air filter sample cartridge. This cartridge was extracted with pure acetonitrile and run on a C18 column. A diode array detector was run in series with the LC MS. Samples and standards were run with both SIM and Scan mode. We were able to create a library with known compounds of interference. We were able to both identify interfering compounds, and to quantitate in the same analytical run.

Abstract# 127 - 10/11/2023 09:30 AM

Environmental Characterization of Rural Cattle Tanks and Well Water

Ryan Lau - Texas A&M CC, Sue D'Antonio - Agilent Technologies

Kovar, Texas is an unincorporated predominantly agricultural community in Bastrop County, Texas. Water was collected in Kovar at the surface and at a depth from various bodies of water as well as one sample of well water; water is from various aquifers. Our experiments were conducted to determine what types of contaminants (heavy metals, microbiological agents, and pesticides) may be present in the water humans and livestock drink from. A total of 9 samples were taken, an original collection and a few more around a month later. Samples were analyzed using IC, LC MS, TOF (Time of Flight), and IC MS Samples were also analyzed by independent labs for analysis of heavy metals and microbiological agents.

Abstract# 146 - 10/11/2023 09:30 AM

Advances in Pure Gas Delivery

Todd Zimmerman - Airgas Specialty Gas

The traditional gas cylinder and valve (package) have remained relatively unchanged for more than 100 years. As the purity of analytical gases continues to increase in importance for the analytical process chain, the evolution of the cylinder package increases in importance as well. The safe handling of high pressure gases is a major concern for users, as well how to continuously improve efficiency of analytical work. Air Liquide has been a pioneer in developing innovation in many areas, including gas packaging systems. This presentation will detail a new valve adapted for analytical gases, which contains a residual pressure valve that simplifies gas handling and safety. The valve is also equipped with a permanent pressure gauge allowing the contents of the cylinder to be checked at any time thereby preventing unexpected runouts or returning the cylinder before it is depleted. Ergonomics has been significantly improved when compared to the classical valve with an on/off lever for easier cylinder valve manipulations.

Abstract# 163 - 10/11/2023 09:30 AM

Group-type quantitation of hydrocarbons in jet fuel using GC×GC–FID (ASTM Method D8396)

Laura McGregor - SepSolve Analytical, Nadin Boegelsack - SepSolve Analytical, Matthew Edwards - SepSolve Analytical

Accurate hydrocarbon composition of finished fuels, such as aviation fuel, is required to ensure quality control and to determine the effects of processes in fuel production. This has become even more important with the development of novel renewable fuels, such as sustainable aviation fuels (SAFs). Here, we demonstrate the use of reverse fill/flush (RFF) flow-modulated GC×GC–FID and automated group-type data processing to provide fast and accurate quantitative information on hydrocarbon composition.

Abstract# 164 - 10/11/2023 09:50 AM

Improving GC×GC workflows for petrochemical analyses

Laura McGregor - SepSolve Analytical, Steve Smith - Schauenburg Analytics, Nick Bukowski - SepSolve Analytical

Comprehensive two-dimensional gas chromatography (GC×GC) has emerged as a powerful analytical technique for complex petrochemical samples due to its enhanced separation capabilities and simple group-type analysis. However, the full potential of GC×GC workflows have not been fully realized, as several challenges persist in terms of optimization, automation, and data analysis.

This poster highlights the ongoing efforts to enhance GC×GC workflows for petrochemical analyses, by addressing these challenges through novel hardware and software improvements.

Abstract# 168 - 10/11/2023 09:30 AM

Remaining Useful Life of Antioxidants in Lubricating Oils

Kia Williams - Metrohm

Effective oil and condition monitoring ensures optimal machinery performance and longevity while enabling proactive maintenance strategies and early issue detection. To prevent the degradation of lubricating oils, antioxidants are utilized to minimize the harmful effects of oxidation. Monitoring the remaining useful life of these antioxidants can help preserve performance and improve machinery reliability. This presentation delves into the significance of the remaining useful life evaluation, ASTM methods, and ongoing enhancements utilizing voltammetry.

Abstract# 182 - 10/11/2023 09:50 AM

Assessing the purity grade of lithium carbonate and lithium hydroxide using ICP-OES and ICP-MS

Mike Mourgas - Thermo Fisher Scientific

Demand for lithium has increased due to the market for lithium-ion batteries. The two most important compounds in which lithium is traded are Li₂CO₃ and LiOH.

ICP-OES is used for lithium analysis as it can quickly perform multi-element analysis, handle diverse sample types, and quantify sub µg·L⁻¹ to % levels of impurities. In coming years, purity requirements will increase to increase battery performance. Increased purity will challenge ICP-OES methods and ICP-MS may be required.

Here, we highlight how both techniques can determine impurities in Li₂CO₃ and LiOH. 45 elements were analyzed using ICP-OES, whereas >60 elements were analyzed using ICP-MS.

Abstract# 183 - 10/11/2023 09:30 AM

Novel developments in Inductively Coupled Plasma Mass Spectrometry: How can the analysis of complex samples be made simple?

Mike Mourgas - Thermo Fisher Scientific

ICP-MS is used for the determination of trace element concentrations in various samples, which may include complex matrices. This is particularly true for environmental monitoring, with standards to ensure that water, wastewater, soils, etc. only contain limited elemental contaminants. One example is EPA Method 6020B, which governs the analysis of soils, solid waste, and wastewaters.

Here, we provide an overview of developments in ICP-MS, providing an unmatched ability to tackle complex samples in terms of matrix and interferences. We will show how %-levels of TDS can be handled effectively and requirements of EPA 6020B can be met.

Abstract# 187 - 10/11/2023 09:30 AM

Sensitivity and Selectivity for the Future: New SeNSE₂ Sulfur Chemiluminescence Detector

Nicole Lock - PAC

In oil and gas, understanding sulfur and nitrogen compounds is important in preventing interferences in processes. Whether you are following ASTM D5504, D7011, or others, it's important to have a highly sensitive and selective detector. The new SCD from PAC advances the already cutting-edge design and adds a new on-board calibration testing mechanism. It's never been easier to qualify if your detector is working independent of the system it is installed on. A fast cold to start, signal stability, sturdy yet compact design, and touchscreen interface makes this SCD the most user-friendly on the market.

Abstract# 202 - 10/11/2023 09:30 AM

ASTM D3606 Capillary Options: Products and tips for getting started

Erica Pack - Restek Corporation

ASTM method D3606 is used to separate benzene and toluene in spark ignition fuels. Analysts may use capillary (option A) or packed (option B) columns for this method. The capillary option uses two columns connected in series, where the first column is nonpolar dimethylpolysiloxane phase (Rxi-1ms, cat# 13338) and the second is a polar 'wax' phase (Stabilwax, cat# 10657) column. After toluene is eluted from the first column, the first column is backflushed while an auxiliary EPC maintains flow through the second column. The complicated setup associated with the ASTM D3606 capillary option may make the method unappealing, but the results show excellent

separation of target analytes. We used Restek's Rxi-1ms and Stabilwax to separate target analytes in D3606 standard 8.5.2 and a sample of gasoline, and generated helpful tips for getting started and troubleshooting this method. Future work may consider performance of this column set for a full method validation, and potential limitations.

Abstract# 203 - 10/11/2023 09:50 AM

Rapid method development and optimization for gas chromatography using Pro EZGC – a free web-based software

Erica Pack - Restek Corporation

Green and sustainable material manufacturing is dependent on the resources available to monitor emissions and effluent from the manufacturing process. Gas chromatography (GC) is frequently used to monitor material purity, contamination, and emissions in samples such as air, water, soil, and in-line production materials. Method development and modification requires time and resources that could otherwise be dedicated to data analysis and interpretation. Restek's free Pro EZGC platform uses proprietary thermodynamic models to predict analyte retention on various GC column phases, dimensions, program conditions, and detectors. Accuracy of chromatographic models was challenged under a variety of changing conditions including column flow, dimensions, oven program, and carrier gas, and consistently demonstrated accuracy in elution order and retention time within 0.5min or 10% of the empirically determined value. The software is shown to be capable of modeling absorption and adsorption-based chromatography conditions. Results provide solutions that help labs rapidly develop and optimize methods for separating and identifying known and emerging pollutants or contaminants. In addition, Pro EZGC facilitates rapid implementation of green changes in environmental monitoring, such as alternative carrier gas options, reducing method run time, and reducing energy requirements related to instrument operation.

Abstract# 204 - 10/11/2023 10:30 AM

Improve Your Linear Alpha Olefins (LAO) Impurity Analysis with Restek's New Rxi-LAO GC Columns

Corby Hilliard - Restek Corporation

As worldwide demand for polyethylene increases, so does the pressure on labs performing linear alpha olefins (LAO) impurity analysis. Restek's Rxi-LAO columns are the first GC columns specifically applied for the impurity analysis of LAOs. The unique selectivity provides high resolution, separating impurities from peaks of interest such as 1-hexene and 1-octene. Herein the Rxi-LAO column was evaluated for selectivity and resolution of peaks of interest. A stringent quality control test was also developed to ensure column robustness and column-to-column reproducibility. As a result, the Rxi-LAO demonstrates high selectivity, resolution and robustness to meet the high throughput needs of labs running the LAO analysis. Two column dimensions are available, with options for one-column and two-column configurations. The one-column method provides substantial benefits compared to two-column methods including a simpler setup, increased instrument uptime, and higher sample throughput. Rxi-LAO columns are also fully supported by our Pro EZGC chromatogram modeler, allowing labs to quickly and easily optimize their LAO analysis.

Abstract# 207 - 10/11/2023 09:30 AM

Benefits of Polishing a Sample Gas Prior to Analysis

Kathleen Hanek - Perma Pure, Yuan Lin - Perma Pure

4°C is the accepted industry standard for the outlet dew point of a thermoelectric cooler. While this temperature is well below the ambient temperature of an environmentally controlled analyzer shed and therefore expected to prevent condensation often water will still accumulate within an

analyzer causing damage to the sensors and affecting analytical accuracy. Polishing a sample gas refers to further drying the sample gas after a thermoelectric conditioning system and prior to an analyzer. The result is an even lower dew point that helps to avoid issues relating to unexpected condensation caused by residual water vapor in the gas sample.

Abstract# 208 - 10/11/2023 09:30 AM

OptiFuel - The New Path for Gasoline Certification

April Zamora - PAC

The analysis of diesel and gasoline has become a cumbersome task for most laboratories across the globe due to the number of instruments that are required to get a full panel of data and the inefficiencies associated with running multiple instruments for one sample certification. With the addition of ASTM D8340 into the ASTM D4814 gasoline specification, those inefficiencies can be eliminated with the use of a spectral analyzer to certify gasoline samples. The OptiFuel, a D8340 compliant FT-IR instrument, can meet those needs of laboratories who need to certify gasoline efficiently and accurately. Come learn how!

Abstract# 227 - 10/11/2023 09:30 AM

Using hydrogen as carrier gas in gas chromatography mass spectrometry (GC-MS) applications – a case study for common contaminants

Nicholas Warner - Thermo Fisher Scientific

The current crisis surrounding the helium gas supply is making laboratory operations unsustainable from both economic and throughput standpoints. Whereas reduction of the helium consumption is a logical first step, some laboratories face challenges to obtain any helium supply. Hydrogen in turn, is a more cost efficient alternative and can be even generated directly in the lab. However, switching to hydrogen as carrier gas often means a change in performance usually requires re-optimization of the method. In this poster, the use of hydrogen for the analysis of polyaromatic hydrocarbons (PAHs) and selected pesticides will be shown to illustrate how reliable and efficient analysis can nonetheless be obtained.

Abstract# 234 - 10/11/2023 09:30 AM

New Methodology for Determining Hindered Amine Light Stabilizers in Polyethylene

Deborah Phelps - Dow Chemical

Hindered amine light stabilizers (HALS) are used to protect polyethylene from weathering during exposure in outdoor applications such as pipe, geomembrane liners, wire and cable, and consumer articles (furniture, playground equipment). HALS are particularly challenging to analyze because of their chemical and physical properties. Most have oligomeric structures, high molecular weight, and lack a strong chromophore for UV/Vis absorbance detection. There are very few external publications applicable to analysis of HALS in PE. A reversed phase liquid chromatography method (RPLC) was developed successfully for rapid and accurate quantitation of HALS additives in PE. The HALS are extracted using total dissolution methodology (TDM) followed by analysis using RPLC with UV/Vis absorbance detection and evaporative light scattering detection (ELSD). This poster will provide details on the methodology and application to HALS in polyethylene resins.

Abstract# 259 - 10/11/2023 09:30 AM

Total Sulfur Analysis in LPG & Gas samples in compliance with ASTM D6667 and D755

Arthur Van Strien - EST analytical

LPG is increasingly used as an automotive fuel sometimes referred to as Autogas and must therefore comply with regulations concerning the sulfur content of automotive fuels, the limits of which are decreasing. LPG and other light hydrocarbons are also finding use as feedstocks for a variety of new refining technologies and can be poisoned by trace amounts of sulfur-bearing materials. The need for low sulfur measurements in this part of the industry is of growing importance. The total sulfur analysis of LPG by combustion UV-Fluorescence detection method is governed by ASTM D6667 [1] and ASTM D7551 [2] and applicable to samples containing 1.0 – 100 mg/kg of sulfur. This application note describes a direct sampling and injection technique that complies with ASTM D6667 and D7551 methods, for measuring low level sulfur in LPG using the NEXIS eQP Total Sulfur Analyzer in conjunction with the NEXIS Gas Module (GM) Gas & LPG Sample introduction module. The obtained data from this application note also indicate the repeatability of the instrument and LPG & Gas sampling configuration. The instrument operating software (NEXIS LINK), enables laboratories to standardize their operation and have full access to instrument control parameters, actual performance and review QC and sample data at all time.

Abstract# 262 - 10/11/2023 09:30 AM

Determination of Total Sulfur in Biocrude by Gas Chromatography (GC) with a Pulsed Flame Photometric Detector (PFPD)

Cynthia Elmore - OI Analytical, Xylem Lab Solutions, Jakob Woodside - OI Analytical, Xylem Lab solutions, Julian Bennett - Worcester Polytechnic Institute, Aidin Panahi - Worcester Polytechnic Institute, Michael Timko - Worcester Polytechnic Institute

Determination of Total Sulfur in Biocrude by Gas Chromatography (GC) with a Pulsed Flame Photometric Detector (PFPD) Cynthia Elmore, Senior Analyst, Product Management, cynthia.elmore@xylem.com, OI Analytical, Xylem Lab Solutions Jakob Woodside, Associate Product Manager, Jakob.woodside@xylem.com, OI Analytical, Xylem Lab Solutions Julian Bennett, PhD Candidate, jabennett@wpi.edu Chemical Engineering Department, Worcester Polytechnic Institute, Worcester, MA Aidin Panahi, Research Professor, apanahi@wpi.edu Chemical Engineering Department, Worcester Polytechnic Institute, Worcester, MA Michael Timko, Professor, mtimko@wpi.edu Chemical Engineering Department, Worcester Polytechnic Institute, Worcester, MA Abstract: Hydrothermal liquefaction (HTL) is an emerging technology for conversion of wet organic wastes, particularly sewage sludge, into transportation fuels. The intermediate product of hydrothermal liquefaction is an energy-dense biocrude. Hydrotreating of biocrude produces renewable diesel and sustainable aviation fuel. Hydrotreating is necessary to remove heteroatom content from the biocrude. Sulfur is especially important to remove to meet stringent fuel specifications. Sulfur removal efficiency is influenced by the molecular makeup of the compounds that contain sulfur. It is well known that sulfur is corrosive and can cause damage to equipment and have negative impacts on production costs and quality of finished products. In this research, we will conduct a comprehensive analysis of total sulfur content within biocrudes derived from the hydrothermal liquefaction (HTL) of sewage sludge. We will consider varying processing parameters such as residence time, and the inclusion of an oxidant. Employing gas chromatography (GC) in tandem with a sulfur-specific pulsed flame photometric detector (PFPD), we will analyze the total sulfur levels present in the biocrudes across these different conditions. This poster will present instrument conditions, QC, and sample results in order to provide a foundational understanding essential for optimizing subsequent refining processes, aiming to produce sulfur-compliant biofuels that meet stringent energy specifications and standards.

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New Product Showcase

2022 New Product Showcase Winner



Best New Analytical Instrument



2022 ATTENDEE WINNER \$100 Gift Card

Mike Taylor, SASOL

Thank you for taking the time to vote in the New Product Showcase!

The 2023 Gulf Coast Conference will sponsor the New Product Showcase event to provide a forum for the introduction of new technology and innovation to our attendees. On Tuesday and Wednesday of the show there will be special table top displays with new products and technology for your review. Exhibitors will provide these products and personnel to describe them during specific times in the central lounge area of the exhibit hall.

We are asking all Attendees to stop by and take a look at these products and complete an opinion survey about what you see. One survey will be drawn on Wednesday afternoon from the completed surveys, the winner will receive a **\$100 gift card**. Must be present to win!

2023 New Product Showcase Entries



Anton Paar



METTLER TOLEDO



EXHIBITORS BY BOOTH NUMBER

Rigaku Americas Corporation	100	Lab Products Inc.	414	Caron Products	914
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Applied Rigaku Technologies, Inc.	102	Avantor	418	Midland Scientific	916
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HORIBA - Process & Environmental	112	Hallmark Casework/Kewaunee Scientific	424	Red Ball Oxygen	925
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4IR Solutions LTD

4IR Solutions is a global holding company focused on NMR-based, real time industrial process analyzers for a variety of industries. 4IR's Process NMR analyzers provide continuous on-line measurements of physical properties and chemical composition in production processes. The AI-60 Process NMR system is especially suited for on-line real time analyses of crude oil and other dark, opaque, and/or corrosive materials.

Booth Number: 200

ABB Measurement & Analytics

ABB's Measurement & Analytics division is among the world's leading manufacturer and supplier of smart instrumentation and analyzers. With thousands of experts around the world and high-performing technology, ABB's team is dedicated to making measurement easy for its industrial and energy customers, helping them operate more efficiently and profitably.

Booth Number: 1007

Accelerated Technology Laboratories

Accelerated Technology Laboratories (ATL) has been a leader in Laboratory Information Management Systems (LIMS) for over 28 years and has implemented its Sample Master® and TITAN® LIMS in over 625 laboratories around the world. ATL's core markets include the environmental, petrochemical and manufacturing sectors. ATL offers both on-premise as well as cloud deployment for clients that wish to leverage a hosted LIMS solution. Finally, as a ISO 9001 certified organization, ATL's LIMS and laboratory automation products are supported by a steadfast commitment to excellence in product quality, support and training.

Booth Number: 1123

Ace Glass Incorporated

Ace Glass Incorporated has been a leader and innovator of scientific glassware, lab equipment, and glass apparatus for over 80 years. Ace Glass provides a wide variety of quality US-manufactured standard and custom scientific glassware, including reactors engineered to any customer's specifications from 100mL – 200L. Laboratory glassware and equipment are also available for Rotary Evaporators, Distillation, Extraction, Filtration, Chromatography, and Air-Sensitive applications. We have thousands of standard catalog products and specialize in custom-made scientific apparatus.

Booth Number: 1021

Activated Research Company

Activated Research Company is an innovative award-winning product development company with expertise in microreactor design, heterogeneous catalysis, and separations. Our goal is to significantly improve gas and liquid chromatography - and our products, like the Polyarc® System (a catalytic microreactor with a universal carbon response) and the Jetanizer™ (a methanizer that enhances the analysis of CO and CO₂) are easy to install, easy to use, and easy to maintain - all of which directly reduce lab downtime, increase lab throughput, and impact your bottom line. Come discover how we're advancing the state of GC, LC, and FID chemical analysis.

Booth Number: 423

Agilent Technologies

Agilent Technologies is a worldwide provider of GC, LC, MS and Spectroscopy instruments, technologies, related consumables, support, services, and workflow solutions that enable labs to analyze, confirm and quantify substances of interest with confidence while maintaining the most stringent laboratory practices, from sample preparation to final report. Learn more: www.agilent.com.

Booth Number: 503

Airgas

Airgas®, an Air Liquide company, is a leading U.S. supplier of industrial, medical and specialty gases, as well as hardgoods and related products; one of the largest U.S. suppliers of safety products; and a leading U.S. supplier of ammonia products and process chemicals. Airgas helps its more than 1 million customers advance their business performance and reach their full potential with reliable products, services and expertise used to create, build, care, serve and sustain. With nearly 18,000 associates, over 1,400 locations, a robust

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Booth Number: 1120

Allometrics, Inc.

Allometrics is a complete laboratory solutions provider. Specializing in accredited laboratory instruments, calibrations, metrology and controlled environment certifications. We manage a broad base of experience and technical competency and have proudly served our diverse customer base since 1976.

Booth Number: 502

AmSpec

AmSpec serves companies all over the world in a variety of industries. With the support of our domestic and international locations, AmSpec provides the highest quality testing, inspection, and certification services in major transit and trading locations globally. AmSpec's professionals span a wide range of industries including additives, agriculture, chemicals, consumer products, energy, infrastructure, marine services, metals, and minerals as well as special projects. We are committed to providing a safe, ethical, and compliant company for both employees and clients.

Booth Number: 1104

Analytical Flow Products

AFP specializes in the design and manufacture of complex chromatography measurement valves for the instrumentation, laboratory, scientific and industrial markets. Our solutions incorporate innovative patented technologies that ensure consistent and extremely precise measurement and they are the choice of the world leading companies in the field. Manufactured with the best technologies available and calibrated and controlled by an expert team dedicated to perfection, our analytical products represent a reliable and affordable option for any company subject to the increasingly stringent requirements of the modern world.

Booth Number: 926

AnalytiChem

We enable laboratories to achieve optimal analytical results for mission critical quality control and compliance applications. AnalytiChem supports customers in the material science, environmental, animal health and chemical industries through our well recognized portfolios of reference materials, culture media, laboratory consumables and sample preparation products. We are global, operating from ISO 17034, ISO 17025 accredited centers of excellence in North America, Europe and Australia.

Booth Number: 221

Analytik Jena US, LLC

Analytik Jena is a leading provider of high-end analytical measuring technology, of instruments and products in the fields of biotechnology and molecular diagnostics, as well as of high quality liquid handling and automation technologies. Analytik Jena's products are focused to offer customers and users a quality and the reproducibility of their laboratory results. Services, as well as device-specific consumables and disposables, such as reagents or plastic articles, complete the Group's extensive range of products. Analytik Jena is part of the Swiss Endress+Hauser Group.

Booth Number: 402

Anton Paar USA - Ashland, VA

Anton Paar produces high-quality measuring & analysis instruments for laboratory, research and industrial applications, and is the established world leader in the fields of density and concentration measurement. Anton Paar's product portfolio also includes viscometers, particle analyzers, XRD, Raman spectrometers, rheometers, polarimeters, refractometers, microwave synthesis and digestion systems. For over 100 years, we have been at the forefront in developing solutions for diverse industries, and a strong emphasis on R&D and global partnerships with external research institutes helps drive relentless innovation. Anton Paar turns ideas into instruments at the cutting edge of technology.

Booth Number: 309

Applied Rigaku Technologies, Inc.

Applied Rigaku Technologies specializes in EDXRF benchtop and on-line elemental analyzers serving upstream and midstream for in-field use and downstream for refineries and commercial labs. With multi-element analysis capabilities, our benchtops include the compact NEX QC Series for S in oil per ASTM D4294, NEX DE Series for quick ASTM D8252 compliance of Ni and V, and NEX CG II indirect excitation analyzer for ultra-low Cl in crude oil per ASTM D4929, lube oils per ASTM D7551, ULSD per ASTM D7220, and more. For real-time process control needs, we offer NEX XT total sulfur analyzer for crude oil and bunker fuel monitoring and blending and NEX OL multi-element analyzer for liquid streams.

Booth Number: 102

Aqua Solutions

Booth Number: 509

ASI Standards

ASI Standards is a worldwide trusted source for calibration standards for petroleum products, polymers, and lubricants. Our product offering includes sulfur standards in various matrices, multi-element standards, polyethylene and polyvinyl chloride disc standards, physical and titration standards, and a full line of biodiesel standards. We specialize in custom formulations in difficult matrices.

Booth Number: 819

ASTM International

ASTM International is a globally recognized leader in the development and delivery of voluntary consensus standards. Today, Over 12,000 ASTM standards operate globally. Defined and set by us, they improve the lives of millions every day by increasing product quality, enhancing health and safety, strengthening market access and trade, and building consumer confidence. Combined with our innovative business services, they enhance performance and help everyone have confidence in the things they buy and use, helping our world work better.

Booth Number: 120

Astrix

Astrix is an industry leader in staffing and recruitment, providing a specialized service to life science companies for over two decades. Offering a comprehensive range of scientific and technical resources, including highly skilled scientists, specialists, and technicians, our unique approach combines the use of proprietary data sets and experienced recruiters with scientific or technical background in their areas of focus. The result is a highly qualified pool of candidates that meet the specific job requirements of employers, delivering immediate results for their businesses.

Booth Number: 223

Avantor

As the delivery channel of Avantor®, a Fortune 500 company, VWR provides access to mission-critical product and service solutions across life sciences and other regulated industries, including: Pharmaceutical, biotechnology, industrial, education, government, healthcare and advanced technologies. We offer an integrated, seamless purchasing experience that is optimized for the way our customers do business and supported by a strong global distribution network. Our global e-commerce platform gives you easy, convenient access to an extensive portfolio, including our own brands, as well as those from thousands of other manufacturers. Avantor is a trusted global partner to customers and suppliers.

Booth Number: 418

Axcend

Axcend® provides high-performance liquid chromatography (HPLC) systems designed to be easily moved to various testing locations or placed in close proximity to other instruments for optimal coupling, such as with mass spectrometry (MS). Its small footprint saves lab space and the performance of our portable HPLC matches the performance of larger, more expensive instruments. Reduction in size allows simpler operation, lower cost and greater productivity. These characteristics are especially important to our customers in the pharmaceutical, food & water, petrochemical, and environmental industries

that need timely chemical measurements in diverse locations. Axcend delivers HPLC Anywhere™.

Booth Number: 1011

Analytical Instruments

Analytical Instruments is a prominent proprietor of the top global petroleum testing manufacturers, helping our customers to meet the growing demands of the industrial world one test at a time. We supply equipment for the reliable testing of physical properties, compositional and quality of fuels such as; , biofuels, biodiesel, lubricants, LPG gases and related substances in refineries, pipelines, and laboratories worldwide.

Booth Number: 1103, 1202

Barnett Technical Services

Distributors of microscopy and spectroscopy systems including artphotonics sensors for process monitoring.

Booth Number: 315

BAYTEK INTERNATIONAL

BLISS is Baytek International's industry-leading Cloud-Capable LIMS for the Refining, Petrochemical, Chemical, Water, and Pharmaceutical process industries. As Baytek celebrates its 40th anniversary, we proudly introduce BLISS40, our most advanced LIMS version yet. QC/PLUS provides fit-for-purpose workflow automation and auditability for ASTM D6299 SQC, EPA QA/QC Compliance, and Reporting. Built on the QC/PLUS foundation: QCEZ provides a simple-to-deploy SAAS SQC solution. Baytek's innovative architecture and leading technology shortens implementation time, reduces cost, and provides a zero-workstation footprint with rugged web security.

Booth Number: 215

Biotage, LLC

Biotage® specializes in automated sample preparation systems for the analysis of semi/nonvolatile organic compounds. Our portfolio includes extraction and evaporation automation as well as consumable products ideal for analytical testing in food safety, agriculture, and environmental markets. The Biotage sample prep portfolio is designed for workflow compatibility to eliminate user error and deliver reproducible data while increasing laboratory efficiency. We invite you to experience our workflow solutions firsthand and see why our products have been adopted by analytical laboratories worldwide.

Booth Number: 621

Brewer Construction Services

Brewer Construction Services, LLC is a general contractor specializing in the design, construction and ongoing maintenance of laboratory and technical facilities. We present an unequaled team of strength and knowledge of construction with a long history of successful laboratory projects. Many of these projects have been for national, international, and Fortune 100 companies that insist on the highest standards of safety, quality and integrity.

Booth Number: 824

Brookhaven Instruments Corporation

Brookhaven Instruments has pioneered specialized techniques in characterizing nanoparticles, proteins and polymers using light scattering for particle sizing, zeta potential and absolute molecular weight. Whether solving routine QC, PC or R&D problems, Brookhaven has the instrumentation, the experience and the expertise to help you get the results you need to be productive.

Booth Number: 122

Bruker

Bruker is one of the world's leading analytical instrumentation companies. We develop state-of-the-art technologies and innovative solutions for a broad range of analytical instruments including NMR, MS, IR and X-ray just to name a few. Our XRF and Mass Spec instruments cover a broad spectrum of applications in all fields of research and development and are used in all industrial production processes to ensure quality and process reliability. Bruker has complete solutions for all your petrochemical analysis needs. We are Innovation with Integrity.

Booth Number: 1216

BTSOFT

BTSOFT is a multi-discipline software company providing cutting-edge lab solutions across the world. Based in Houston, Texas our team is comprised of a diverse background of laboratory professionals and expert computer programmers dedicated to your success at all levels of your laboratory. With innovative and scalable products and services, we work alongside our partners to guarantee their unique laboratory needs are met.

Booth Number: 224

Camin Cargo Control

Inspection, Lab and Additive service provider for the oil, gas and bio industry.

Booth Number: 222

CANNON Instrument Company

CANNON is a global leader in viscosity, rheology and other physical property testing. Our products meet or exceed ASTM, AASHTO and SAE J300 regulatory standards. CANNON products include manual and automated viscometers, oil standards, constant temperature baths and more. We partner with Tanaka, Eralytics, and GreenLab to offer instruments for density, flash point, moisture and distillation point. Services include instrument calibration/maintenance, lab testing and custom formulation.

Booth Number: 202

Caron Products

We offer Fume Hoods, Biosafety Cabinets, Chemical Storage, environmental/Stability chambers as well as custom and modular enclosures for product and/or user protection.

Booth Number: 914

CDS Analytical, LLC

CDS Analytical is an ISO 9001 certified manufacturer of sample prep and introduction instrument for GC-MS. For over 50 years, CDS has been offering a complete suite of diverse front-end GC equipment including pyrolyzers, purge and trap, headspace, and thermal desorption systems. The Pyroprobe 6000 series pyrolyzer, 8500 series and 7000 series Purge and Trap concentrator, 9300 series and 7550S series Thermal Desorption devices are meeting and exceeding today's most demanding analytical laboratories. CDS has acquired right from 3M to manufacture the legendary Empore SPE consumables.

Booth Number: 324

CE Elantech

Booth Number: 618

CFR Engines Inc.

CFR Engines Inc. (CFR®) is a leading, global manufacturer of fuel rating test instruments and equipment. For over 94 years, CFR made-in-USA products have provided value and confidence in Gasoline and Diesel fuel quality. XCP® technology provides computer-based accuracy and process accountability. Your first choice in fuel testing globally with CFR F1/F2 for Octane (D2699/D2700), CFR F5 for Cetane (D613), CFR Ignition Quality Tester (IQT®) for Cetane (D6890), and CFR Continuous Testing System (CTS) for Online Direct Comparison (D2885). CFR continues its tradition with advanced technology, robust design, and strict manufacturing processes. Best in quality. Best in service. Second to none.

Booth Number: 518

Chemetrics

CHEMetrics offers accurate, affordable colorimetric test kits that meet the highest quality control standards for your water testing needs. Our vacuum-sealed ampoules provide reliable results without the need for reagent preparation, multiple steps, and extra clean-up required by traditional testing methods. Simply immerse a CHEMetrics ampoule in the provided sample and snap the tip to obtain results. Now in our sixth decade, we're proud to partner with AquaPhoenix Scientific based in Hanover, Pennsylvania. CHEMetrics: for Simplicity in Water Analysis.

Booth Number: 209

Chemplex Industries Inc

A leading global provider of Sample Preparation Products. Chemplex® is the manufacturer of over 40 different sizes and styles of sample cups along with

thin-film sample supports, including our exclusive SpectroMembrane® thin-film carrier frames with a variety of thin-film material such as Etnom®, Prolene®, Mylar® and more, in a range of thicknesses. Our line of Calibration and Check standards will enable you to routinely maintain consistent results. Our G and E Series Automated Fluxers consistently prepare fused beads for XRF and solutions for ICP, AA analysis. High quality platinum ware is available for any Fluxer including our PREP program to replace unusable platinum ware with new ones at a fraction of the cost. A line of grinders and pellet presses are available to consistently prepare solid samples for any application.

Booth Number: 411

Choice Analytical, Inc.

Choice Analytical, Inc. is a leading-edge analytical instrumentation company focused on cutting edge technology backed up by knowledgeable, experienced and caring professionals. We work with state-of-the-art manufacturers supplying the most innovative instrumentation for the Petroleum, Petrochemical and Bio-fuel industries as well as developing unique products for automated color and haze testing. Our strategic location along the Gulf Coast keeps us in the forefront of the latest developments, regulations and requirements in this complex industry.

Booth Number: 821

Chromatotec Inc.

Chromatotec is designing, manufacturing and selling online solutions for gas and liquid analysis exclusively made in France. Our analyzers are dedicated for the following markets: environment (air and water), industrial efficiency and petrochemistry.

Booth Number: 624

Cold Shot Chillers

Booth Number: 1023

Compass Instruments

Booth Number: 724

CSols Inc.

CSols Inc. is recognized as the premier informatics services consultancy in North America. We have earned and maintained a reputation for excellence in everything we do over more than two decades in the chemical/petrochemical industries. Our team of informatics, domain, regulatory, data, and IT experts has evolved beyond the lab to provide informatics expertise to forward-thinking organizations in many industries. As a truly independent firm, we provide objective guidance and tailored solutions through our holistic services of developing informatics strategy and implementing, integrating, enhancing, and validating informatics systems. For more information about CSols, visit www.csolsinc.com.

Booth Number: 121

Custom Solutions Group LLC

Custom Solutions Group was formed in April 2004 to provide U.S.-based gas chromatographers with the highest quality, customized solutions in gas chromatography. Since then, CSG operations have expanded to include clients all over the world. In conjunction with Agilent, Custom Solutions Group designs, builds, and commissions new and used gas chromatographs, customized to meet the needs and the specific analytical challenges of scientists, chemists, engineers, and technicians in a variety of industries, including: petroleum, petrochemical, natural gas, industrial gas, specialty gas, specialty chemical, semi-conductor and electronics gas, catalysis, biofuels, and research industries.

Booth Number: 1122

Cytiva

Enabling you to solve the toughest problems in life science. Simplify your research needs with accurate and reliable results. Great Customer Support. Custom solutions. Strong research protocols. Advance Product Search. Application and methods. 300,000+ products.

Booth Number: 426

DC Scientific

DC Scientific is a Manufacturer of high-quality ASTM glassware, an ISO 17025 Accredited Calibration Lab and Service provider, and a leading Distributor of innovative, dependable instruments and reference materials for the Petroleum-Chemical Industry. Our Mission is to provide client-level support and service, application-specific knowledge, and 'fit-for-purpose' solutions for the needs of the modern laboratory.

Booth Number: 1008

DCG Partnership

DCG is a manufacturer of ISO 17034 and ISO 17025 certified reference materials (Calibration standards). DCG also manufactures cylinder heat blankets and sample lines. Distributor of Concoa regulators and manifolds.

Booth Number: 419

ECH Americas INC

ECH Americas inc, part of ECH Elektrochemie Halle GmbH have opened a direct sales and service center here in Houston Texas. Our decision is directly support the growing Aquamax KF and H2S Analyser client base here in North America. The ECH R&D team from Halle Germany are responsible for creating World renowned technology used in D6304, D7621, D4928 and D7995 for water content and H2S determinations in crudes, oils, fuels, LPG, natural gases, chemicals, waste water and many more applications. Our booth will be attended by Dr Michael Hahn, Dr Dorit Wilke, Karl Robertson, Tom Gallant and Thomas Stockmann. We are here to answer and support your applications.

Booth Number: 521

Eigenvector Research, Inc.

Eigenvector Research is a leading provider of advanced data analysis solutions specializing in chemical data science. Our team of experts combines domain-specific knowledge with modern multivariate statistical methods to unlock valuable insights from complex datasets. We offer research and consulting services, develop user-friendly software tools, and provide comprehensive training programs. With a deep understanding of chemical, physical, and biological systems, we deliver customized solutions tailored to the unique needs of industries such as pharmaceuticals, biotechnology, and environmental science. Our mission is to empower researchers, scientists, and engineers with the tools they need.

Booth Number: 1222

Element Staffing Services

Element Staffing Services is an industry-leading, scientific and technical staffing company, offering contract, contract to hire, direct placement, and payroll services to companies and organizations within the Petrochemical, Specialty Chemical, Oil and Gas, Biotechnology, Pharmaceutical, Material Science, Food and Beverage, Consumer Care, Medical and Clinical Research Industries. Element's mission is to become a trusted partner by providing the most qualified scientific and technical talent for our clients and by creating pathways for career advancement for our candidates. We promise to deliver results while always abiding by our core principles of integrity, professionalism, and excellence

Booth Number: 517

Elemental Scientific

ESI offers rapid and precise measurements of wear metals in lubricants and coolants with minimal operator intervention to meet ASTM requirements. Visit www.icpms.com for more information on SampleSense Oil, prepMASS Station, and prepFAST X Coolant.

Booth Number: 1014

Elementar Americas

More than 120 years of experience in elemental analysis. Elementar is the world leader in high performance analysis of organic and inorganic elements. Our product portfolio includes dedicated analyzers for CHNOS elemental analysis, TOC/TNn analysis, determination of nitrogen/protein according to Dumas, elemental analysis of metals and other inorganic materials, stable isotope analysis (IRMS), and optical emission spectrometry (OES). Arisen from the Analytical Instrumentation Department of the Heraeus technology group,

we develop and manufacture for more than 120 years instruments for elemental analysis in the Rhine Main area near Frankfurt.

Booth Number: 1212

Endress+Hauser

Endress+Hauser, a global leader in measurement and automation technologies for process and laboratory applications, is a family-owned company with a broad portfolio of services, solutions and instrumentation. Endress+Hauser serves customers in the chemical, food and beverage, life sciences, power and energy, oil and gas and water and wastewater industries. The company's products provide valuable data and insights into processes, support process optimization, efficiency and safety for people and the environment. Today, Endress+Hauser has more than 8,600 patents and patent applications.

Booth Number: 321

Entech Instruments

Entech Instruments is a leading manufacturer of sampling and analytical instrumentation for the analysis of VOCs. With over 30 years of experience, we have consistently innovated to become the leading supplier of EPA Method TO-15 systems. Our state-of-the-art technologies currently empower professionals globally with Environmental Air Monitoring, Soil & Water Testing, Industrial Hygiene, Food Safety, Flavor & Aroma R&D, Material Emissions Testing, and many more. Extensive validation studies have positioned Entech as the sole system approved by NASA for VOC testing on the ISS, and it is the most widely utilized instrument by EPA and state labs for ambient air monitoring.

Booth Number: 225

Envantage, Inc

Envantage offers chromatography instrument and software solutions to refineries and petrochemical laboratories. We build and service applicated systems and standardized ISO/ASTM analyzers. Our standardized Dragon SimDist and DHA software applications are in widespread use in hundreds of laboratories around the world. We maintain expertise in a variety of hardware, CDS, and informatics systems. Due to our custom software capability we are able to provide seamless integrations of instrumentation and in-house data systems. We have opened a CFR Service Center in Beaumont where our CFR professionals offer training, operation, and maintenance.

Booth Number: 302

EST analytical

EST analytical along with TSHR have merged to form one of the largest privately held manufacturers of combustion elemental analyzers for total sulfur, nitrogen, and chlorine globally the Nexis. The merger has come about in order to leverage each company's resources to innovate and provide a reliable and sustainable solution. The Nexis, is a next generation combustion elemental analyzer that is fast becoming the instrument of choice worldwide. The Company will focus on global customer needs, product stability as well as driving innovation that benefits laboratories.

Booth Number: 216

Fisher Scientific

Fisher Scientific is a top distributor that is all about building a bridge between business and science as the industry's definitive single source for a comprehensive range of laboratory equipment, chemicals, instruments, reagents, and consumable supplies. This also includes safety-related products like cleanroom and controlled-environment supplies; personal protective equipment (PPE); firefighting, military, and first responder equipment and supplies; and environmental monitoring and sampling equipment.

Booth Number: 706, 707

Fox Scientific, Inc.

Established in 1988, Fox Scientific, Inc. is a wholesale stocking distributor offering a full line of laboratory supplies, chemicals and equipment from a wide range of manufacturers.

Booth Number: 1022

Frontier Laboratories Ltd.

Frontier Laboratories, Ltd. designs and manufactures analytical instruments for materials characterization. The main products, supported by a number of

accessories and software, including the EGA/PY-3030D Multi-functional Pyrolysis System, the PY-3030S Single-Shot Pyrolyzer, the Rx-3050 series of Rapid Screening Reactors for catalyst screening, and a line of Ultra ALLOY® stainless steel capillary columns. Frontier Lab products are compatible with most gas chromatographs and mass spectrometers from major manufacturers such as Agilent, Perkin Elmer, Shimadzu, and ThermoFisher.

Booth Number: 1005

General Laboratory Supply

General Laboratory Supply is a 45 year old Houston-based, family/veteran owned company offering what our name implies, general supplies for laboratories of all kinds. We have an unmatched depth of knowledge in the realm of refineries and chemical plants and invented the concept of laboratory inventory management. Please stop by our booth and ask our experienced staff how we can make your life easier.

Booth Number: 124

GenTech Scientific LLC

Since 1996, GenTech Scientific has been supplying quality refurbished GC, MS, HPLC, GC-MS, & LC-MS instrumentation. Our skilled technicians meticulously inspect, refurbish and test all our products to rigorous specifications before they are deemed GenTech Certified. Our instruments come with warranty options to fit your needs.

Booth Number: 207

GFS Chemicals, Inc.

GFS manufactures ACS/Reagent grade products for use in research, analytical, pharmaceutical, petrochemical and manufacturing laboratories. Besides ACS reagents, GFS provides pH & volumetric solutions, an extensive line of Karl Fischer Reagents, ppt & ppb grade acids, high purity solvents and primary & reference standards. Additionally, you can find an extensive offering of High Purity Inorganic Compounds and Fine & Specialty Organics and much much more. For more information, visit www.gfschemicals.com

Booth Number: 203

Glas-Col

In business for over 80 years, Glas-Col's core line of laboratory equipment includes: standard and custom heating mantles with temperature up to 600C, evaporators, mixers, shakers and temperature controls/monitors. Many of these products are used in EPA and Distillation methods. Our air quality division Airfiltronix, offers Ductless Fume Hoods, Fume Extractors and localized Class 100 clean space workstations.

Booth Number: 722

H2I Group Inc

Booth Number: 815

Hach

At Hach, our products are meant to make water analysis better, faster, and more informative with our knowledgeable experts and easy to use products.

Booth Number: 1205

Hallmark Casework/Kewaunee Scientific

Distributor for Kewaunee Scientific fume hoods and casework.

Booth Number: 424

Hanna Instruments, Inc

Hanna's analytical and scientific instruments help surface finishers deliver a quality product while increasing productivity, profitability, and customer satisfaction. Our solutions help the production floor meet specifications and improve efficiency.

Booth Number: 1117

Honeywell International

Make the world safer, cleaner and enable the modernization of a growing middle class by enhancing our customer offerings through a differentiated portfolio of chemistries, materials, value-added solutions, connected services and superior customer service.

Booth Number: 1209

HORIBA - Process & Environmental

HORIBA P&E provides a wide range of technologies to measure air, water, & soil quality. As an ISO certified manufacturer its measurement technologies that comply with environmental regulations around the world and contributes to the development of environmental conservation. Applications in air pollution, stack gas monitoring, multi-component process gas analysis, process water, water pollution and water quality. HORIBA P&E provides engineering, design, & system integration svcs. for continuous process analyzer systems. HORIBA's engineering team can evaluate your current process or environmental conditions to make recommendations that improve process conditions compliance w/ EPA regulations

Booth Number: 112

HORIBA Instruments Incorporated

Booth Number: 506

Houston Electron Microscopy, Inc.

Houston Electron Microscopy is a materials laboratory specializing in microanalysis of inorganic and organic materials by using the latest microanalysis technology, the ColorSEM or ChemiSEM and micro FTIR. We provide these services to manufacturers, laboratories, consultants, engineers, and researchers.

Booth Number: 201

Houston MJ Associates, Inc

Houston MJ Associates is a manufacturer and global supplier of Dilute Solution Viscometer (DSV) and specialty GPC columns/standards. We are also the exclusive distributor of Scigentec CALPAS Intelligent Foreign Particle Analyzers and Linkoptik Laser Diffraction Particle Size Analyzers for the Americas.

Booth Number: 523

Huber USA, Inc.

Huber is the technology leader for high-precision thermoregulation solutions in research and industry. Their products ensure precise temperature control in laboratories, pilot plants and production processes throughout the whole world – from -125 °C to +425 °C. Besides dynamic temperature control systems, Huber develops and produces chillers as well as classic heating and cooling circulators. Typical applications can be found in the automotive industry, chemical and pharmaceutical industries, aerospace engineering and medical industry.

Booth Number: 919

HunterLab

Booth Number: 1108

IKA Works, Inc.

IKA laboratory technology offers a wide range of innovative equipment for numerous applications in research and development. Market leaders trust in our proven technology for their mixing, heating, distilling and crushing applications. IKA has gained a leading position in the world market with its innovative magnetic stirrers, mixers, overhead stirrers, shakers, homogenizers, mills, rotary evaporators, calorimeters, laboratory reactors and specially developed software for laboratory and analysis applications, as well as temperature control products such as circulators, baths and chillers.

Booth Number: 416

INFICON

INFICON is a leading provider of innovative instrumentation, critical sensor technologies, and advanced process control software that enhance productivity and quality in sophisticated industrial vacuum processes. These analysis, measurement and control products are essential for gas leak detection in air conditioning/refrigeration and automotive manufacturing and aftermarket. They are vital to equipment manufacturers and end-users in the complex fabrication of semiconductors and thin film coatings for optics, flat panel displays, solar cells and industrial vacuum coating applications.

Booth Number: 422

Intertek Caleb Brett

Intertek Caleb Brett is the one company in the world that has a 130-year track record of performance, available globally 24/7, with the fastest turnaround time, providing the highest quality Inspection and Testing services to the petroleum, petrochemical and chemical industry to win in every port, every day with expertise, precision, pace and passion.

Booth Number: 1206

JASCO

JASCO specializes in analytical instruments for spectroscopy and chromatography applications, with over 60 years of experience. JASCO's worldwide presence, superior product quality and outstanding service and support make the company an industry leader. JASCO is recognized for its robust and reliable line of spectroscopy products including FTIR, single point and imaging FTIR microscopes, Field-Rugged FTIR, UV-Vis/NIR, Fluorescence, Confocal Imaging Raman Microscopes, Field-Rugged Raman Probes, Polarimeters, Circular Dichroism and Dissolution. Additionally, JASCO offers a complete line of chromatography instruments including SFC/SFE (analytical, semi-prep, & preparative systems), HPLC, RHPLC and UHPLC.

Booth Number: 1020

JEOL USA

"JEOL is a world leader in analytical equipment and instrumentation for high-end scientific and industrial research and development. Core product groups include electron microscopes (SEMs and TEMs), instruments for the semiconductor industry (electron beam lithography and a series of defect review and inspection tools), and analytical instruments including mass spectrometers, NMRs and ESRs.

Booth Number: 306

Keit, Ltd.

Keit provides real-time monitoring of chemical, petrochemical & biorefinery processes with the IRmadillo process analyzer. The IRmadillo is a breakthrough technology with a robust design enabling it to be integrated in-line for continuous analysis of liquid processes. Reliable & highly accurate, the IRmadillo enables chemical manufacturers a trustworthy method to monitor, control and optimize their processes. The IRmadillo allows petrochemical companies a high-performance analytical technique for real-time distillation control, reaction monitoring & end point determination.

Booth Number: 320

KIN-TEK Analytical, Inc.

KIN-TEK Analytical, Inc. manufactures, sells, and supports calibration gas standard generators, custom configured calibration systems, and process calibration equipment for use in applications that require trace gas standards. We specialize in permeation devices that provide NIST traceable standards (ppm, ppb, ppt) for over 550 gases including many species unstable in static cylinder mixtures. Headquartered in La Marque, TX, our products are sold and supported worldwide. Visit www.kin-tek.com for more information.

Booth Number: 619

Koehler Instrument Company, Inc.

Providing quality testing instrumentation and technical support services for research and testing laboratories has been our specialty since 1925. Meeting your testing needs is the primary focus of our business, which is why Koehler Instrument Company is a leading producer and supplier of petroleum, syngases and petrochemical instrumentation worldwide.

Booth Number: 1124

Lab Products Inc.

Established in 1985 and located in Houston, TX, Lab Products is your source for quality chromatography supplies, environmental sample containers, and lab ware.

Booth Number: 414

Labtopia

Labtopia's extensive knowledge of quality, regulatory, and operational requirements is incorporated into all of Labtopia's services including quality consulting, staffing, training, and Laboratory Information Management System (LIMS) implementation projects.

Booth Number: 811

LabWare, Inc.

As the Global Leader for LIMS and ELN, LabWare's sole focus is building the best laboratory automation software to empower our customers to work efficiently, accurately, and compliantly. Our Enterprise Laboratory Platform is a proven suite of software technology encompassing the most configurable Laboratory Information Management System, Electronic Laboratory Notebook, and Laboratory Execution System (LES) in an integrated solution. Advanced data science-driven features extend the LabWare platform by leveraging analytics and artificial intelligence. The world's leading oil, gas, and chemical companies rely on LabWare automation technology to improve efficiency, quality, and productivity.

Booth Number: 1015

Lauda Brinkmann

LAUDA is the global leader in manufacturing temperature control units. Our TCUs range from -150°C to 550°C with cooling capacity up to 365 kW. With an extensive range of measuring equipment and accessories - our technologies are customizable to your application and delivers data with the highest accuracy and reproducibility. We provide measuring instruments to determine the viscosity of polymer solutions, optical contact angle meters to measure surface free energy and wetting behavior, and classic tensiometers to determine the surface and interfacial tension of oils and surfactants.

Booth Number: 513

Lazar Scientific, Inc.

Lazar Scientific is the factory-authorized provider of instrumentation from Stanhope Seta, Seta Analytics, Orbis BV, Biolab, Bruker, Lovibond, and Schmidt+Haensch throughout the United States and XOS throughout the Midwest. With 20+ years of experience, our team provides sales and service support for physical properties characterization, including flash point, viscosity, refractometry, inline process refractometry, cloud, pour and freezing points, distillation, corrosion properties, fuel cleanliness, polarimetry, densitometry, penetration, spectroscopy, and oxidation stability, among others. We provide analytical solutions, quality instruments, and reliable instrument service for the petroleum, renewable fuel, and biofuel industries.

Booth Number: 915

LCGC/Spectroscopy

For 40 years LCGC® has been the gold standard. LCGC is the leading provider of digital and print content to the separation science market, enhancing the productivity, efficiency, and the overall value of separation techniques globally. With our commitment to editorial excellence, we have pioneered innovation across a broad portfolio of digital and print platforms. Spectroscopy provides peer-reviewed articles, trusted advice from expert columnists, and the latest breaking developments to facilitate the advance of analytical spectroscopy and its use as an essential tool across a variety of applications and fields. www.spectroscopyonline.com

Booth Number: 524

LECO Corporation

LECO's technologies for separation science resolve complex samples and pioneer high-sample throughput using GC-TOFMS GCxGC-FID and GCxGC-TOFMS. A unique combination of easy-to-use software and advanced instrumentation provide an innovative solution for today's most demanding petroleum applications. Our Pegasus BT instruments provide users with all the information they could ever need from a single sample run, and our flow modulators provide another option for routine GCxGC analysis. Ask about our new innovations in GCxGC that will satisfy total cost of ownership, ease of use, and safety while maintaining excellent performance. Stop by and discuss how it can fit into your petroleum analysis!

Booth Number: 1003

LECO Corporation

LECO'S instruments resolve the most complex chemistries and deliver complete results using our suite of GC, GCxGC, GCMS, and high-resolution time-of-flight systems. Our most sensitive mass spectrometer, the Pegasus BT, reveals a myriad of analytes that had previously escaped detection in laboratories. Our extensive modulator technologies can take any GC workflow

to the next dimension, multiplying peak capacity ten-fold in the same analysis time. Our unique combination of easy-to-use software and advanced instrumentation provide solutions for today's most demanding petroleum application.

Booth Number: Mobile Lab

LGC Standards

Booth Number: 1204

LIMS Wizards, LLC.

LIMS Wizards, LLC is a global scientific software solutions provider developing intuitive software products to fulfill unmet needs at the interface of the lab and the rest of the organization. Our products are complementary to laboratory information management systems (LIMS) to encourage organizational digital transformation and improve scientific data integrity, visualization, and analytics. These solutions are designed for a simple implementation so those who use scientific data can be guided to wise business decisions.

Booth Number: 119

LK Industries Products LLC & Envirodyne Laboratories Inc.

LK Industries is a niche manufacturer of petroleum testing equipment and measurement instruments, and operates a 17025 accredited calibration laboratory. Since 1930, the company has helped pipeline operators, crude transporters, and energy companies ensure their products meet regulatory specifications and quality standards. Envirodyne Laboratories, Inc (ELI), headquartered in Houston, Texas, is a leading full-service NELAP environmental testing laboratory. Since 1990, the company has served a wide variety of customers in the municipal, industrial, and commercial industries. ELI specializes in environmental drinking water and wastewater lab services.

Booth Number: 1119

LNI Swissgas

LNI Swissgas is a multinational specialist in the manufacturing of premium gas generators for on-site hydrogen, zero air and nitrogen gas production, premium gas mixers and premium gas calibrators. LNI Swissgas is ISO 9001 and ISO 14001 certified. To insure the highest quality, LNI Swissgas has received ISO 17025 accreditation of its Gas Flow Standard laboratory.

Booth Number: 322

Lovibond

We look out for the little things that make a big difference in simplifying water analysis. From making reagents safer to handle, to designing instruments that prevent common errors from occurring, our goal is to save you time and reduce the chance of measurement errors. We've Got You Covered. With over 50 years of experience in manufacturing water quality instrumentation and reagents, Lovibond® is proud to offer solutions that simplify water analysis. From easy to use visual test kits, to complex spectrophotometers, we are confident that you can find a testing solution that fits your accuracy requirements and budget needs.

Booth Number: 319

MAC-MOD Analytical

MAC-MOD supplies HPLC/UHPLC columns and accessories to all industries as well as now providing our NEW GC and Chiral GC columns. MAC-MOD also now exclusively offers all Fortis columns including the NEW Evosphere monodisperse columns. We also offer safety caps which prevent hazardous materials from evaporating into your lab, keeping you safer. Stop by our booth to learn more about our products and application guides or for questions about your toughest separations. We look forward to speaking with you.

Booth Number: 1102

Malvern Panalytical

At Malvern Panalytical we are Big on Small™... big on helping you understand how small things like particle size, mineralogy, and elemental composition impact the processability of oils and fuels, polymers and catalyst. Our petrochemical solutions provide our customers with highly reliable, robust elemental, morphological, mineralogical and structural information that can identify problematic elements in spot crude, add efficiency to well operations, and produce in spec petrochemical products. Our analytical instrumentation

and solutions set new standards in data quality, functionality, flexibility and value. Visit Malvern Panalytical at booth 421.

Booth Number: 421

Mandel

Mandel Scientific Inc. is an American provisioner of scientific instrumentation, reagents, consumables, and services and the exclusive distributor for Nittoseiko Analytech Co. in the United States. Nittoseiko Analytech Co., Inc were formerly known as Mitsubishi Chemical Analytech Co., Ltd. who responded to the diverse needs of their customers with proprietary, cutting-edge technologies and have provided a wide range of analytical measuring instruments for technology and services with applications in the petrochemical, energy, environmental, pharmaceutical, semiconductor, and plastic industries.

Booth Number: 1111

Metaspec & Pacific Sensor

Metaspec and Pacific Sensor are leading manufacturers of precision test specimens, coupons, catalysts and panels. These specimens are used to test crude, fuels, lubricants, chemicals, coatings, and adhesives. Our products meet requirements from numerous ASTM, NACE, ISO, DIN, EN, IP, FTM, and MIL test methods and specifications. These include ASTM D6079, D3241, D130, D665, D2272, D1748 and hundreds more. We also manufacture customized test specimens from unusual alloys, plastics, and other materials. Leading laboratories all over the world have trusted us for more than 70 years as their supplier of precise and consistent test specimens.

Booth Number: 420

Metrohm

Booth Number: 803

Mettler Toledo

METTLER TOLEDO is a leading global manufacturer of precision instruments. The Company is the world's largest manufacturer and marketer of weighing instruments for use in laboratory, industrial and food retailing applications. The Company also holds top-three market positions in several related analytical instruments markets and is a leading provider of automated chemistry systems used in drug and chemical compound discovery and development.

Booth Number: 105

Midland Scientific

Midland Scientific, Inc. is a woman-owned, full-line distributor of laboratory products such as chemicals, instrumentation, general lab supplies, glassware, lab consumables, media, measurement equipment, plasticware, reagents, solutions, and much more.

Booth Number: 916

Milestone, Inc

Milestone offers a suite of customer-centric technology solutions encompassing the sample prep workflow for elemental analysis, including microwave digestion, reagent addition, acid purification, and labware cleaning. With more than 25,000 instruments installed worldwide covering industrial, government, and research laboratories, they are the acknowledged industry leader in microwave technology. For more information, please visit milestonesci.com.

Booth Number: 1002

MilliporeSigma

MilliporeSigma is the U.S. and Canada Life Science business of Merck KGaA, Darmstadt, Germany. With 19,000 employees and 72 manufacturing sites worldwide, MilliporeSigma's portfolio spans more than 300,000 products enabling scientific discovery and analysis. Extensive expertise in laboratory water purification, separations, reagents, solvents, and reference materials enables MilliporeSigma to provide advancements in chromatography (including HPLC, TLC, GC) and point of use testing for industrial research, testing, and industrial hygiene monitoring.

Booth Number: 802

Norsk Analyse**Booth Number: 1203****PAC**

PAC is a leading global manufacturer of advanced analytical instruments for laboratory and online process applications in the hydrocarbon processing industry. PAC offers an extensive product portfolio with cutting-edge solutions for gas chromatography, elemental analysis, physical properties, fuels composition, and laboratory automation. PAC complies with ISO 9001-2015 and 17025-2017 standards, which guarantees the quality of our products and reaffirms our commitment to quality, precision and customer support.

Booth Number: 111**Pace Analytical Services, LLC.**

Pace® Technical Field Services offers customizable laboratory instrument and facility solutions to keep your lab up and running. Our multi-vendor maintenance and repair services support GC, GC/MS, ICS, TOC, LC, and LC/MS as well as laboratory relocation and calibration services.

Booth Number: 807**PEAK Scientific**

Peak Scientific develops market-leading nitrogen, hydrogen and zero air systems mainly for the fields of LC-MS and GC. An on-site gas generator from Peak Scientific is the practical and cost-effective alternative to pressurized gas cylinders. What differentiates us is our world-class technical support and ongoing service care throughout the generator's lifespan, giving you peace of mind. With a rapid response time and offices on every continent we deliver a local service on a global scale.

Booth Number: 1113**Performance Distillation Solutions**

Performance Distillation Solutions is a recognized leader with our proprietary Pro-Pak® high efficiency distillation packing material. Pro-Pak is engineered and designed to meet a variety of industry needs and a range of applications from laboratory and pilot plant distillation, to those used in smaller manufacturing plants. PDS is also the Exclusive Distributor for Iludest® in the U.S. and Canada.

Booth Number: 204**PerkinElmer**

PerkinElmer is an industry leader in lubricant testing solutions, providing laboratories globally with the analytical instruments, accessories, and services they need to meet their most complex challenges. Our solutions accelerate scientists' ability to perform wear and additive metals analysis, lubricant chemistry, or contamination testing and enable laboratories to increase throughput and accelerate results.

Booth Number: 903**Perma Pure****Booth Number: 902****Petro Industry News**

Petro Industry News (PIN) is a world-wide publication that focuses on the instrumentation sector of the oil and petroleum related industries. The magazine is published every 2 months and reaches a global audience of over 30,000 buyers or end-users of analytical equipment in refineries, plants and petroleum/petrochemical labs, with a further readership of over 20,000 receiving the digital version. The publishers of PIN recently launched PEFTEC, Europe's only conference and technical exhibition for analytical instrumentation for refining, petroleum and petrochemical applications. In addition, there is a website (www.petro-online.com) which is updated daily with the latest news, events, product launches and application articles of relevance to analytical chemists working within the oil/petroleum related sectors. PIN is part of International Labmate, a publishing house which recently celebrated 40 years of specialising in magazines related to analytical instrumentation technology. Other magazines in the International Labmate range include International Environmental Technology, Asian Environmental Technology, International Labmate, Lab Asia, Measurement Analysis China and Chromatography Today.

Booth Number: 101**Petrolab Company**

Petrolab Company is your source for the latest in Analytical Laboratory Instrumentation. Grabner Instruments designs and manufacturer's the most advanced selection of products for the petroleum industry. Petrolab Company provides products for analysis of Octane, Cetane, Flash Point, and Vapor Pressure. Be sure to check out the Online Vapor RVP process analyzer that determines vapor pressure of gasoline, crude oil, LPG, NPG and vapor-liquid ratio (LVR) of gasoline.

Booth Number: 103**Petroleum Systems Services Corporation****Booth Number: 1025****Photovolt Instruments**

Photovolt Instruments is an equipment manufacturer specializing in high quality lab instrumentation. We offer a Karl Fischer titrator and colorimeter. All accessories and glassware needed for our instruments is available as well.

Booth Number: 326**PID ANALYZERS, LLC**

PID Analyzers develops sensors and systems for air, water and process monitoring using technologies such as: photoionization, flame ionization, thermal conductivity, flame photometry, infrared & UV absorption, electrochemistry, capacitance, and gas chromatography. Their design expertise includes sensors, GC detectors, spectroscopy, gas chromatography, and software for systems: gas chromatographs, controllers, and PLC's.

Booth Number: 110**Pollution S.r.l.**

Pollution Analytical Equipment manufactures on-site innovative chemical analysers of volatile compounds for Environment, Quality & Process, Research and chemical risk protection in the CBRNe field. The desire to be closer to our customers leads us to maintain a complete and steadily growing support system. Our aim is not limited to helping clients in their choice of tools, but also to increase the value of our offer with technical contributions that support customers in their use of our tools.

Booth Number: 918**Precise Standards & Solutions, Inc.****Booth Number: 205****Premier Lab Supply**

An industry leading manufacturer and distributor and trusted global advisor of XRF sample preparation products and services. PREMIER's robust line of XRF liquid sample cups and thin film materials include innovative deliverables, such as CEMBLE® and CapX® pre-assembled XRF sample cup products and FILMVELOPES® thin film assembly that meet our customers' specifications. Our line of platinum and fusion labware along with binding, grinding and flux additives are excellent in the preparation of reference samples for XRF, ICP and AA analysis. Our platinum refabrication services restore worn labware to pristine condition at a fraction of the price of new labware. Our fusion and press pelletizing equipment ensure your samples are produced with quality and reliability. Our mission is to help you achieve accurate and reproducible results, all at value-based prices. We are XRF Sample Preparation Specialists®.

Booth Number: 904**Process Insights**

Process Insights provides real-time analytical instrumentation, gas and water analysis solutions, and safety products for a variety of industries including lab, chemical, petrochemical, oil and gas, pharmaceutical, environmental, and more. Our analytical, process, liquid, gas, and moisture measurement solutions are recognized around the world and help reduce complexity, improve yield, and keep personnel, facilities, and environment safe. Our brands include ALPHA OMEGA INSTRUMENTS, ATOM INSTRUMENTS COSA XENTAUR, EXTREL, HYGROCONTROL, LAR, ANALECT, MGA, and TIGER OPTICS.

Booth Number: 910

Process Instruments, Inc.

Process Instruments, Inc. specializes in Raman spectroscopy for on-line process control throughout the refinery. We offer ATEX, IEC EX, and NRTL (ETL) certified Raman systems with multiplexing capabilities up to 17 streams. With detection capabilities < 2 ppm for many components. Raman can be used for measuring most down stream petroleum product parameters for gasoline, diesel and Jet fuels. In addition we offer upstream applications including, LPG Alkylation feed streams, Alkylation acid content, Crude Unit optimization by measuring Flash, Pour and Cloud points. Reformer optimization by measuring incoming and outgoing, Sulfur, Olefin, and Octane levels. Raman offers an economical opt

Booth Number: 511

Purge Solutions, Inc.

purge/pressurization systems

Booth Number: 607

Quality Environmental Containers - QEC

QEC containers are prepared to meet the exacting standards of environmental labs and will provide exceptional performance in any laboratory application. Visit <https://www.qecusa.com> to browse our products, including: Qromix™ chromatography vials, closures, septa; Custom-Preserved containers prepared for your needs, including all UCMR5 methods; Q-Seal & UltraLab containers for PFAS sampling; soil sampling kits and tools; plus caps, closures, labels, custody seals, and air sampling bags.

Booth Number: 323

Quantum Analytics

Quantum Analytics is a value-added distributor of analytical instruments, specializing in offering a streamlined path to getting the critical assets your laboratory needs. Our flexible financing programs include short-term rentals, rentals-with-equity, capital leases, fair-market value leases and 0% interest financing. We are a multi-vendor distributor, partnering with Agilent Technologies, Bruker Corporation, Frontier Labs, Markes International, and other distinguished manufacturers. We have a rich inventory of used and refurbished instrumentation available for quick shipping.

Booth Number: 909

Radom Corporation

Radom is a global leader in advanced plasma technologies. We provide sustainable and innovative plasma solutions for industries including analytical instrumentation, clean tech, and hydrogen generation. Our products and instruments lead to safer processes, faster performance, and the reduction of pollution with the promise of continuing to detoxify our earth.

Booth Number: 1016

Ramin' Corporation

Ramin' Corporation has produced and distributed environmental & petroleum glassware, laboratory & scientific apparatus, custom glass designs, precision machined metals and plastics since 1984. Our facility manufactures ISO, ASTM, and OEM products for petroleum testing and specialty applications. Custom design, calibration, and certification services are available.

Booth Number: 608

Red Ball Oxygen

Red Ball Oxygen Red Ball Technical Gas Services, High Purity Gases, Certified Gases, EPA Protocols, IPG Grade Gases Red Ball TGS is dedicated to providing our customers the highest quality pure, mixed, and custom blended gases available with some of the fastest lead times in the industry. We operate two specialty gas manufacturing facilities. An ISO 17025 Accredited Specialty Gas Laboratory in Shreveport, LA and a Hydrocarbon Specialty Gas Laboratory in Houston, TX. Red Ball TGS offers a complete turn-key solution to all of your gas requirements: including production, certification, delivery, and inventory management.

Booth Number: 925

Restek Corporation

Booth Number: 303

Rigaku Americas Corporation

Booth Number: 100

Rudolph Research Analytical Corp

Rudolph Research Analytical is a leading, US based manufacturer of high accuracy, bench-top Density Meters, Refractometers, and Sample Automation instrumentation for the Petroleum and Chemical Industry. Density Meters comply with ASTM D4052, D5002, ISO 12185, D5931 for determination of API Gravity, Density and Specific Gravity. We also manufacture Refractometers compliant to ASTM D1747, D1218. Systems are available with and without automation, heated sample loading.

Booth Number: 921

Sartorius

Sartorius is Simplifying Progress as a trusted partner of the Life Science and Biopharmaceutical Industries. Although well known as a leading international pharmaceutical and laboratory equipment supplier, Sartorius is actually working with and for a wide range of customers across practically every industry. With innovative and intuitive products and solutions, we help increase efficiency and productivity whether in routine or complex lab processes or industry specific workflows.

Booth Number: 1106

Saybolt LP

Saybolt's goal is to remain the fastest laboratory and inspection company in the world. We focus our resources to stay ahead of the competition in terms of know-how, instrumentation and logistics.

Booth Number: 519

Scion Instruments

SCION Instruments designs, develops, supplies and supports GC, GC-MS, LC and Compass CDS (chromatography data system) product lines. Built on the history of Chrompack and Varian in GC and GC-MS, SCION Instruments was acquired by the Techcomp group in 2014. SCION Instruments maintains a global infrastructure to support sales around the world. As well as providing support for SCION Instruments customers, there is also service and support available for users of legacy Varian systems.

Booth Number: 310

Selerity Technologies, Inc.

Founded in 1998, Selerity Technologies has become the market leader in Supercritical Fluid Chromatography and continues to grow by adhering to its basic business concept of understanding customers' expectations, developing customer loyalty and continued development of a well-executed business strategy. Selerity is committed to increasing the analytical community's productivity and quality of results utilizing chromatography in the most cost-effective manner. We strive to exceed customer expectations for product quality and value. We provide our customers a competitive advantage by building long-term relationships through personalized contact and enhanced customer service and support.

Booth Number: 1210

Separation Systems, Inc

Separation Systems offers GC and GC-MS based analysis systems, specialized software, consumables, standards, reference material and services for common petroleum refining, biofuels and petrochemical applications. While most of our products are designed to meet the international standard method requirements (ex. ASTM, EN, ISO), we can also offer products for special requirements including custom software. Separation Systems, Inc. established in 1981 is privately owned and located in Gulf Breeze, FL USA.

Booth Number: 116

SepSolve Analytical

SepSolve Analytical provides analytical platforms for separation scientists using GC. A cornerstone of its product portfolio in petrochemical analyses is the BenchTOF2™ mass spectrometer for GC and GC×GC, with enhanced confidence in identification through its excellent spectral quality, improved mass accuracy and Tandem Ionisation® technology. Other products include sample preparation robots and thermal desorption instruments, as well as its own INSIGHT® flow modulator and ChromSpace® software for robust GC×GC

separations and powerful data mining. Together, these tools enable you to discover more about your sample, and to deliver higher throughput for both research and routine applications.

Booth Number: 325

SGS North America Inc.

SGS provides a wide range of independent laboratory testing and cargo inspection services and expertise on a 24/7/365 basis. SGS has state-of-the-art laboratories & offices across the Gulf Coast region, the USA, and the world. SGS supports quality testing, research, troubleshooting, back-up, and other testing needs and requirements. Testing standards include ASTM, ISO, IP, GPA, AASHTO, and many others.

Booth Number: 206

Shimadzu Scientific Instruments, Inc.

Shimadzu is the leading provider of analytical measurement and testing instrumentation for a broad range of applications in such markets as foods, pharmaceuticals, life science, environmental, chemicals, cannabis testing solutions and forensics. With an extensive portfolio of high-quality platforms, we can provide customers with unparalleled solutions-based offerings that address their specific laboratory workflows and encourage collaborations that focus on results. From chromatography, mass spectrometry, and spectroscopy to particle size, thermal, and total organic carbon analyzers, to balances and materials testers, we can address your most challenging applications requirements.

Booth Number: 403

SilcoTek

SilcoTek is the worldwide leader in inert surface coating technology. With their patented chemical vapor deposition (CVD) coating processes, SilcoTek invents and applies coatings like SilcoNert® and Dursan® to chemical sampling and analysis components to increase their reliability, extend their lifetime, and improve overall performance.

Booth Number: 117

SK Petro

Established in 2012, SK Petro is a Texas company specializing in various Petroleum Testing Instruments, including Automatic Fuel Blender, Octane/Cetane Rating Unit, Kinematic Viscometer, Flash/Fire Point Tester, Distillation Tester, Vapor Pressure Tester, and so on.

Booth Number: 1018

Spectrum Quality Services

Spectrum Quality Standards Certified, Verified and Analytically Traceable Standards to the Petrochemical Industry. We are ISO 9001:2015 Registered and A2LA 17034 Accredited. Booth # 317

Booth Number: 317

SPL, Inc.

SPL is a trusted North American leader providing testing, inspection, certification, and compliance (TICC) services as well as innovative digital solutions to the Environmental and Energy sectors. Through our ISO and NELAP certified labs, verifiable test methods, and world-renowned scientists SPL is dedicated to ensuring accurate and defensible data to our clients and communities. By providing best-in-class laboratory, metrology and data management services, as well as access to data in real-time, our customers are able to efficiently track and optimize their operations.

Booth Number: 125

StanCo Scientific Inc

Booth Number: 610

TA Instruments – Waters Corporation

TA Instruments is a world leader in manufacturing industry-leading systems for thermal analysis, rheology, microcalorimetry and mechanical analysis. We offer innovative and reliable instruments that help scientists in top laboratories test the physical properties of their materials. Our instruments contribute to leading discoveries in medicine, materials science, energy, electronics, and other areas of science devoted to improving our world.

Booth Number: 1004

Tannas Co. and King Refrigeration

Precision. Progress. Passion. With over 40 years of laboratory instrument innovation, Tannas Company continues to set higher standards to advance the research, testing, and development of engine oils, lubricants, and related fluids. We enrich the industry through our elite manufacturing of quality bench-top laboratory instruments, including: • Quantum® Oxidation Tester (our exclusive non-liquid RPVOT) • SBT@+2 (Low-Temperature Pumpability & Gelation Index) • TBS Viscometer (High-Temperature, High-Shear Rate) • Tannas Foam Air Bath: TFAB (Foam Tendency & Stability) Additionally, our King Refrigeration instruments deliver accurate research results for low-temperature applications.

Booth Number: 720

TE Instruments USA

TE Instruments designs, develops, manufactures, markets, sells and supports a range of laboratory equipment for industrial, petrochemical and environmental applications. TE Instruments is a young and growing company with a strong mix between experienced employees and highly qualified upcoming young talents. We have an in house Research & Development section as well as an Glass Manufacturing Facility & Production section. Customer applications are developed and carried out in our laboratory. We have introduced a full range of combustion analyzers and accessories, dedicated to handle all sorts of samples according to ASTM methods and other international standards. Besides combustion analyzers,

Booth Number: 603

TECH 2000 Services & Staffing, Inc.

Over the past quarter of a century, TECH 2000 has been recognized as the trailblazer in scientific staffing. Based upon a growing demand for skilled personnel, TECH 2000 set out on its journey to support the scientific laboratory needs of industry. Founded in the Gulf Coast and with offices in Texas and Louisiana, TECH 2000 searches for and identifies individuals with laboratory, scientific, and STEM backgrounds who are able to support our clients' staffing requirements.

Booth Number: 211

Teledyne Analytical Instruments

Teledyne Analytical Instruments (TAI) is a world leader in the design and manufacture of high-quality gas and liquid analyzers, sensors, and custom integrated analysis solutions. With over 50 years of experience, our mission is to meet the various industry requirements while providing the highest standards of performance and quality in order to meet our customer's needs.

Booth Number: 1110

Texas Scientific Products

TSP is a respected manufacturer, distributor, and supplier of a whole array of consumables & sample introduction systems for ICP & ICPMS including nebulizers, spray chambers, torches, & pump tubing. We provide TSP brands as well as the brands essential for all major manufacturers of ICP-MS & ICP-OES, AA, XRF & Viscometers. We offer inorganic & organic standards, vials & probes compatible with autosamplers.

Booth Number: 616

Thermo Fisher Scientific

Thermo Fisher Scientific offers the most comprehensive portfolio of routine and non-routine workflow solutions in the Oil & Gas industry to best suit your specific application requirements and budget. Whether your workflow requires gas chromatography, mass spectrometry, ion chromatography, combustion ion chromatography, FTIR or ICP-OES, our instruments deliver timely, critical information. We also offer LIMS and chromatography data systems (CDS) to connect your upstream, midstream and downstream production workflows as well as your industrial water preventative maintenance processes.

Booth Number: 702 & 703

UCT

UCT is a vertically integrated manufacturer of high-quality sample prep products and U/HPLC columns. We combine this with world-class technical support. Product lines include Solid Phase Extraction (SPE) cartridges, EPA method-specific columns, Selectra® U/HPLC columns, SelectraCore® coreshell columns, disc and universal cartridge extraction manifolds and

Specialty chemicals including silanes and silicones. UCT is excited to highlight our Hydraflow®, a 4 Channel cartridge manifold for efficient sample processing. It features easy channel switching between waste discharge and sample collection, precision controls for desired flow rates and an effective waste management system. Visit our booth to learn more about our latest application notes.

Booth Number: 305

Veolia WTS - Sievers Instruments

Sievers Instruments simplify compendial water testing, process monitoring, and cleaning validation for manufacturers in various industries around the world. Complete solutions for TOC, conductivity, bacterial endotoxin testing (BET), and bioburden drive efficiency gains and enable real-time testing (RTT), automation, process control, and risk mitigation. Manufacturers rely on Sievers instruments, software, consumables, services, and expertise, to make critical testing easier, more efficient, accurate, and compliant. Sievers TOC Analyzers cover a dynamic analytical range from 0.03 ppb up to 50,000 ppm and provide solutions across diverse industries and applications.

Booth Number: 924

VICI Valco Instruments

For over 50 years, VICI Valco Instruments Co. Inc. has been the leading designer and manufacturer of standard and custom valves and fittings for precision analytical, biomedical, and biocompatible instrumentation. Our product line also includes a wide range of related products such as pneumatic and electric actuators, tubing and sampling loops, heated enclosures, valve sequence and temperature controllers, gas purifiers, GC detectors, and digital interfaces.

Booth Number: 104

VUV Analytics Inc.

VUV Analytics is the leader in vacuum ultraviolet (VUV) detector technology for gas chromatography and automated analyzer applications. Virtually every compound absorbs strongly in the vacuum ultraviolet spectrum with unique spectral signatures, providing a new dimension of chemical analysis. Learn more at www.vuvanalytics.com or contact VUV Analytics directly at (512)333-0860.

Booth Number: 525

Wasson-ECE Instrumentation

We've been designing, building and applying lab and process GC systems for over 35 years. Our turn-key analyzers cater to the needs of the hydrocarbon processing industry and can be found in more than 50 countries around the world. Customers such as ExxonMobil, BP, Phillips 66, Chevron, UOP, and Dow rely on our expertise and the GUARANTEED RESULTS our systems provide. We have the experience. We have the innovation. We have your GC solution. Let's get to work!

Booth Number: 920

XOS

XOS is an innovator in elemental analysis solutions that help ensure product compliance, protect critical assets, and improve customer efficiency in industries like petroleum, maritime, semi-conductor, and academic research, to name a few. We deliver these breakthrough solutions for the petroleum industry by offering a suite of benchtop and process analyzers suitable for a wide range of applications like crude oil, gasoline, jet fuels, catalysts, aromatics, distillates, biofuels, and more. Our newest generation of analyzers – the R Series – provides unparalleled precision with enhanced UX, improved data management, and even greater ease of use.

Booth Number: 721

XRF Scientific Americas Inc

XRF Scientific Limited is an Australian listed company (ASX: XRF) based in Perth, Western Australia. XRF manufactures equipment and chemicals, which are distributed to production mines, construction material companies and commercial analytical laboratories, in Australia and overseas, and used in the preparation of samples for analysis. XRF has manufacturing, sales and support facilities located in Perth, Melbourne, Europe and Canada, plus a global network of distributors. The Company has representation in the United States, South America, Africa, the Middle East and Asia. XRF's technology is used to measure the composition and purity of materials and is mainly applied in industrial quality.

Booth Number: 123

Xylem Lab Solutions

Booth Number: 620

YSI

YSI is part of Xylem Analytics and a leading provider of water measurement solutions. Xylem Analytics' global brands have been leaders in the water and laboratory instrumentation market for decades, and are relied upon every day across more than 150 countries. Working in true partnership with our clients, we listen, learn and adapt to individual needs, offering deep application expertise built upon our long history of innovation in instruments and services. Our solutions for analysis, measurement and monitoring help enable many of today's environmental monitoring, modern laboratories and industrial processes, and provide our customers the high performing solutions they need to succeed.

Booth Number: 623

Zeltex

Zeltex is a manufacturer of Near Infrared Fuel Analyzers used widely by state and federal regulators as well as fuel manufacturers and distributors.

Booth Number: 425

HORIBA
Scientific

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10/09/23 - 10/11/23

MOODY GARDENS HOTEL & CONVENTION CENTER - EXHIBIT HALLS A-C - GALVESTON, TX

REVISION

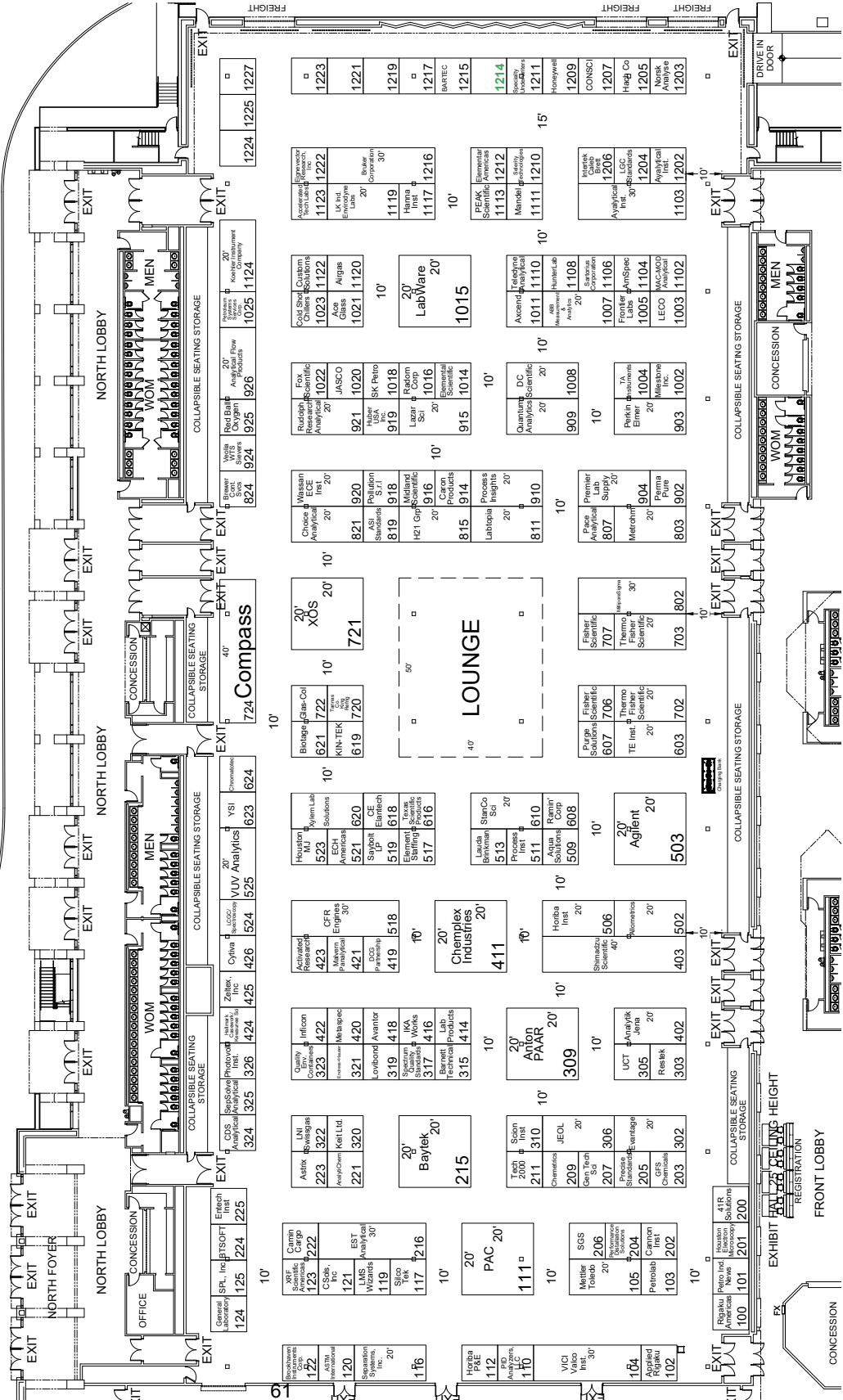
Date: 9/15/2023
By: TIMOTHY CLARK

BOOTH COUNT

Inventory as of 09/15/2023	Dimension	Qty	Sq Ft	Rented
10'x10'	100	129	12,900	118
10'x20'	200	28	5,600	28
10'x30'	300	6	1,800	6
10'x40'	400	2	800	2
20'x20'	400	7	2,800	7
Totals:	172	243,900	161	

BLDG. LEGEND:

NOTE: Floor plan is subject to Fire Marshal approval.



DRAWING INFO
Passport Line Item Number:
#8962281

Facility: MOODY GARDENS HOTEL & CONVENTION CENTER
Facility Location: EXHIBIT HALLS A-C
City & State: GALVESTON, TX
Scale: CUSTOM
Project #: ---
Acct. Sales: ---
Acct. Mgmt.: CHAD LEWIS
Started: 8/23/2023
Started by: LYDIA GONZALES
Prod. Branch: HOUSTON

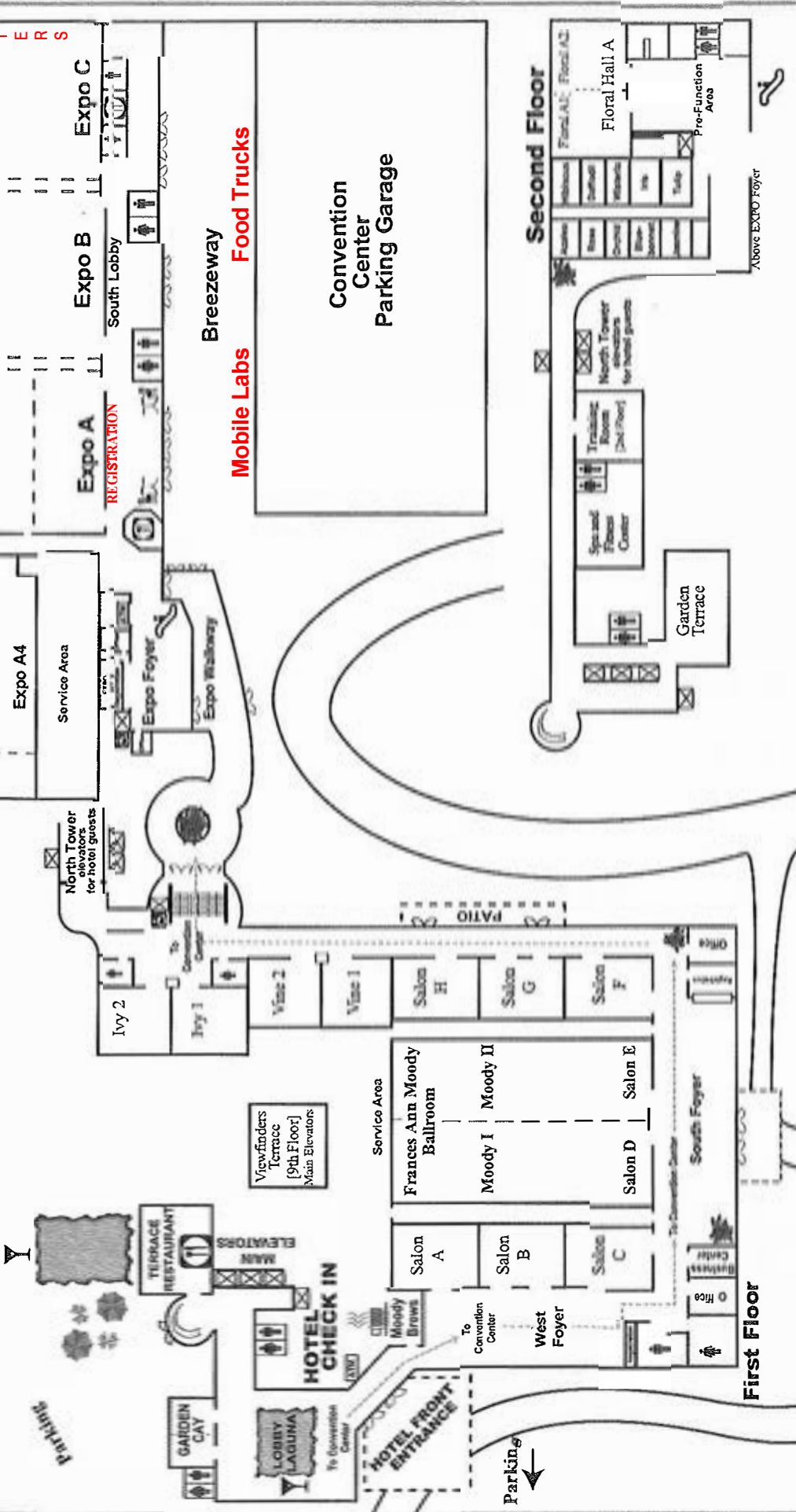


Disclaimer - This floor plan is preliminary and subject to change pending review and official approval by all authorities having jurisdiction. Every effort has been made to ensure the accuracy of all information contained on this floor plan. However, no warranties, either expressed or implied, are made with respect to this floor plan. If the location of building columns, utilities or other architectural components of the facility is a



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