MICRO GC FUSION®
ADVANCING GAS ANALYSIS

Abstract # 128 Paper - 10/11/2016 - 1:10 PM - Room 380 A
Micro GC Fusion – Advancing Gas Analysis

Chingyue Yeung

Product Manager

- Micro GC Fusion
- 3000 Micro GC
- DataFID / MicroFID II

Located to Syracuse, New York

Abstract # 128 Paper - 10/11/2016 - 1:10 PM - Room 380 A
Micro GC Fusion – Advancing Gas Analysis

Advancing Gas Analysis

- INFICON Introduction
- Industry driving forces
- Traditional and new Micro (Fast) GCs
- Responding to needs
- Focus applications

Global Presence of INFICON

950 employees; offices in 17 countries

Local support of customers is INFICON's competitive advantage

INFICON Markets

Semi & Vacuum Coating	Security & Energy	Refrigeration, Air Conditioning & Automotive	General Vacuum
• Display • Optics • Semiconductor • Solar	• Emergency Response • Environmental Health and Safety • Military • **Alternative Energy and Petrochemical** • Public Utilities	• Refrigeration • Air Conditioning • Automotive • Service Tools	• Research and Development • Vacuum Furnace and Metallurgy • Industrial Vacuum Coating

Industry Driving Forces for GC

Faster
- Shorter analysis time
- Shorter instrument setup time
- Shorter method development time

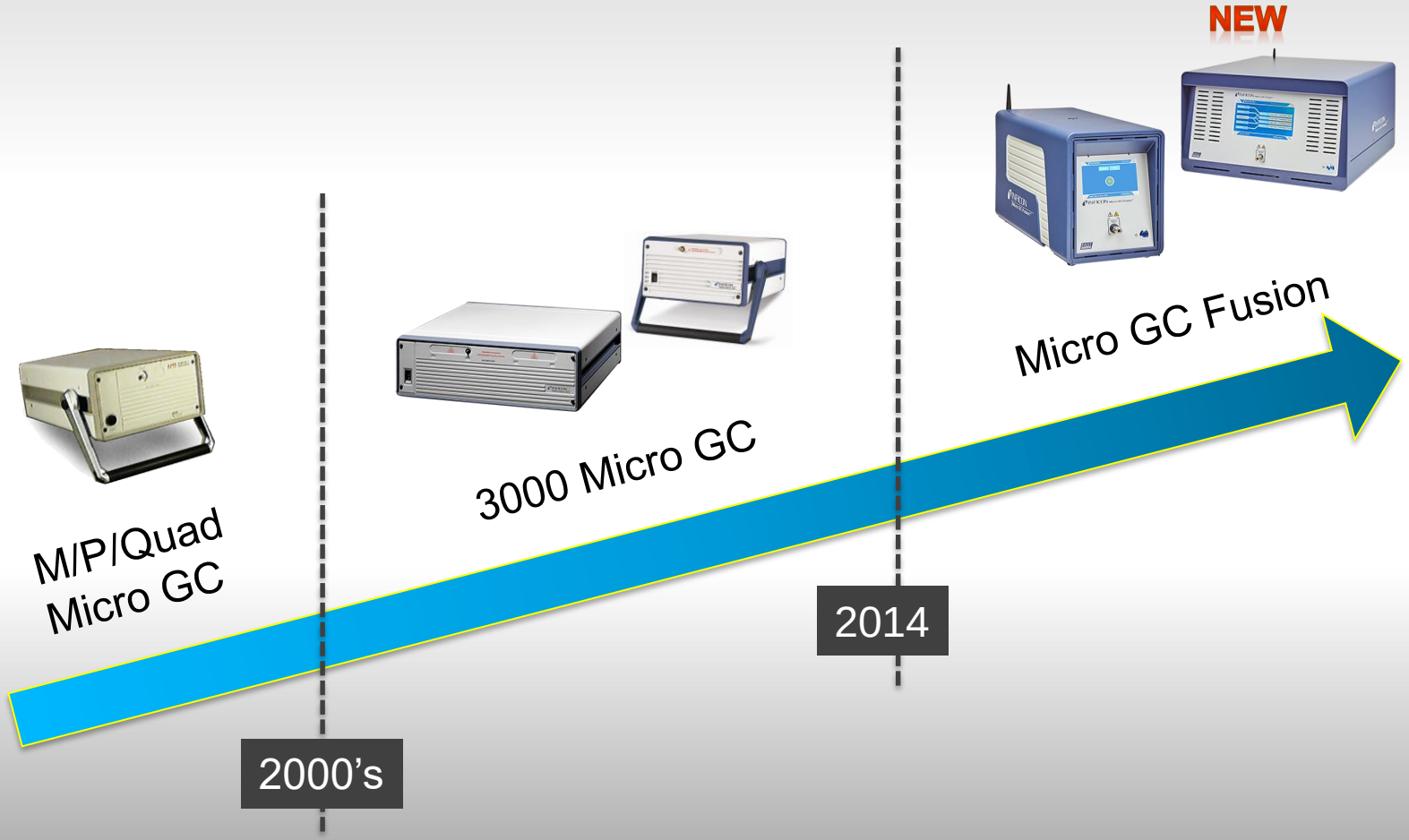
Easier
- Run and get result
- Minimal operation training
- No OS headaches
- Easy sample handling

On-site Analysis
- Efficiency improvement
- Avoid sample contamination

Better Performance
- Meet industry requirements
- Better than legacy products

Traditional and New Micro (Fast) GCs

INFICON Response to Industry Needs



Responding to needs

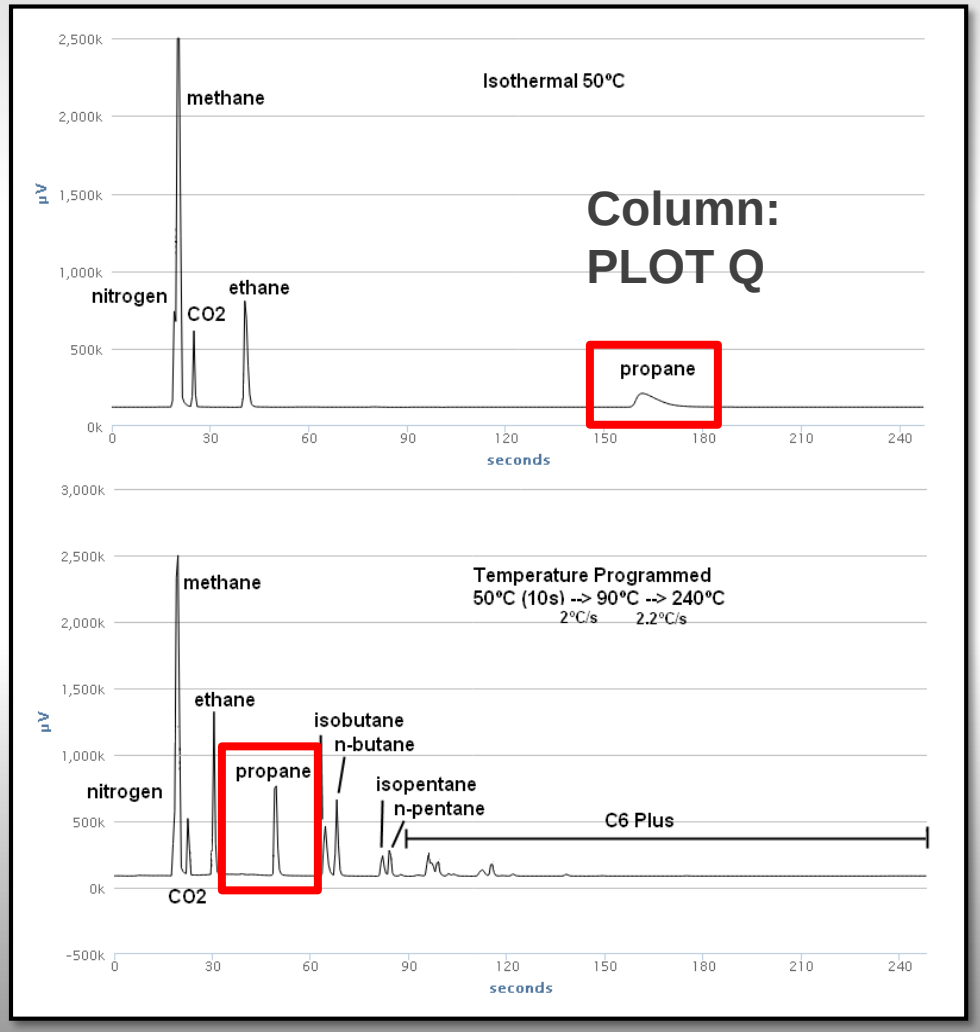
Faster

Temperature Programming

Resistive column heating technology

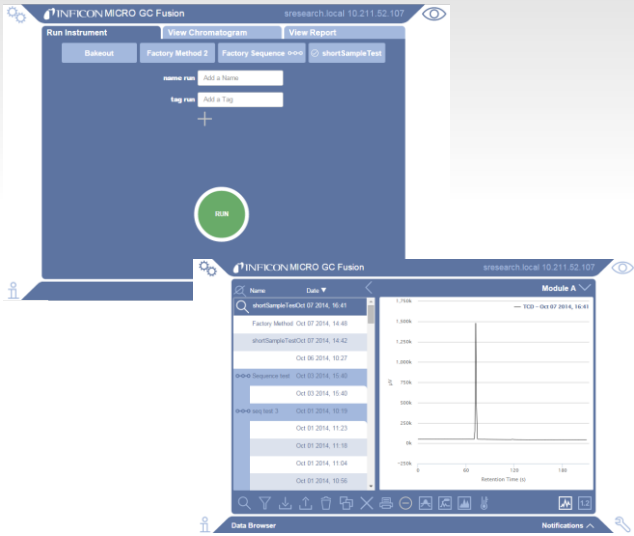
Example – Propane

- Isothermal ~160 seconds
- Temperature programming ~50 seconds
- Increased peak height
- Improved peak resolution



Responding to needs
Easier

Embedded Software w/ Web-based UI



- No installation and licensing
- OS platform independent
  - Runs on Internet browsers
- UI caters to both non-expert users and chromatographers
- Eliminates method and data synchronization delays with external computer

Wired or Wi-Fi Connectivity

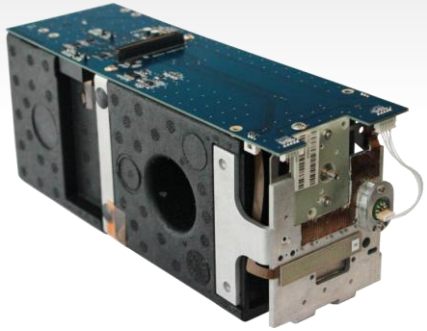
- Easily connects with computer or tablet or smart phone
- Eliminates unnecessary wiring

Responding to needs

On-site

Lighter

- Expanded Polypropylene
  - 25% weight reduction
  - Excellent heat insulation

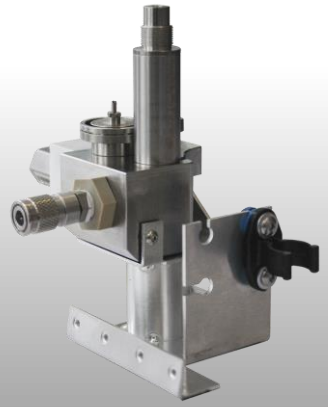


More Stable

- Fully heated sample path
  - Optional Integrated Sample Conditioner keeps sample “hot”

Low Consumption

- Max. 260W in dual module configuration
- 2-3 ml/min flow

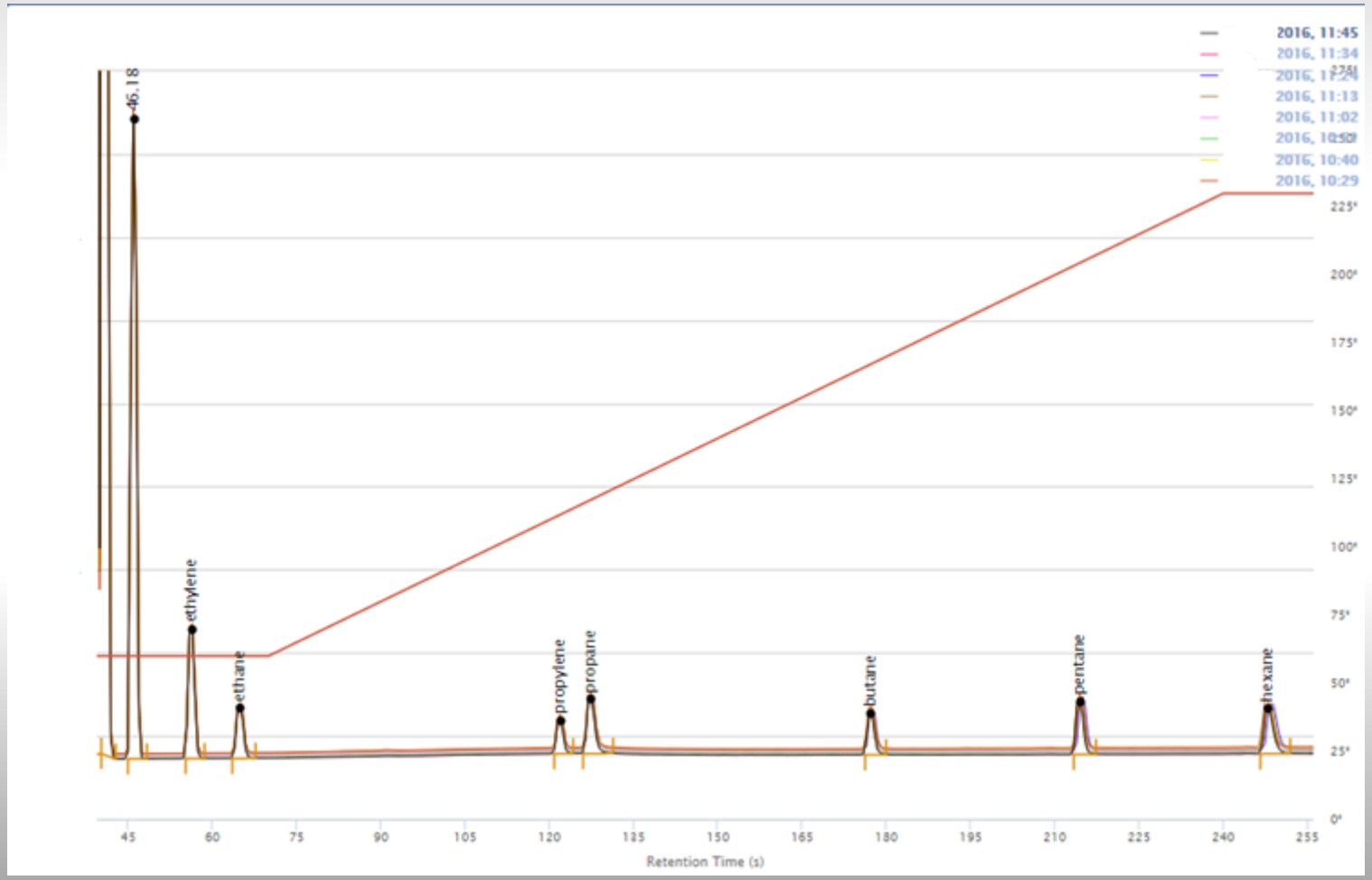


Robust

- Tested to MIL-STD-810, MODIFIED Highway Truck Vibration and/or Two-wheeled Trailer Vibration

Responding to needs

Bottom Line – Good Performance



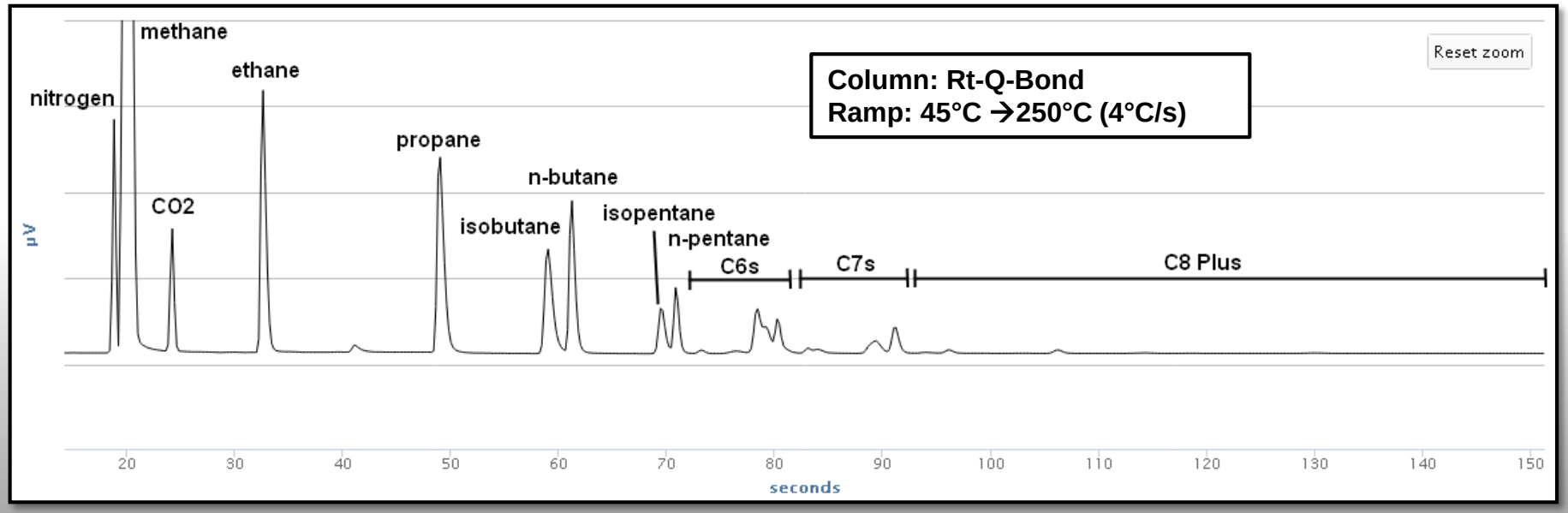
Sampling Universal Checkout Gas with Rt-Q-Bond

Typical Applications

Natural Gas

Pipeline quality

- Using temperature programming, the Rt-Q-Bond can be used for C1-C8 Plus natural gas analysis

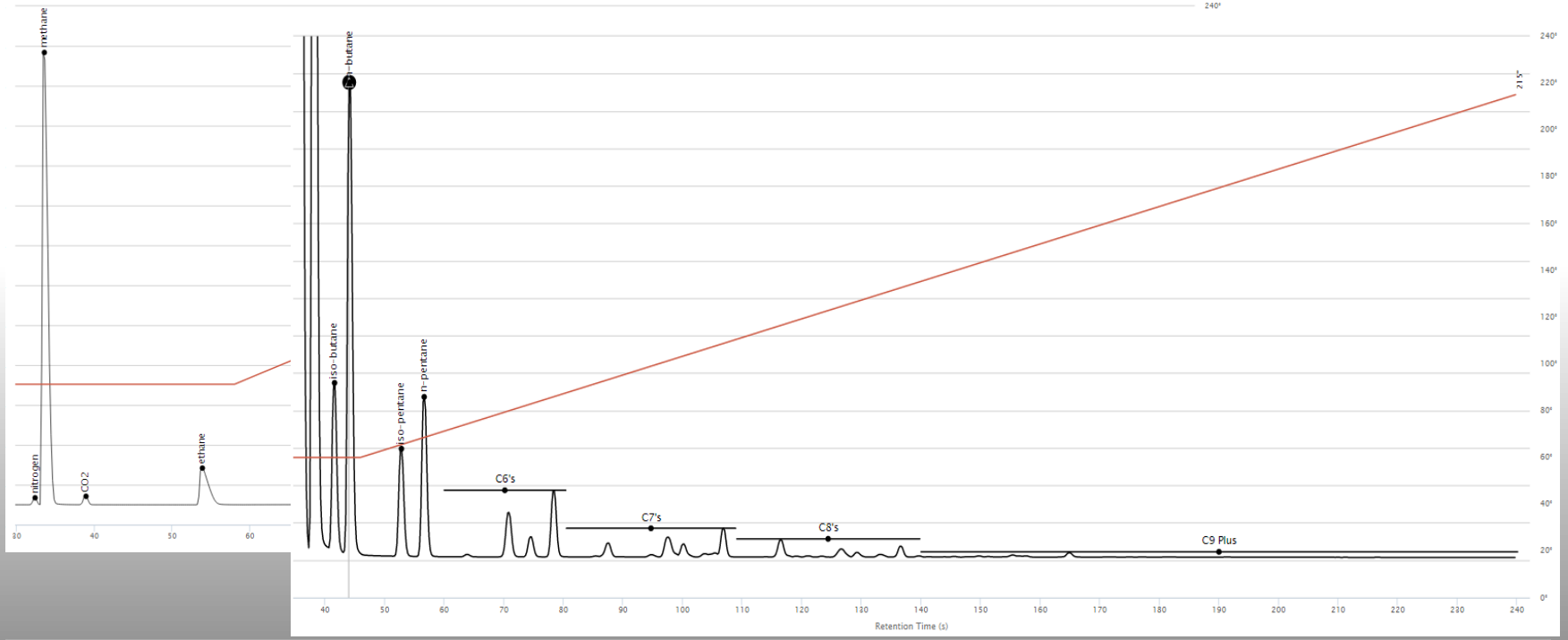


Typical Applications

Natural Gas

At Well Site

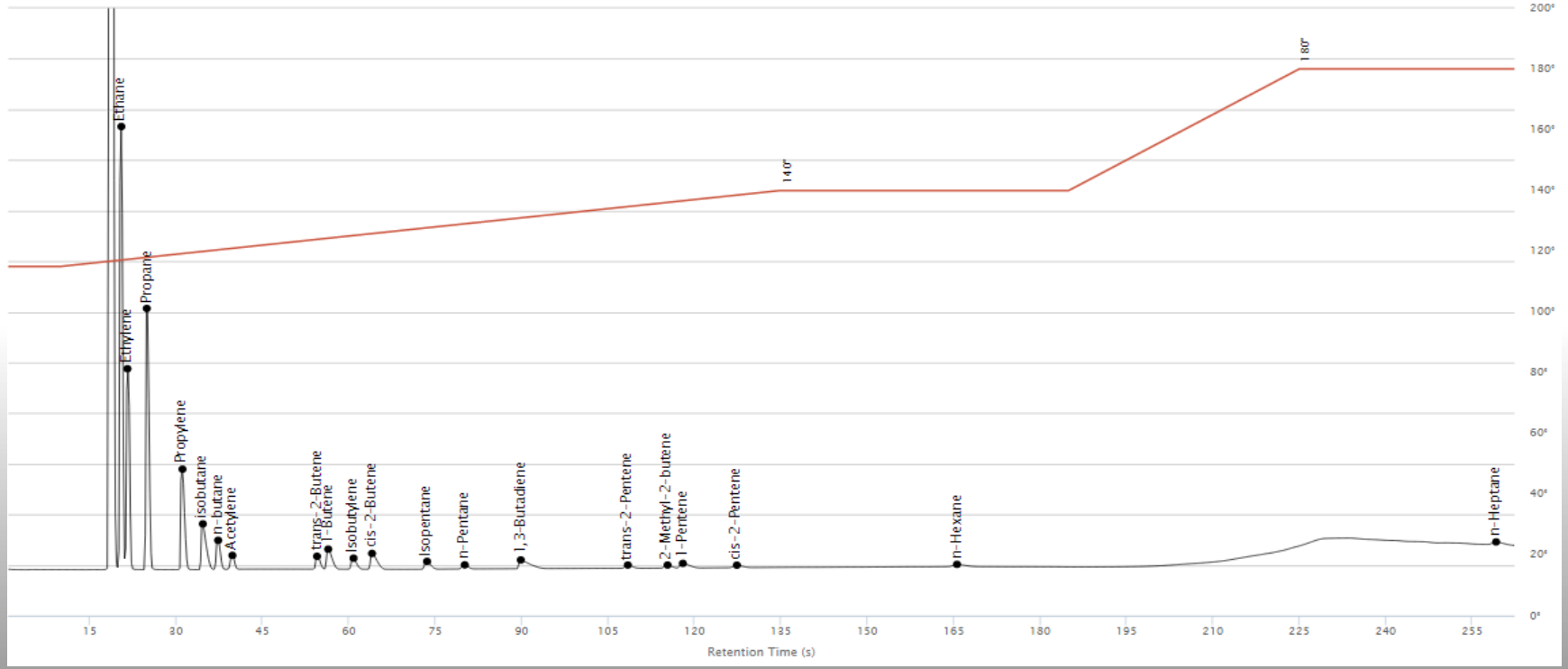
- Two modules approach
  - Rt-Q-Bond for N2, C1 - C3
  - Rxi-1ms for C4 - C9 Plus



Typical Applications

Olefins in Refinery Gas

- Well separated C2-C5 olefins within 130 seconds
- Applicable to traditional refinery gas, LPG and catalyst reaction monitoring



Standard Compliance

GPA 2261-13 standard compliance on single module implementation for pipeline quality natural gas.

Sample Information	Result 1	Result 2
Results ID	23	24
Sample name	No INT	No INT
Injection Date	2016-08-12 15:57:12	2016-08-12 16:04:27

Component	Result 1 Amount	Result 2 Amount	Repeatability	Lower Limit	Upper Limit	Status
Nitrogen	1.5596	1.5588	0.04	1.52	1.60	Pass
Methane	89.146899999999988	89.147	0.04	89.11	89.18	Pass
Carbon Dioxide	1.2075	1.2078	0.01	1.20	1.22	Pass
Ethane	3.0115	3.0111	0.02	2.99	3.03	Pass
Propane	2.0061	2.0028	0.01	2.00	2.02	Pass
i-Butane	1.0012	1.0013	0.01	0.99	1.01	Pass
n-Butane	0.9963	0.9948	0.01	0.98	1.01	Pass
i-Pentane	0.3	0.301	0.01	0.29	0.31	Pass
n-Pentane	0.2983	0.2987	0.01	0.29	0.31	Pass
Hexanes Plus	0.4726	0.4767	0.01	0.46	0.48	Pass

Micro GC Fusion – 4 Modules System Product Launch at GCC

INFICON launched the 4-Module Micro GC Fusion on October 11

- Analyze complex sample compositions with speed and accuracy
- Runs on the same robust modular design
- Configuration tailors to customer applications

INFICON Presence at GCC

Booth Information - #334

- Showing the new 4-Module Fusion, 2-Module Fusion, and the IS certified DataFID

4-Module Micro GC Fusion

2-Module Micro GC Fusion

DataFID for LDAR

Abstract Presentation

- Abstract # 38 Paper - 10/11/2016 - 1:50 PM - Room 371 D
- Fast and extended refinery gas analysis with temperature programmable Micro GC (Shawn Wilson)

THANK YOU!!

Micro GC Fusion

Simplify and Accelerate Gas Analysis