

AC MDA Analyzer Determines Aromatic Content of Diesel Fuels Using HPLC

Product Brief



INTRODUCTION

To reduce the particulate emission generated by diesel combustion, environmental laws control the aromatic content of diesel fuels.

California refiners use test method ASTM D 5186 to determine aromatics in diesel and jet fuel by supercritical fluid chromatography (SFC). In Europe, refiners use the high performance liquid chromatography (HPLC) method IP 391 to measure ring aromatics in diesel fuels. The IP 391 method is similar to EN 12916

FAST AROMATICS ANALYSIS

To assist refiners in determining the aromatic content of diesel fuels, AC Analytical Controls developed a fast, robust and easy-to-use system: the AC Mid Distillates Analyzer (MDA). The MDA system (IP 391-2001) incorporates the high performance liquid chromatography (HPLC) technology to detect:

- Mono-ring aromatics
- Di-ring aromatics
- Poly-ring aromatics
- Total aromatics

in diesel fuels and petroleum distillates in the 150°C to 400°C (752°F) range within 25 minutes.

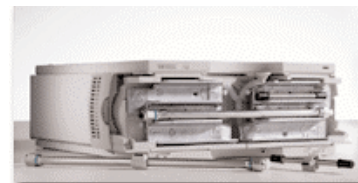
PROVEN INSTRUMENTATION

The AC MDA system consists of the proven Agilent 1200 Series high performance liquid chromatograph (HPLC) configured with:

- a **refractive index detector (RID)** to detect different hydrocarbon groups
- an **isocratic HPLC pump** to allow precise and independent pressure control
- a **thermostatted compartment** which contains the column and the column switching valve for stable operation above, at and below ambient temperature
- a **manual injector** for sample introduction
- an optional **autosampler** to fully automate the MDA system
- an optional **degasser** to remove dissolved gases from the mobile phase

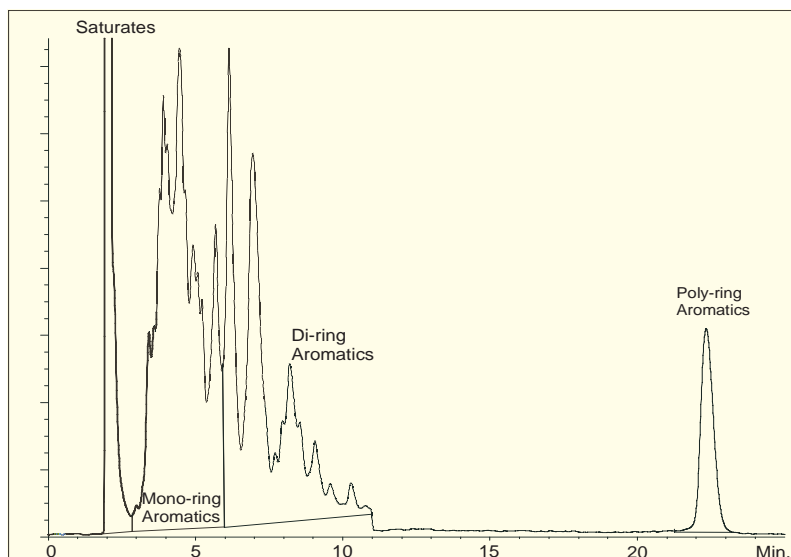


Agilent 1200 Isocratic pump



Agilent 1200 Thermostatted compartment

The user-friendly software is based on the latest Agilent LC ChemStation. The package reduces operator involvement by automating data handling, calibration, analysis and data reporting. AC fully integrates the hardware and software components and tunes the system for the IP 391 and EN 12916 method.



AC MDA (IP 391) analysis of a diesel fuel

QUALITY CONTROL

The AC MDA application includes a set of samples to fully calibrate and validate the system:

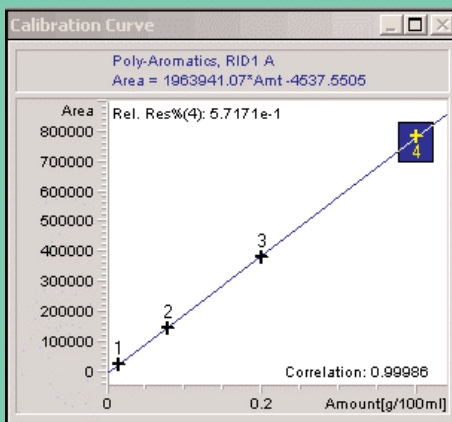
- a **system calibration standard** to determine the column resolution and backflush time
- four **calibration standards** to perform a multilevel calibration
- a **quality control (QC) diesel sample** with certified values to verify the system performance

AC MDA REPEATABILITY based on QC sample analyses			
Aromatic Groups	AC Average Mass%	AC Standard Deviation Mass%	AC Relative Standard Deviation Mass%
Mono-Aromatics	21.0	0.2	1.1
Di-Aromatics	3.9	0.2	5.6
Poly-Aromatics	0.7	0.04	5.3
Total Aromatics	25.8	0.4	1.7

ESTD PERCENT REPORT					
Retention time	Type	Area (nRIU*s)%	Amt/Area	Amount	Name
4.308	MF	8.74653e5	9.67009e-7	15.118640	Mono-Aromatics
5.923	FM	6.67941e5	5.41673e-7	6.467281	Di-Aromatics
21.766	MM	9.62204e4	4.24766e-7	0.730573	Poly-Aromatics
Totals		22.316494			

ASSURED PERFORMANCE

The AC MDA system meets the precision data of IP 391 and EN 12916. AC assures the repeatability data as stated in the repeatability table. A performance test demonstrates that the MDA application shows a linear response for the mono-, di- and poly-aromatics. The minimum detection limit is 0.1 mass%.

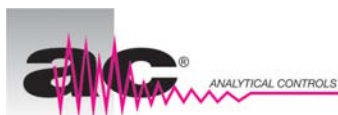


Linearity curve for poly-aromatics

FEATURES & BENEFITS

- ✓ Fast aromatic ring analysis in 25 minutes
- ✓ Robust and easy-to-use HPLC technique
- ✓ Proven Agilent Technologies instrumentation
- ✓ Precise and independent pressure control achieved by pumping system
- ✓ An optional autosampler fully automates the system
- ✓ User-friendly software controls data handling, calibration, analysis, and data reporting
- ✓ Complete system integration of hardware and software components
- ✓ Application delivered factory-tuned for the IP 391 and EN 12916 methods
- ✓ Assured performance with a linear response
- ✓ Calibration and quality control samples assist you in calibrating and validating the system
- ✓ On-site installation and familiarization by a qualified support engineer
- ✓ One year hardware and application warranty including free helpdesk

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