



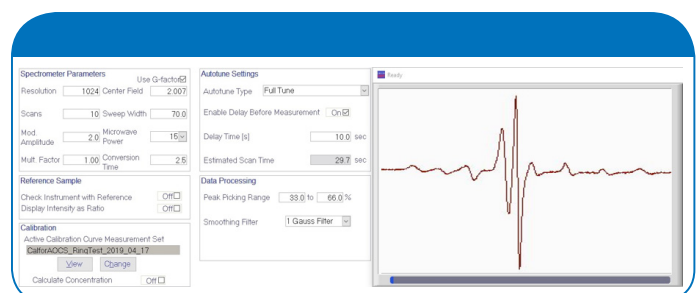
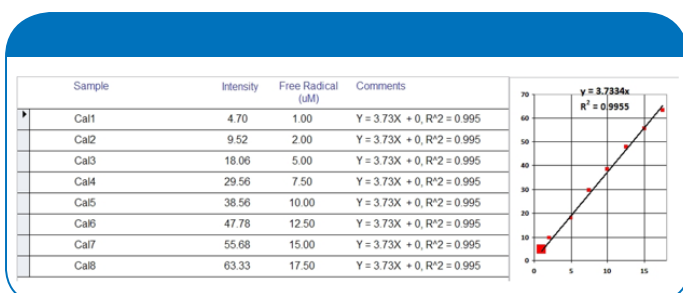
Bruker Product Information (microESR Analysis of Asphaltene and Vanadium in Crude Oil)

Toughly one-third of the world's energy currently comes from crude oil. The quality of oil is determined by its chemical composition, which can affect its processing, performance, and market price. Therefore, qualitative and quantitative oil condition monitoring is essential.

The component that has the largest influence on oil quality is asphaltene, the heaviest fraction of crude oil. Asphaltene is made up of a complex mixture of compounds with polyaromatic rings and aliphatic side chains, combined with trace amounts of vanadium and nickel. Small concentrations of asphaltene can easily aggregate, leading to an increase in viscosity and resulting in plugging wellbores and flowlines during oil extraction and processing. In addition, asphaltenes can also deactivate catalytic reactions during upgrading and refining processes.

Analyzing the asphaltene concentration in the complex mixture of hydrocarbons in crude oil is difficult, especially for online monitoring. Traditionally, the physical properties of the oil, such as viscosity and dielectric constant, were measured and these data was used to determine the underlying chemical composition. And when specific asphaltene analysis has been performed, it is often in model systems or in samples that have been diluted into simple solvents.

The introduction of electron spin resonance (ESR) or electron paramagnetic resonance (EPR), has enabled asphaltene to be directly characterized. This technique provides high-resolution and quantitative data, which gives real dynamic information within the local environment. Furthermore, ESR is a non-destructive method and requires no sample preparation



New SampleBench Automation

- Specifically designed for the microESR
- Provides automated, unattended use
- Fully reproducible results

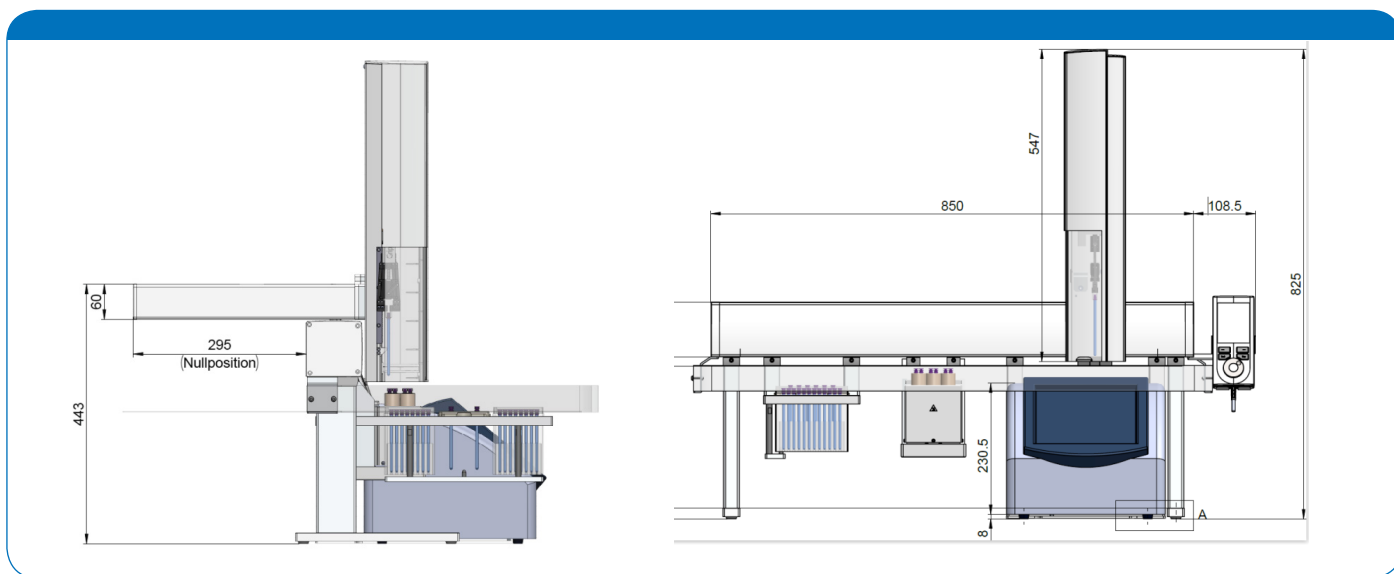


Technical data for the SampleBench

Weights and Dimensions: Autosampler Base assembly: microESR:	30 kg x-axis 850 mm; y-axis 512 mm; z-axis 534 mm 9 kg
Input Voltage:	110V / 230V
Heater Block:	30 – 200°C
Available Tube Diameters:	O.D. 1.7 mm L x 103.5 mm O.D. 5.0 mm L 103.5 mm:
Racks (supplied):	1 x Input Sample Rack (96 position) 1 x Output Sample Rack (96 position) 1 x Calibration Sample Rack (12 position)

micro ESR Specifications

Frequency	9.6 to 9.8 GHz
Resonator	Cylindrical Dielectric
Sample Tube Diameter	Up to 5.8 mm
Sweep Range	Over 500 Gauss, centered at g=2
Supply Voltage	15 VDC (120/240 V Wall Adapter Included)
Data Interfaces	Ethernet and USB
Screen	21 cm Touch Panel display with Windows 7 Embedded DVI/HDMI/ VGA
Dimensions	30.5 x 30.5 x 30.5 cm ³
Mass Screen	10kg



info@bruker.com
www.bruker.com