

Thermal extraction of hydrocarbons from reservoir and source rock samples

The **G9+** service provides customers with the characterization of liquid hydrocarbons in drill cutting samples through the application of detailed gas chromatography. It can be applied in reservoir rocks to detect and characterize oil occurrence and in source rocks to define source type and properties. Newly acquired cuttings at the wellsite are analyzed in a very short time preventing any loss of lighter hydrocarbons.



Benefits

- Liquid hydrocarbon detection in the presence of oil based muds
- Identification of reservoir oil properties to better evaluate the economics of the asset (gravity, viscosity, biodegradation)
- Relative abundance of liquid hydrocarbons aids in reservoir evaluation and completion design
- A complementary fluid contact identification method (GOC, OWC)
- Reservoir connectivity for improved reserves evaluation and completion design
- Identification and evaluation of source rock type and maturity for asset and regional evaluations
- Oil-source rock correlation

Challenges and Solutions

Thermal Extraction Gas Chromatography from cuttings is a well-known technique but GEOLOG is unique in bringing this type of analysis to the well site to supply real-time information about oil properties. In this way it is not necessary to use solvents and perform time consuming chemical extractions to analyse liquid hydrocarbons in cuttings. One of the major problems currently in fluid characterization is contamination by oil based muds (OBMs).

G9+ is able to distinguish between mud contamination and native hydrocarbons, thus revealing information about oil properties and variations in the reservoir.

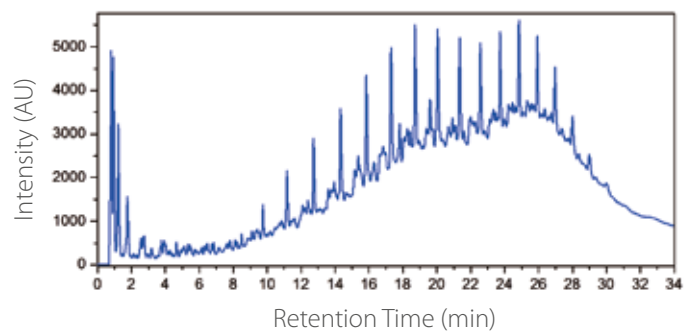
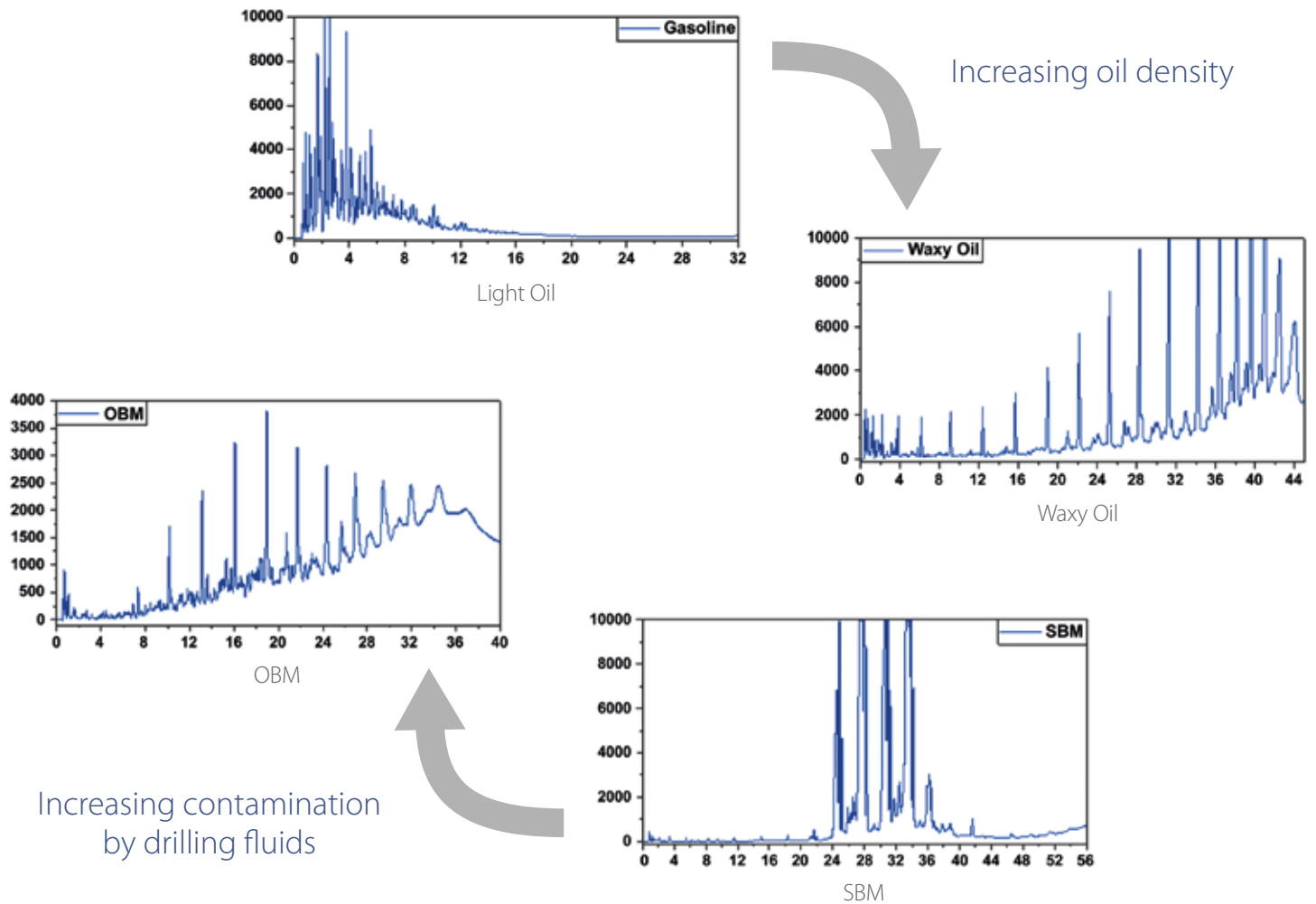


Figure 1. Well defined oil signature in the presence of oil based mud.

Applications

The G9+ service is suitable for exploration, appraisal, and development projects in areas where liquid hydrocarbons are present. In exploration it can be used to characterize source rocks and assess the presence of oil and fluid contacts in reservoirs. In appraisal and development phases it can provide important information about oil properties, reservoir compartmentalization and aid multi well correlations. Due to the short time between sample retrieval and analysis, fresh samples exhibit very low levels of hydrocarbon evaporative loss.

"This was the first time a deep spectrum of fluid characterization (from C1 to C27) was performed at the well-site, allowing us to better understand the type and complexity of fluids in our reservoirs", Chevron Senior Geologist



G9+ provides detailed analysis of cuttings for fluid characterization. As shown in the graphs above, the thermal desorption process can distinguish different fluid characteristics, helping the reservoir engineer better understand the reservoir fluid properties and at the same time identify the signatures of contaminating agents such as (synthetic) oil based muds.

These unique fingerprints can easily identify the presence of pay zones and oil-to-water contacts, can help trace the connectivity of reservoirs and provide a fast proxy for the determination of the biodegradation index of fluids absorbed onto cuttings. Its use at the wellsite helps in optimizing sampling programs and the resources allocated for the completion of the well.

Specifications

G9+ Analysis	C9 – C27
Minimum Sample Required	25-2000 mg*
Analysis Time	40 minutes**

* dependent on fluid richness of sample

** including sample preparation

GEOLOG around the World

