Drilling Method for Spectrometer Analyzers

Overview

Drilling Method for Spectrometer AnalyzersThe portable, well site ED-XRF technology offered by SPECTRO is unmatched in the petroleum geology world and wide.

Key Takeaways

Spectrometer analyzers are integrated into drilling operations through wellsite mass spectrometry, portable ED-XRF, ICP-OES, and LIBS techniques to provide real-time elemental and chemical analysis of drill cuttings, mud, and cores.

Wellsite Mass Spectrometry

Mass spectrometry (MS) is widely used for mud logging and real-time formation fluid analysis. Portable quadrupole mass analyzers can measure C1–C10 hydrocarbons, inorganic gases like CO_2, He, N_2, O_2, and sulfur-bearing volatiles, and discriminate between paraffins, naphthenes, aromatics, and BTEX compounds (benzene, toluene, xylene) while drilling. These instruments often operate with rapid cycle times (~90 seconds) and can be remotely monitored via satellite, enabling unmanned operation and continuous geochemical logging during drilling.

The data is combined with drilling parameters such as rate of penetration (ROP), pump strokes, and depth to generate geochemical logs and evaluate formation fluids efficiently. Portable ED-XRF and ICP-OESEnergy Dispersive X-Ray Fluorescence (ED-XRF) spectrometry is used for on-site elemental analysis of drill cuttings and mud. Portable instruments like SPECTROSCOUT, SPECTRO XEPOS, and SPECTROCUBE provide rapid, non-destructive analysis at the wellhead, delivering results in minutes.

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Handheld XR

F devices, such as SPECTRO xSORT, allow drill core analysis without destroying the sample. For higher sensitivity and detection of light elements, ICP-OES spectrometers like SPECTROGREEN and SPECTRO ARCOS are employed, offering sub-ppm detection limits and automated high-throughput analysis.

Laser-

Induced Breakdown Spectroscopy (LIBS)LIBS is applied to drill core scanning, where a high-energy laser pulse vaporizes a small portion of the sample, creating plasma. The emitted light is collected by a spectrometer, dispersed into wavelengths, and analyzed to determine elemental composition.

LIB

S provides elemental profiles and mineral maps, enabling detailed mineralogical and textural characterization of cores. This method is particularly useful for rapid, high-resolution mapping of elemental distribution along the drill core. Integration with Drilling OperationsThese spectrometer methods are integrated into drilling workflows to provide real-time or near-real-time data for decision-making.

Automated systems, such as Fluid Inclusion Technology (FIT) and PetroFecta, combine fluid inclusion analysis, elemental composition, and high-resolution imaging to preserve relationships between rock composition, texture, and trapped fluids. This integration allows geologists and engineers to assess formation properties, manage exploration risk, and optimize drilling strategies efficiently.

Summary

In modern drilling operations, spectrometer analyzers are applied through: Wellsite mass spectrometry for hydrocarbon and gas analysis in mud and cuttings. Portable ED-XRF and ICP-OES for rapid elemental analysis of cuttings and cores.

LIB

S for high-resolution core scanning and mineral mapping. Automated integrated systems combining fluid, elemental, and imaging data for comprehensive formation evaluation. These methods enable real-time geochemical and petro-physical characterization, supporting informed drilling decisions and reservoir evaluation.

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Article Content

Drilling Method for Spectrometer Analyzers

The portable, well site ED-XRF technology offered by SPECTRO is unmatched in the petroleum geology world and widely used for mud logging and logging-while-drilling applications worldwide.

Drill Cuttings Analysis

At both the wellsite and in the laboratory, Fluid Inclusion Technology (FIT), a Schlumberger company, provides specialized analysis of the trapped fluids in

Maximising the value of hyperspectral drill core

In this contribution, we propose and demonstrate a novel open-source workflow for rapidly processing hyperspectral data acquired on exploration

ANCORELOG

ANCORELOG, a mobile drill core logging system that measures chemical, mineralogical, and structural rock properties with high accuracy, will significantly reduce time and costs along the raw materials

Spectroscopic Logging

Pulsar multifunction spectroscopy service provides the key quantitative measurements of elements and mineralogy for cased wells, delivered at higher accuracy and speed than previously possible.

Core Scanning for Mineral Exploration

Core Scanning for Mineral Exploration Analysis of diamond drill core and RC chips are at the heart of the mineral exploration and target assessment process. New technologies for core analysis has

Drilling Method for Spectrometer Analyzers

Spectrometer Analyzers during drilling or from selected samples. This method gives direct information abo core, capturing data at regular intervals. Hyperspect The portable, well site ED-XRF technology

Application of the Portable Niton XRF Analyzer in Mud Logging

Laboratory methods such as x-ray diffraction (XRD) and Raman spectroscopy are used in mineralogy to identify mineral composition of rocks. Now, these techniques are complemented by field-portable x

Industrial applications of laser-induced breakdown spectroscopy: a ...

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In this review we present a short, although comprehensive, review on the industrial applications of laser-induced breakdown spectroscopy (LIBS). Attention has been devoted to the

Laser-Induced Breakdown Spectroscopy for Rapid Elemental Analysis

The elemental and mineralogical contents of rock drillcore can be analyzed using a variety of methods. For efficient exploration the characterization of the drillcore should be performed rapidly,

The DQ1000 Analyzer Offers Greater Specificity | SLB

The DQ1000™ wellsite mass spectrometer gas analyzer provides real-time, semiquantitative analysis of formation fluids in a portable, fully automatic package. It analyzes a broad range of petroleum

Method and apparatus for analyzing a downhole fluid using a thermal ...

Thus, there is a need for a method and apparatus for directly analyzing a fluid sample and determining percentage of filtrate contamination in a sample. Properties of formation fluids and gases have been

Formation Testing and Sampling: Downhole Fluid Analysis

Formation testing and sampling are essential for effective reservoir management and production optimisation. Advanced technologies, such as the evolution of real-time optical fluid

(PDF) IADC/SPE-178877-MS Automated Drilling Fluid Analysis using ...

The era of drilling fluid property analysis carried out manually by a mud engineer is rapidly disappearing. Novel measurement tools and techniques are now making it possible to carry out sophisticated

Elemental Analysis Solutions & Analytical Instruments | SPECTRO

SPECTRO is a global leading supplier of advanced analytical instruments like ICP, Arc Spark OES, and XRF spectrometers for precise elemental analysis of materials.

Technology Focus: X-ray Fluorescence (XRF) in Mining

XRF Applications in Mining Handheld XRF analyzers are a reliable method to analyze ore samples in open pits and underground mines – achieving the accuracy required to provide

Low Field Nuclear Magnetic Resonance

9 Summary This is an exciting time to be working with low-field NMR instrumentation. The recent availability of fully digital spectrometers capable of performing complicated experiments on

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Maximising the value of hyperspectral drill core ...

Hyperspectral core imaging as a commercial technology is fairly new to the oil and gas industry, providing a rapid and non-destructive method for mapping mineralogy of drill core and cuttings.

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Website: https://bagyou.es
Technical inquiry: https://bagyou.es/project-enquiry.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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