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EDXRF1769 - Mud Logging



Scope

Use of EDXRF for elemental determination of drill cuttings.

Background

When drilling for crude oil and natural gas, rock cuttings are brought to the surface for examination and characterization of the rock strata. Mineralogy and elemental composition are some of the tests that go into the lithology of the rock layers, giving valuable information on the formation being drilled for well logging and positioning of the drill bit when geosteering. XRF gives elemental composition of the cuttings, an important part of the overall well logging system. To meet the industry needs, Applied Rigaku Technologies offers EDXRF analyzer [NEX QC+ QuantEZ](#) for measuring elemental composition of various geological materials.

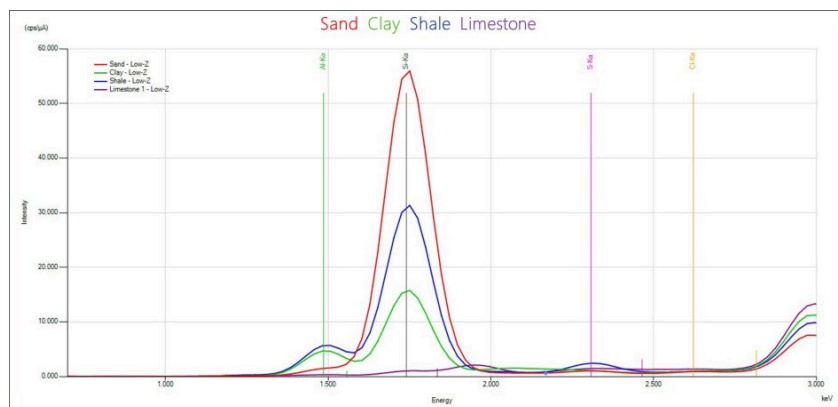
Methodology

Fundamental parameters (FP) is used to generate semi-quant results without the need for any reference standards. The semi-quant approach is ideal for general screening and comparative characterization. Rigaku RPF-SQX is an advanced FP methodology that automatically models background and deconvolutes any peak overlaps. To optimize the FP model, the QuantEZ software includes the feature for the user to easily create a Matching Library using one or more samples that have been characterized and assayed by a reference technique such as ICP. In this way, the FP model can be matched to site samples and referee results and provide fully quantified results.

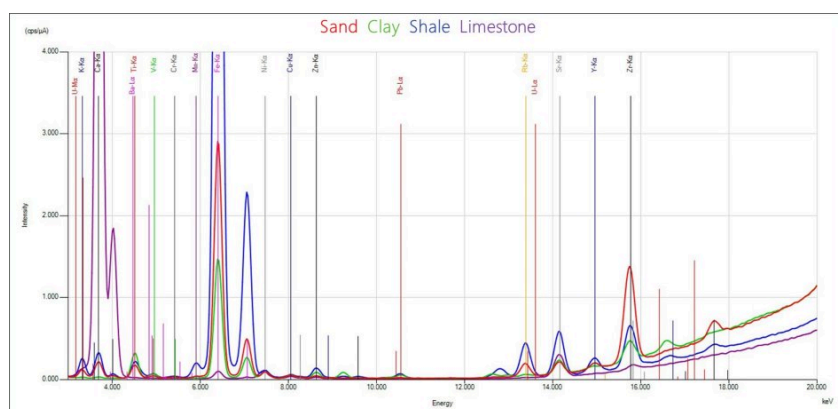
Spectra – qualitative comparative viewing

Spectra are generated using element KLM markers to identify peaks. Qualitative viewing of spectra can also be used to see the presence of unexpected elements and compare various samples to view overall composition differences.

Light element spectra overlap



Middle element spectra overlap



Features

- Transportable in hard-shell Pelican case with optional laptop PC
- Rugged end-window transmission X-ray tube for extended tube life
- X-rays on only during measurements
- High-performance SDD detector
- Intuitive software with both empirical calibration and FP capabilities
- Rigaku RPF-SQX FP software
- Pre-set templates make creating application methods simple

- Users can easily create Matching Library to match site-specific standards closely to XRF FP model
- Calculation Parameters to automatically report KUT number and other algebraic relationships

Calculation parameter

Parameter name: KUTh

Unit: None

Formula:

[Al]
[Si]
[P]
[S]
[Cl]
[K]
[Ca]
[Ti]
[V]

4.0000 * [Th] + 8.0000 * [U] + 16.0000 * [K]

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Conclusion

EDXRF provides a rapid, non-destructive means of semi-quantitative measurement for screening, identification, as well as elemental quantification of metals, solids, powder, pellets, thin films and liquids. QuantEZ software allows users to optimize the characterization of cuttings by easily creating a Matching Library based on representative samples assayed by a referee technique. The NEX QC+ QuantEZ powerful, yet simple and intuitive software is an ideal system for measuring elemental composition of drill cuttings at the drill site or in the lab.

Related products



NEX QC Series

Combines quality, affordability, and performance for a wide range of applications