PREMIER COREX

XRF Methodology

The formation material is cleaned, and hand crushed using a mortar and pestle. The material is transferred to the ball mill to powder and homogenize the material. The powder is placed into a 13mm die set and put into a pellet press where 8 tons of pressure is applied. The homogenized pellet is analyzed with a Bruker AXS Tracer 5i Energy-Dispersive X-Ray Fluorescence (ED-XRF) instrument allowing non-destructive analysis of major and trace elements. Major element data is acquired using a Rh X-ray generator tube set at 15 kV and 35 µA, this allows improved resolution of the low-energy elements such as Na and Mg. Trace elements are analyzed at 45 kV and 40 µA, with an Al-Ti filter, and optimized Uranium acquisition is performed using a dedicated scan at 44 kV and 60 µA with an Al-Ti-Cu "green" filter to remove spectral interferences.

This analysis involves a 10-second low-energy scan for the following major elements: Na, K, Mg, Al, Si, P, S, Ca, Ti, Mn, and Fe. Furthermore, the 11 major elements are reported in percent (%) by weight as bulk oxides: SiO2, TiO2, Al2O3, Fe2O3, MnO, MgO, CaO, Na2O, K2O, P2O5, and SO3. The major elements are the primary constituents of the most abundant rock-forming minerals. A 20-second higher energy scan for trace elements: V, Cr, Co, Ba, Ni, Cu, Zn, Ga, As, Pb, Se, Th, Rb, Sr, Y, Zr, Nb, Mo, and an optional 60-second scan used to optimize the analysis of Uranium.

For core-face scans, the acquisition is typically planned to include four to six measurements per foot. This facilitates an accurate spatial comparison to wireline logs, particularly elemental capture data. Where appropriate, XRF data from infrequent features such as nodules, cemented laminations, mineralized burrows, or mineralized fractures can be collected to supplement the host rock data. Care is taken to not collect data on a bedding boundary, which will give a false compositional signal. The core face is washed immediately prior to data acquisition at each point to remove any precipitated salts that may have formed due to capillary evaporation of pore fluid.

The acquired raw XRF spectral data is then calibrated with our own proprietary reference materials as expanded from the original calibration of Rowe et al. (2012) and industry standards. A gamma response in API units (Elemental gamma Ray, or EGR) is calculated from the measured values of K, Th, and U. This provides an essential tie-back to LWD, wireline, or core gamma curves. If necessary, depth-shifting is undertaken to best match the high-resolution GR log for confident interpretation. In addition, each raw XRF spectrum is visually examined during and after analysis for potential errors or analytical problems. If erroneous results are identified, the sample is re-analyzed.

CONTACT US:

Premier Corex

Global Headquarters

11335 Clay Road
Suite 180
Houston, TX 77041
+1 281 783 6130