Combined XRD, XRF and μCT characterization for geological and drill core samples

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X-ray techniques are powerful tools for characterizing geological and drill core samples. In particular, X-ray computed microtomography (μCT) is a fast and non-destructive tool that allows both qualitative and quantitative examination of internal sediment structure, fractures, porosity and other features. When used in combination with X-ray diffraction (XRD) and X-ray fluorescence (XRF), one can identify discrete materials within core samples and identify chemical composition.

In this study, we use XRD, XRF and methods to examine several core samples, including carbonates and sandstones. Each core samples was analyzed using Rigaku's MiniFlex, Supermini200 and CT Lab HX130 μCT systems. XRD and XRF data were used to determine mineral composition. μCT tomograms were used to analyze distribution of minerals throughout the 3D samples. These results show that integration of μCT, XRD and XRF methods provides valuable information when characterizing rock and mineral samples.