Analysis of Gypsum and Carbonate Rocks using a new silicon drift detector based EDXRF instrument


Carbonate rocks are a class of sedimentary rocks composed primarily of carbonate minerals. The two major types are limestone and dolomite. Gypsum is also a sedimentary rock and is mostly used as building material and fertilizer. For grade control X-Ray fluorescence analysis (XRF) is the best-suited analytical technology. Due to its simple sample preparation method, XRF is practical and fast.

Energy dispersive X-ray fluorescence (EDXRF) spectrometry is very commonly used for controlling mining operations and determining final product grade. Benefits are its ease of use and the advanced analytical performance of modern instruments. EDXRF instruments are typically very compact, and offer low cost of ownership with easy maintenance making them attractive for dedicated analytical tasks. Up to now the performance for light elements especially sodium and magnesium was very limited. A thick entrance detector window absorbed nearly all radiation from light elements. Modern detector technology combined with high power direct excitation and a thin stabilized entrance window of SDD detector make it more suitable for analysis of light elements down to Fluorine than other conventional units. This enhanced analytical performance for light elements allows using the fusion method for sample preparation, which makes the achievable accuracy and precision much better. The analytical performance of this new instrument for the analysis of carbonate rocks and gypsum will be shown.