

## Determination of Rare Earth Elements using the Agilent 5100 SVDV ICP-OES

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The determination of Rare Earth Elements (REEs) in geological materials can provide valuable information about the geochemical formation and origin. Among the spectrometric techniques available, instrumental neutron activation analysis (INAA) and inductively coupled plasma mass spectrometry (ICP-MS) are commonly applied for REEs determination in mineral samples. However, those techniques are costly and suffer from interferences caused by long irradiation times and spectral overlaps, respectively. ICP-OES offers greater flexibility for choosing emission wavelengths and viewing position without interferences. Traditionally, REEs are measured radially with a vertical plasma, due to the heavy matrix nature of geological samples. The Agilent 5100 Synchronous Vertical Dual View (SVDV) ICP-OES allows for wavelengths to be read axially from the vertically-oriented plasma, ideal for geological samples. The instrument allows for synchronous measurement, capturing the axial and radial views of the plasma in one read, saving on sample analysis time and thereby reducing argon consumption per sample.

In this study the Agilent 5100 (SVDV) ICP-OES was used for the determination of REEs, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th and Tm in commercial mining geological samples.

Linear calibrations for all elements were obtained up to 5 mgL<sup>-1</sup>, with calibration coefficients greater than 0.9990 for both radial and SVDV measurements. Excellent Method Detection Limits were achieved for Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pr, Sc, Sm, Tb, Th and Tm using the SVDV viewing mode, and are comparable to values obtained radially. Spike recoveries of 2.5 mgL<sup>-1</sup> for all elements in geological samples were within  $\pm 10\%$  of target value. The Agilent 5100 SVDV ICP-OES proved to be well suited to the determination of REEs in geological samples.