Ultra-fast ICP-OES determinations of base metals in geochemical samples using an Aqua Regia digestion and the new SVS 2+ on the 5100 ICP-OES SVDV.

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High throughput, low cost analysis of geochemical samples is desirable but it can be challenging to achieve using spectrochemical techniques due to the wide range of element concentrations present in typical samples and high levels of total dissolved solids (TDS). Agilent's 5100 Synchronous Vertical Dual View (SVDV) ICP-OES features a vertical torch that can be viewed both axially and radially, giving the TDS handling capability of a radial with the performance of an axial system. A 5100 SVDV ICP-OES was coupled to an Agilent SVS 2+ Switching Valve System to maximize sample throughput and minimize argon gas consumption.

A geochem base metal Certified Reference Material (CRM) OREAS 45e (ORE Research & Exploration P/L) was used to validate the method. The sample preparation consisted of an Aqua Regia (AR) digestion on a hot plate with 1.0 g sample to 40 mL total volume, resulting in a 30% AR solution with 2.5% TDS. Inter-element correction (IEC) factors were used to correct for spectral interferences.

Excellent linearity was achieved for all wavelengths over a wide concentration range (up to 10,000 mg/L for Fe). The Method Detection Limits (MDL) achieved were significantly lower than a conventional radial system due to the vertically oriented, axially viewed plasma. Recoveries from the analysis of the CRM were within +/-10% for the base metals with results analyzed 3 times over 3 separate days. The sample throughput time was 40 seconds per sample, with a total argon consumption of just 14 Litres per sample.