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Fast Method of Multi-Elemental Analysis of Ore Samples by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) with prior Single-Step Microwave-Assisted Digestion

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To perform a geological characterization of five Ore samples, a one-step microwave-assisted digestion procedure was investigated with the scope to obtain a fast method for 44 elements analysis by inductively coupled plasma-mass spectrometry (Q-ICP-MS) in 3 minutes. A mixture of HNO_3/HCl/HF (8:1:1 v/v/v) combined with an MW digestion procedure (T max= 230ºC, Pmax= 1400 W; t(ramp)= 20 min) allowed a complete chemical characterization of the samples. The analytical results for certified reference material (NCS DC 73325, a Soil), used for quality control purposes, are in close agreement with certified values with recoveries within 90-110% and RSD <5% for most of the elements measured. The RSD values for some elements that were measured in low concentrations in solutions (such as Mg, Al, Se, Sr, and Cd) were above 10%.