

## **A rapid acid digestion technique for simultaneous determination of bromine and iodine in soils and sediments by ICP-MS**

TAO HE<sup>1</sup>, JUNYI XIE<sup>1</sup>, ZHAOCHU HU<sup>1\*</sup>, TING LIU<sup>1</sup>, TAO LUO<sup>1</sup>, WEN ZHANG<sup>1</sup> AND QI MIAO<sup>1</sup>

<sup>1</sup>State Key Laboratory of Geological Processes and Mineral Resources, Wuhan 430074, China  
(\*correspondence: zchu@vip.sina.com)

Bromine and iodine are important tracers for geochemical and environmental studies. In this study, a rapid acid digestion ( $\text{HNO}_3 + \text{HF}$ ) with ammonia dilution for simultaneous determination of bromine and iodine in soils and sediments using ICP-MS was developed. The recoveries of Br and I were controlled by the synergic effect of temperature and time. It takes only 15 minutes at 140 °C for the completely recoveries of Br and I in sediment (GSD-2) and soil (GSS-24). That needs 2-6 hours at 90 °C. The serious loss of Br and I were found at high digestion temperature of 190 °C. The 5% w/w  $\text{NH}_4\text{OH}$  dilution effectively eliminates the memory effects and stabilize the signals of Br and I. Moreover, the ammonia dilution also avoids the corrosive of HF on the sample introduction system and torch of ICP-MS. The developed method was successfully applied to determine Br and I in a series of soil and sediment materials. The simple method shows a great potential for the rapid determination of Br and I in a large batch of geological and environmental samples which is common for mineral exploration and environmental geochemistry studies.