**In-situ measurement of sulfur isotopic composition (δ^{34}S) in sphalerite using LA-(QQQ)-ICP-MS**

**PETER ONUK**¹, **CHRISTOPH WALKNER**², **MICHAEL Pribil**³, **Frank Melcher**¹

¹ Department of Applied Geological Sciences and Geophysics, Chair of Geology and Economic Geology, Montanuniversität, A-8700 Leoben, Austria (*correspondence: peter.onuk@unileoben.ac.at)

² Department of Analytical Chemistry and Physical Chemistry, Chair of General and Analytical Chemistry, Montanuniversität, A-8700 Leoben, Austria

³ U.S. Geological Survey, Denver, CO, USA

Laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) is a well established tool for in-situ trace element analysis in geological samples. Recent development of in situ multi-collector (MC)-ICP-MS has proven to be an accurate and precise method for measuring sulfur isotope ratios. However, sulfur isotope ratios are difficult to determine by quadrupole ICP-MS due to polyatomic interferences, i.e. O₂⁺ and NO⁺ molecular ions at m/z=32 and m/z=34. Triple quadrupole (QQQ)-ICP-MS reduces or eliminates polyatomic interferences on δ^{32}S and δ^{34}S to a level that δ^{34}S in sulfide (sphalerite) minerals can be measured by in-situ LA-QQQ-ICP-MS. The method was validated using natural sphalerite samples from 3 different locations by LA-MC-ICP-MS (Figure 1). According to these results, δ^{34}S by LA-QQQ-ICP-MS can result in precise and accurate sulfur isotope data with a 2SD of 0.8‰ for sphalerite minerals.

**Figure 1:** LA-QQQ-ICP-MS and LA-MC-ICP-MS measurements on 3 different natural sphalerite samples, error bar indicate 2 SD.