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

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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. $O_2^+$ and $NO^+$ molecular ions at m/z=32 and m/z= 34. Triple quadrupole (QQQ)-ICP-MS reduces or eliminates polyatomic interferences by introducing $N_2O$ as a reaction gas that minimizes the polyatomic interferences on $^{32}S$ and $^{34}S$ to a level that $\delta^{34}S$ 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, $\delta^{34}S$ by LA-QQQ-ICP-MS can result in precise and accurate sulfur isotope data with a 2SD of 0.8‰ for sphalerite minerals.

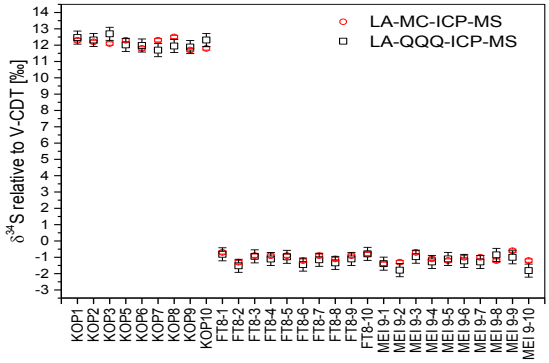


**Figure 1**: LA-QQQ-ICP-MS and LA-MC-ICP-MS measurements on 3 different natural sphalerite samples, error bar indicate 2 SD.