

In situ Hf isotope analysis of cassiterite by LA-MC-ICP-MS - *IAG Young Scientist Medal Lecture*

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We report laser ablation multi-collector inductively coupled plasma mass spectrometry (LA-MC-ICP-MS) $^{176}\text{Hf}/^{177}\text{Hf}$ ratios for cassiterite of known age and demonstrate that $^{176}\text{Hf}/^{177}\text{Hf}$ ratios can be measured accurately and reproducibly with adequate precision for cassiterite with Hf contents around 100 $\mu\text{g g}^{-1}$. Although cassiterite only has minor rare earth elements (REEs), corrections of Yb and Lu interferences are required as they may affect the determination of $^{176}\text{Hf}/^{177}\text{Hf}$ ratios. We determined the Hf isotope composition of several cassiterite samples that had been characterized earlier to serve as possible primary and secondary reference material for LA-ICP-MS U-Pb dating. This study expands on this earlier work, characterizing the Hf isotopic composition of those samples that had potential to serve as primary or secondary reference material for *in situ* Hf isotope analysis. Among the investigated samples, Rond-A has a homogeneous Hf isotopic composition. We recommend cassiterite sample Rond-A as primary reference material for *in situ* Hf isotope analysis. Sample Kard has a homogeneous Hf isotopic composition and is suited as primary reference material once its Hf isotopic composition has been confirmed by solution-based MC-ICP-MS. Samples BB#7, 19MP and 19GX show minor variation in their Hf isotopic compositions and, therefore, can only be used as the secondary reference materials.

[1] M. Yang, R.L. Romer, Y.H. Yang, et al. (2022), *Chemical Geology* 593, 120754.