

OP.02

Development of correction methods for interferences by LREE oxides on the medium and heavy REE in the LA-ICPMS technique

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Laser Ablation coupled to ICP-MS is a powerful tool for in-situ analysis of geological materials. The interferences caused by generation of isobaric molecular species inside the plasma or at the extraction interface are an important limitation. The main interferences are the MO⁺ and MOH⁺ species; examples are the barium oxide effect on LREE (Eu) and LREE (La, Ce) on the medium and heavy REE (Gd, Tb, Er, Tm).

Generation of REE oxides during analysis of rock solutions by ICP-MS technique, as well as the correction methodology for these isobaric interferences has already been widely discussed in the literature (Aries et al. 2000, *Geostand. Newsl.*, 24: 19-31). However, a simple method for corrections does not exist for LA-ICPMS procedure, despite proposals by Kosler et al. 2002 (*Anal. Bioanal. Chem.*, 374: 251-254) and Kent et al., 2005 (*J. Anal. At. Spectrom.*, 20: 1256-1262) that have shown the significant contribution of these molecular species in materials where the Ba/Eu > 1000 or [La/Gd]_N > 3. These relationships are found in materials such as reference rock glasses (e.g. BCR-2G, T1G), alkali feldspars with high Ba concentrations and minerals rich in LREE, as apatite, monazite, etc.

A methodology is here proposed for the determination of molecular species MO⁺ and MOH⁺ oxides and hydroxides of LREE, especially in apatite, and the interference corrections in LA-ICPMS methods for medium and heavy REE. This study used synthetic materials, similar to monazite and/or xenotime, obtained by fusion of common REE phosphates at temperatures of 1100 to 1300°C in the presence of fluxes containing mixtures of MoO₃, Li₂CO₃ and Na₂CO₃ (Cherniak et al. 2004, *Amer. Mineral.*, 89: 1533-1539). Chemical and mineralogical characterization of these materials must precede their use as standards of molecular interference corrections.

Key words: LA-ICPMS, molecular interferences, REE, phosphates, apatite.

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