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COMPARING OF METHODS FOR CORRECTION OF ISOBARIC INTERFERENCES OF Ba ON THE MEDIUM RARE EARTH ELEMENTS IN ALCALI FELDSPAR ANALYSIS BY LA-ICP-MS

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Inductively coupled plasma mass spectrometry, hyphenated with laser ablation (LA-ICP-MS), represents an important tool for the direct chemical analyses in solid phases and for *in-situ* analysis of geological materials. Major advances have been made in laser ablation techniques for the direct sampling of solids. At the same time, there have been significant improvements in ICP-MS instrumentation.

The interferences caused by generation of isobaric molecular species as MO^+ and MOH^+ are an important limitation: examples are the barium oxide effect on the medium rare earth elements (Sm, Eu and Gd), mainly for Ba/Eu > 1000 or $[La/Gd]_N > 3$.

A methodological approach for the determination and correction of oxide molecular species of Ba in alkali feldspars with high Ba concentrations is performed using synthesized homogeneous glass standard of Ba (NIST-K378) to calculate the factors for the correction of values obtained during analysis. Comparing with the results obtained by mathematical corrections, a QCell technology with flatpole low mass cut off is used to interference removal, caused by Ba oxides. Helium gas is used on QCell and the interferences are removed by kinetic energy discrimination.

For both methods, LA-ICP-MS system was tuned to have Th/U ration close to 1,0 and ThO/Th ratio less than 0.5% using NIST SRM 610. Four to eight different regions of the three samples were analyzed as well as the synthetic standard of Ba. NIST SRM 610 and NIST SRM 612 were analyzed for drift corrections and quality control. Detection limits are calculated for each element in each sample directly by the Glitter® software (developed by the GEMOC program, Geochemical Evolution and Metallogeny of Continents, Macquarie University, Australia).

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References

1 Baker J, Waight T, Ulfbeck D. Geochimica et Cosmochimica Acta, 66, 2002, 3635

2 Aries S, Valladon M, Polvé M, Dupré B, Geostand. Newsl, 24, 2000, 19

3 Kent A.J.R., Ungererb C.A. - 2005 - Journal Anal. Atomic Spectrom., v. 20, 1256-1262.