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# A comparison of laser ablation and solution ICP-MS determination of REE in BIR-1G, BHVO-2G and BCR-2G reference materials

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Laser ablation ICP-MS is one of the methods used to detect trace concentrations of rare earth elements (REE) in solid samples. Since the first coupling of a laser ablation unit with an inductively coupled plasma in 1985, this method has undergone a number of improvements over the last decade; commercial instruments have become available and the method is well established today in many geochemical laboratories. Comparison of data for REE in three geological glass reference materials (BIR-1G, BHVO-2G and BCR-2G) using a UV (266 nm) laser ablation ICP-MS system and the classical ($HF$-$HClO_4$) acid decomposition method, followed by conventional nebulization ICP-MS was done. The reference glass of primitive basalt BIR-1G is significantly depleted in LREE (0.55 - 2.5 $\mu$g.g-1) in contrast to the two basalts BHVO-2G and BCR-2G (2 - 53 $\mu$g.g-1). External calibration of laser ablation analyses was performed using SRM NISTs with internal standardisation using $^{29}$Si and $^{44}$Ca, based on electron microprobe measurements of the $SiO_2$ and CaO contents in the reference glasses. Data reduction included correction for the gas blank and the internal standard and a calibration check, and the data were processed off line in a MS Excel spreadsheet-based program**.**

The $^{29}$Si-corrected data exhibit a slight over-evaluation compared with analysis obtained using internal correction for $^{44}$Ca (especially in BHVO-2G and BCR-2G) and thus a "preferred average" was used. Generally, replicate analyses of reference basaltic glasses yielded an analytical precision of 1-5% (RSD) for all the elements by solution

ICP-MS and 1-8% (RSD) by laser ablation ICP-MS. **T**he standard deviations exhibit random distribution and are independent of the concentration of the analysed element.The results of both solution and laser ablation ICP-MS agree well, generally better than 7%, with the exception of La, Pr and Sm in BIR-1G. In addition, the measured REE laser ablation data for BIR-1G, BHVO-2G and BCR-2G agree with the previously published data on these reference basaltic glasses, within a range of 0-10% for most elements. No significant influences were observed for the predicted spectral interferences on some REE isotopes in the analysis of basaltic glasses.