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LA-SF-ICP-MS whole-rock trace element analyses in glass beads produced with sodium borate

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Trace element analyses provide crucial information about the origin and evolution of the Earth and other planets. One common issue regarding their analyses is the reduced analyte recovery during hot plate acid digestion for some samples. To overcome this issue, lithium tetraborate has been used to lower the melting point and viscosity of whole rock powders and produce an homogeneous synthetic glass that can be used then for both XRF and LA-ICP-MS [1, 2]. However, for laboratories that are also interested in measuring Li isotopes, or that use Li to set the tune parameters of the ICP-MS, the vast amount of Li introduced to the system this way can pose a threat. One alternative would be to produce these glasses employing sodium tetraborate ($Na_2B_4O_7 \cdot 10H_2O$). Therefore, our aim was to develop a method for LA-SF-ICP-MS whole rock trace element analyses in glasses prepared by mixing high-purity sodium tetraborate and rock powders at high-temperature. We selected six international reference materials including peridotite (JP-1), basalt (BRP-1), kimberlite (SARM-39), pyroxenite (NIM-P), diorite (DR-N) and andesite (JA-1). Glasses were produced in a fully automatic PanAnalytical® Eagon 2 fusion machine. Run products analyses were carried out on a Thermo® Element2 SF-ICP-MS coupled to a New Wave Research® Nd:YAG (213nm) laser ablation system by internal standardization [3]. Preliminary results show that glasses are homogeneous and there is good agreement between our data and literature values for most trace elements, including LILE, HFSE and REE. The exception is the peridotite, an issue probably explained by flux contamination. Future work will involve modifying the sample:flux proportion, using different types of reference materials, and preparing flux-free fusions.

[1] Eggins (2003) *Geostandards Newsletter* **27**: 147-162.[2] Panteeva et al. (2003). *Spectrochimica Acta Part B* **58**, 341-350. [3] Longerich et al. (1996) *Journal of Analytical and Atomic Spectrometry,* **11**, 899-904.