Alkali background reduction in routine laser ICP-MS analysis

C. W. MAGEE, JR.¹

¹ Research School of Earth Science, Australian National University, Canberra ACT 0200 Australia ; charles.magee@anu.edu.au

Laser ICP-MS offers a powerful and straightforward method of analysing the minor and trace elemental compositions of a wide variety of cations in crystalline or glass matrixes. However, the measurement of alkali elements can be complicated by the presence of high backgrounds. These backgrounds result from the sputtering of alkali impurities in the skimmer cone. Although soft extraction can considerably reduce the presence of conebased contamination, this technique results in reduced sensitivity.

Preliminary experiments with lithium have shown that by sequestering lithium borate analyses onto a designated set of cones, previously Li contaminated cones can have their Li backgrounds reduced from > 106 cps to < 103 cps over a few weeks.

Sequestering high Na materials is a more difficult task, as Na is a major element in the crust and mantle. However, attempts to use alkali-free standards for tuning and machine performance benchmarking are currently being evaluated, and will be compared with the Li results. Other methods of alkali reduction, such as high temperature volatilisation and various cleaning regimes, will also be investigated.

Examples of background-limited Li measurements will be cited, as will Na, Rb, and Cs results, if the background reduction for those elements is successful.