

## **The Preparation and Preliminary Characterisation of Three Synthetic Andesite Reference Glass (ARM-1, ARM-2, ARM-3) for In-Situ Microanalysis**

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This work is benefited from lots of collaborators (lab manager/geochemist/geologist) from more than twenty-three research institutes and laboratories.

We have prepared three andesitic reference glass material (ARM-1, ARM-2, ARM-3) that are the andesitic major composition and dopped with different level trace elements of  $\sim 500\mu\text{g/g}$ ,  $\sim 50\mu\text{g/g}$  and  $\sim 5\mu\text{g/g}$ , respectively, used for in-situ microanalysis techniques (LA-ICPMS and SIMS). These glasses were produced via directly fusing and string 3800g of well-mixed high purity element oxides or chemicals at 1550-1600°C. Homogeneity test of major and trace elements were made via EPMA and LA-ICPMS in three independent laborateries. EPMA results from Uinversity of Hannover illustrate that the analytical precision is better than 2% (2 RSD) for the major elements higher than 1.0 w.t%. LA-ICPMS homogeneity test in IGGCAS reveal that the analytical precision of 100 spots analysis from 20 random picked glass splits each with 5 random analysis is in general better than 3% (1 RSD) for most trace elements. LA-ICPMS homogeneity test in MPI-Chemie reveal that the analytical precision of 45 spot and 45 line analysis from 5 random glass splits each with 9 random analysis is better than 2% (1 RSD), except for the line analysis of ARM-3 ( $\sim 7\%$ ). The preliminary value of 50 elements and 10 isotope composition were compiled from the results of twenty-three laborateries with independent bulk- and micro-techniques including XRF, ICP-OES, ICP-MS, ID-MC-ICPMS, ID-TIMS, EPMA, LA-ICPMS, LA-MS-ICPMS and SIMS. Isotope compositions of O, Mg, Fe, Ca, Sr, Nd, Hf, Pb, U and Th were determined mainly by the high precision single bulk techique. The series glass could work as alternative reference glass along NIST and USGS GS materials for LA-(MC)-ICPMS and SIMS techniques.