

New olivine (MongOl sh11-2) reference material for in-situ microanalysis

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A new olivine reference material – MongOL Sh11-2 – for in-situ analysis has been prepared from a central portion of a large (20 x 20 x 10 cm) mantle peridotite xenolith from basaltic breccia at Shavaryn-Tsaram, central Mongolia. The xenolith is a fertile mantle lherzolite with minimal signs of alteration. Approximately 10 grams of 0.5 to 2 mm gem quality olivine fragments were separated under binocular microscope and analysed by EPMA, LA-ICP-MS, SIMS and bulk analytical methods (ID ICP-MS for Mg and Fe, XRF, ICP-MS) for major, minor and trace elements at six institutions worldwide. For the 120 olivine chips, over 1020 in-situ analyses were performed by EPMA, LA-ICP-MS, SIMS; 8 aliquots were analyzed by ID-ICP-MS, nine aliquots were analyzed by solution ICP-MS, and 2 aliquots by XRF. The results show that the olivine fragments are sufficiently homogeneous with respect to major (Mg, Fe, Si) and minor and trace elements. Significant inhomogeneity was revealed only for phosphorus (hi of 12.4), whereas Li, Na, Al, Sc, Ti and Cr show minor inhomogeneity (hi between 1-2). We report reference and information concentrations for Si, Mg, Fe, Li, Na, Al, P, Ca, Sc, Ti, V, Cr, Mn, Co, Ni, Cu, Zn, Ga, Sr, Y, Zr, Dy, Ho, Er, Tm, Yb, and Lu.