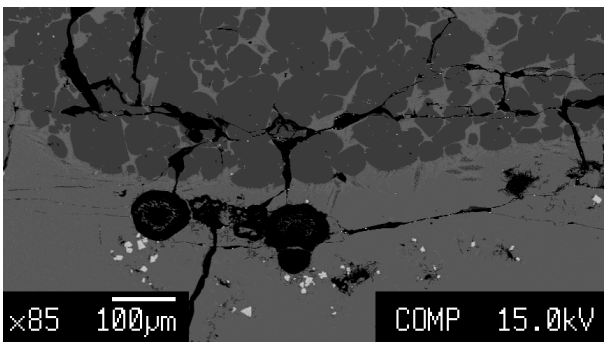
An experimental approach to the origin of ultrapotassic lavas from the Alpine-Himalayan belt

H.R. SCHMÜCK[1]*, S. BUHRE[1], M.W. FÖRSTER[1] AND D. PRELEVIC[1]

[1]Institute for Geosciences, University of Mainz, 55099 Mainz, Germany (*schmueck@students.uni-mainz.de)

Ultrapotassic lavas are widespread in the Alpine-Himalayan region. Extreme trace element and radiogenic isotope enrichment point at indirect crustal contamination of their mantle source [1], whereas high-forsterite olivine and refractory Cr-spinel phenocrysts suggest their origination from depleted mantle [2]. To investigate a melting scenario in metasomatized lithospheric mantle, it was assumed to consist of phlogopite-clinopyroxenite veined harzburgite.



Our experiments were conducted in a 0.5“ piston cylinder apparatus. Starting materials were synthesized from oxides and carbonates, ground and sandwiched in a Pt outer with graphite inner capsule. Vitreous carbon spheres were added as a melt trap. Hot-piston-out technique was applied at 1 and 2 GPa in a temperature range of 1200 to 1250 °C and 1250 to 1300 °C respectively. Oxygen fugacity was buffered by the graphite inner capsule through the C-COH equilibrium.

Solidus for the sandwich assemblage was determined for 1 GPa at 1215±10°C and for 2 GPa at 1275±20°C. Melts comprise of MgO >20 wt% and K_2O >3.5 wt% with K/Na >6. Phenocrysts grown from the melt are spinel with Cr# 83 and olivine with Mg# 93, thus resembling typical features of phenocrysts in natural lamproites from the Alpine-Himalayan orogenic belt.

[1] Tommasini *et al*. (2011) *EPSL* **301**, 469-478. [2] Prelevic *et al*. (2010) *Terra Nova* **22**, 443-452.