CARBONATE BEARING VEINS AND MELT POCKETS IN UPPER MANTLE XENOLITHS FROM THE BAKONY–BALATON HIGHLANDS AND LITTLE HUNGARIAN PLAIN, HUNGARY

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Lithospheric upper mantle xenoliths hosted in Neogene alkali basalts from the Bakony–Balaton Highlands and Little Hungarian Plain Volcanic Fields of the Carpathian–Pannonian Region have been studied extensively (e.g. EMBEY-ISZTIN *et al.*, 1989, DOWNES *et al.*, 1992,). However, detailed study on silicate melt pockets and veins occurring in these xenoliths has not been carried out yet. Melt pockets and veins recognized recently worldwide in peridotite xenoliths can form by host magma infiltration, decompression melting of mantle minerals or mantle metasomatism.

About 5 % of the Hungarian xenoliths contain carbonate bearing silicate melt veins and pockets. Silicate melt veins, occurring as thin parallel veins crosscutting the whole xenolith, contain immiscible andesitic silicate glass and calcite with various amounts of MgO (up to 2.29 m/m%), FeO (up to 0.46 m/m%), MnO (up to 0.63 m/m%) and SrO (up to 0.50 m/m%). Small amounts of idiomorphic spinel and clinopyroxene can also be found in these veins. Silicate melt pockets, sometimes showing shapes after clinopyroxenes and/or amphiboles, differ in composition from those of veins. Glasses in the pockets are basaltic to andesitic and the carbonates have elevated MgO (up to 3.15 m/m%), FeO (up to 0.54 m/m%), MnO (up to 1.51 m/m%) and lower SrO (0.00–0.13 m/m%) content compared to carbonate in veins. These carbonate compositions are consistent with those recorded in peridotite xenoliths in Mongolia and Spitsbergen (IONOV, 1998).

Based on the modal composition of melt pockets and the chemical composition of mineral phases, we calculated the bulk composition of silicate melts that filled up the melt pockets. The calculated bulk compositions are strongly different from the compositions of primary mantle minerals (amphibole and clinopyroxene) which can melt and those of the host alkali basalt. We suggest that these mantle minerals reacted with a carbonatitic melt migrating in the upper mantle. This percolating melt could have caused mantle metasomatism and reaction melting in the mantle prior to the basaltic volcanic activity. Based on our estimation this percolating silicate melt which metasomatised the upper mantle contained carbonate up to 44 %.

References

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