Geophysical Research Abstracts
Vol. 14, EGU2012-12120-1, 2012
EGU General Assembly 2012


# An FTIR study on nominally anhydrous minerals in mantle xenoliths with diverse textures from the central Carpathian-Pannonian region (Bakony-Balaton Highland Volcanic Field, Hungary)

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The youngest alkali basaltic activity at 2.61 Ma (Füzes-tó) in the Bakony-Balaton Highland Volcanic Field (BBHVF) brought numerous xenoliths to the surface. The studied xenolith suite includes the most variable textures from the BBHVF according our knowledge. We chose nine xenoliths for a detailed FTIR study covering a range in textures from protogranular to equigranular (i.e. protogranular, coarse-grained, porphyroclastic, mosaic and tablular equigranular) and some special textured xenoliths (poikilitic and recrystallized features). The xenoliths lie in the spinel stability field, most of them are lherzolithes, but harzburgite and olivine orthopyroxenite also occur.
The water content of nominally anhydrous minerals (NAMs) from the selected xenoliths was quantified by analyzing 10-15 randomly oriented grains from each mantle mineral. The $H_2O$ contents were calculated from averaged unpolarized FTIR spectra of each nominally anhydrous silicate phase according to Kovács et al. (2008). During the evaluation the substitutions-specific calibration (i.e. Kovács et al., 2010) was used for olivine, whereas, for pyroxenes the mineral specific calibration (Bell et al., 1995) was used. Bulk $H_2O$ contents were calculated from the water content of each modal constituent and their respective modal proportions.
The protogranular and coarse-grained lherzolites show higher bulk water contents (bulk NAM's content: $\sim$20 ppm) relative to the deformed peridotites and pyroxenites (16 - 3 ppm). However the tabular equigranular peridotites are also enriched in bulk $H_2O$ concentrations akin to the coarse-granular ones, where the concentrations are 24-25 ppm. This trend may coincide with the results of Kovács et al. (2012) who proposed that the present lithosphere beneath the centra Carpathian-Pannonian region can be divided into two layers: a shallower layer resembling the deformed relatively water poor xenoliths, and a deeper layer corresponding to the coarser grained, relatively water-rich xenoliths. The tabular equigranular xenoliths (Hidas et al., 2007) are special and may represent a domain separating these shallower and deeper layers of the present day lithosphere. The deeper part of the present day lithosphere is a juvenile one, which may have added to the lithosphere following the Miocene extension.

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