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Mantle xenoliths from Bondoró Volcanic Complex

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The late Miocene Bondoró Volcanic Complex belongs to the Bakony-Balaton-Highland-Volcanic-Field (BBHVF) in the western part of the Pannonian Basin on the northern shore of Lake Balaton, Hungary. The volcanic field includes approximately 150 erosional remnants of maars, tuff rings, scoria cones and shield volcanoes. The Pannonian Basin is an extensional back-arc basin of the Carpathian Arc formed between Miocene and Pleistocene. Mantle xenoliths brought to the surface by alkali basalts comprise sp-lherzolites, sp-harzburgites and pyroxenites. Two distinct types of textures have been found: fine-grained, equigranular textures that are predominantly foliated and coarse grained, protogranular textures which often exhibit layering of pyroxenes. A striking feature of some harzburgites is a noticeably high modal composition of orthopyroxenes. While phlogopite was only found in one sample, intergranular, percolating melt and melt pockets are common in Bondoró mantle xenoliths.
Whole rock $Al2O_3$ and CaO contents range from 1.01 to 3.93 wt% and 0.71 to 3.20 wt%, respectively. Mineral analyzes of primary ol reveal Fo contents of 89.4 to 91.4. Cpx are predominantly Cr-Diopsides with En48.1-51.9-Wo43.4-47.7-Fs3.2-6.1 and Mg# of 0.89 to 0.93. Opx compositions are in the range of En87.8-90.3-Wo0.8-2.3-Fs8.1-9.9 with Mg# between 90 and 91.8. While Cr# in primary sp range from 12 to 21, secondary sp in melt pockets and melt intrusions reveal higher Cr# of 41 to 55. The (La/Yb)N ratios in clinopyroxenes vary from 0.35 to 2.63 with an exception of a sample with a by far higher ratio of 17.9.
Equilibration temperatures calculated using two-pyroxene-thermometer of Brey and Koehler (1990) are estimated to be in the range of 950 to 1100°C at 1.5 GPa pressure.
According to the clinopyroxene incompatible trace element composition three groups have been identified, which reflect different kinds of metasomatic overprint: (a) hydrous silicate metasomatism, (b) basaltic melt percolation, (c) percolation of fluids.

References

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