Geophysical Research Abstracts
Vol. 15, EGU2013-393, 2013
EGU General Assembly 2013

Diopside megacrysts from eastern part of Cenozoic Central European Volcanic Province: the Ostrzyca Proboszczowicka (SW Poland) case

Danuta Lipa (1), Jacek Puziewicz (1), and Theodoros Ntaflos (2)

(1) University of Wroclaw, Institute of Geological Sciences, Department of Experimental Petrology, Wrocław, Poland (dajoli1@o2.pl), (2) University of Vienna, Vienna, Austria

The Ostrzyca Proboszczowicka basanite (Lower Silesia) is one of over 300 hundred outcrops of Cenozoic alkaline volcanic rocks forming the north-eastern part of Central European Volcanic Province in SW Poland. The basanite forms conic hill located close to Złotoryja and is known for few centimetre (typically 1.5 – 3 cm) clinopyroxene megacrysts. The megacrysts are anhedral fragments of broken crystals of larger size, is some singular euhedral faces are preserved. They are green in thick (100 μm) section. The sector-zoning is common; locally the sectors show internal zoning. The megacrysts contain euhedral apatite crystals up to 7 mm in length or scarce, euhedral yellow 5 mm diopside crystals of older generation. The margins of megacrysts are covered by reaction fringe.
The megacrysts have the composition of iron-rich diopside (mg# = 0.61 – 0.68), contain significant sodium (0.09 – 0.12 atoms per formula unit, a pfu in the following), are Cr-free and Ti-poor. Aluminium content varies from 0.13 to 0.27 a pfu, and that of Ca is 0.89 – 0.92 a pfu. The composition of sectors differs, some are enriched in Al (0.17 – 0.27 a pfu) and Ti (0,04 - 0,05), whereas others contain 0.13 – 0.15 atoms of Al pfu. The fringe contains 0.23 – 0.39 atoms of Al pfu, is more calcic (0.92 – 0.96 a pfu) and more titaniferous (up to 0.12 atoms of Ti pfu). The clinopyroxene crystals occurring in the basanite groundmass have the composition of subsilicic diopside (Si down to 1.6, Ca up to 1.1 atoms pfu; Al: 0.21 – 0.48, Cr: 0.00 – 0.02, Ti: 0.05 – 0.14 a pfu).
Large broken crystals with intergrowths of euhedral apatite and older generation diopside suggest that the megacrysts are fragments of very coarse-grained cumulate. Major element composition indicates that the megacrysts formed at significant depth (lower crust? upper mantle?). Trace-element study is necessary to find if the megacrysts have originated by crystal settling from host basanite magma or have crystallized from melt of another composition.