QUARTZITE XENOLITHS FROM THE BULHARY BASANITE AND THEIR ALKALINE RICH CONTACT AUREOLA, A NEW CONTACT ZONE

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Introduction: In the last decades different types of mantle and crust xenoliths have been found from the Pliocene-Pleistocene Nógrád-Gemer Volcanic Field (e.g., [1-4]). One of these localities is the Bulgary maar, which is mostly build of alkaline basalt (basanite) and inside the basanite a lot of crustal origin xenoliths can be found.

The collected xenolith samples (except for one) are quartzites and each of these xenoliths have individual thick, light greenish rim (contact aureola), which macroscopically can be seen. Polished thin sections were made from the biggest xenoliths and from these polished thin sections we made (1x enlarged, 1 nicol) microscopic maps. Within the thin sections we could distinguish 6 types of zones: (1) basanite, (2) metasomatized basanite, (3) leucitic, (4) clinopyroxene, (5) felspar and pyroxene rich and (6) the xenolith. With SEM–EDS chemical analyses we could state, that the clinopyroxene zone devides the whole contact aureola to a Si-undersaturated (the basanite side of the contact aureola) and a Si-oversaturated area (the xenolith side of the contact zone). Based on the mineral texture and composition we presume the following development of the contact aureola: First of all the basaltic magma was rising towards the surface and teard more rock pieces out from the crust layers, including the quartzite xenoliths. A clinopyroxene corona formed around the xenolith (this was possible, because in this stage the xenolith didn't melt). After the pyroxene corona formed, the xenolith started to melt and the newly formed, Si-rich melt began to mix with the basaltic magma, which leaked through the pyroxene corona. Because of the mixing new contact diopside formed, which was followed by alkaline rich minerals (alkaline amphibole, Ti-aegirine, sanidine). When the melting of xenolith stopped, the area between the clinopyroxene zone and the xenolith was filled with the newly formed minerals. From the pyroxene zone's point of view the system continued on the basanite side of the contact aureola and a leucitic zone evolved. Inside the newly formed huge leucite crystals, brownish coloured, pinned-lath ilmenite can be seen, which mostly forms oriented texture. The texture of the ilmenite and leucite shows that these two minerals crystallised at the same time. Finally the remained fluids metasomatized the bazanite rock and new volatile rich minerals (eg. calcite, biotite, apatite) formed.

Compared to rest of the xenoliths of Carpathian-region, the Bulhary xenoliths don't contain any glass phase, from which we conclude that these xenoliths went through a very slow cooling process. The slow cooling could be due to the sub-volcanic nature of the formation and because of this the leucite rich zone could form, which (as far as we know) is worldwide unique.

From the petrography and the literature we conclude that these rocks originate from the Gemericum, which situates at the middle-crust region.

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