

Fluid and melt inclusions in mantle xenoliths from the Eastern Transylvanian Basin

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In the Carpathian–Pannonian Region (CPR) there are five major volcanic areas where basalt volcanoes, active during the Neogene-Quaternary period, brought large numbers of upper mantle xenoliths to the surface [1]. Majority of basalt volcanoes, particularly at the edge of the CPR (Styrian Basin, Eastern Transylvanian Basin), contain frequently amphibole-bearing xenoliths. The easternmost and youngest alkaline basaltic volcanic field is developed in the Perşani Mountains (Eastern Transylvanian Basin, Romania), which provides the xenolith suite to this study. Our main aim is to describe the fluid system, in four selected spinel lherzolite/hornblendite composite xenoliths.

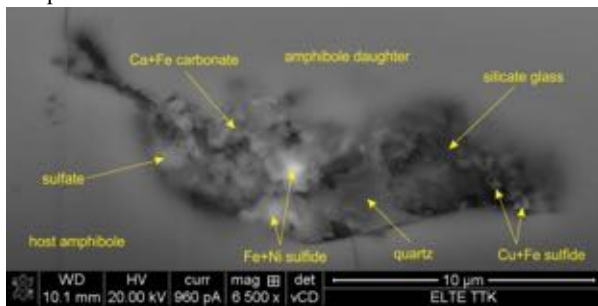


Figure 1: BSE image of fluid rich silicate melt inclusions in amphiboles from the hornblendite xenoliths.

Fluid rich silicate melt inclusions in amphiboles from the hornblendite part of the xenoliths were studied at room temperature Raman spectroscopy and FIB/SEM technique. The inclusion is volatile rich, it contains vapor CO₂. The inclusions contain solid phases: amphibole (as a daughter phase), carbonate, burbankite, quartz, rutile, sulfate, different types of sulfides and silicate glass.

These features indicate a complex volatile rich melt-mantle interaction beneath the study area, which can be related to the subduction of the European plate beneath the Eastern Carpathians [2] which occurred in the Neogene causing extensive fluid/melt percolation and mantle metasomatism.

[1] Szabó *et al.* (2004) *Tectonophysics* **393**, 119-137. [2] Wortel & Spakman (2000) *Science* **290**, 1910-1917.