

RHÖNITE IN SILICATE MELT INCLUSIONS OF OLIVINE PHENOCRYSTS FROM THE ALKALI BASALT OF HEGYESTŰ, BALATON HIGHLANDS, HUNGARY

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The Bakony–Balaton Highlands are one of the major Late Tertiary alkali basalt volcanic fields within the Carpathian–Pannonian Region. We have studied rhönite bearing silicate melt inclusions occurring in olivine phenocrysts in porphyritic alkali basalt at the locality of Hegyestű, Bakony–Balaton Highlands. The olivine phenocrysts formed under mantle conditions and enclosed small droplets as silicate melt inclusions from the magma at great depth.

Besides rhönite, the silicate melt inclusions contain augite, Na and K rich glass, apatite, spinel, sulfide blebs and bubbles. Rhönite occurring in similar environments has not been studied yet extensively, although SHARYGIN (unpublished), KUZMIN *et al.* (1999) and SZABÓ (unpublished) have also recognized rhönite in silicate melt inclusions from mafic volcanic rocks.

Rhönite is a reddish brown Ti rich silicate mineral, a member of the aenigmatite–rhönite group, based on the classification of KUNZMANN (1999). According to experimental data, the stability field of rhönite in alkali basalts is between temperatures of 840 to 1200 °C and below pressure of 600 bars. These conditions are true if the coexisting alkali basalts have $ne/(ne+ab+or+lc)$ above 0.18 and $Mg/(Mg+Fe)$ ratio greater than 0.46. In our case, the estimated bulk composition of the silicate melt inclusions are consistent with the experimental conditions. Based on experimental results for the stability of rhönite (KUNZMANN, 1999), crystallization of rhönite should happen near the surface; however, our observation is inconsistent with it. We propose that the partial crystallization of the silicate melt inclusions occurred at a greater depth than suggested by KUNZMANN (1999).

References

- KUNZMANN, T. (1999). *European Journal of Mineralogy*, 11: 743–756.
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