

MAGMATIC EVOLUTION OF THE KYMI TOPAZ-BEARING GRANITE STOCK: A MELT INCLUSION STUDY

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High-pressure rapid-quench hydrothermal experiments on melt inclusions in quartz and topaz grains from different intrusive phases in the Kymi granite complex have been carried out to evaluate the evolution of volatile-rich melts in magmatic systems. The Kymi stock consists of even-grained and porphyritic leucocratic topaz-bearing biotite granites, and a marginal pegmatite (stockscheider), all of which represent different stages of evolution in one of the most evolved intrusive phases of the Wiborg batholith in southeastern Finland. Hydrothermal experiments were performed at high pressure in order to prevent leakage of volatiles. Melt inclusions in quartz and topaz grains from porphyritic granite and pegmatite were rehomogenized at 3 kbar and 700°C for 24 hours, and at 1 kbar and 900°C for 96 hours, respectively. The preliminary results from melt inclusions in porphyritic granite and marginal pegmatite show that the quartz phenocrysts in porphyritic granite have crystallized from very volatile-rich melt (9-11 wt% volatiles). Fluorine varies from 0.05 to 1.81 wt%, (average 0.58 wt%) and Sn content is about 250 ppm, (29 ppm in the porphyritic granite). The pegmatite melt is less rich in volatiles (4.5-9.0 wt%), but more rich in fluorine (1.08-1.72 wt%, average 1.38 wt%), Sn (550 ppm) and Rb (up to 4700 ppm). During the evolution of the magma F, Sn and Rb are strongly enriched in the melt fraction but the solubility of volatiles in the melt decreases.