

Preliminary petrography and microthermometry of the fluid and melt inclusions from the Vidruța beryl mineralization, Lotru Metamorphic Suite (South Carpathians, Romania)

IOAN PINTEA AND GAVRIL SĂBĂU

Geological Institute of Romania

Presenting Author: g_sabau@yahoo.co.uk

The Vidruța beryl pegmatite occurrence is located in the South Carpathians, in a sillimanite-grade Permian gneiss dome emplaced subsequently to Variscan stacking of reworked and juvenile metamorphic units of the Lotru Metamorphic Suite. It appears in a pegmatite swarm containing beryl, which extends in apparent structural concordance at the highest topographic elevations of the Lotru and Mănăileasa Mountains bordering the Lotru River. The pegmatite body is coarse grained, containing blocky aggregates of quartz, beryl and microcline, grading into a quartz core. Additional phases of the assemblage are spessartine garnet, albite, muscovite, tourmaline, and zircon. Abundant beryl tends to form large-sized crystals, displaying frequently particular habits, such as striated parallel intergrowths or skeletal textures with the accompanying phases.

We identified four types of inclusions in two investigated samples cut along and normal to the c axis. The first sample consists of parallel intergrowths of beryl individuals up to 10 mm wide and more than 30 mm length, the other being a hexagonal plate 150 mm wide containing millimetre-sized skeletal intergrowths with microcline and quartz. The microinclusions in beryl are mostly primary and can be classified as follows: 1. former glassy inclusions with vapor bubble ± microcrystals, 2. completely recrystallized silicate melt inclusions with a cloudy appearance with parallel streaks, 3. complex glassy silicate-aqueous-carbonic fluids, and 4. biphasic (L+V) aqueous inclusions (Figure 1). Microthermometry indicated that the aqueous vapor phase in the triphasic aqueous - silicate glass inclusions (L+V+glass±carbonic phases) homogenizes between 180° to 220°C (n=15), whereas in the biphasic inclusions (L+V±solids) the homogenization temperature is 190° to 240°C (n=9). Preliminary interpretation of petrography and microthermometry suggests that the four types of inclusions are representative for a hydrosilicate pegmatite melt (silicothermal fluids) similar to those reported in the literature worldwide [1]. Specifically, it is to emphasize that the beryl mineralization from Vidruța was formed from squeezed hydrosilicate (silicagel) melt by local filter pressing conditions at around 0.6 GPa (gt+sill+ilm) and trapping temperature ranging from 400° to 600°C.

[1] Thomas. R. Davidson P. (2016) Ore Geol. Rev. 72, 1088-1101.

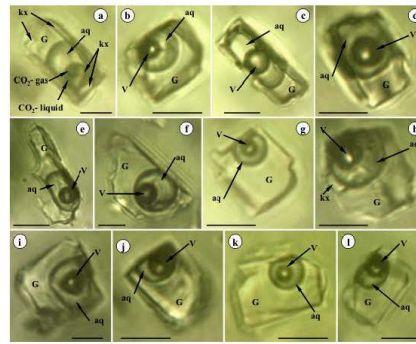


Figure 1. Complex hydrosilicate melt inclusions from the Vidruța beryl mineralization. Notations: G - hydrosilicate glass, aq - H₂O-rich fluid, V - vapor, kx - unknown; scale bar: 10 microns.