

Morphological features and genesis of fluid inclusions in quartz crystals from the chamber pegmatites of Upper Cretaceous monzonites, eastern Bulgaria

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Smoky quartz crystals that were formed during the post-magmatic stage of the evolution of the monzonitic magma have been studied. The crystals have grown in elongated cavities. Aggregates of feldspars, individual biotite crystals and epidote geodes were growing together with the quartz. After this typical pegmatitic parageneses chalcopyrite, molybdenite, zeolites and calcite were formed.

The quartz crystals are trigonal, up to 3 cm in length. They have well-preserved primary growth forms of the walls. The crystals are transparent, especially in their outer parts. In the base parts, however, variable amount of fractures with the same orientation as the R and r walls of the crystals can be observed.

Microscopically, the different fractures contain considerable variety of multi-phase and two-phase fluid inclusions. Typical are cross-cutting relationships and refilling of earlier from later fluids. Some of the fluid inclusions have accidentally trapped earlier minerals. The studied inclusions in the chamber pegmatites share similar features with the well-characterized inclusions in Cu-porphyry deposits.

Primary fluid inclusions in the studied quartz crystals are very rare. They are observed only in cases of concomitant growth of smoky quartz crystals with zonal growing epidote aggregates within the quartz. It should be emphasized that the primary inclusions are low salinity two-phase (L+V).