

New evidence of liquid immiscibility occurrence during formation of rare metal volatile-rich granitic systems

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The study of melt and fluid (FI) inclusions in quartz from the differentiates of rare-metal granite massifs from Transbaikalia showed that crystal fractionation process is accompanied by multiple occurrence of liquid immiscibility during the temperature decrease [1]. The ongonitic stage in the evolution of the melt leads to accumulation of volatile and F (wt. %: H₂O = 10, F = 2,8, B₂O₃ = 2,1) and completes by "geochemical inconsistencies": the sharp decrease of the stable association of elements - Na, Al, F, Li, Ta in the melt vs. whole rocks. This suggested their separation from aluminosilicate melt in the form of water-silicate-salt substances. Three types of inclusions were detected in quartz from Ta-bearing amazonite granites: (1) salt-melt inclusions with Al, F, K (with topaz), (2) salt-melt inclusions with Na, Cl, (without topaz) and FI CO₂-H₂O-rich with Bi, Zn, As. Inclusions were studied by Raman spectroscopy and scanning electron microscopy of solid phases. These results are in good agreement with previous studies of type-A and type-B melts inclusions (after R. Thomas) in beryl from Orlovka endocontact massif [2]. Identified inclusions are typical only for Ta-bearing volatile-rich granite massifs: Etyka, Orlovka (Transbaikalia), Yichun (Southeast China).

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[1] Badanina E.V. et al. (2006) *Can Min* **44**, 667-692. [2] Thomas R. et al. (2009) *Miner Petrol* **96**, 129-140.