

A Study on Origin and Rock-forming Simulating Experiment of Aquamarine-bearing Pegmatite of Ailaoshan, Yunnan, China ※

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Aquamarine-bearing pegmatite is found among Proterozoic metamorphic rocks and migmatized granite at the southern section of the Ailaoshan folded belt in an occurrence mostly consistent with the regional tectonic line. The Rb-Sr isochron of this pegmatite is 26-31 Ma, which falls in Himalaya Period. Its $^{87}\text{Sr}/^{86}\text{Sr}$ ratio is 0.70681-0.71044 and homogenization temperature of inclusions in beryl is 1,050-180°C. The ore-forming fluid of the pegmatite is rich in CO_2 and C_2H_2 , C_2H_4 and CH_4 . C, H, O isotopes and REE analysis and the geological characteristics indicated metamorphic anatectic melting origin of this aquamarine-bearing pegmatite.

The pegmatite rock-forming simulating experiment was operated with a pressure vessel at 840°C and $1,500 \times 10^5$ Pa., in which ground metamorphic rock along with SiO_2 , NaF, KF and H_2O were sealed within a gold tube. When the liquidus was reached, the temperature was gradually decreased at the rate of 5-10°C/day for three months. SEM/Quant analyses were performed with the experiment product. A series of pegmatite textures were observed including graphic texture, ribbon texture of minerals, drusy cavity, coarse-crystallized grain of feldspar, gold-bearing veinule and ball quartz. Different rock melting generated different mineral association. The experiment provided supportive basis of metamorphic anatectic melting origin of the Ailaoshan aquamarine-bearing pegmatite.

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