

SCG082-P12

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Crystallization kinetics in the system Ab-Qtz-H₂O: Implications for formation of pegmatite texture

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We have examined crystallization kinetics in the system Ab-Qtz-H₂O by using piston cylinder apparatus at 0.8 GPa. Mixture of natural mineral (quartz and albite) powder were used as a starting material to obtain adequate nucleation density. In the system having compositions between the eutectic and end-members (Qtz, Ab), crystallization of euhedral quartz or albite crystals from the temperature slightly lower than the liquidus temperature proceeded in almost equilibrium at a cooling rate of 0.05 degree/min. This shows that diffusivity was fast enough to accomplish equilibrium crystallization at this cooling rate, under the presence of seed crystals. By constast, in the system with the eutectic composition and without seed crystals, variable amount of quench glass and graphic intergrowth of albite and quartz showing colloform texture were formed. Coarse euhedral minerals in the cavities have grown to form miarolitic structure. These textures resemble natural pegmatite, providing information about its cooling rate.