

Crystallization from albite-composition glass at high pressure and high temperature

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Plagioclase is one of the important constituent in meteorite. In the case of shocked meteorites, maskernite (amorphous phase) has been commonly observed. Recently, we found crystals with albite composition in a shocked meteorite. Raman spectra showed, however, only the Raman modes of jadeite, and no difference of peaks from the synthetic jadeite. In order to clarify the shock condition, the phase transformation of Amelia albite and NaAlSi₃O₈-composition glass was investigated experimentally at high pressure and high temperature. High-pressure experiments were performed by using a 1000-ton (Hymag) and a 1200-ton (Sumitomo) hydraulic press in Bayerisches Geoinstitut, Germany. Samples were heated to 1773 K in the rate of 500 K/min and then cooled in the rate of 500 K/min. Raman spectra confirms that albite was broken down to jadeite + coesite at 8 GPa. However, on the samples heated in the stability field of stishovite (at 14 and 20 GPa), only the Raman modes of jadeite were observed. This missing silica implies that (1) SiO₂ is amorphous, or (2) SiO₂ crystal has no Raman-active mode. The present study showed that albite-composition phase with Raman mode of jadeite was formed in the stability field of stishovite.