

Possible stabilization of CMA phase in MORB at CMB

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CMA-phase was known to have a composition close to MORB and to be stable at relatively low temperature and high pressures (Funamori et al.,2000). In this study, we investigated the stability field of CMA phase in MORB using a laser-heated diamond anvil cell combined with synchrotron X-ray. The starting material was glass with MORB composition. After compressing of the glass sample in diamond anvil cell with 200 micron culet, it heated by Nd:YAG laser at about 2000 K. Pressures and temperatures were measured by ruby fluorescence method and radiation thermometer, respectively. While garnet phase was crystallized from glass below about 20 GPa, CMA phase was observed after laser heating above the pressure. At below 70 GPa, the CMA phase showed further transformation to the mixture of Mg-Pv phase, Ca-Pv phase and stishovite at elevated temperature to 2500 K. However, the CMA phase was observed stably to 2800 K above 100 GPa. Another interesting behavior was decomposition to the perovskite mixtures by compression at room temperature above 100 GPa, which transformed back to the CMA phase by laser-heating. These observations suggest the CMA phase would stabilize in the descending slab to CMB region.