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SIT040-P05

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Hydrous phase in water-saturated MORB at the lower mantle conditions

Keiyou Ishio^{1*}, Tadashi Kondo¹, Takumi Kikegawa²

¹Graduate School of Science, Osaka Univ, ²IMSS KEK

Mantle minerals as water reservoir are important issue to consider the structure, dynamics and evolution of the Earth. We investigated the water saturated MORB system under high pressure and high temperature using laser-heated diamond anvil cell (LHDAC) combined with in-situ X-ray diffraction method at AR-NE1, KEK(Tsukuba, Japan). Starting materials were synthetic glass with a MORB component and distilled water. The experimental pressure and temperature range are up to 70GPa and 1700K, respectively. X-ray diffraction experiments were performed using monochromatic X-ray with 30keV and imaging plate detector. Pressures are determined by the equation of state of gold. We found PhaseD exist in the heated sample with coexist phases of Ca-Perovskite, Mg-Perovskite, Stishovite, and CF-Phase, though no significant hydrous mineral has been reported In the previous experiments on dry and wet MORB. The decomposition of phase D was also observed above 60GPa. The appearance of phaseD seems to be related with small intensity from the Mg-perovskite phase. Bulk modulus of each phase was well consistent with the previous reports in the literature. However the absolute volume was slightly different from those in literature. The present results indicate that PhaseD, which could contain up to 19.wt% of water, is one of the candidate minerals as a water reservoir in subducting slab in the lower mantle condition if it was locally in water-saturated condition. The details of experiments and analysis will be presented with analysis of the recovered samples.

Keywords: LHDAC, MORB, Hydrous minetals, PhaseD, Lower mantle, KEK