I128-P017 **Room: Poster Session Hall** **Time: May 27**

Chemical equilibrium between (Mg,Fe)SiO3 perovskite and liquid iron to 146 GPa

Haruka Ozawa[1]; Kei Hirose[1]

[1] Dept. Earth & Planet. Sci., Tokyo Tech.

The molten outer core may be in chemical equilibrium, at least with the bottom thin layer of the mantle, which may be comprised mainly of (Mg,Fe)SiO_3-rich perovskite or post-perovskite and (Mg,Fe)O ferropericlase. The element partitioning data between molten iron and these mantle minerals at high pressure and temperature are important to constrain the chemical compositions of the liquid core and the lowermost mantle. The element partitioning between post-perovskite and molten iron and between ferropericlase and molten iron has been studied to the core-mantle boundary pressure. Here we examined the chemical equilibrium between perovskite and molten iron to 146 GPa and 3500 K by using the laser-heated diamond-anvil cell techniques. A starting material was prepared as powder mixtures of iron metal and gel with a composition of $(Mg_{0.9}Fe_{0.1})_2SiO_4$, $(Mg_{0.8}Fe_{0.2})_2SiO_4$, or $Mg_{0.9}Fe_{0.1}SiO_3$. Mineral assemblage was confirmed by in-situ synchrotron X-ray diffraction measurement at high pressure and temperature at BL10XU of SPring-8. The chemical compositions of coexisting perovskite and quenched liquid iron were determined with analytical transmission electron microscope. A thin section of the recovered sample was obtained parallel to the compression axis by Ar-ion milling method using Ion Slicer (JEOL EM-09100 IS). Results demonstrate that the dissolution both of oxygen and silicon into a liquid metal is enhanced with increasing pressure. Combining these experimental results with previous partitioning data between perovskite, ferropericlase, and molten iron, we will discuss the chemical compositions of the outer core and the bottom of the mantle.