Structure of (Mg,Fe)O and SiO2 at the lowermost mantle condition.

High pressure behaviors of (Mg,Fe)O and SiO2 were studied by in situ X-ray diffraction method using diamond anvil cell and synchrotron radiation (KEK-PF:BL-13). Rhombohedral distortion was observed for all of (Mgx, Fe1-x)O (X=0.1, 0.2, 0.4, 0.6), but the initiation pressure of the distortion was depended on the Mg composition. No further phase change was observed up to 100 GPa and about 800 K by external heating. The CaCl2-like phase of SiO2 was observed above 55 GPa and was stable at 80 GPa and about 2200 K under laser heating. These results indicate that the CaCl2-like phase is stable not only in cold slab but also in the surrounding lower mantle.