Phase equilibria in the system MgO-FeO-SiO2 at 26GPa and 1500 to 2000 degreeC

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We have determined phase equilibria in the system MgO-FeO-SiO2 at 26GPa and 1500, 1750 and 2000 degreeC. Experiments were conducted with a uniaxial multi-anvil press (Sakura-2500) at the magma Factory, Tokyo Institute of Technology. Eight tungsten carbide cubes (14 mm edge length and 2.0mm truncated corners) were used. Starting materials of Fo60, Fo70 and Fo80 were synthesized at 1 atm under controlled oxygen fugacity (QFM-1 log unit) at 1300 degreeC for 20hours. A natural olivine starting material (Fo90) was separated from the peridotite KLB-1. Experiments were conducted for 30 min at 1500 and 1750 degreeC and 15 min for 2000 degreeC experiments, respectively.

The Kd partition coefficients (Fe/Mg)Pv/(Fe/Mg)Mw decreases as Fe/Mg increases at given temperatures. The Kd partition coefficient increases as temperature increase at lower Fe/Mg samples but the temperature dependence is uncertain at the Fe-rich compositions. Above compositional dependence is consistent with early study by Ito et al.(1984) but the absolute number of the Kd values are systematically higher in our experiments. The temperature dependence of Kd values in our experiments is consistent with those prediction by Mao et al.(1997) using DAC experiments at 30GPa
for the Fe-poor samples.