Stability of hydrous phases in the transition zone in the systems MgO-Al2O3-SiO2-H2O

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Phase equilibrium experiments were conducted in the system MgO-Al2O3-SiO2-H2O at 20.9 - 22.4 GPa and 1000C. We identified the following H2O containing phases; Al rich phase G, Al rich superhydrous phase B, phase egg, pyrope, majorite, stishovite and some unknown aluminous phases.

For the Pyrope-H2O system. the phase G and superhydrous phase B were observed in the X-ray diffraction patterns of the recovered sample. However, EPMA analysis revealed that were alminous these phases. Stishovite and pyrope contain several wt.% H2O. Phase egg was stable above 22.4 GPa at 1000C. We observed a new hydrous phase with the composition close to AlO (OH). This phase may have a structure similar to InO (OH).