

Effect of H₂O on phase boundary of beta-gamma transformation in olivine

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The beta-gamma phase transformation in both anhydrous and hydrous conditions have been studied at a temperature of 1673K and pressures from 14.2 to 20.6 GPa to clarify the effect of H₂O in the phase boundaries. In Mg₂SiO₄ system, the transformation pressures are 19.3 GPa in both conditions. In (Mg_{0.9}Fe_{0.1})₂SiO₄ system, the coexisting region of beta and gamma in hydrous condition is narrower than that in anhydrous condition, and the transformation pressure in hydrous condition moves to high pressure side. In (Mg_{0.8}Fe_{0.2})₂SiO₄ system, the coexisting region in hydrous condition is wider than that in anhydrous condition, and the transformation pressure in hydrous condition moves to low pressure side. Using the above results, the nature of 520 km seismic discontinuity is discussed.