

Equations of state of dry wadsleyite and hydrous wadsleyite

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The equation of state experiments of dry wadsleyite, Mg_2SiO_4 and hydrous wadsleyite, $\text{Mg}_{1.75}\text{SiO}_4\text{H}_{0.5}$ were carried out using a combination of the synchrotron radiation and a large volume multianvil high pressure device (SPEED-1500). In the in situ experiments, pressures were applied first at a ram load of the desired values, and then temperatures were increased to $\sim 1073\text{--}1173$ K to release the deviatoric stress. In these experiments, Au was used as a pressure marker, and the pressures were calculated by an equation of state proposed by Anderson et al. (1989). In addition, MgO was also used for the determination of pressure. Using the above data, we determined the equations of state of dry and hydrous wadsleyite under the condition of mantle transition zone.