

Effect of oxygen fugacity on the storage of H in nominally anhydrous minerals

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The Earth's transition zone is potentially a zone within the mantle with a high H storage capacity due to its constitutive minerals, wadsleyite and ringwoodite that can contain up to 3 weight percent H₂O. This study aims to experimentally constrain the hydrogen storage capacities of olivine and wadsleyite at a depth around 410 km (13.5 GPa) under water-saturated conditions, as a function of temperature, oxygen fugacity and carbon content. Experiments have been conducted in the multi-anvil press, with sealed double capsules to preserve fluids and with different redox buffers to vary oxygen fugacity. The concentration and speciation of H in NAMS were measured by Raman spectroscopy.