

The effect of H₂O and CO₂ on the physical properties of the Earth's mantle materials

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H₂O and CO₂ are the important components in the Earth, and the existence of these components influences the physical properties of the Earth's constituent materials. The first important effect is for the melting of the mantle; this does not only lower the melting temperature but also change the composition of the partial melt. The second important effect is for the phase transformations of the mantle minerals, because beta- and gamma-phases include several wt% of H₂O in their crystal structures. The third important effect is for the thermoelastic properties of the mantle minerals. We are clarifying the above effects systematically by understanding the importance of these phenomena. In this presentation, we will introduce some of our recent work about the above themes.