

Properties of Magnesium Oxide in Super-Earths

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The Kepler spacecraft led to the discovery of numerous Super-Earth-type planets. Little is known about them, as there is no equivalent in the Solar System. For instance, it is uncertain whether they have a convective mantle like the Earth. It is also unclear if their mantle is insulating or conducting. In the latter case the mantle could generate a magnetic field via dynamo processes. In order to better understand the properties of silicate materials under pressure-temperature conditions relevant for Super-Earth interiors, we studied MgO, one silicate end-member, with *ab initio* simulations based on density functional theory. We explored its phase diagram and complete equation of state. We also determined its electronic transport properties, conductivity and reflectivity, to characterize its behavior in the different phases. We find that liquid and solid MgO behave differently and discuss the consequences for the planetary interiors.