

A Progress on Spin Transition of Ferroperriclinite in the Lower Mantle

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Abstract: Pressure-induced spin transition of iron, occurring in the major minerals of the lower mantle, can play a significant role in minerals properties of dynamical, physical and chemical. So the research on spin transition and its associated effects on the properties of the major minerals in the lower mantle under lower mantle P-T conditions is considered to be an important part to constrain the model of geophysics, geochemistry and geodynamics of the lower mantle. As the second abundant phase in the lower mantle, ferroperriclinite (Mg, Fe)O has been reported on spin transition under different pressures and temperatures and the associated effects on the properties including density, sound velocities, elasticity, iron partition, radiative thermal conductivity and electrical conductivity. In this paper, the progress was reviewed including the explaining of physical origin of the spin transition, the main techniques on studying the transition of ferroperriclinite, and the associated effects on physical properties previously reported. Meanwhile, the further prospect was also discussed.

Keywords: spin transition; ferroperriclinite; high temperature and high pressure; lower mantle