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Rare-earth orthoferrites RFeO₃

Rare-earth orthoferrites RFeO₃ are important functional materials and are very promising due to their innovative use in advanced technologies. They have extensive application prospects because of their unique magnetic properties, such as spin reorientation, spin canting, ultra-fast spin switching, magneto-optical, magnetization reversal, and so on. Spin reorientation is one of important magnetic properties for orthoferrites because this transition is closely related to excellent coupling between electric and magnetic orders, and this coupling is very important to search for the novel magnetoelectric multiferroics by controlling the polarization used a magnetic field and the magnetizations used an electric field. In addition, RFeO₃ such as LaFeO₃ is chemically stable in both reducing as well as oxidizing atmosphere. Extensive research is going on the doped LaFeO₃ as they show high electrical conductivity, outstanding thermal stability, high dielectric constant, low dielectric loss, moderate permittivity, susceptibility, polarizability, ferroelectricity, piezoelectricity.

Recently, magnetic photocatalysts have attracted increasing attention in the photocatalysis research today. The solar light-driven photocatalysts is desirable, since the visible light accounts for the largest portion in the solar spectrum. Hence,

development of the catalysts possessing of magnetic property and visible light activity (i.e., bifunctional photocatalyst) has become an important topic. The Mn-doped LaFeO_3 is the photocatalyst possessing of magnetic property and visible light activity, i.e., bifunctional photocatalyst. The higher catalytic activity of the Mn-doped LaFeO_3 is due to its higher oxygen vacancies, variable valency Mn ions and the strong absorption in visible light.