

Evolution of Structure and Magnetic Behavior by Pr doping in SrRuO₃

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We report the evolution of structure and magnetic properties in perovskite ruthenates Sr_{1-x}Pr_xRuO₃ ($x = 0.0$ and 0.1). Our main expectations, to induce the structural modification and change the Ru charge state by Pr doping at Sr site. By the Pr doping on Sr site retains orthorhombic structure while we find minor change in structural parameters. The SrRuO₃ have itinerant type of ferromagnetism with ordering temperature ~ 160 K. By Pr doping, the magnetic moment decrease and ZFC shows three distinct peaks (three transition temperature; T_{M1} , T_{M2} and T_{M3}). Further analysis of magnetization of both samples, at high temperature follow modified CWL and Pr doping gives Curie temperature ~ 129 K which is close to T_{M2} . Above T_{M2} to T_{M3} , the inverse susceptibility shows upward deviation from CW behavior, indicating the existence AFM like clustered in this regime. The low temperature isothermal magnetization M (H) shows moment is decreases by Pr doping. The Arrott plot gives spontaneous magnetization (M_s) which is also decreases by Pr doping. The evolution of Rhodes-Wohlfarth ratio increases which suggests the FM in this system evolves toward the itinerant type by Pr doping.