

Physical Studies of Oxygen Deficiency Effects in Electronic Structures of Perovskite Materials $\text{YBaMn}_2\text{O}_{6-\delta}$

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Abstract

The perovskite materials of manganese oxides have been widely investigated because of many interesting physical properties, such as CMR, multiferroics, semimetal, and topological insulator, and so on. It has been known that the coupling between the different degrees of freedom of charge, spin, orbital and lattice plays a key role for these unusual physical properties. According to the chemical formula, the Mn atoms in the oxygen-deficient perovskite YBaMn_2O_5 should have different valence states of Mn^{3+} and Mn^{2+} , so it is therefore a good candidate for studying the coupling between the charge and spin ordering. Through solid-state reaction, we have successfully synthesized two powder samples of YBaMn_2O_5 and YBaMn_2O_6 . Both samples were characterized to be good quality powder samples by the x-ray powder diffraction and to possess the different magnetic properties.

Keywords: YBaMn_2O_5 ; Double perovskite oxide; electromagnetic