

Accepted Manuscript

Heavy-rare-earth-induced structural and magnetic properties in $(\text{Sr}_{2-x}\text{Ln}_x)\text{FeMoO}_6$ ($\text{Ln} = \text{Sr}, \text{Gd}, \text{Tb}, \text{Dy}, \text{Y}$ and Ho) double perovskite

Q. Zhang, Z.F. Xu, H.B. Sun, X. Zhang, H. Wang, G.H. Rao



PII: S0925-8388(18)30694-7

DOI: [10.1016/j.jallcom.2018.02.207](https://doi.org/10.1016/j.jallcom.2018.02.207)

Reference: JALCOM 45083

To appear in: *Journal of Alloys and Compounds*

Received Date: 16 November 2017

Revised Date: 25 January 2018

Accepted Date: 15 February 2018

Please cite this article as: Q. Zhang, Z.F. Xu, H.B. Sun, X. Zhang, H. Wang, G.H. Rao, Heavy-rare-earth-induced structural and magnetic properties in $(\text{Sr}_{2-x}\text{Ln}_x)\text{FeMoO}_6$ ($\text{Ln} = \text{Sr}, \text{Gd}, \text{Tb}, \text{Dy}, \text{Y}$ and Ho) double perovskite, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2018.02.207.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Heavy-rare-earth-induced structural and magnetic properties in ($\text{Sr}_{2-x}\text{Ln}_x$) FeMoO_6 ($\text{Ln} = \text{Sr}, \text{Gd}, \text{Tb}, \text{Dy}, \text{Y}$ and Ho) double perovskite

Q. Zhang^{*1}, Z.F. Xu¹, H.B. Sun¹, X. Zhang², H. Wang¹, G.H. Rao²

1. School of Science, Shandong Jiaotong University,

Jinan, 250357, People's Republic of China

*2. School of Material Science and Engineering, Guilin University
of Electronic Technology, Guilin, 541004, People's Republic of China*

Abstract

Heavy-rare-earth-doped (HR-doped) ($\text{Sr}_{2-x}\text{Ln}_x$) FeMoO_6 ($x = 0, 0.1$ and 0.15 , $\text{Ln} = \text{Sr}, \text{Gd}, \text{Tb}, \text{Dy}, \text{Y}$ and Ho) have been synthesized by solid-state reaction. Crystal structure, magnetic and transport properties of the compound are investigated systematically. Structural refinement shows that although all the compounds belong to the same space group, $I4/m$, prominent structural distortion is introduced: all the compounds seem to be divided into two groups: for ($\text{Sr}_{2-x}\text{Gd}_x$) FeMoO_6 and ($\text{Sr}_{2-x}\text{Tb}_x$) FeMoO_6 compounds, FeO_6 octahedra becomes expansive and MoO_6 octahedra becomes contractive, while FeO_6 octahedra is compressed and MoO_6 octahedra is stretched for the other compounds. Owing to the competing interaction between structural distortion and electron doping, T_C of ($\text{Sr}_{2-x}\text{Gd}_x$) FeMoO_6 and ($\text{Sr}_{2-x}\text{Tb}_x$) FeMoO_6 is increased, resistivity is decreased and metallic behavior is enhanced, while the reverse occurs to the other compounds. Saturation magnetization of ($\text{Sr}_{2-x}\text{Ln}_x$) FeMoO_6 suggests that the long-range-ordered-moments of Gd^{3+} , Tb^{3+} , Dy^{3+} and Ho^{3+} maybe parallel with that of Fe^{3+} spin at low temperature, which is the same as La-, Ce-, Pr-, Nd- and Sm-doped case. Above results reveal that rare earth elements (La-Ho, except for Eu) exhibit the same coupling effect with $\text{Sr}_2\text{FeMoO}_6$, despite of their different magnetic nature. Our investigation offer comprehensive knowledge on the structural and magnetic properties of rare-earth-doped $\text{Sr}_2\text{FeMoO}_6$.
Key words: Heavy-rare-earth, Double perovskite, Crystal structure, Magnetic property

Download English Version:

<https://daneshyari.com/en/article/7992835>

Download Persian Version:

<https://daneshyari.com/article/7992835>

[Daneshyari.com](https://daneshyari.com)