

Crystallographic and Magnetic Properties of Double Perovskite Oxide $\text{Ba}_{2-x}\text{Sr}_x\text{FeMoO}_6$

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In order to study on the change of magnetic properties according to the tolerance factor, polycrystalline single phase double perovskite oxide $\text{Ba}_{2-x}\text{Sr}_x\text{FeMoO}_6$ ($x = 0.0, 0.5, 1.0, 1.5, 2.0$) are prepared. The crystallographic and magnetic properties have been studied by X-ray diffraction, magnetization measurements and Mössbauer spectroscopy. The $\text{Ba}_2\text{FeMoO}_6$ is analyzed as a cubic structure with Fe^{3+} and Mo^{5+} ions ordered at the B-sites. As the x value increases from the cubic structure, the lattice constant decreases more rapidly in the a - b -axis direction than in the c -axis. So that the tetragonal structure starts from $x = 1.0$. The Curie temperature of the $\text{Ba}_2\text{FeMoO}_6$ and $\text{Sr}_2\text{FeMoO}_6$ were 345 K and 425 K, respectively. As the value of x increases, the Curie temperature increases linearly. In addition, the magnetic hyperfine field fluctuation due to relaxation effects are observed in the Mössbauer spectrum of all series samples.

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