

## Effect of grain size on magnetoresistance in $\text{Ba}_2\text{FeMoO}_6$

H. Han, B. J. Han, J. S. Park, and B. W. Lee<sup>a)</sup>

*Department of Physics, Hankuk University of Foreign Studies, Yongin, Kyungki 449-791, Korea*

S. J. Kim and C. S. Kim

*Department of Physics, Kookmin University, Seoul 136-702, Korea*

Effect of grain size on magnetoresistance (MR) and electrical and magnetic properties of double perovskite  $\text{Ba}_2\text{FeMoO}_6$  (BFMO) have been investigated. BFMO samples with different grain size have been prepared by the conventional solid state reaction followed by sintering in a stream of 5%  $\text{H}_2/\text{Ar}$  at 1100 °C with various sintering times. The size of grain increases with increasing of sintering time. Temperature dependent magnetization is the same for samples with different grain size. However, electrical resistivity  $\rho(T)$  and MR are affected by the grain size; the  $\rho(T)$  and the MR value decrease with an increase in grain size. In spite of the different grain size, the  $\rho(T)$  shows a metallic behavior below the ferromagnetic transition temperature. Low magnetic field applied to the sample considerably reduces the resistivity over the whole temperature. The magnitude of MR for the sample sintered for 5 h is as large as 31% and 7% with the magnetic field of 0.7 T at 12 and 300 K, respectively. © 2001 American Institute of Physics. [DOI: 10.1063/1.1362655]