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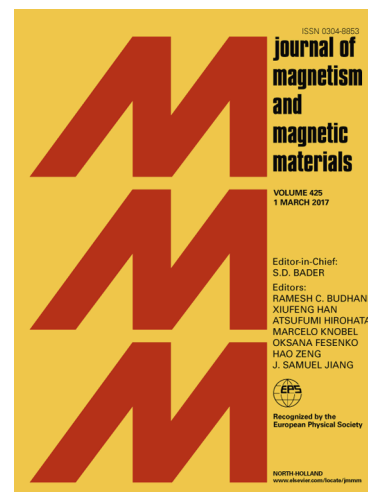
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O.G. Ellert, A.V. Egorysheva, O.M. Gajtko, D.I. Kirdyankin, R.D. Svetogorov

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Highly frustrated Bi-Cr-Sb-O pyrochlore with spin-glass transition

O.G. Ellert,^a A.V. Egorysheva,^{*a} O.M. Gajtko,^a D.I. Kirdyankin^a and R.D. Svetogorov^b

^a Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Leninskii pr. 31, Moscow, 119991 Russia

^b National Research Center "Kurchatov Institute", Acad. Kurchatov sq., 1, Moscow 123182, Russia

*Corresponding author: E-mail: anna_egorysheva@rambler.ru.

Tel.: +7 495 633 85 46; fax: +7 495 954 12 79;

Postal address: Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Leninskii pr. 31, Moscow, 119991 Russia (A. Egorysheva)

Abstract

The detailed study of magnetic properties, including *dc* and *ac* measurements, has been carried out on the Bi-Cr-Sb-O pyrochlore. The region of pyrochlore phase existence was determined and photocatalytic properties have been also studied. We revealed that the Bi-Cr-Sb-O pyrochlore phase occurs along $\text{Bi}_{2-x}\text{Cr}_{1+x}\text{SbO}_7$ section within the region $x=0.1-0.4$. The Cr^{3+} ions oxidation state in Bi-Cr-Sb-O pyrochlore was confirmed by XANES spectra. The best Rietveld refinement results for $\text{Bi}_{1.8}\text{Cr}_{1.2}\text{SbO}_7$ composition were achieved for the disordered structure model (space group *Fd-3m*). According to the magnetic data $\text{Bi}_{1.8}\text{Cr}_{1.2}\text{SbO}_7$ is a highly frustrated pyrochlore with short-range antiferromagnetic exchange interactions between the nearest Cr^{3+} ions. At $T_g = 4$ K this compound undergoes spin-glass transition.

Keywords

Pyrochlore, homogeneity range, magnetic properties, spin-glass.

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