XPS AND MAGNETIC STUDIES OF $SmNi_4B$ COMPOUND

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9.7 cm

Our investigations show that the $SmNi_4B$ compound is ferromagnetic with the ordering temperature $T_C = 39$ K obtained from the temperature dependence of magnetization. Our measurements of the magnetic moment versus the external magnetic field yield an evidence of a very large coercive field, $H_C > 7.0$ T. The magnetic moment $\mu(SmNi_4B)$ equal to 0.32 μ_B/f.u. in $H = 9$ T is reduced in comparison with the free ion value ($\mu(Sm) = 0.71\ \mu_B$). The large H_C value is indicative of a significant anisotropy of this compound. X-ray photoemission spectroscopy shows that the valence band is well separated from the 4f peak. Between the Ni $2p_{1/2}$ and Ni $2p_{3/2}$ bands a satellite is visible, which may be related to the existence of a small magnetic moment on the Ni atoms. The measured hysteresis loop reveals no saturation of the magnetic moment in the applied magnetic field of 9 T.

13.4 cm

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