ELECTRONIC STRUCTURE AND TRANSPORT PROPERTIES OF UFe_2 SYSTEM

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9.7 cm

The electronic structure of UFe_2 compound has been studied by X-ray photoemission spectroscopy (XPS) and ab initio self-consistent tight binding linear muffin tin orbital (TB LMTO) method. This compound crystallizes in the cubic Laves phase. UFe_2 is a ferromagnet with T_c= 175 K and saturation magnetization M_s= 1.09 μ_B at T = 4.2 K [1]. The valence bands are compared with the calculated density of states. The uranium f electrons form a wide band with the centre of gravity lying above the Fermi level. The iron d- and uranium f electrons have the main contribution to the total density of electronic states at the Fermi level (2/3 and 1/3, respectively). Contrary to USi_3 [2,3] the uranium 6p electrons forms wider band which is located between 17.5 and 20 eV (for USi_3 1.5 and 19.4 eV) below the Fermi level. The transport properties will be analyzed based on temperature dependence of resistivity.

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[2] J.A. Morkowski, A. Szajek, A. Jezierski, Acta Phys. Slov. **46**, 109 (1996)
[3] J.A. Morkowski, A. Szajek, Acta Phys. Polon., **46**, 109 (1996)

13.4 cm

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