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Superconductivity in $YbGa_xSi_{2-x}$ with the AlB_2-type structure
N. TSUJII, M. IMAI, NIMS, Japan, H. YAMAOKA, RIKEN, H. OHASHI, NIMS, Japan, D. NOMOTO, SPring-8 Service Co., I. JARRIGE, Japan Atomic Energy Agency, T. TOCHIO, Keihanna Interaction Plaza Inc., K. HANDA, J. IDE, H. ATSUTA, Y. ITO, Inst. Chem. Res., Kyoto University, H. YOSHIKAWA, H. KITAZAWA, NIMS, Japan — The discovery of superconductivity in MgB_2 has triggered the search for novel superconductors with the AlB_2-type structure. Very recently, we discovered superconductivity in the AlB_2- type compound $YbGa_{1.15}Si_{0.85}$ below $T_C = 2.5$K *. We report here on the structural and electronic properties of the $YbGa_xSi_{2-x}$ series. XRD and SEM/EDS analysis suggested that the AlB_2-type phase can be sustained for $1.0 \leq x \leq 1.4$. T_C is found to decrease from 2.5K for $x = 1.0$ to 1.9K for $x = 1.3$ and eventually vanish for $x = 1.4$. High-resolution x-ray absorption spectra across the Yb-L_{III} edge were measured at SPring-8 on the beamline BL15XU. The valence of Yb was estimated to be 2.3+, suggesting a predominant Yb^{2+} character with minor importance of 4f electrons in the superconductivity.
* M. Imai et al., submitted.

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