

Itinerant-electron metamagnetism of magnetocaloric material RCo_2 and their borides

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The itinerant-electron metamagnetic transition of Co-based cubic Laves phase has been investigated theoretically and experimentally. In ErCo_2 , a discontinuous change of the temperature dependence of the magnetic susceptibility at $T_C = 46$ K due to the magnetic transition, which is accompanied by a large volume transition.¹ This result implies that the magnetic coupling is exclusively determined by the volume of the compound. In the present work, we investigate of the volume dependence of T_C and magnetocaloric effect of ErCo_2 by doping boron.

Several ErCo_2B_x compounds of $x < 0.2$ were prepared by arc melting in an argon gas atmosphere. The x-ray powder diffraction patterns of all the specimens identified as a cubic C15 Laves structure. The lattice parameter is increased by doping boron. On the other hand, The value of T_C is increased significantly to 64 K at $x = 0.07$.

¹R. Minakata, M. Shiga, Y. Nakamura, J. Phys. Soc. Jpn. **41**, 1435 (1976).