

The magnetic phase transitions in $R(\text{Co}, \text{Al})_2$ compounds (R: Dy, Ho, Er)

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Abstract: The type of the magnetic phase transition in the $R(\text{Co}_{1-x}\text{Al}_x)_2$ (R=Dy, Ho, Er) compounds is studied by means of magnetization, thermal-expansion and electrical-resistivity measurements. With increasing Al content, a change from a first-order to a second-order transition is observed, at $x \approx 0.075$, 0.075 and 0.025 for Er, Ho and Dy, respectively. An explanation is offered in terms of the Inoue-Shimizu model by introducing a concentration dependence of T_3 , the temperature at which $a_3(T)$ changes sign (a_3 is the coefficient of the M_d^4 -term in the expansion of the free energy of the d-subsystem). In fact, T_3 is taken proportional to T_m , the temperature at which the susceptibility of the corresponding $Y(\text{Co}, \text{Al})_2$ shows a maximum. ?? 1992.

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