

Magnetocaloric effects in RCo_2 compounds

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Abstract: Magnetisation isotherms were measured for a number of $(\text{R}, \text{R}')\text{Co}_2$ and $(\text{R}, \text{Y})\text{Co}_2$ ($\text{R}, \text{R}' =$ rare earths) compounds. A metamagnetic transition is observed just above the Curie temperature (T_C) of compounds having a first-order phase transition, i.e. ErCo_2 , HoCo_2 and $(\text{Dy}, \text{Y})\text{Co}_2$. The magnetic entropy change ΔS_m shows a largest value of -11.8 J/mol K at 35 K for ErCo_2 and it decreases exponentially with increasing temperature. The obtained thermal variation of ΔS_m is compared to that of RAl_2 and other intermetallic compounds. Giant magnetocaloric effects observed in RCo_2 -based compounds are discussed in terms of the $4f(\text{R})$ -localised spin, $3d(\text{Co})$ -spin fluctuations as well as nature of the phase transition. ?? 2002 Elsevier Science B.V. All rights reserved.

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