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Magnetic and Magnetocaloric Properties of $Y(\text{Co}_{1-x}\text{Fe}_x)_2$ ($x = 0.12-0.20$) and $\text{Lu}(\text{Co}_{0.84}\text{Fe}_{0.16})_2$ Compounds

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To clarify the nature of the anomalously high magnetocaloric effect at low temperatures in the RMe_2 Laves type phases with „non-magnetic“ rare-earth ions ($R = Y$ or Lu) and 3d elements of the Fe group ($Me = \text{Fe}, \text{Co}$), the $Y(\text{Co}_{1-x}\text{Fe}_x)_2$ ($x = 0.12-0.20$) and $\text{Lu}(\text{Co}_{0.84}\text{Fe}_{0.16})_2$ compositions have been synthesized and their magnetic and magnetocaloric properties were investigated (isothermal magnetic entropy change ΔS_m and adiabatic temperature change ΔT_{ad}). It has been established that the iron concentration increases and/or Y by Lu replacement with unchanged Co:Fe ratio gives rise in the energy of the $d-d$ exchange interaction, which is followed by an increase in the Curie temperature value as well as by the low-temperature anomaly shift on the $\Delta S_m(T)$ dependence to a higher temperatures range.

Keywords: magnetocaloric effect, adiabatic temperature change, magnetic moments, Laves phase, Curie temperature, mictomagnetism.