# Effects of iron substitution on the magnetic anisotropy of $YCo_4B$

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Abstract: The effects of iron substitution on the magnetization, the magnetic anisotropy, the spin-reorientation temperature, and the Curie temperature of $Y(Co_{1-x}Fe_x)_4B$ have been studied on the cobalt-rich side for x values below 0.4. Temperature-induced spin-reorientation phenomena may be observed in compounds with x values below 0.02 by inspecting the low-field magnetization curves of bulk polycrystalline samples and by observing the change in the easy direction in field-oriented powdered samples. The spin-reorientation temperature shifts from 145 K for $YCo_4B$ to higher values with increasing x and the phenomenon disappears for values larger than 0.03. By analyzing the magnetization curves of field-oriented powder samples, the magnetic anisotropy has been evaluated. The value for the first anisotropy constant $K_1$ at 4.2 K decreases in a nonlinear way with increasing x values and reaches a minimum around x=0.3.

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