

ORIGIN OF MAGNETIC ANISOTROPY OF $\text{Gd}_5\text{Si}_2\text{Ge}_2$ COMPOUND

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The second-order anisotropy constant K_2 in polycrystalline $\text{Gd}_5\text{Si}_2\text{Ge}_2$ giant magnetocaloric material was measured as a function of temperature by the modified singular point detection technique. Although the structural, electrical, thermal, magnetic and magnetocaloric properties of the $\text{Gd}_5\text{Si}_2\text{Ge}_2$ have been rather well investigated experimentally, magnetic anisotropy of this system is almost unknown. The singularity indicating the anisotropy field was determined analyzing ac susceptibility data taking into account several features of the magnetization curve. The temperature dependence of the anisotropy fields was measured from 4.2 K up to the Curie temperature. The observed relationship between $K_2(T)/K_2(0)$ and magnetization $M(T)/M(0)$ was explained assuming dipolar origin of magnetic anisotropy in $\text{Gd}_5\text{Si}_2\text{Ge}_2$.

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9.7 cm

13.4 cm

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