Abstract Submitted
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Magnetocrystalline anisotropy in single crystal $Gd_5Si_{2.7}Ge_{1.3}$ DAVID JILES, Wolfson Centre for Magnetics, Cardiff University, UK, RAVI HADIMANI, YEVGEN MELIKHOV, JOHN SNYDER — We have determined the magnetocrystalline anisotropy, easy and hard axes and the anisotropic constants for single crystal $Gd_5Si_{2.7}Ge_{1.3}$ using magnetization vs. angle of rotation and magnetization vs. magnetic field measurements carried out on a vibrating sample magnetometer (VSM). Magnetization was measured as a function of angle with an applied field of 0.12 MA/m (1500 Oe) in the 'ab', 'bc' and 'ca' planes with angles measured from the 'a', 'c' and 'c' axes respectively. It was determined from the measurements that the 'b' axis has the highest susceptibility and hence is the easy axis, while the 'a' and 'c' have lower and approximately equal susceptibilities and hence are the hard axes. The magnetic anisotropy energy E_{an} was calculated using $E = \mu_0 HM$. The first order uniaxial anisotropic constant K_1 was determined by fitting the E_{an} vs. θ curve to uniaxial anisotropy energy equation $E_{an} = K_1 \sin^2\theta$and was determined to be 1.451×10^4 J/m^3. This research is supported by the Royal Society under a Wolfson Research Merit Award.

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