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Magnetic and magnetoelastic properties of Ge-substituted cobalt ferrite NARESH RANVAH, IKENNA NLEBEDIM, Cardiff University, YEVGEN MELIKHOV, JOHN SNYDER, DAVID JILES, ANTHONY MOSES, PAUL WILLIAMS, Cardff University, WOLFSON CENTRE FOR MAGNETICS TEAM
— Research in past has shown chemical substitution of Fe^{3+} by trivalent ions (Cr^{3+}, Mn^{3+} and Ga^{3+}) to alter the properties of these materials, notably reducing Curie temperature and magnetic anisotropy, which lead to increase in permeability. The change in properties has been understood in terms of site preference of the dopant cation. The current study investigated the temperature dependence of magnetic and magnetoelastic properties of germanium substituted cobalt ferrite, $Co_{1-x}Ge_xFe_{2-2x}O_4$, over a temperature range of 10 – 400 K. Both magnetic hysteresis loops and magnetostriction loops have been measured for several selected compositions with $0 \leq x \leq 0.8$. At room temperature, saturation magnetization, magnetic anisotropy and magnetostriction were seen to decrease with increasing Ge-content. This new class of materials is therefore highly suitable for magnetic sensor and actuator applications in which the magnetic properties can be tailored to meet specific needs.

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