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Magnetism of MnGa-based nanostructures[1] PARASHU KHAREL, Nebraska Center for Materials and Nanoscience(NCMN) and Department of Physics and Astronomy, University of Nebraska, Lincoln, NE, 68588, YUNG HUH, NCMN and Department of Physics, South Dakota State University, Brookings, SD, 57007, VALLOPPILLY SHAH, NCMN,University of Nebraska, Lincoln, NE, 68588, RALPH SKOMSKI, DAVID SELLMYER, NCMN and Department of Physics and Astronomy University of Nebraska, Lincoln, NE, 68588 — Materials with high magnetic anisotropy and Curie temperature well above room temperature have potential for a range of applications including high-density recording, nonvolatile memory and permanent-magnet materials. Mn_yGa ($1 \leq y \leq 2$) is one such compounds that can be synthesized in the tetragonal $L1_0$ or $D0_{22}$ structures based on the value of y in Mn_yGa. Our experimental investigation of the rapidly quenched nanostructured ribbons shows that the material with y =1.2, 1.4 and 1.6 prefers the $L1_0$ structure and that with y =1.9 and 2.1 prefers $D0_{22}$ structure. We have found a maximum saturation magnetization of 88 emu/g in $Mn_{1.2}Ga$ which decreases monotonically to 50 emu/g as y reaches 2.1. Although both the $L1_0$ and $D0_{22}Mn_yGa$ samples show a high Curie temperature (T_c) well above room temperature, the value of T_c decreases almost linearly from 740 K for $Mn_{2.1}Ga$ to 550 K for $Mn_{1.2}Ga$. We will also discuss the effect of boron doping on the structural and magnetic properties of this material.

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