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Magnetic and Structural Properties in Non-Stoichiometric Gallium Deficient Ni_2MnGa_{1-x} Heusler Alloys IAN FERRALLI, ANTHONY RUFFINO, MICHAEL PIERCE, LINDA BARTON, Rochester Institute of Technology — Magnetic data show that off-stoichiometric gallium deficient Heusler alloys of the form Ni_2MnGa_{1-x} have martensite transition temperatures that increase strongly with x, while their ferromagnetic Curie temperatures remain nearly unchanged. The martensite transition approaches room temperature for $x = 0.13$. Within the tetragonal martensite phase, bulk magnetic properties depend strongly on stresses within the sample. These effects were investigated using post annealing, thermal cycling, and grinding. These treatments effect the bulk coercivity but do not move the transition temperatures. As the martensite forms, lattice elongations of $> 3\%$ are observed using XRD. Domain properties are reported, for both structural grains and magnetic ones, within the martensite phase, from optical and MFM imaging.

Linda Barton
Rochester Institute of Technology

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