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Magnetic and Transport Properties of Ni-Cr-Mn-Ga Heusler Alloys of Selected Compositions. HEATHER STATT, DR MAHMUD KHAN, Miami Univ — The phase transitions of selected Ni-Cr-Mn-Ga Heusler alloys were investigated by x-ray diffraction, magnetization, electrical resistivity, and SEM measurements. A total of six $Ni_{+x}Cr_{.15}Mn_yGa$ ($0.5 \leq x \leq 0.2$; $0.65 \leq y \leq 0.80$) samples were prepared where the Cr and Ga concentrations remained constant while the Ni and Mn concentrations were varied. All samples exhibited the first order martensitic phase transformation upon cooling from 400 K to lower temperatures. The compounds with Mn concentration $y<0.75$, exhibit a ferromagnetic transition, which is separate from the martensitic phase transition. For the compounds with $y>0.7$, the martensitic and ferromagnetic phase transitions are coupled and occur at the same temperature. In addition to these two phase transitions, the samples with $y<0.75$ exhibit the inter-martensitic phase transformation. In the vicinity of the martensitic phase transformation, a sharp drop in resistivity has been observed for all samples. The experimental results and discussion will be presented in detail.

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