# Magnetocaloric effect and physical properties of slowly cooled $NiMn_{1-x}Cr_xGe$ ($0.04 \leq x \leq 0.25$)

A. Szytuła,[1] S. Baran,[1] T. Jaworska-Gołąb,[1] M. Marzec,[1] A. Deptuch,[1] Yu. Tyvanchuk,[2] B. Penc,[1] A. Hoser,[3] A. Sivachenko,[4] V. Val'kov,[4] V. Dyakonov,[5] and H. Szymczak[5]

[1] *Institute of Physics, Jagiellonian University, Kraków, Poland*

[2] *Ivan Franko National University of Lviv, Lviv, Ukraine*

[3] *Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany*

[4] *Donetsk National Academy of Sciences of Ukraine, Donetsk, Ukraine*

[5] *Institute of Physics, Polish Academy of Sciences, Warszawa, Poland*

The compounds undergo a martensitic phase transition. The temperature of the structural phase transition significantly decreases with increasing x. AF helicoidal ordering with the propagation vector $\vec{k} = (k_x, 0, 0)$ for x = 0.04 and 0.11 and F one for x = 0.25 has been found. The sample with x = 0.18 shows a coexistence of a helicoidal AF structure and the F one below ~170 K while at higher temperatures the ferromagnetic ordering remains stable up to 362 K. Maximum entropy change (-$\Delta$S) increases with increasing Cr concentration from about 8 J/(kg K) at 90 kOe, found for x = 0.04 and 0.11 at the Nèel temperature, up to 29 J/(kg K) observed for x = 0.25 in cooling regime at the magnetostructural phase transition temperature.