Low-temperature Properties of $U_2Co_2InH_{1.9}$

Ladislav Havela[a], Khrystyna Miliyanchuk[a,b], Laura C. J. Pereira[c], and Eva Šantavá[d]

[a] Department of Condensed Matter Physics, Faculty of Mathematics and Physics, Charles University, Ke Karlovu 5, 121 16 Prague 2, Czech Republic
[b] Department of Inorganic Chemistry, Faculty of Chemistry, Ivan Franko National University of Lviv, Kyryla i Mefodiya 6, 79005 Lviv, Ukraine
[c] Departamento do Quimica, InstitutoTechnólogico e Nuclear/CFMC-UL, P-2686-953, Sacavém, Portugal
[d] Institute of Physics, Academy of Sciences of the Czech Republic, Na Slovance 2, 182 21 Prague 8, Czech Republic

Reprint requests to Prof. L. Havela. E-mail: havela@mag.mff.cuni.cz

Z. Naturforsch. **2007**, *62b,* 977 – 981; received April 5, 2007

Dedicated to Dr. Bernard Chevalier on the occasion of his 60th birthday

$U_2Co_2InH_{1.9}$, synthesized by high-pressure hydrogenation of U_2Co_2In, crystallizes in the tetragonal structure similar to the parent compound, expanded by 8.4 %. Although U_2Co_2In is a weak paramagnet, its hydride shows properties suggesting a proximity to the magnetic order. Its magnetic susceptibility exhibits a maximum at T = 2.4 K, ascribed to spin fluctuations. Magnetization at low temperatures goes through a metamagnetic transition between 2 – 3 T. The specific heat characteristics, with a pronounced upturn of C_p/T *vs.* T at low temperatures which can be fitted using an additional $-T^{1/2}$ term, resemble the behaviour of U_2Co_2Sn. The γ coefficient of the electronic specific heat, reaching 244 mJ mol^{-1} K^{-2}, is gradually suppressed by high magnetic fields.

Key words: Uranium, Hydrides, Magnetism