Low-temperature Properties of $\text{U}_2\text{Co}_2\text{InH}_{1.9}$

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, Instituto Tecnológico 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


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

$\text{U}_2\text{Co}_2\text{InH}_{1.9}$, synthesized by high-pressure hydrogenation of $\text{U}_2\text{Co}_2\text{In}$, crystallizes in the tetragonal structure similar to the parent compound, expanded by 8.4%. Although $\text{U}_2\text{Co}_2\text{In}$ 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 $\text{U}_2\text{Co}_2\text{Sn}$. The $\gamma$ 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