Antiferromagnetic Ordering in $GdRhIn_5$

Kazimierz Łątka[a], Roman Kmieć[b], Michał Rams[a], Andrzej W. Pacyna[b], Vasyl' I. Zaremba[c,d], and Rainer Pöttgen[d]

[a] Marian Smoluchowski Institute of Physics, Jagiellonian University, Reymonta 4, 30-059 Kraków/Poland
[b] Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences, Radzikowskiego 152, 31-342 Kraków/Poland
[c] Inorganic Chemistry Department, Ivan Franko National University of Lviv, Kyryla and Mephodiya Street 6, 79005 Lviv/Ukraine
[d] Institut für Anorganische und Analytische Chemie, Westfälische Wilhelms-Universität Münster, Corrensstraße 8, D-48149 Münster/Germany

Reprint requests to R. Pöttgen. E-mail: pottgen@uni-muenster.de

Z. Naturforsch. **59b,** 947 – 957 (2004); received May 17, 2004

Dedicated to Professor Kurt O. Klepp on the occasion of his 60th birthday

A polycrystalline sample of tetragonal $GdRhIn_5$ ($HoCoGa_5$ type, space group $P4/mmm$) was obtained by induction melting of the elements in a glassy carbon crucible in a water-cooled sample chamber and subsequent annealing at 670 K. X-ray powder data yielded the cell parameters $a = 460.65(7)$, $c = 743.52(12)$ pm. The magnetic and electronic properties of $GdRhIn_5$ have been studied by magnetic susceptibility, electrical resistivity, and ^{155}Gd Mössbauer spectroscopic measurements. Antiferromagnetic ordering is detected at 41.0(2) K. The results are discussed using a simple molecular field approximation.

Key words: Indide, Solid State Synthesis, Mössbauer Spectroscopy