Intermetallic Magnesium Compounds $RE_2Ni_2Mg_3$ (RE = Gd, Dy–Tm, Lu) with $Tb_2Ni_2Mg_3$-type Structure

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New intermetallic magnesium compounds $RE_2Ni_2Mg_3$ (RE = Gd, Dy–Tm, Lu) were synthesized from the elements by induction melting. They are isotypic with $Tb_2Ni_2Mg_3$. The structure of $Gd_2Ni_2Mg_3$ was refined from X-ray powder data: *Cmmm*, a = 398.7(1), b = 2121.9(7), c = 368.39(9) pm, R_B = 7.49 %, 3800 data points, 23 parameters. The $RE_2Ni_2Mg_3$ intermetallics are intergrowth variants of AlB_2- and CsCl-related slabs. $Gd_2Ni_2Mg_3$ is a Curie-Weiss paramagnet above 75 K with an experimental magnetic moment of μ_{eff} = 8.16(1) μ_B / Gd atom. Antiferromagnetic ordering sets in at T_N = 42.0(5) K.

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