

Ferromagnetic Ordering in the Thallide EuPdTl₂

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The new thallide EuPdTl₂, synthesized from the elements in a sealed tantalum tube in a high-frequency furnace, was investigated by X-ray diffraction on powders and single crystals: MgCuAl₂ type, *Cmcm*, *Z* = 4, *a* = 446.6(1), *b* = 1076.7(2), *c* = 812.0(2) pm, *wR*² = 0.0632, 336 *F*² values, 16 variables. The structure can be considered as an orthorhombically distorted, palladium-filled variant of the binary Zintl phase EuTl₂. The palladium and thallium atoms build up a three-dimensional [PdTl₂] polyanion with significant Pd–Tl (286 – 287 pm) and Tl–Tl (323 – 329 pm) interactions. The europium atoms fill distorted hexagonal channels of the [PdTl₂] polyanion. Susceptibility measurements show a magnetic moment of 7.46(5) μ_B /Eu atom, indicative of divalent europium. EuPdTl₂ is a soft ferromagnet with a Curie temperature of *T*_C = 12.5(5) K.

Key words: Thallide, Europium, Intermetallics, Crystal Chemistry, Magnetochemistry