Der $PrPS_4$-Strukturtyp und eine „aufgefüllte“ Variante: Die Verbindungen $TbPS_4$ und $LiEuPS_4$

The $PrPS_4$ Type Structure and a Filled Variant: The Compounds $TbPS_4$ and $LiEuPS_4$

Stefan Jörgens, Lirija Alili und Albrecht Mewis

Institut für Anorganische Chemie und Strukturchemie II, Heinrich-Heine-Universität, Universitätsstraße 1, D-40225 Düsseldorf, Germany

Sonderdruckanforderungen an Prof. Dr. A. Mewis. E-mail: Albrecht.Mewis@uni-duesseldorf.de

Z. Naturforsch. **60b,** 705 – 708 (2005); eingegangen am 13. April 2005

Colourless single crystals of $TbPS_4$ ($a = 10.696(2)$, $c = 19.053(4)$ Å) were obtained by reaction of the elements (750 °C; 30 h). The compound crystallizes with the $PrPS_4$ type structure ($I4_1/acd$; $Z = 16$). The structure consists of isolated PS_4 tetrahedra each surrounded by four Tb^{3+} cations. Both crystallographically different Tb^{3+} cations are coordinated by eight sulfur atoms which are part of four PS_4 tetrahedra. Orange single crystals of $LiEuPS_4$ ($a = 11.498(2)$, $c = 19.882(4)$ Å) were prepared by reaction of Eu and P with Li_2S_4 (700 °C; 20 h). The crystal structure corresponds to the $PrPS_4$ type, in which tubes running along [001] are occupied by Li atoms, which are surrounded by four S atoms in strongly distorted tetrahedra. LiS_4 and PS_4 tetrahedra are connected *via* common edges into alternating chains.

Key words: Thiophosphates, Rare-Earth metals, Lithium, Crystal Structures