

A New Ternary Arsenide LaNi_5As_3 : Preparation and Crystal Structure

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The title compound was prepared from the elements by arc-melting followed by annealing in silica tubes at 1070 K for 3 months. The orthorhombic structure of LaNi_5As_3 was solved and refined from X-ray single crystal data: space group $Pnma$, $a = 11.179(2)$, $b = 3.9133(5)$, $c = 24.443(3)$ Å, $Z = 8$, $R = 0.040$, $R_w = 0.039$ for 1045 unique reflections with $I > 2\sigma(I)$ and 110 parameters. It is a new structure type, which can be described by condensed units of trigonal prisms around the arsenic atoms linked together to infinite zigzag chains. The structural features of LaNi_5As_3 are discussed in comparison with some representatives of a large family of structures with a metal/non-metal ratio equal or close to 2:1.

Key words: Ternary Arsenides, Crystal Structure, Rare-Earth Compound