

# Palladium-Cadmium Ordering in $REPdCd$ ( $RE = La, Ce, Pr, Nd, Sm, Eu, Gd, Tb$ ) and Comparison with Isotypic Indium Compounds

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Ternary intermetallic compounds  $REPdCd$  ( $RE = La, Ce, Pr, Nd, Sm, Eu, Tb$ ) were synthesized by reaction of the elements in sealed tantalum tubes in a high-frequency furnace. All compounds were investigated by X-ray diffraction on powders. Those with  $RE = La, Ce, Pr, Nd, Sm,$  and  $Tb$  contain trivalent rare earth metals and they crystallize with the hexagonal  $ZrNiAl$  type structure.  $NdPdCd$  [ $a = 764.8(3), c = 401.3(2)$  pm] and  $TbPdCd$  [ $a = 756.5(2), c = 389.0(1)$  pm] are reported here for the first time as well as  $EuPdCd$ . The compounds with  $La, Ce, Pr,$  and  $Sm$  [J. Alloys Compd. **182**, 87 (1992)] are confirmed. The crystal structure of  $EuPdCd$  was refined from X-ray single crystal diffractometer data:  $TiNiSi$  type,  $Pnma$ ,  $a = 745.9(3), b = 439.8(2), c = 863.7(3)$  pm,  $wR2 = 0.0405$ , 683  $F^2$  values, and 20 variable parameters. The three-dimensional [PdCd] substructure consists of strongly puckered, orthorhombically distorted  $Pd_3Cd_3$  hexagons with Pd-Cd distances ranging from 283 to 285 pm. The europium atoms fill the cavities within the [PdCd] network. Chemical bonding in the series  $REPdCd$  and  $REPdIn$  is compared.