

Polymorphism in the Germanides *REPdGe* with the Heavy Rare Earth Elements

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Dedicated to Professor Gerhard Maas on the occasion of his 60th birthday

The structures of the equiatomic germanides *REPdGe* with the heavy rare earth elements have been reinvestigated with respect to palladium-germanium ordering. The samples were prepared by arc-melting of the elements followed by annealing procedures in sealed silica ampoules at different temperatures. The structures of YPdGe, HT-TbPdGe, LT-DyPdGe, HT-DyPdGe, LT-HoPdGe, HT-HoPdGe, ErPdGe, and TmPdGe, and of the new germanide LuPdGe, were refined from single crystal diffractometer data. LT-DyPdGe and LT-HoPdGe crystallize with the YPdSi-type structure, space group *Pmmn*. The other germanides crystallize with the non-centrosymmetric YbAuSn structure, space group *Imm2*. All structures are orthorhombically-distorted superstructure variants of AlB_2 , and they show strong intralayer Pd–Ge bonding within the ordered Pd₃Ge₃ hexagons. There is weak Pd–Ge and Pd–Pd interlayer bonding. The crystal chemical relationship between the different superstructures is discussed.

Key words: Intermetallics, Rare Earth, Germanides, Crystal Chemistry, Superstructure