

Structure Refinements of $REAuSn$ ($RE = Sm, Gd, Tm$)

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Well-shaped single crystals of the stannides $REAuSn$ ($RE = Sm, Gd, Tm$) were obtained from arc-melted ingots. The samples were investigated on the basis of X-ray powder and single crystal data: NdPtSb type, $P6_3mc$, $Z = 2$, $a = 467.3(1)$, $c = 748.9(2)$ pm, $wR2 = 0.0468$, BASF = 0.273(14), 273 F^2 values, 12 variables for $SmAuSn$, $a = 465.14(9)$, $c = 742.4(1)$ pm, $wR2 = 0.0686$, 265 F^2 values, 11 variables for $GdAuSn$, and MgAgAs type, $F\bar{4}3m$, $Z = 4$, $a = 658.54(9)$ pm, $wR2 = 0.0384$, 120 F^2 values, 5 variables for $TmAuSn$. The $[AuSn]$ networks in $SmAuSn$ and $GdAuSn$ are two-dimensional with intralayer Au–Sn distances of 278 and 277 pm in the slightly puckered Au_3Sn_3 hexagons, respectively. The interlayer Au–Sn distances of 308 and 302 pm are much longer. $TmAuSn$ has a network of corner-sharing $AuSn_{4/4}$ tetrahedra with Au–Sn distances of 285 pm. The thulium atoms fill octahedral sites formed by the tin atoms. The crystal chemistry of these $REAuSn$ stannides is briefly discussed.

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