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Three new ternary mixed lanthanum stannide/germanides have been synthesized and characterized in the course of a systematic study of the phase formation at the 3 : 5, 3 : 4 and 1 : 1 pseudo-binary sections of the ternary system La - Ge - Sn, *i. e.* a study of the 'coloring' in mixed tetrelides. The structures of the title compounds have been determined using single-crystal X-ray data, and the electronic structure was analyzed by means of simple electron counting rules and FP-LAPW band structure methods. Even a very minor substitution of Sn by Ge in the 3 : 5 stannide La_3Sn_5 already changes the structure from the Pu_3Pd_5 type of the binary stannide towards the Tl_4PbTe_3 type ($La_3Sn_{4.4}Ge_{0.6}$: tetragonal, space group $I4/mcm$, a = 861.35(10), c = 1211.48(13) pm, Z = 4, $R1$ = 0.0420). According to the anionic building blocks present, isolated $[Ge/Sn]^{4-}$ anions and heavily puckered 4.8^2 nets of three-bonded tin atoms (*i. e.* $[Sn_4]^{4-}$ Zintl ions), a small formal electron excess ($+9/-8$) occurs, which is also apparent from the position of the minimum in the calculated tDOS. In contrast, starting from the known binary stannide La_3Sn_4 (orthorhombic, space group $Cmcm$, Er_3Ge_4 structure type) a substitution of tin by germanium is possible without a change of the structure type up to the border composition $La_3Sn_{3.1}Ge_{0.9}$ (a = 448.61(5), b = 1170.68(14), c = 1556.0(2) pm, Z = 4, $R1$ = 0.0380). Germanium preferentially occupies the sites of the $[Ge/Sn]_3$ trimers, whereas the site of the square-planar coordinated Sn(3), which is stabilized by hypervalent bonding, is not populated by germanium. Taking the respective partial bonding into account, the Zintl electron count is also nearly exact ($+9/-8$). The new complex mixed tetrelide $La_9Sn_{6.7}Ge_{3.3}$ (tetragonal, space group $P4_2/ncm$, a = 1602.04(3), c = 1724.42(5) pm, Z = 8, $R1$ = 0.0706) exhibits nine crystallographically different tetrel positions, which are occupied by isolated Sn and Ge atoms, $[Sn/Ge]_2$ dumbbells, bent $[Sn_3]$ trimers, planar four-membered rings $[Ge_4]$, and planar six-membered rings $[M_6]$. In this compound, the electron count following the Zintl concept also reveals only a very small formal excess of electrons ($+54/-52$).

Key words: Lanthanum, Tetrelides, Stannides, Germanides, Band Structure Calculation