each for the other two compounds.

The ionic model proposed for the NaCl-type intermetallic compounds allows one to predict when solid solutions will exist and in which of the elements they will be rich. In the Sn-Te system, NaCl-type compounds rich in Te should be expected because in $Sn_{1-x}Te$ the valency of Te may be balanced by both Sn^{2+} and Sn^{4+} ions. It is unlikely, however, that NaCl-type Sn-Te compounds rich in Sn will exist. Similarly compounds of PbS, PbSe, and PbTe rich in the Group-VI element should be attainable, but not those rich in Pb. The high-pressure NaCl-type CdSe and CdTe phases[12] should not have solid solution ranges because of the single stable valences of the atoms involved. In the Sn-Sb system, solid solutions rich in either constituent should occur as has been reported.[8] Similarly, in the Sn-As system solid solutions rich in either consittuent are to be expected. Although Hägg and Hybinette[8] did not observe this at atmospheric pressure, we have found that compounds $Sn_{1+x}As$ and $Sn_{1-x}As$ can be made at high pressures and retained metastably at atmospheric pressure. However, they begin to revert to the $Sn_4As_3 + SnAs$ and $SnAs + As$ phases, respectively, within a few hours after release of pressure. A test for superconductivity on what was later realized to be a partially reverted specimen indicated that again in this system a decrease in n results in decrease in T_c.

The NaCl-type phases in the In-Te system must therefore also have In-rich phases.[6] Despite our earlier conclusion[1] to the contrary, such phases, to about $In_{1.15}Te$, do exist; they cannot be retained metastably very long, but[6] again for these, T_c decreases with decreasing n.

Finally, it is worth emphasizing that the NaCl-type structure has now been shown to be favorable to both semiconductivity and superconductivity. If the carrier concentration is high enough, the compound will be a superconductor. This should be true also for the compounds with the Sn_4As_3 structure and for another related structure, the Bi_2Te_3 structure. If it were possible to obtain, for example, a Ge_2Te_3 with the Bi_2Te_3 structure, it would be a superconductor and have a higher transition temperature than that of Ge_3Te_4.

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[10] Hägg and Hybinette (reference 8) reported that the compound Sn_3As_2 was actually the one that existed but had the Sn_4As structure. We have found that "Sn_3As_2" has two T_c's, $\sim\frac{1}{3}$ of the specimen at 3.6-3.5°K, $\sim\frac{2}{3}$ at 1.21-1.17°K. The powder photograph indicates that free Sn is present and the T_c's confirm the presence of Sn and Sn_4As_3 in the right proportions.

[11] For a discussion of the calculation of these n's, see reference 6.

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