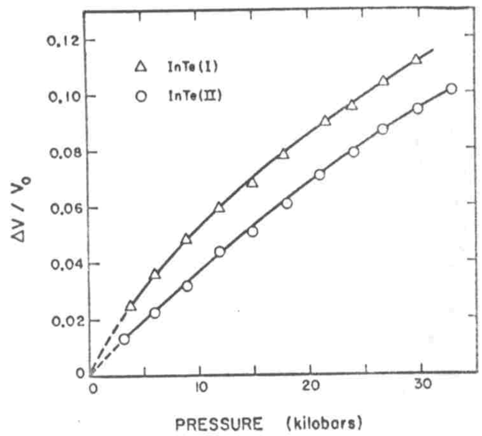

FIG. 4. Compression of InTe(I) and InTe(II) at 25°C.

powdered InTe(II). The lattice parameter a_0 calculated from the five smallest values of d_{hkl} is 6.177±0.002 Å at 25°C. This is in agreement with the lattice parameters reported by Banus *et al.*,[40] Sclar *et al.*,[41] and Geller *et al.*[43]

2. *Expansion Coefficient; Density*

The average coefficient of linear expansion between 25 and −196°C calculated from the different lattice constants at these temperatures is $22\pm2\times10^{-6}$ deg^{-1}. The density of InTe(II) calculated from a_0 in Table II is 6.83±0.01 g/cm^{-3}. The density measured pycnometrically is 6.68±0.06 g/cm^{-3}. The theoretical density of InTe(I) calculated from lattice constants given by Schubert *et al.*[44] is 6.34 g/cm^{-3}. Thus, the decrease in volume for the hypothetical case InTe(I) → InTe at 1-atm pressure and 25°C is 7.2%, much smaller than for InSb.

3. *Compressibility*

The relative volumes of InTe(I) and InTe(II) were determined up to 30-kbar pressure at 25°C. The compressibility of InTe(I) and InTe(II), calculated from the initial slopes (Fig. 4) is 6.3×10^{-6} and 3.8×10^{-6} bar^{-1}, respectively. Using the densities and compressions given above, then the volume decrease at the equilibrium pressure for the transition InTe → InTe(II) at 25°C should be about 5.5%. Use of this volume change and the slope (dT/dP) of the InTe(I) ⇄ InTe(II) transition given by Banus *et al.*[40] gives 0.4 kcal/mole for this transition at 25°C.

4. *Electrical Resistivity*

The electrical conductivity of the InTe(II) is metallic in behavior in contrast to that of InTe(I) which is a semiconductor. Figure 2 shows the resistance as a function of temperature at 1-atm pressure. In Te(II) has a somewhat lower temperature coefficient of resistance (77 to 300°K) than does copper. The electrical resistivity between 77 and 4.2°K is essentially constant. This is probably due to the impurity, InTe(I) since the samples for these measurements were made by direct conversion of InTe(I) to InTe(II). No pieces of InTe(II) large enough for electrical measurements by the 4-probe method could be obtained by using the liquid → InTe(II) method of synthesis.

5. *Magnetic Susceptibility*

The susceptibility of the tetragonal and cubic forms of indium telluride were measured by the Gouy balance technique. Both forms of indium telluride were diamagnetic. The susceptibilities of InTe(I) and InTe(II) are -0.22×10^{-6} and -0.14×10^{-6} emu/g. Borg *et al.*[45] reports a susceptibility of -0.17×10^{-6} emu/g for InTe(II) from nuclear magnetic resonance studies.

VII. CONCLUSION

A new family of artificial metals has been produced which should have most revealing properties.

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