

kbar. Thus, it is not surprising that this phase boundary has not been observed in the earlier work.

Minomura *et al.*¹⁵ observed a small peak in the resistance-vs-pressure curve of InSb at 80 kbar in measurements of the resistance to 170 kbar. It is unlikely that this peak results from the transition to the orthorhombic phase, since 80 kbar is substantially higher than the pressures at which the orthorhombic phase was observed by Kasper and Brandhorst, McWhan and Marezio, and by us. This resistance irregularity may indicate, therefore, the transition from the orthorhombic phase to InSb-III at room temperature, as shown by the dotted line in Fig. 3.

The existence of InSb-III explains a disagreement in the superconducting transition temperatures reported earlier for the high pressure indium antimonide-tin system. According to the measurements from this laboratory,¹⁹ T_c abruptly increases from 2.1°K to about 4°K on the addition of only a few atomic percent tin, then increases more gradually to a maximum of about

5°K at 50 at.% tin, and finally decreases to the value of 3.7°K for tin in the tetragonal structure. Tittman *et al.*,²⁰ however, reported a gradual monotonic increase in T_c from 2.1° to 3.7°K with increasing tin content. Since our specimens containing tin were prepared at 37 kbar by annealing above 315°C, they were solid solutions with the InSb-III structure, while the specimens of Tittman *et al.* probably had the InSb-II structure.

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¹⁹ M. D. Banus, S. N. Vernon, and H. C. Gatos, *J. Appl. Phys.* **36**, 864 (1965).

²⁰ B. R. Tittman, A. J. Darnell, H. E. Bömmel, and W. F. Libby, *Phys. Rev.* **135**, A1460 (1964).