

the Te solubility to $\text{In}_{0.80}\text{Te}$; previously we reported that it extends to $\text{In}_{0.82}\text{Te}$. The results of superconductivity tests on these specimens are given in Table 1.

The lattice constants of all specimens are listed in Table 1 and plotted vs. composition in Fig. 1.* On the In-rich side, there is practically no change in lattice constant with change in In concentration; this was one of the reasons we thought earlier that solid solution on the In-rich side did not exist. Further, although excess Te enhances the odd-index X-ray reflections, excess In does not appear to do so. In fact, careful examination now shows that although we can just see the {111} reflection of stoichiometric InTe, it can no longer be seen in the photograph of $\text{In}_{1.15}\text{Te}$. Also, the stability at atmospheric pressure of these phases is greater, the greater the Te content; on the In-rich side, the stability is markedly less than that of stoichiometric InTe. Superconductivity tests on the In-rich specimens which had already begun to revert

* A reconsideration of the plot of lattice constant vs. $1-x$ for the In_{1-x}Te phases⁽¹⁾ indicated that a straight line could be passed through the points for $x \geq 0.05$. This line extrapolates to $a = 6.175 \text{ \AA}$ for stoichiometric InTe (see Fig. 1). The back-reflection lines of the powder photograph of our original InTe were quite broad. We have since made a new specimen for which the back-reflection lines were much sharper and which gave $a = 6.177 \text{ \AA}$.

indicate that the composition tends to move toward the stoichiometric InTe with exsolution of In possibly containing dissolved Te.

Table 1. Superconducting transition temperature, T_c , and lattice constants, a , and carrier concentrations, n , for In_{1-x}Te and In_{1+x}Te compounds with NaCl-type structure

$1+x$	T_c (°K)	a (Å)	$n \times 10^{-22}/\text{cm}^3$
1.15	2.60-2.35	6.179 ± 0.005	1.34
1.10	2.80-2.55	6.182	1.45
1.05	3.41-2.95	6.181	1.58
1.015	3.51-3.25	6.178	1.67
1.00	3.45-3.20	6.177	1.71
$1-x$			
0.95	2.7-2.5	6.14 ± 0.01	1.47
0.91	2.04-1.87	6.110 ± 0.003	1.28
0.87	1.55-1.40	6.081	1.09
0.83	1.15-1.09	6.055	0.88
0.82	1.06-1.02	6.052	0.83
0.80		6.040	

The X-ray data on the In-rich compounds indicate that the excess In atoms replace Te atoms. If Te vacancies were to occur, the intensity of the {111} reflection should first decrease and at about

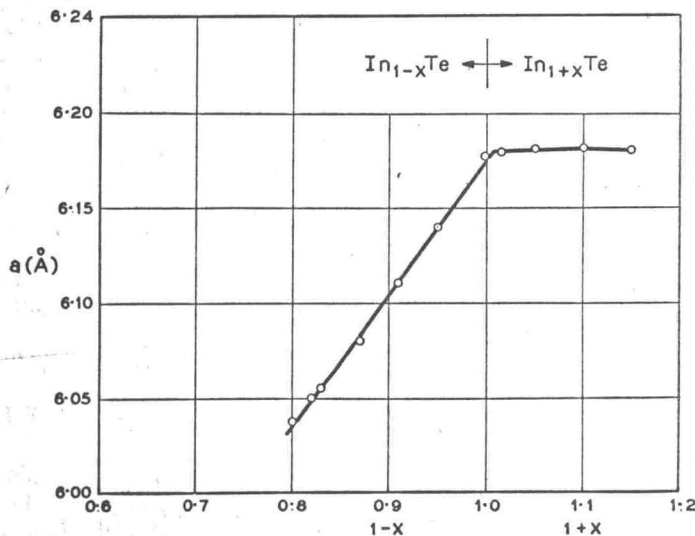


FIG. 1. Lattice constant vs. composition.

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