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In-Ti (Indium-Titanium)

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The In-Ti phase diagram in [Massalski2] was redrawn from [1987Mur]. The existence of In_4Ti_3 and $InTi_3$ was known.

Figure 1 shows the In-Ti phase diagram determined by [2003Gul] using differential thermal analysis, x-ray diffraction, and energy-dispersive x-ray analysis. The existence of $InTi_3$ was confirmed. The In_4Ti_3 phase with the Mn_2Hg_5 structure reported in [1987Mur] was found to be In_5Ti_2. In addition, two new phases with a narrow solubility range were found at 56 and 61.5 at.% Ti. As shown with dashed lines in Fig. 1, the liquidus boundaries and solubility limits of $\beta/\alpha InTi_3$, (βTi), and (αTi) are still uncertain.

In-Ti crystal structure data are shown in Table 1.

References

1987Mur: J.L. Murray, The In-Ti (Indium-Titanium) System, *Phase Diagrams of Binary Titanium Alloys,* J.L. Murray, Ed., ASM International, 1987, p 143-145

2003Gul: L.D. Gulay and J.C. Schster, Investigation of the Titanium-Indium System, *J. Alloys Compd.,* Vol 360, 2003, p 137-142

Table 1 In-Ti crystal structure data

Phase	Composition, at.% Ti	Pearson symbol	Space group	Strukturbericht designation	Prototype
(In)	0	*tI*2	*I*4/*mmm*	*A*6	In
In_5Ti_2	28.6	*tP*14	*P*4/*mbm*	…	Mn_2Hg_5
$InTi_{1+x}$	56	**P*4	…	…	$AuCu_3$ or PbO
In_5Ti_8	61.5	*cP**	$p\bar{4}3m$	…	γ-brass related
$\beta InTi_3$	66 to 76	…	…	…	…
$\alpha InTi_3$	67 to 75	*hP*8	$P6_3/mmc$	$D0_{19}$	Ni_3Sn
(βTi)	79 to 100	*cI*2	$Im\bar{3}m$	*A*2	W
(αTi)	90 to 100	*hP*2	$P6_3/mmc$	*A*3	Mg

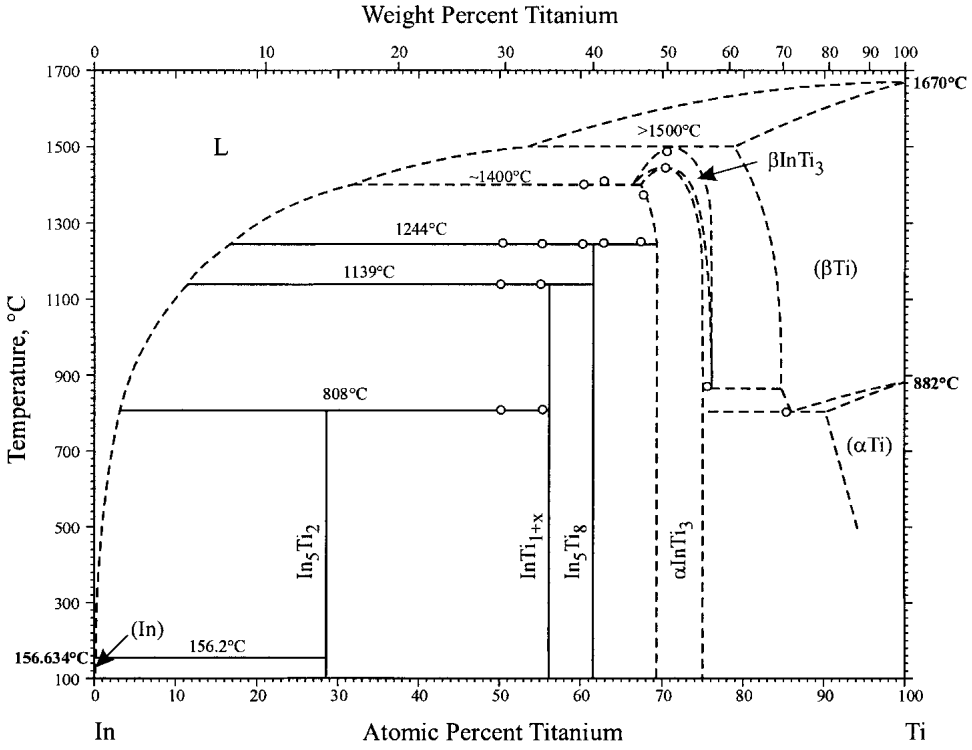

Fig. 1 In-Ti phase diagram