

Sn-Ti (Tin-Titanium)

H. Okamoto

The Sn-Ti phase diagram in [Massalski2] was redrawn from [1987Mur].

[1998Kup] discovered that a phase Sn_xTi exists at 40 at.% Ti, which was absent in the diagram of [1987Mur]. According to [1998Kup], this new phase is stable up to at least 700 °C but probably not above 770 °C.

[1998Kup] also reported that hexagonal $\beta\text{Sn}_5\text{Ti}_6$ is stable down to at least 670 °C and that $\alpha\text{Sn}_5\text{Ti}_6$ may or may not be stable below this temperature. The Sn_xTi phase found by [1998Kup] is Sn_3Ti_2 [2003Obr].

The Sn-Ti system was assessed thermodynamically by [2005Liu] and [2007Yin]. Solid lines in Fig. 1 show

Table 1 Sn-Ti crystal structure data

Phase	Composition, at.% Ti	Pearson symbol	Space group	Strukturbericht designation	Prototype
(β Sn)	0	<i>tI4</i>	<i>I4₁/amd</i>	<i>A5</i>	β Sn
(α Sn)	0	<i>cF8</i>	<i>Fd$\bar{3}m$</i>	<i>A4</i>	C (diamond)
Sn_3Ti_2	40	<i>oC*</i>	<i>Cmca</i>
$\beta\text{Sn}_5\text{Ti}_6$	54.5	<i>hP22</i>	<i>P6₃/mmc</i>
$\alpha\text{Sn}_5\text{Ti}_6$	54.5	<i>oI44</i>	<i>Immm</i>	...	Nb_6Sn_5
Sn_3Ti_5	62.5	<i>hP16</i>	<i>P6₃/mcm</i>	<i>D8₈</i>	Mn_5Si_3
SnTi_2	64.5-67.3	<i>hP6</i>	<i>P6₃/mmc</i>	<i>B8₂</i>	Ni_2In
SnTi_3	75-77.2	<i>hP8</i>	<i>P6₃/mmc</i>	<i>D0₁₉</i>	Ni_3Sn
(β Ti)	86.4-100	<i>cI2</i>	<i>Im$\bar{3}m$</i>	<i>A2</i>	W
(α Ti)	88.6-100	<i>hP2</i>	<i>P6₃/mmc</i>	<i>A3</i>	Mg

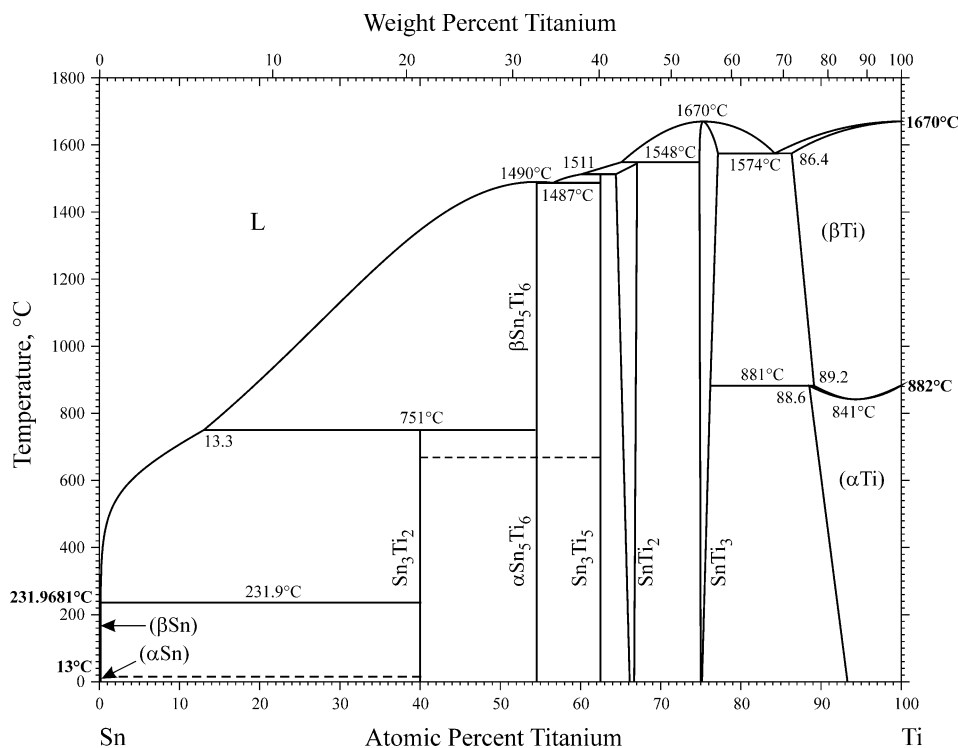


Fig. 1 Sn-Ti phase diagram

the Sn-Ti phase diagram calculated by [2007Yin]. The result obtained by [2005Liu] was similar, but the result of [2007Yin] agreed better with experimental phase boundary data.

Sn-Ti crystal structure data are summarized in Table 1.

References

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