

Sn-U (Tin-Uranium)

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The Sn-U phase diagram in [Massalski2] was redrawn from [87She]. The existence of three intermetallic compounds, Sn_3U , Sn_5U_3 , and Sn_2U_3 , was reported. This diagram was based almost exclusively on [45Tre].

Figure 1 is the Sn-U phase diagram revised by [95Pal] by means of DTA, XRD, metallography, and electron microscopy. The existence of Sn_3U was confirmed, but Sn_5U_3 and Sn_2U_3 were not found. Instead, four other phases were found for a total of five (Table 1). Sn_7U_3 and SnU were reported earlier by [83Sar]. However, Sn_5U_4 and Sn_3U_5 reported by [83Sar] were not found by [95Pal].

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

Cited References

- 45Tre:** D.A. Treick, J.H. Carter, A.I. Snow, R.R. Baldwin, and A.S. Wilson, U.S. Atomic Energy Comm., M-3107 (1945).
54Fro: B.R.T. Frost and J.T. Maskrey, *J. Inst. Met.*, 82, 171-180 (1954).
83Sar: C. Sari, F. Vernazza, and W. Muller, *J. Less-Common Met.*, 90, 304-310 (1983).
87She: R.I. Sheldon, E.M. Foltyn, and D.E. Peterson, *Bull. Alloy Phase Diagrams*, 8(4), 347-352 (1987).
95Pal: A. Palenzona and P. Manfrinetti, *J. Alloy. Compd.*, 221, 157-160 (1995).

Table 1 Sn-U Crystal Structure Data

Phase	Composition, at. % U	Pearson symbol	Space group	Strukturbericht designation	Prototype	Reference
(β Sn).....	0	<i>tI4</i>	$I4_1/amd$	A5	β Sn	...
(α Sn).....	0	<i>cF8</i>	$Fd\bar{3}m$	A4	C (diamond)	...
Sn_3U	25	<i>cP4</i>	$Pm\bar{3}m$	$L1_2$	AuCu_3	[54Fro]
Sn_7U_3	30	<i>oC20</i>	$Cmmm$	...	\text{Ce_3Sn_7	[95Pal]
Sn_2U	33.3	<i>oC12</i>	$Cmmm$	...	\text{Ga_2Zr	[95Pal]
SnU.....	50	<i>oP24</i>	$Pbcm$	...	InTh	[95Pal]
Sn_4U_5	55.5	<i>hP18</i>	$P6_3/mcm$	...	\text{Ti_5Ga_4	[95Pal]
(γ U).....	100	<i>cI2</i>	$Im\bar{3}m$	A2	W	...
(β U).....	100	<i>tP30</i>	PA_2/mnm	A_b	β U	...
(α U).....	100	<i>oC4</i>	$Cmcm$	A20	α U	...

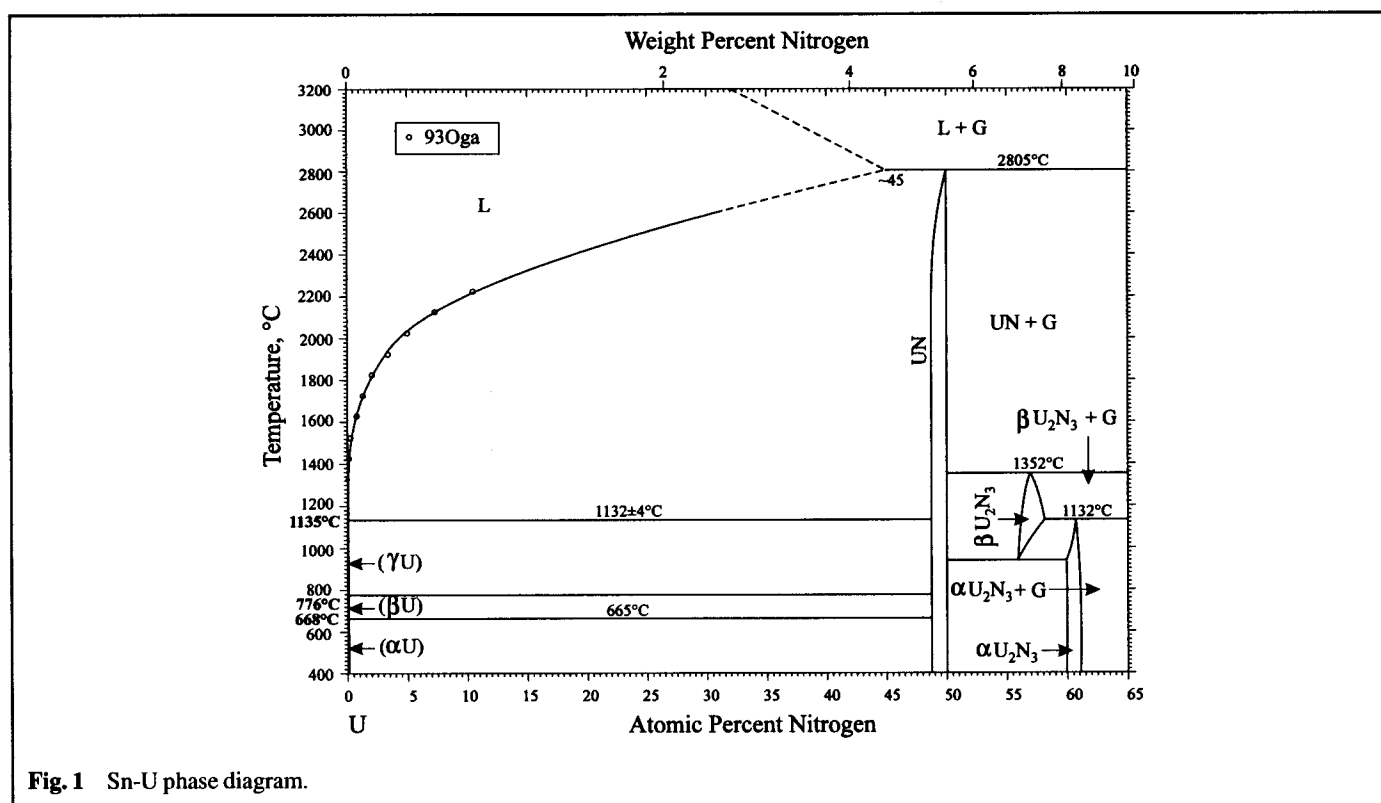


Fig. 1 Sn-U phase diagram.