

Co-Sn (Cobalt-Tin)

H. Okamoto

The Co-Sn phase diagram in [Massalski2] was adopted from [1991Ish]. [1993Oka] updated this phase diagram based on [1992Com].

The Co-Sn system was reassessed by [2004Jia], the same author's group as [1991Ish]. The reassessment is based on more recent experimental data including [1992Com] and [1996Lan]. The result is shown in Fig. 1. A new phase, CoSn_3 , found by [1996Lan] was added. However, a polymorphic transition in CoSn_3 is shown at 275 °C in Fig. 1 based on [1996Lan]. According to [2004Jia], an ordering phenomenon from β - to α - Co_3Sn_2 occurs in the temperature range between 563 and 568 °C. The Co-Sn crystal structure data are given in Table 1.

References

- 1991Ish:** K. Ishida and T. Nishizawa, The Co-Sn (Cobalt-Tin) System, *J. Phase Equilib.*, 1991, **12**(1), p 88-93
- 1992Com:** H. Comert and J.N. Pratt, Constitutional Studies of the Cobalt-Tin System, *Metall. Trans. A*, 1992, **23**, p 2401-2407
- 1993Oka:** H. Okamoto, Co-Sn (Cobalt-Tin), *J. Phase Equilib.*, 1993, **14**(3), p 396-397
- 1996Lan:** A. Lang and W. Jeitschko, Two New Phases in the System Cobalt-Tin: The Crystal Structures of α - and β - CoSn_3 , *Z. Metallkd.*, 1996, **87**(10), p 759-764
- 2004Jia:** M. Jiang, J. Sato, I. Ohnuma, R. Kainuma, and K. Ishida, A Thermodynamic Assessment of the Co-Sn System, *Calphad*, 2004, **28**, p 213-220

Table 1 Co-Sn crystal structure data

Phase	Composition, at.% Sn	Pearson symbol	Space group	Strukturbericht designation	Prototype
(α Co)	0-3	<i>cF4</i>	$Fm\bar{3}m$	A1	Cu
(ϵ Co)	0	<i>hP2</i>	$P6_3/mmc$	A3	Mg
$\beta\text{Co}_3\text{Sn}_2$	37-42	<i>hP4</i>	$P6_3/mmc$	$B8_1$	NiAs
$\alpha\text{Co}_3\text{Sn}_2$	40-42	<i>oP20</i>	$Pnma$...	Ni_3Sn_2
CoSn	50	<i>hP6</i>	$P6/mmm$	$B35$	CoSn
CoSn_2	66.7	<i>tI12</i>	$I4/mcm$	C16	Al_2Cu
βCoSn_3	75	<i>tI16</i>	$I4_1/acd$
αCoSn_3	75	<i>oC32</i>	$Cmca$...	PdSn_3
(β Sn)	100	<i>tI4</i>	$I4_1/amd$	A5	β Sn

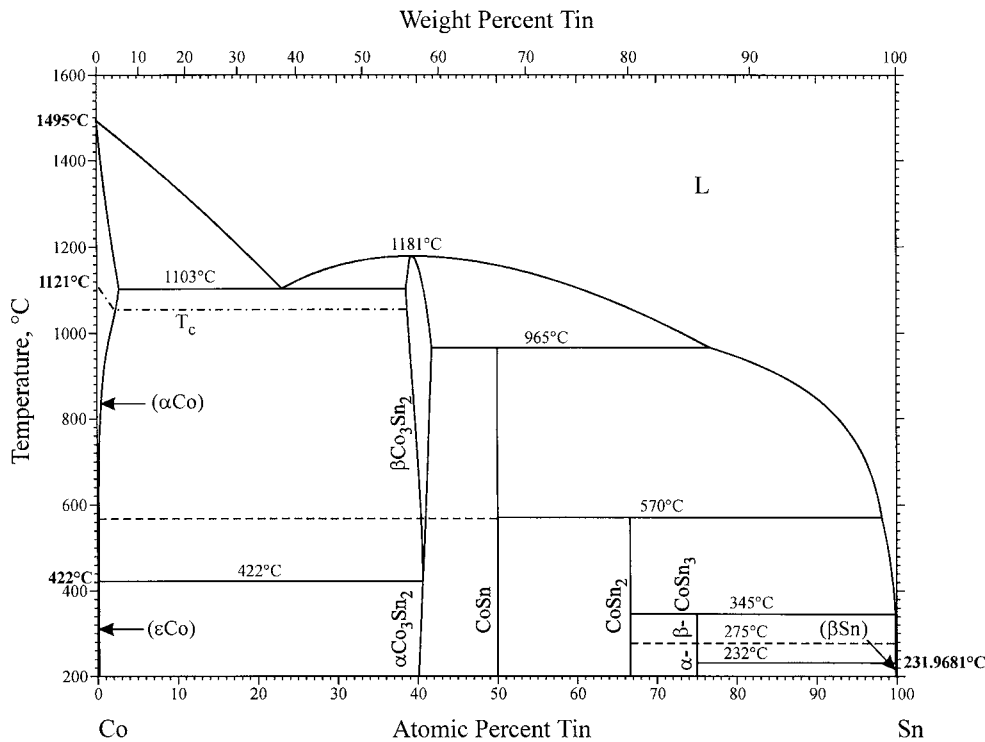


Fig. 1 CoSn phase diagram