

Ga-Na (Gallium-Sodium)

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The Ga-Na phase diagram in [Massalski2] was redrawn from [1990Pel].

Based on essentially the same phase boundary data as [1990Pel], [2007Wan] calculated the Ga-Na phase diagram, as shown in Fig. 1. The melting reaction of Ga₄Na was a congruent type in [1990Pel]. The peritectic type shown in Fig. 1 is likely because it requires a more symmetric peak in the liquidus boundary around Ga₃₉Na₂₂ [1991Oka]. The peak of the miscibility gap on the Na-rich side was estimated to be around 550 °C in [1990Pel], which is very much lower than the calculated value in Fig. 1. Experimental data are not available for confirmation of either value.

References

- 1990Pel:** A.D. Pelton and S. Larose, The Ga-Na (Gallium-Sodium) System, *Bull. Alloy Phase Diagrams*, 1990, **11**(4), p 347-353
- 1991Oka:** H. Okamoto and T.B. Massalski, Thermodynamically Improbable Phase Diagrams, *J. Phase Equilib.*, 1991, **12**(2), p 148-168
- 2007Wan:** J. Wang, W. Yuan, and M. Li, Thermodynamic Modeling of the Ga-Na System, *J. Cryst. Growth*, 2007, **307**, p 59-65

Table 1 Ga-Na crystal structure data

Phase	Composition, at.% Na	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Ga)	0	<i>oC8</i>	<i>Cmca</i>	<i>A11</i>	Ga
Ga ₄ Na	20	<i>tI10</i>	<i>I4/mmm</i>	<i>D1₃</i>	Al ₄ Ba
Ga ₃₉ Na ₂₂	36.1	<i>oP244</i>	<i>Pnma</i>
(βNa)	100	<i>cI2</i>	<i>Im$\bar{3}m$</i>	<i>A2</i>	W

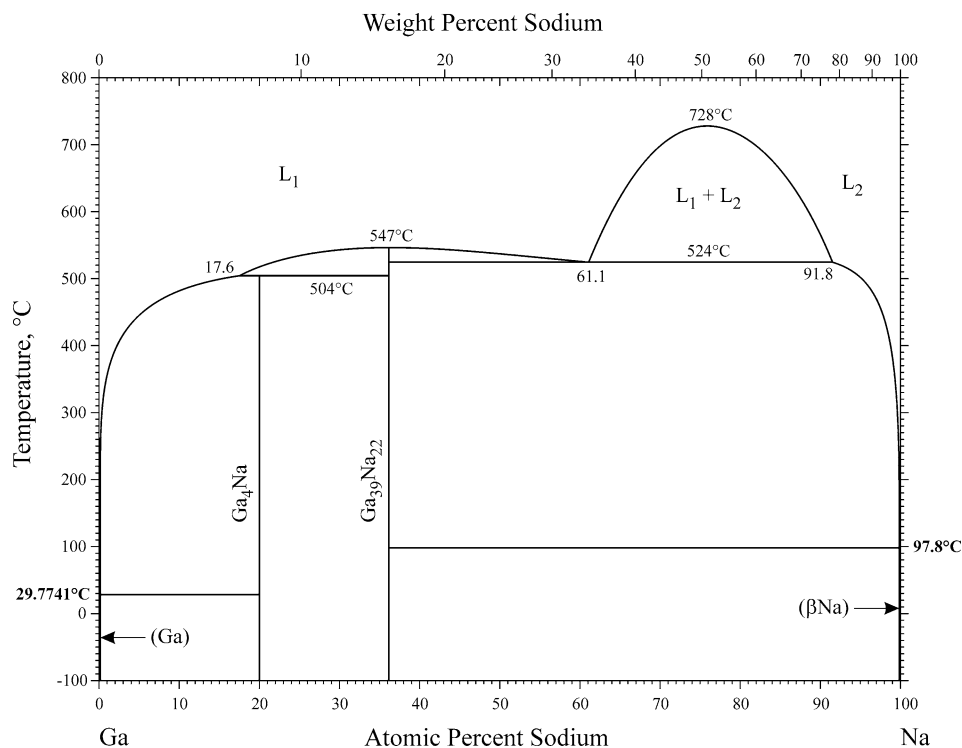


Fig. 1 Ga-Na phase diagram