

# Ga-Ni (Gallium-Nickel)

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The Ga-Ni phase diagram in [Massalski2] was assessed by [1991Lee].

Since then, the Ni-rich side of the phase diagram was investigated by [1999Ike] by means of electron probe microanalysis using heterophase alloys and more extensively by [2007Duc] by means of electron probe micro-

analysis using diffusion couples, differential scanning calorimetry, and X-ray diffraction. Because the topology of the phase diagram in the Ni-rich side was reported variously in the literature, [2007Duc] examined this region with special attention. Figure 1 shows the results of [2007Duc] for the Ni-rich side and [1991Lee] for the Ga-rich side of the Ga-Ni phase diagram.

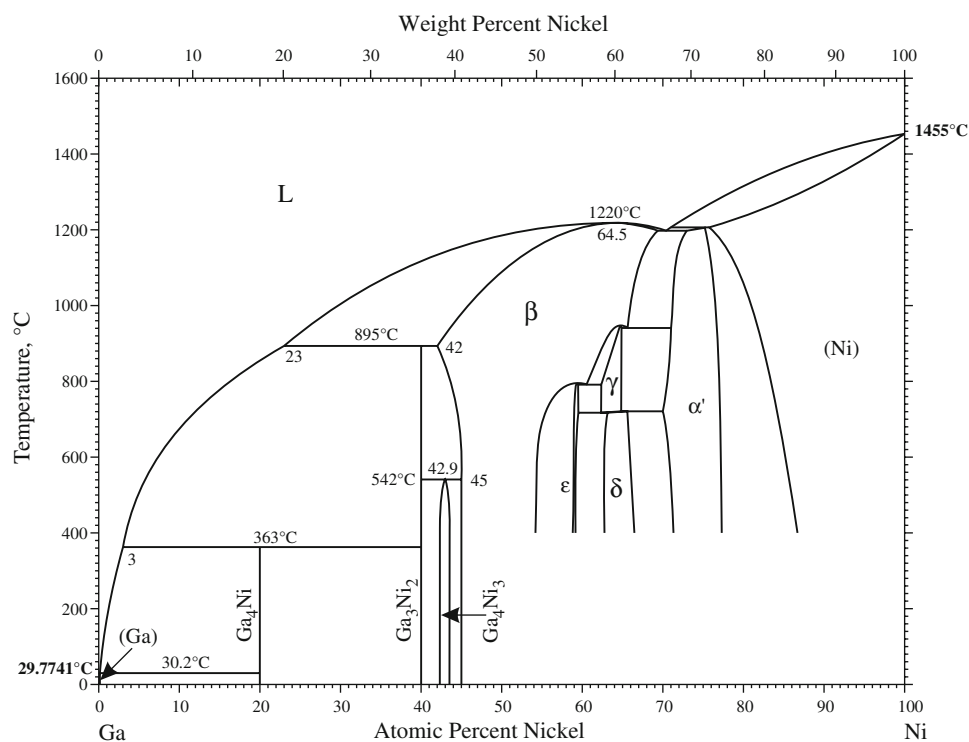
Table 1 shows Ga-Ni crystal structure data.

**Table 1** Ga-Ni crystal structure data

Phase	Composition, at.% Ni	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Ga)	0	<i>oC8</i>	<i>Cmca</i>	<i>A11</i>	Ga
Ga <sub>4</sub> Ni	20	<i>cI52</i>	<i>I43m</i>	<i>D8<sub>2</sub></i>	Cu <sub>5</sub> Zn <sub>8</sub>
Ga <sub>3</sub> Ni <sub>2</sub>	40	<i>hP5</i>	<i>P3m1</i>	<i>D5<sub>13</sub></i>	Al <sub>3</sub> Ni <sub>2</sub>
Ga <sub>4</sub> Ni <sub>3</sub>	42.4-43.4	<i>cI112</i>	<i>Ia3d</i>	...	...
β	42-69.4	<i>cP2</i>	<i>Pm3m</i>	<i>B2</i>	CsCl
ε	59-59.5	...	...	...	...
γ	62.5-65	<i>hP4</i>	<i>P6<sub>3</sub>/mmc</i>	<i>B8<sub>1</sub></i>	NiAs
δ	63-66.5	<i>oC16</i>	<i>Cmmm</i>	...	Ga <sub>3</sub> Pt <sub>5</sub>
α'	70-77	<i>cP4</i>	<i>Pm3m</i>	<i>L1<sub>2</sub></i>	AuCu <sub>3</sub>
(Ni)	75.7-100	<i>cF4</i>	<i>Fm3m</i>	<i>A1</i>	Cu

## References

- 1991Lee:** S.Y. Lee and P. Nash, Ga-Ni (Gallium-Nickel), *Phase Diagrams of Binary Nickel Alloys*, P. Nash, Ed., ASM International, Materials Park, OH, 1991, p 133-140
- 1999Ike:** T. Ikeda, Y. Nose, T. Korata, H. Numakura, and M. Koiwa, The Homogeneity Ranges of the L1<sub>2</sub>-type Intermetallic Compounds Ni<sub>3</sub>Ga and Ni<sub>3</sub>Ge, *J. Phase Equil.*, 1999, **20**(6), p 626-630
- 2007Duc:** R. Ducher, R. Kainuma, and K. Ishida, Phase Equilibria in the Ni-Rich Portion of the Ni-Ga Binary System, *Intermetallics*, 2007, **15**(2), p 148-153



**Fig. 1** Ga-Ni phase diagram