Ni-Re (Nickel-Rhenium)

H. Okamoto

Because the shape of the liquidus in the Ni-Re phase diagram in [Massalski2] was thermodynamically very unlikely, [1992Oka] calculated the phase diagram using more plausible thermodynamic parameters under the condition that the overall form of the phase diagram is similar to that reported in [Massalski2]. The result is shown with dashed lines in Fig. 1.

Recently [2007Sai] determined the (Ni) solvus and (Re) solvus by measuring the compositions of specimens equilibrated at various temperatures. The results agreed well with data of [1994Neu] and [2003Nar] determined earlier by diffusion couple measurements. The approximate positions of the solvus curves observed by these three investigations are shown with solid lines in Fig. 1. The experimental (Ni) solvus is located around the calculated line. However, the solubility of Ni in (Re) is much greater than the predicted value. For further improvement of the Ni-Re phase diagram,

experimental data are needed for the liquidus and solidus also.

References

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- 2007Sai:** S. Saito, K. Kurokawa, S. Hayashi, T. Takashima, and T. Narita, Tie-Lined Compositions of the γ and σ Phases in a Ternary Re-Cr-Ni System at 1423K, *Nippon Kinzoku Gakkaishi*, 2007, **71**(8), p 608-614, in Japanese

Fig. 1 Ni-Re phase diagram