Phase Diagram Evaluations

The *Journal* contains provisional evaluated phase diagrams (together with associated data) of systems that are of principal interest to those in metallurgy and metals-related fields, including metal-metal, metal-metalloid, and metal-gas systems; the various forms of presentation can include pressure-temperature, metastable, and multicomponent diagrams.

All evaluations are contributed to the *Journal* by Category Editors, Contributing Editors, and their co-investigators. To enhance the value of the list of references accompanying each evaluation, the editors are providing some additional specific information in parentheses following each reference. These annotations will include indication of: (a) key papers, by an asterisk placed in front of the reference designation (*e.g.,* *1983Abc); (b) nature of the data available (*i.e.,* Equilibrium Diagram, Metastable Phases, Crystal Structure, Thermodynamics, and Pressure); (c) document classification (*i.e.,* Experimental, Theory, Review, or Compilation); and (d) presence of an accepted phase diagram, or portion of one, by a number sign (#) at the end of the annotation. References frequently cited in evaluations that follow are cited by author name rather than by number; these general references are listed below.

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Addendum

Ternary and Higher Order Aluminum Phase Diagram Updates

Ternary aluminum phase diagrams were compiled by ASM International (*Handbook of Ternary Alloy Phase Diagrams,* P. Villars, A. Prince, and H. Okamoto, Ed., Volumes 3-4) and by VCH Verlagsgesellschaft, Germany (*Ternary Alloys,* G. Petzow and G. Effenberg, Ed., Volumes 3-8). They cover the period from 1900 to 1990. A large number of new publications have appeared in the literature in the last 15 years. It is the purpose of this Addendum to review briefly the new information, using as the starting point either the data compiled in the ASM volumes or any other later evaluation.

Many of the phase equilibrium studies of Al-Ni-X and Al-Ni-X_1-X_2 systems have been in the Ni-rich region, due to the technological importance of the nickel aluminides. The nickel aluminide NiAl (β) has a low density, high melting temperature, and excellent oxidation resistance. Ni_3Al (γ') has the unusual property of increasing strength with increasing temperature. In order to improve the other properties of nickel aluminides such as creep resistance and room-temperature ductility, various additions are made to Al-Ni alloys and the corresponding phase diagrams have attracted a great deal of attention in recent years. Another significant development is the recent discovery of quasi-crystalline structures in the Al-rich region. This issue carries updates on eleven Al-Ni-X (X: As, B, C, Fe, Hf, Mn, Pt, Re, Ru, Si, or Zr) ternary systems and on Al-Cr-Ni-Re, Al-Cr-Ni-Ru, Al-Ir-Nb-Ni, and Al-Nb-Ni-V quaternary systems. Updates on Al-Ni-X (X: Co, Cr, Cu, La, Mo, Nb, Nd, Ta, Ti, V) and Al-Co-Cr-Ni, Al-Co-Ni-Ti, Al-Cr-Mo-Ni, Al-Cr-Ni-Ta, Al-Cr-Ni-Ti, Al-Cr-Ni-W, Al-Cu-Ni-Ti, Al-Mn-Ni-Ti, Al-Mo-Ni-Ta, Al-Nb-Ni-Ti, Al-Ni-Ta-V, and Al-Ni-Ti-V systems have appeared in the earlier issues of this journal.

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Editor
Phase Diagrams of Ternary Iron Alloys
Parts 1, 2, 3, 5, and 6