



Phase diagrams have been used by materials scientists and engineers in the development of new alloy compositions, phases, and processing and fabrication techniques. The diagrams basically provide graphical presentation of thermodynamic possibility for alloy phases and their compositions at given temperature and external pressure. As such, the diagrams provide road maps for alloy design and development. Although the diagrams do not provide kinetics and rate information, they do provide powerful tools to predict phases and compositions that are thermodynamically permissible—those phases that can be achieved under proper processing conditions. In many cases, phase diagrams also provide insight into the possibility of forming metastable or transitional states. For example, phase diagrams can be used to predict metastable phases that may form in the absence of the stable phases. As such, phase diagrams combined with kinetics information have become an indispensable tool for materials designers.

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