Mn-Zr (Manganese-Zirconium)

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In the Mn-Zr phase diagram compiled by [Massalski2], the Mn_2Zr phase was shown with a congruent melting point at ~1350 °C and a constant solubility range from 21 to 36 at.% Zr below ~1150 °C. No other intermetallic phases have been reported.

[97Kod] reinvestigated the width of the Mn_2Zr phase field by measuring the chemical composition dependence of the powder XRD-profile halfwidth of twenty-seven specimens with compositions ranging from $Mn_{3.59}Zr$ (21.8 at.% Zr) to $Mn_{0.98}Zr$ (50.5 at.% Zr). These specimens had been homogenized for 5 h at 800, 1000, or 1250 °C and furnace cooled. The result indicated that the range of the Mn_2Zr phase field extends from $Mn_{2.9}Zr$ (25.6 at.% Zr) to $Mn_{1.9}Zr$ (34.4 at.% Zr) regardless of the preceding heat treatment. Because the width of a single phase field generally decreases as the temperature decreases, the observed range appears to represent the equilibrium boundaries at a temperature below 800 °C.

In addition, [97Kod] reported the possible existence of a new intermetallic compound MnZr based on unidentified peaks observed in powder XRD patterns. [97Kod] speculated that MnZr is stable at high temperatures and unstable at room temperature.

Figure 1 is the Mn-Zr phase diagram of [Massalski2] modified by this editor based on the information given by [97Kod], as above. Apparently, further investigations are needed particularly in regard to the equilibrium phase relationships of the MnZr phase.

Cited Reference

97Kod: T. Kodama, *J. Alloy. Compd.*, *256*, 263-268 (1997).

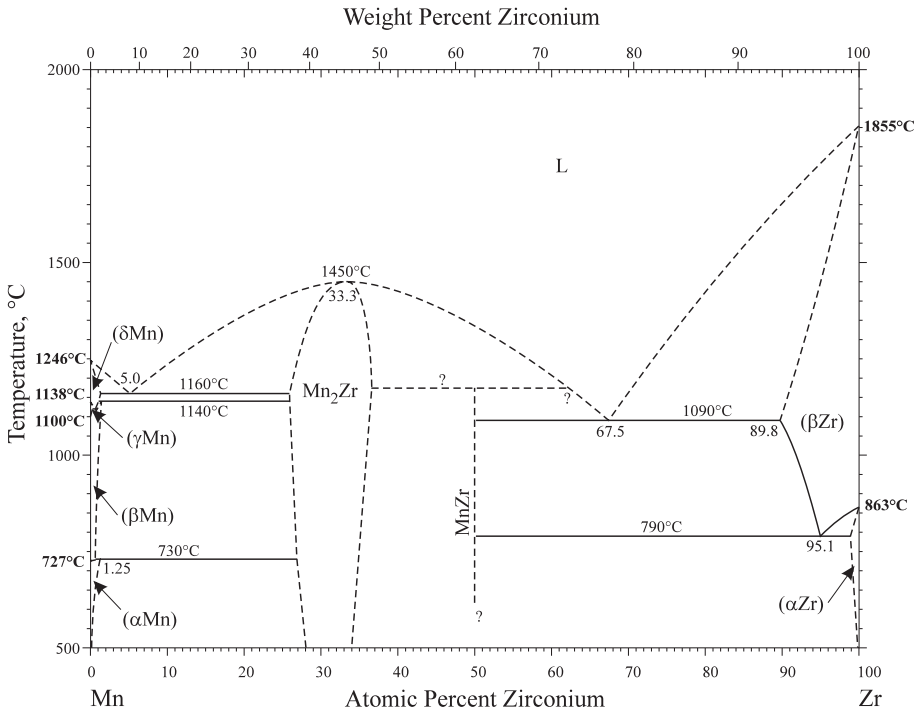

Fig. 1 The Mn-Zr phase diagram.