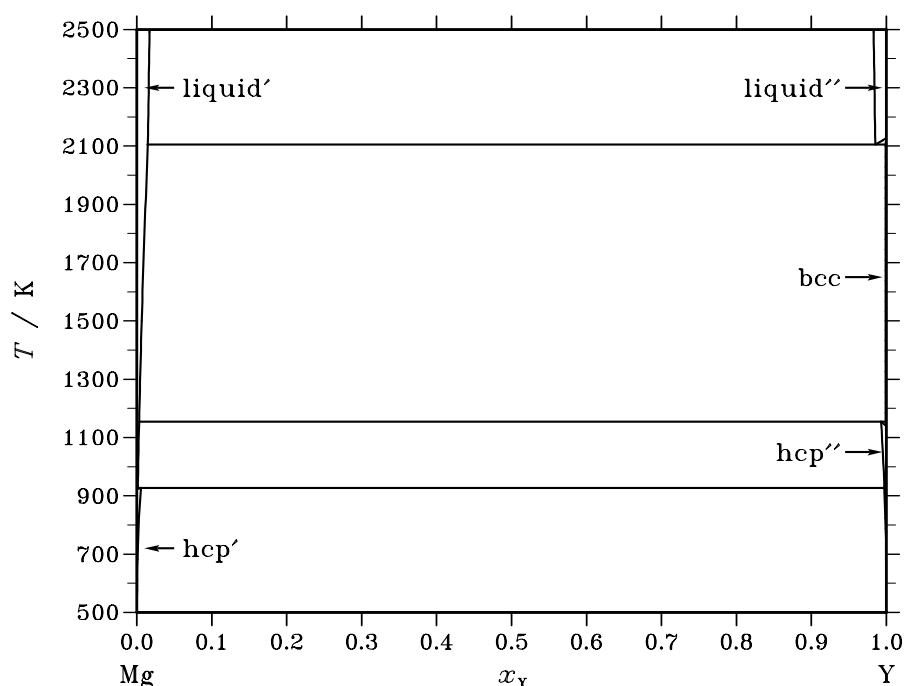


Mg – Zr (Magnesium – Zirconium)**Fig. 1.** Calculated phase diagram for the system Mg-Zr.

Small amounts of zirconium are frequently added to magnesium alloys for grain refining. The Mg-Zr binary system is characterised by miscibility gaps in the solid as well as in the liquid state. The experimental information is reviewed by Nayeb-Hashemi and Clark [85Nay]. The accepted assessment which is in good agreement with the available experimental phase diagram data is taken from Hämäläinen and Zeng [98Ham]. The solubility of Zr in solid Mg is small and is calculated to be 0.57 at.% Zr at the peritectic point. The corresponding concentration in the liquid is 0.12 at.% Zr. The solubility of Mg in solid Zr is negligible.

Table I. Phases, structures and models.

Phase	Strukturbericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	(Mg,Zr) ₁
hcp	A3	Mg	<i>hP2</i>	<i>P6₃/mmc</i>	HCP_A3	(Mg,Zr) ₁
bcc	A2	W	<i>cI2</i>	<i>Im$\bar{3}m$</i>	BCC_A2	(Mg,Zr) ₁

Table II. Invariant reactions.

Reaction	Type	T / K	Compositions / x_{Zr}			$\Delta_r H / (\text{J/mol})$
liquid'' \rightleftharpoons liquid' + bcc	monotectic	2104.8	0.000	1.000	1.000	–20746
liquid' + bcc \rightleftharpoons hcp''	peritectic	1154.6	0.003	0.999	0.993	–3727
liquid' + hcp'' \rightleftharpoons hcp'	peritectic	926.6	0.001	0.997	0.006	–8255

References

- [85Nay] A.A. Nayeb-Hashemi, J.B. Clark: Bull. Alloy Phase Diagrams **6** (1985) 246–250.
[98Ham] M. Härmäläinen, K. Zeng: Calphad **22** (1998) 375–380.