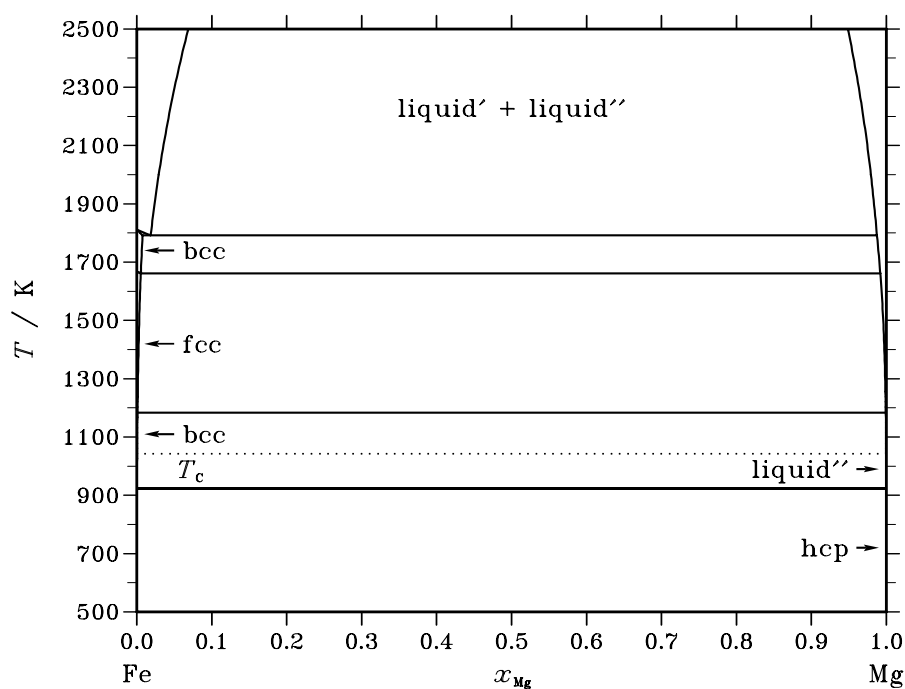


Fe – Mg (Iron – Magnesium)**Fig. 1.** Calculated phase diagram for the system Fe-Mg.

The phase diagram for the Fe-Mg system is not well defined by experiment partly because of the high vapour pressures of Mg associated with equilibria at high temperatures. The experimental data for the system have been reviewed by Nayeb-Hashemi *et al.* [85Nay, 88Nay] who also provided assessed parameter values for all the phases in the system. The phase diagram for the system is dominated by a wide region of immiscibility in the liquid phase. The solubility of Mg in fcc and bcc Fe and also of Fe in hcp Mg is low and not particularly well defined. Experimental thermodynamic data for the Fe-rich liquid phase have been analysed more recently by Tarby [93Tar]. The dataset adopted by SGTE was derived by Tibballs [98Tib].

Table I. Phases, structures and models.

Phase	Strukturbericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	(Fe,Mg) ₁
bcc	A2	W	<i>cI2</i>	<i>Im$\bar{3}m$</i>	BCC_A2	(Fe,Mg) ₁
fcc	A1	Cu	<i>cF4</i>	<i>Fm$\bar{3}m$</i>	FCC_A1	(Fe,Mg) ₁
hcp	A3	Mg	<i>hP2</i>	<i>P6₃/mmc</i>	HCP_A3	(Fe,Mg) ₁

Table II. Invariant reactions.

Reaction	Type	T / K	Compositions / x_{Mg}			$\Delta_r H / (J/mol)$
liquid \rightleftharpoons bcc + liquid	monotectic	1791.4	0.018	0.008	0.987	−14060
bcc \rightleftharpoons fcc + liquid	metatectic	1661.6	0.005	0.005	0.992	−839
fcc \rightleftharpoons bcc + liquid	metatectic	1183.4	0.001	0.001	0.999	−1022
liquid \rightleftharpoons bcc + hcp	eutectic	922.9	1.000	0.000	1.000	−8482

References

- [85Nay] A.A. Nayeb-Hashemi, J.B. Clark, L.J. Swartzendruber: Bull. Alloy Phase Diagrams **6** (1985) 235–238.
- [88Nay] A.A. Nayeb-Hashemi, J.B. Clark in: Phase Diagrams of Binary Magnesium Alloys, ASM Internatl., Metals Park, Ohio USA, 1988, pp. 118–121.
- [93Tar] S.K. Tarby: Metall. Trans. B **24B** (1993) 909–910.
- [98Tib] J. Tibballs in: I. Ansara, A.T. Dinsdale, M.H. Rand (eds.): COST 507, “Thermochemical database for light metal alloys”, Vol. 2, EUR 18499, 1998, 195–196.