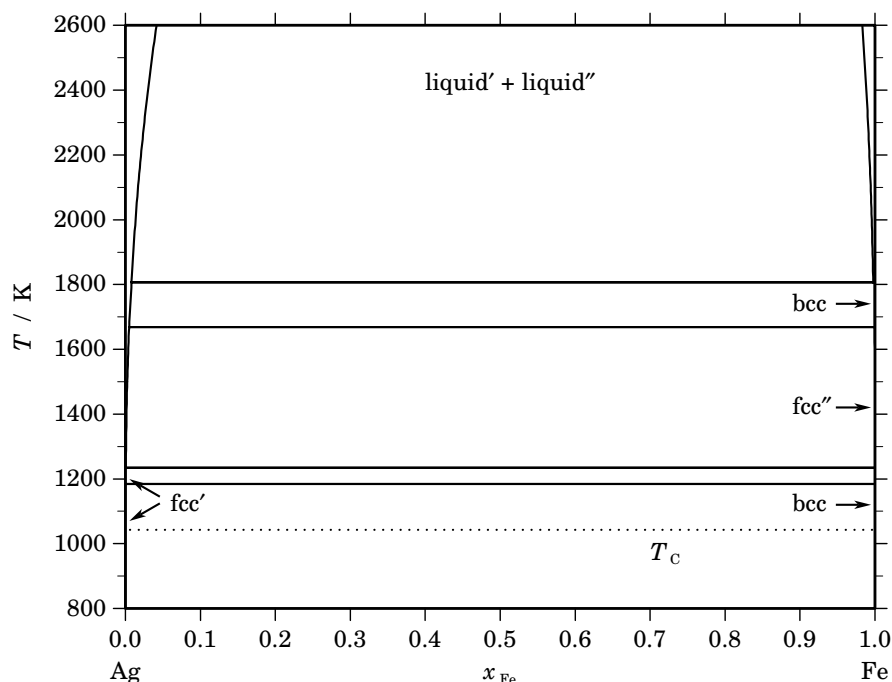


Ag – Fe (Silver – Iron)**Fig. 1.** Calculated phase diagram for the system Ag-Fe.

The Ag-Fe system has been reviewed in [1984Swa] and a critical thermodynamic assessment has been done by Korb [2004Kor]. The equilibrium phases of the Ag-Fe system are the liquid, the bcc solid solution based on low-temperature α -Fe as well as high-temperature δ -Fe, and the fcc phase with a large miscibility gap between the Ag- and γ -Fe-based terminal solutions. The mutual solubility of Ag and Fe is indeed very low in both the solid and the liquid state. According to [1973Wri] the solubility of Ag in solid γ -Fe reaches a maximum of approximately 0.022 at.% at 1671 K. Data on the Fe-rich side for the solubility of Ag in the fcc phase were taken from [1973Wri]. On the Ag-rich side, the data of [1969Ber] were used for the solubility of Fe between 923 and 1185 K. The assessed phase diagram is based on the results of [1930Tam, 1955Chi, 1958Gib].

Table I. Phases, structures and models.

Phase	Struktur-bericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	(Ag,Fe) ₁
fcc	A1	Cu	<i>cF4</i>	<i>Fm$\bar{3}m$</i>	FCC_A1	(Ag,Fe) ₁
bcc	A2	W	<i>cI2</i>	<i>Im$\bar{3}m$</i>	BCC_A2	(Ag,Fe) ₁

Table II. Invariant reactions.

Reaction	Type	<i>T</i> / K	Compositions / <i>x</i> _{Fe}			$\Delta_r H$ / (J/mol)
liquid'' \rightleftharpoons liquid' + bcc	monotectic	1807.3	0.998	0.008	1.000	−13929
liquid' + bcc \rightleftharpoons fcc''	peritectic	1668.9	0.005	1.000	1.000	−825
liquid' \rightleftharpoons fcc' + fcc''	eutectic	1234.6	0.001	0.000	1.000	−11330
fcc'' \rightleftharpoons fcc' + bcc	eutectoid	1184.7	1.000	0.000	1.000	−1014

References

- [1930Tam] G. Tamman, W. Oelsen: *Z. Anorg. Chem.* **186** (1930) 277–279.
[1955Chi] J. Chipman, T.P. Floridis: *Acta Metall.* **3** (1955) 456–459.
[1958Gib] W.S. Gibson, W. Hume-Rothery: *J. Iron Steel Inst.* **189** (1958) 243–250.
[1969Ber] J. Bernardini, A. Combe-Brun, J. Cabane: *C.R. Hebd. Séances Acad. Sci.* **269** (1969) 287–289.
[1973Wri] H.A. Wriedt, W.B. Morrison, W.E. Cole: *Metall. Trans.* **4** (1973) 1453–1456.
[1984Swa] L.J. Swartzendruber: *Bull. Alloy Phase Diagrams* **5** (1984) 560–564.
[2004Kor] J. Korb, unpublished assessment, GTT-Technologies, 2004.