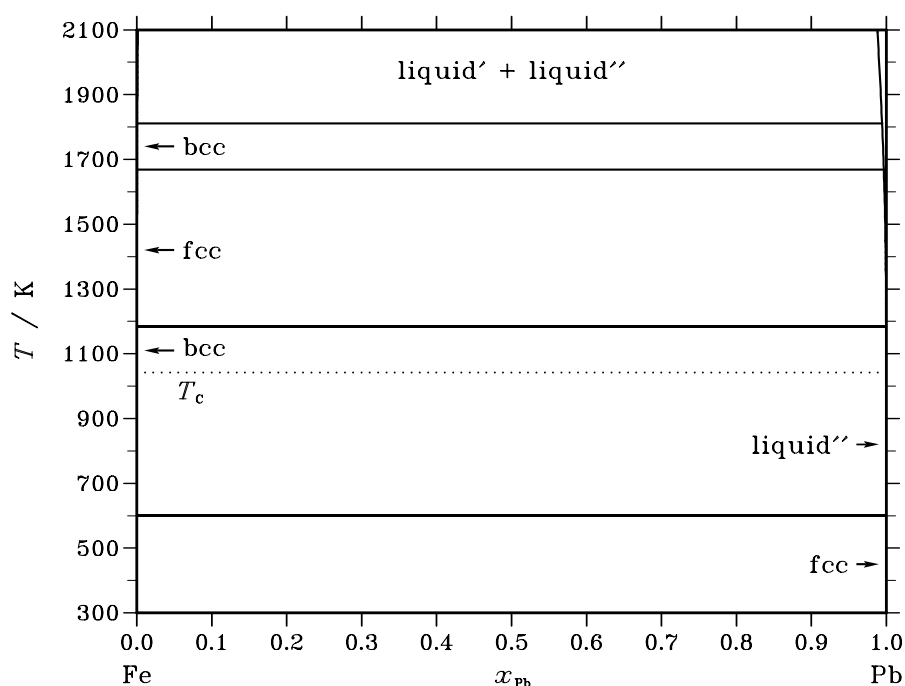


Fe – Pb (Iron – Lead)**Fig. 1.** Calculated phase diagram for the system Fe-Pb.

The phase diagram for the Fe-Pb system is dominated by a miscibility gap in the liquid phase and extremely low mutual solubility of the elements in the crystalline phases. There is very limited experimental data indicating the extent of the region of immiscibility and these are rather scattered. There seems to be some consensus that in the region of the melting point of Fe the solubility of Pb in the liquid is about 0.05 at.%. In the Pb rich side of the phase diagram the solubility of Fe in liquid Pb at the melting point of Pb is thought to be in the region 0.025 at.%. There appear to be no experimental thermodynamic data for the system. The experimental phase diagram data have been reviewed by Burton [91Bur]. The critically assessed data adopted by SGTE were taken from an unpublished assessment by Dinsdale and Gohil [87Din].

Table I. Phases, structures and models.

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

Table II. Invariant reactions.

Reaction	Type	T / K	Compositions / x_{Pb}			$\Delta_r H / (J/mol)$
liquid' + liquid'' \rightleftharpoons bcc	syntectic	1811.3	0.000	0.994	0.001	−13791
bcc + liquid'' \rightleftharpoons fcc	peritectic	1668.3	0.000	0.997	0.000	−826
fcc \rightleftharpoons bcc + liquid''	metatectic	1184.7	0.000	0.000	1.000	−1014
liquid'' \rightleftharpoons bcc + fcc	degenerate	600.6	1.000	0.000	1.000	−4774

References

- [87Din] A.T. Dinsdale, D.D. Gohil: unpublished work, National Physical Laboratory, UK, 1987.
[91Bur] B. Burton: J. Phase Equilibria **12** (1991) 200–202.