Li – Zr (Lithium – Zirconium)

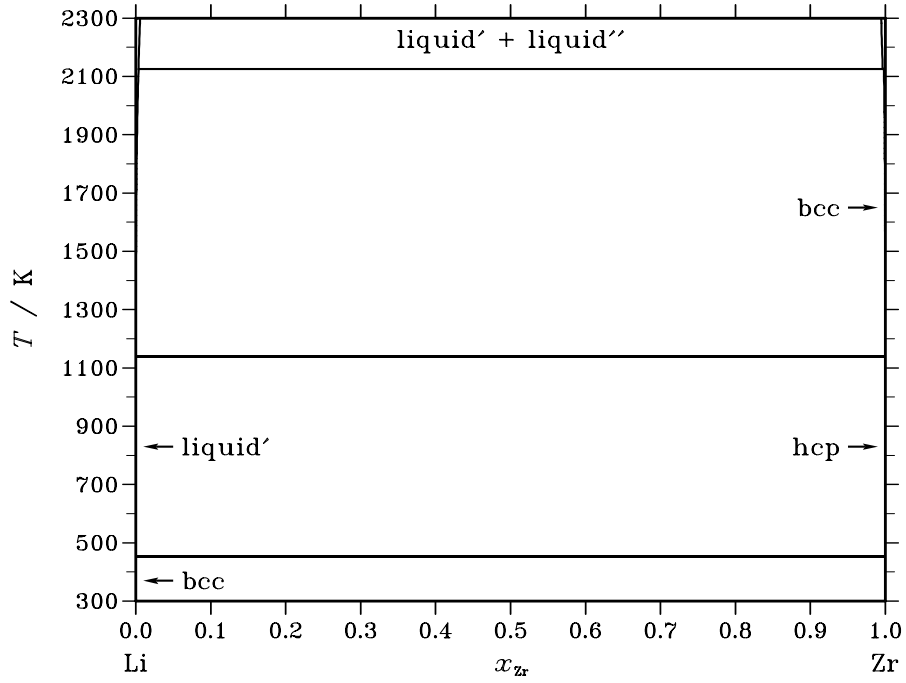

Fig. 1. Calculated phase diagram for the system Li-Zr.

Lithium and zirconium are almost insoluble in each other in the liquid as well as in the solid phases. The interest in this system is related to the use of Zr additions in Al-Li-alloys. Virtually no data are available for the binary Li-Zr system, except for the solubility of Zr in molten Li, which is very small. The system has been reviewed by Bale [87Bal] and a thermodynamic assessment of Li-Zr has been prepared by Saunders [89Sau] in connection with the evaluation of the ternary system Al-Li-Zr.

Table I. Phases, structures and models.

Phase	Struktur-bericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	$(Li,Zr)_1$
bcc	$A2$	W	$cI2$	$Im\overline{3}m$	BCC_A2	$(Li,Zr)_1$
hcp	$A3$	Mg	$hP2$	$P6_3/mmc$	HCP_A3	$(Li,Zr)_1$

Table II. Invariant reactions.

Reaction	Type	T / K	Compositions / x_{Zr}			$\Delta_r H$ / (J/mol)
liquid″ ⇌ liquid′ + bcc	monotectic	2124.9	0.996	0.004	0.998	−21080
bcc ⇌ liquid′ + hcp	degenerate	1139.0	1.000	0.000	1.000	−4107
liquid′ + hcp ⇌ bcc	degenerate	453.6	0.000	1.000	0.000	−3000

References

[87Bal] C.W. Bale: Bull. Alloy Phase Diagrams **8** (1987) 48–50.
[89Sau] N. Saunders: Z. Metallkd. **80** (1989) 894–903.