JPEDAV (2007) 28:197
DOI: 10.1007/s11669-007-9030-0
1547-7037 ©ASM International

Al-Si-Zn (Aluminum-Silicon-Zinc)

V. Raghavan

[1986Mey] computed a liquidus projection and six isothermal sections at 727, 527, 385, 357, 307, and 247 °C for this ternary system. These diagrams are given in [1995Vil]. More recently, [1995Jac] computed two vertical sections at 40 at.% Zn and 4.7 at.% Si respectively and compared the same with new experimental data.

Binary Systems

The Al-Si phase diagram [Massalski2] is a simple eutectic system with the eutectic at 12.2 at.% Si and 577 °C. The Al-Zn phase diagram [1995Oka] shows no intermediate phases. There is a miscibility gap in the Al-based face-centered cubic (fcc) phase below 351.5 °C, where two phases (Al)′ and (Al)″ form. The Si-Zn phase diagram [Massalski2] is a simple eutectic system, with the eutectic point very close to the Zn end.

Ternary Phase Equilibria

Using the thermodynamic descriptions of the binary systems carried out under the COST 507 program of Thermochemical Data Base for Light Metal Alloys, [1995Jac] computed two vertical systems for this system at 40 at.% Zn and 4.7 at.% Si respectively. These are shown in Fig. 1 and 2. No ternary interaction parameters were found necessary during the optimization. The sections were compared by [1995Jac] with the unpublished experimental data of [1995Ibe]. The agreement was found to be satisfactory.

References

1986Mey: S. an Mey and K. Hack, A Thermodynamic Evaluation of the Si-Zn, Al-Si and Al-Si-Zn Systems, *Z. Metallkd.*, 1986, **77**(7), p 454-459

1995Ibe: G. Ibe and S. Holtz, unpublished work, cited by [1995Jac]

1995Jac: M.H.G. Jacobs and P.J. Spencer, Thermodynamic Evaluations of the Systems Al-Si-Zn and Cu-Mg-Ni, *J. Alloys Compd.*, 1995, **220**, p 15-18

1995Oka: H. Okamoto, Al-Zn (Aluminum-Zinc), *J. Phase Equilib.*, 1995, **16**(3), p 281-282

1995Vil: P. Villars, A. Prince, and H. Okamoto, Al-Si-Zn, *Handbook of Ternary Alloy Phase Diagrams*, Vol 4, ASM International, Materials Park, OH, 1995, p 4337-4341

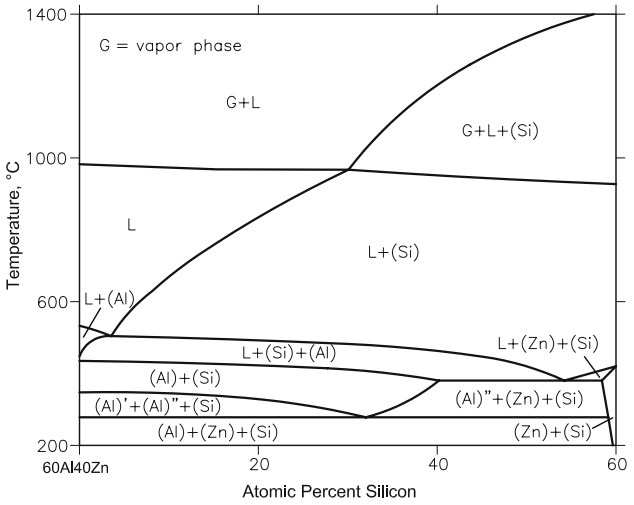

Fig. 1 Al-Si-Zn vertical section at 40 at.% Zn [1995Jac]

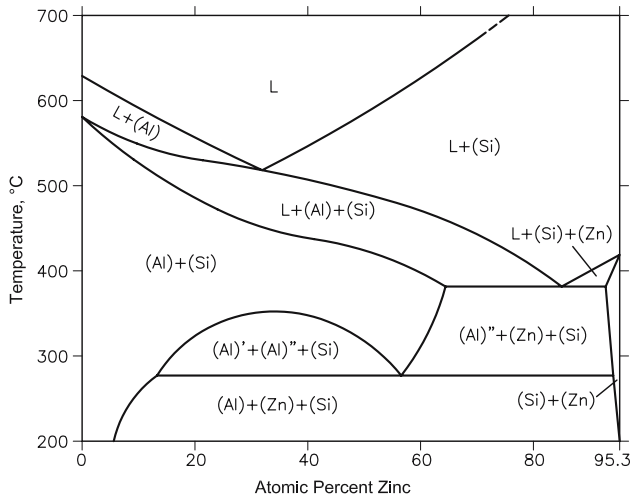

Fig. 2 Al-Si-Zn vertical section at 4.7 at.% Si [1995Jac]