

Fe-Li-S (Iron-Lithium-Sulfur)

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[88Rag] briefly reviewed the Li_2S -FeS pseudobinary section on which the ternary compound Li_2FeS_2 is located. [86Sch] has determined an isothermal section for this system at 400 °C.

Update

[88Bat] redetermined the crystal structure of Li_2FeS_2 denoted τ in this review. It has hexagonal symmetry with the space group $P\bar{3}m1$, $a = 0.3902$, and $c = 0.6294$ nm. The structure consists of cph layers of S with Fe and Li filling the tetrahedral and octahedral interstices.

Using electrochemical measurements, [86Sch] determined an isothermal section for this system at 400 °C: this section is redrawn in Fig. 1. The ternary compound τ shows a significant range of homogeneity with respect of the Li content. It forms tie lines with (αFe) , Fe_{1-x}S , FeS_2 , and Li_2S .

Another study of phase equilibria in the range of 350 to 550 °C was conducted using the same technique by [87Wen], a reference that is not available to this reviewer.

Cited References

- 86Sch:** J.A. Schmidt, "Phase Equilibria and Thermodynamic Studies of the Ternary Li-Fe-S System," *An. Asoc. Quim. Argent.*, 74(2), 141-149 (1986) in Spanish. (Experimental; #)
- 87Wen:** T. Wen and W. Weppner, "Determination of the Phase Diagram in the Low-Li Region of Li-Fe-S Ternary System by Electrochemical Technique," *Yingyong Xexue Xuebao*, 5(2), 147-151 (1987) in Chinese. (Experimental; #)
- 88Bat:** R.J. Batchelor, F.W.B. Einstein, C.H.W. Jones, R. Fong, and J.R. Dahn, "Crystal Structure of Li_2FeS_2 ," *Phys. Rev. B, Condens. Matter*, 37(7), 3699-3702 (1988). (Experimental).

88Rag: V. Raghavan, "The Fe-Li-S System," *Phase Diagrams of Ternary Iron Alloys. Part 2*, Indian Institute of Metals, Calcutta, 151 (1988). (Review).

Indicates presence of a phase diagram.

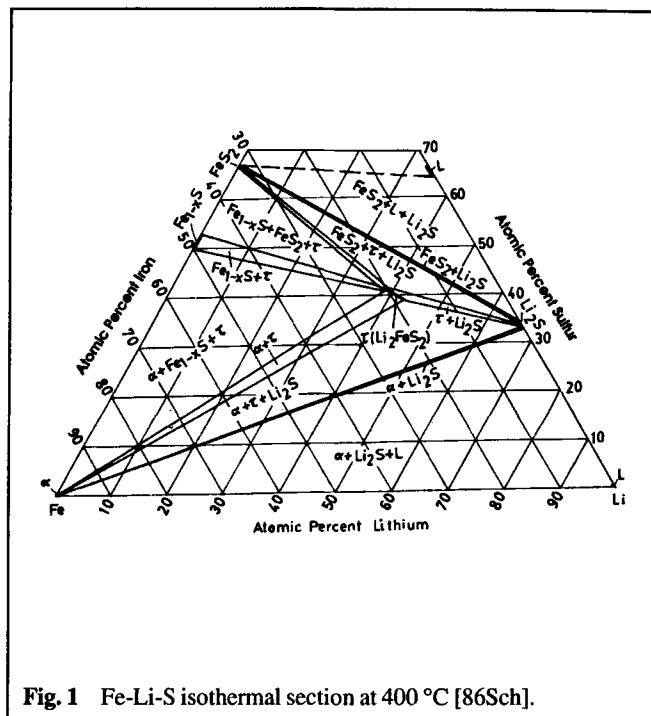


Fig. 1 Fe-Li-S isothermal section at 400 °C [86Sch].