

Sc-Th (Scandium-Thorium)

[90Ter] determined the Sc-Th phase diagram primarily based on thermal analysis (8 specimens) and lattice parameter measurements (950 and 650 °C). In comparison with [Massalski2], which was redrawn from [69Bad], the new Sc-Th diagram (Fig. 1) defines the solid phase boundaries more accurately.

The minimum melting point occurs at 1405 °C and 24 at.% Th [90Ter], rather than ~45 at.% Th [69Bad]. The $(\beta\text{Sc},\beta\text{Th}) \leftrightarrow (\alpha\text{Sc}) + (\alpha\text{Th})$ eutectoid temperature is 1150 °C, which is substantially (~150 °C) higher than the estimate made by [69Bad]. The solubility of Th in (αSc) is 16 at.% at 650 °C, which was not well defined by [69Bad]. The agreement is reasonable regarding

the solubility limit of Sc in (αTh) (61 at.% Sc by [90Ter] and 55 at.% Sc by [69Bad] at ~650 °C).

The lattice parameter of (αTh) is 0.493 nm at 39 at.% Sc [90Ter].

Cited References

69Bad: T.A. Badayeva and P.I. Kuznetsova, "Nature of the Interactions between Thorium and Rare-Earth Elements," *Russ. Metall.*, (5), 101-106 (1969).

90Ter: G.I. Terekhov and S.I. Sinyakova, "The Th-Sc Phase Diagram," *Izv. Akad. Nauk SSSR, Met.*, (3), 215-218 (1990) in Russian.

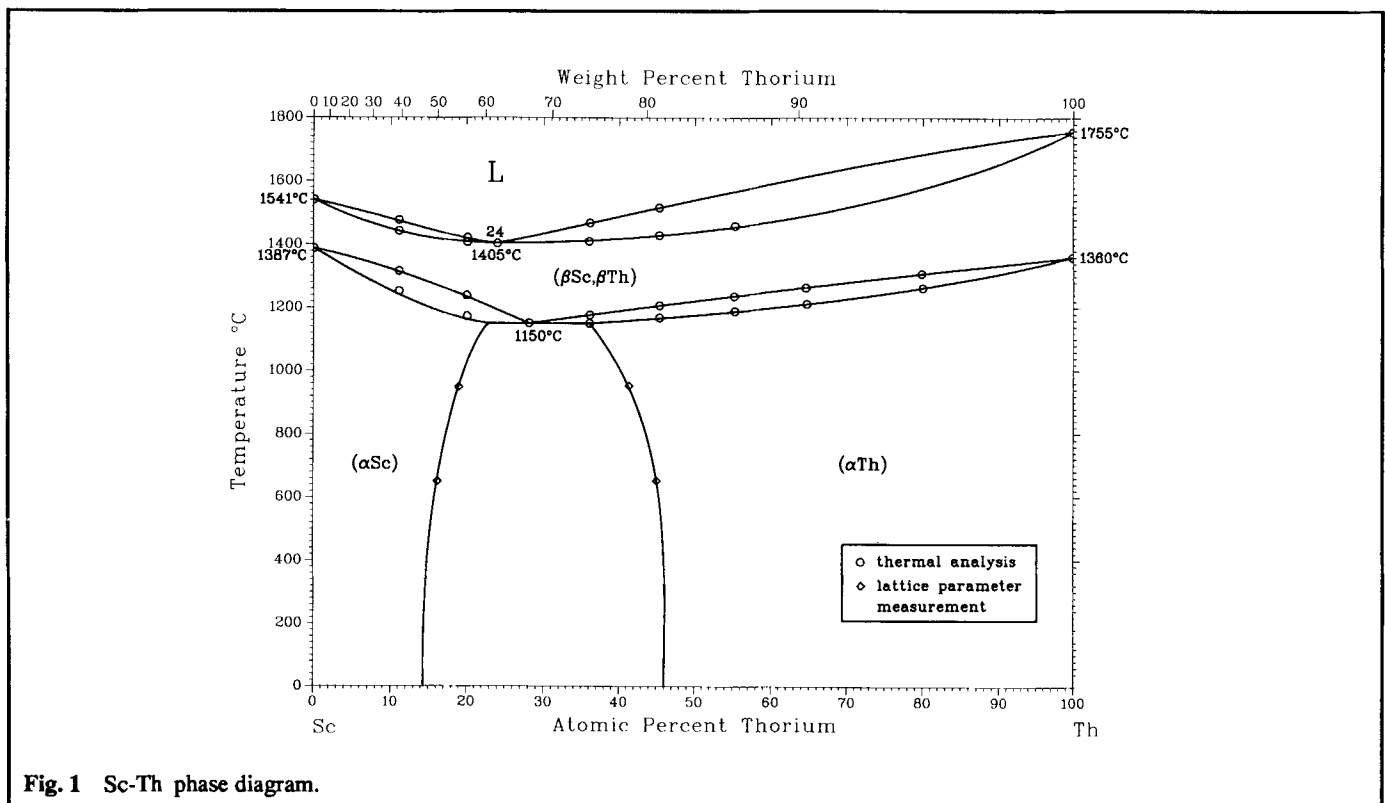


Fig. 1 Sc-Th phase diagram.