

Fe-Ho-Sb (Iron-Holmium-Antimony)

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Recently, [2004Zen] determined an isothermal section for this ternary system at 500 °C, which depicts a ternary compound FeHo₄Sb.

Binary Systems

The Fe-Ho phase diagram [Massalski2] depicts four line compounds: Fe₁₇Ho₂ (Ni₁₇Th₂-type hexagonal), Fe₂₃Ho₆ (D_{8_a}, Mn₂₃Th₆-type cubic), Fe₃Ho (Ni₃Pu-type rhombohedral), and Fe₂Ho (C15, MgCu₂-type cubic). The Fe-Sb phase diagram has two intermediate phases: FeSb_{1-x} (41-49 at.% Sb; B₈₁, NiAs-type hexagonal) and FeSb₂ (C18, marcasite-type orthorhombic). The intermediate phases in the Ho-Sb system at 500 °C are: Ho₅Sb₃ (D_{8₈}, Mn₅Si₃-type hexagonal) and HoSb (B1, NaCl-type cubic).

Ternary Isothermal Section

With starting metals of 99.5% Fe, 99.9% Ho, and 99.95% Sb, [2004Zen] induction-melted 122 alloys under Ar atm. The samples were given a final anneal at 500 °C for 200 h and quenched into liquid nitrogen. The phase equilibria were studied with x-ray powder diffraction and scanning electron microscopy with an energy dispersive spectroscope. The isothermal section at 500 °C constructed by [2004Zen] is shown in Fig. 1. The ternary compound FeHo₄Sb (hexagonal, *a* = 0.8126 nm and *c* = 0.4142 nm; denoted τ here) is present. The solubility of the third component in the binary compounds is negligible [2004Zen].

Reference

2004Zen: L. Zeng and H. Zhao, The 773 K Isothermal Section of the Ho-Fe-Sb Ternary System, *J. Alloys Compd.*, 2004, **366**, p 201-204

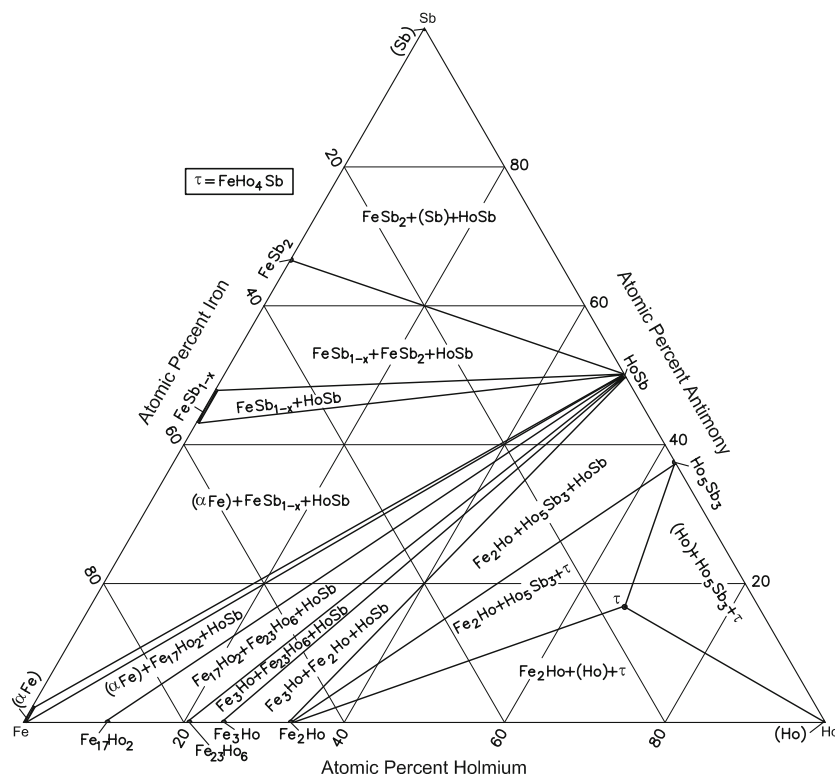


Fig. 1 Fe-Ho-Sb isothermal section at 500 °C [2004Zen]. Narrow two-phase regions are omitted