

# Au-Ho (Gold-Holmium)

H. Okamoto

The Au-Ho phase diagram in [Massalski2] was redrawn from [1987Gsc]. This phase diagram was derived by thermodynamic modeling by assuming systematic changes

in thermodynamic parameters of related phases in the gold-rare earth systems.

Figure 1 shows the Au-Ho phase diagram determined by [2002Sac] by means of X-ray powder diffraction, optical and scanning electron microscopy, electron probe microanalysis and differential thermal analysis. A new phase  $Au_{10}Ho_7$  was found in this work.

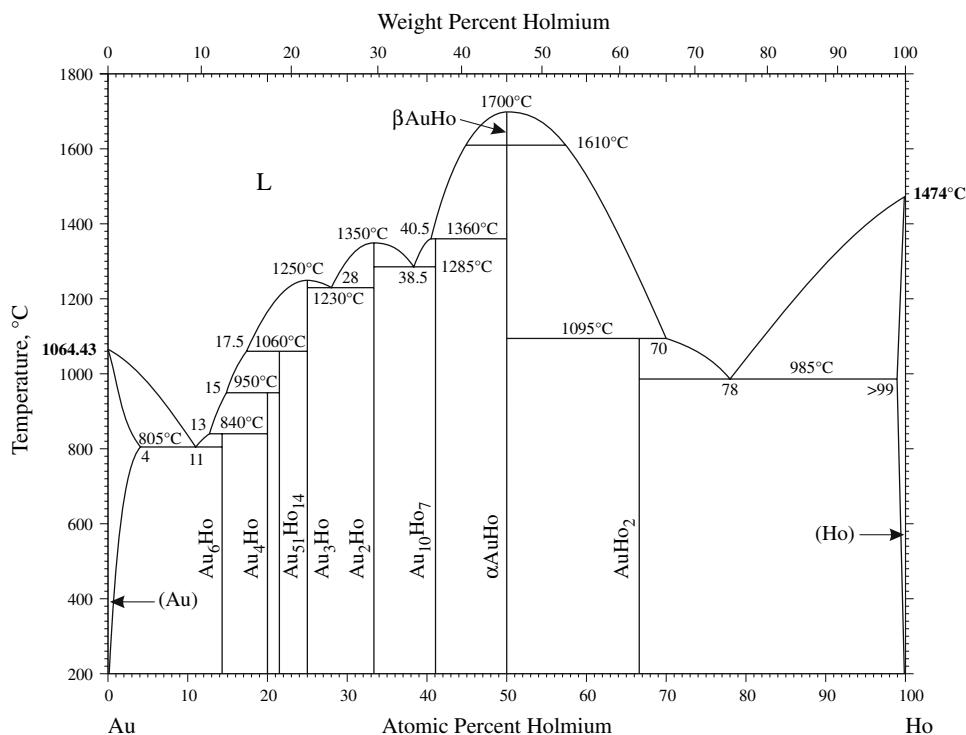
Table 1 shows Au-Ho crystal structure data.

**Table 1 Au-Ho crystal structure data**

Phase	Composition, at.% Ho	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Au)	0 to 4	<i>cF4</i>	<i>Fm<math>\bar{3}m</math></i>	<i>A1</i>	Cu
$Au_6Ho$	14.3	<i>tP56</i>	<i>P4<sub>2</sub>/ncm</i>	...	$Au_6Ho$
$Au_4Ho$	20	<i>tI10</i>	<i>I4/m</i>	<i>D1<sub>a</sub></i>	$MoNi_4$
$Au_{51}Ho_{14}$	21.5	<i>hP65</i>	<i>P6/m</i>	...	$Ag_{51}Gd_{14}$
$Au_3Ho$	25	<i>oP8</i>	<i>Pmmn</i>	<i>D0<sub>a</sub></i>	$\beta TiCu_3$
$Au_2Ho$	33.3	<i>tI6</i>	<i>I4/mmm</i>	<i>C11<sub>b</sub></i>	$MoSi_2$
$Au_{10}Ho_7$	41.1	<i>tI136</i>	<i>I4<sub>1</sub>/acd</i>	...	$Au_{10}Gd_7$
$\beta AuHo$	50	<i>cP2</i>	<i>Pm<math>\bar{3}m</math></i>	<i>B2</i>	$CsCl$
$\alpha AuHo$	50	<i>oC8</i>	<i>Cmcm</i>	<i>B<sub>f</sub></i>	$CrB$
$AuHo_2$	66.7	<i>oP12</i>	<i>Pnma</i>	<i>C23</i>	$Co_2Si$
(Ho)	>99 to 100	<i>hP2</i>	<i>P6<sub>3</sub>/mmc</i>	<i>A3</i>	Mg

## References

- 1987Gsc:** K.A. Gschneidner, Jr, F.W. Calderwood, H. Okamoto, and T.B. Massalski, The Au-Ho (Gold-Holmium) System, in *Phase Diagrams of Binary Gold Alloys*, H. Okamoto and T.B. Massalski, Eds., ASM International, Metals Park OH, 1987, p 139-141
- 2002Sac:** A. Saccone, D. Macciò, S. Delfino, and R. Ferro, Alloying Behavior of the Rare Earth Metals with Gold: The Ho-Au, Er-Au, and Tm-Au Systems, *Intermetallics*, 2002, **10**(9), p 903-913



**Fig. 1** Au-Ho phase diagram