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Au-Gd (Gold-Gadolinium)

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The Au-Gd phase diagram in [Massalski2] was redrawn from [1987Gsc]. This diagram was mostly speculative due to lack of experimental data.

Table 1 Au-Gd crystal structure data

Phase	Composition, at.% Gd	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Au)	0-0.7	*cF*4	$Fm\bar{3}m$	*A*1	Cu
Au_6Gd	14.3	*tP*56	$P4_2/ncm$	…	Au_6Ho
$Au_{51}Gd_{14}$	21.5	*hP*65	*P*6/*m*	…	$Ag_{51}Gd_{14}$
Au_3Gd	25	*oP*8	*Pmmn*	$D0_a$	$\beta TiCu_3$
Au_2Gd	33.3	*tI*6	*I*4/*mmm*	$C11_b$	$MoSi_2$
$Au_{10}Gd_7$	41.2	*tI*136	$I4_1/acd$	…	…
Au_4Gd_3	42.9	*hR*42	$R\bar{3}$	…	Pu_3Pd_4
βAuGd	50	*cP*2	$Pm\bar{3}m$	*B*2	CsCl
αAuGd	50	*oC*8	*Cmcm*	B_f	CrB
$AuGd_2$	66.7	*oP*12	*Pnma*	*C*23	Co_2Si
(βGd)	100	*cI*2	$Im\bar{3}m$	*A*2	W
(αGd)	100	*hP*2	$P6_3/mmc$	*A*3	Mg

Figure 1 shows the Au-Gd phase diagram determined by [1996Sac] based on differential thermal analysis, x-ray diffraction, optical and scanning electron microscopy, and electron probe microanalysis. Two new intermetallic compounds ($Au_{10}Gd_7$ and Au_4Gd_3) unknown in [Massalski2] were discovered.

Table 1 shows Au-Gd crystal structure data.

References

1987Gsc: K. Gschneidner, Jr., F.W. Calderwood, H. Okamoto, and T.B. Massalski, The Au-Gd (Gold-Gadolinium) System, *Phase Diagrams of Binary Gold Alloys*, H. Okamoto and T.B. Massalski, Eds., ASM International, Metals Park, OH, 1987, p 118-121

1996Sac: A. Saccone, M.L. Fornasini, D. Macciò, and S. Delfino, Phase Equilibria in the Gd-Au System, *Intermetallics*, 1996, **4**, p 111-119

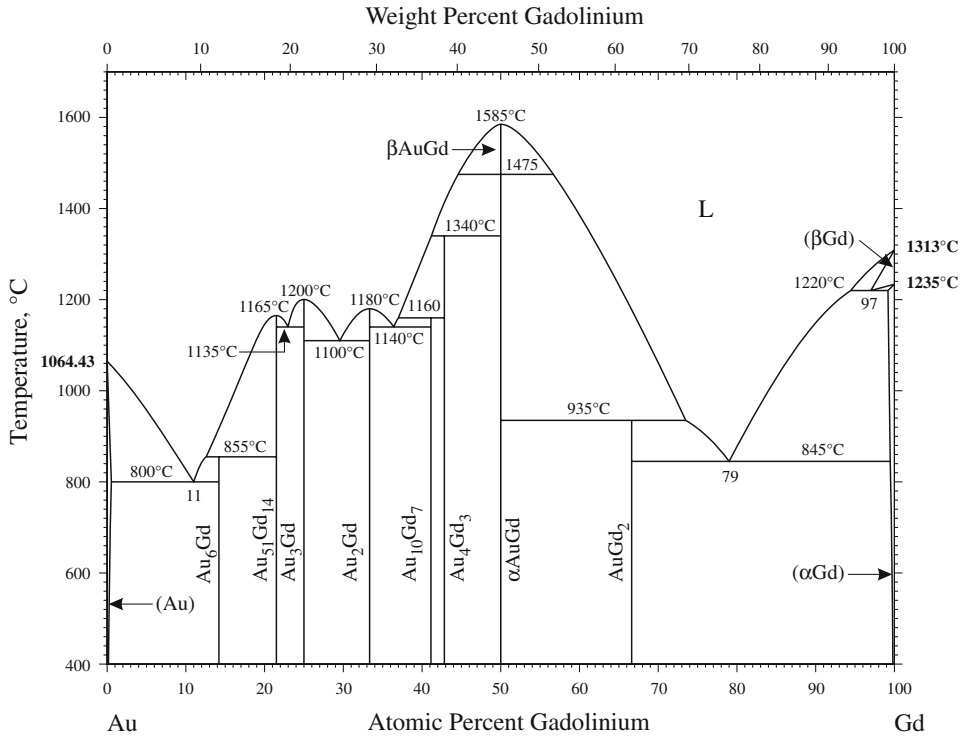

Fig. 1 Au-Gd phase diagram