

# Au-Pr (Gold-Praseodymium)

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The Au-Pr 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.

[1997Sac] determined the Au-Pr phase diagram by means of X-ray powder diffraction, optical and scanning electron microscopy, electron probe microanalysis and differential thermal analysis. Data points are shown Fig. 1. Two new phases, Au<sub>36</sub>Pr<sub>17</sub> and Au<sub>4</sub>Pr<sub>3</sub>, were discovered.

Solid lines in Fig. 1 show the Au-Pr phase diagram thermodynamically assessed by [2004Du] based on the data obtained by [1997Sac].

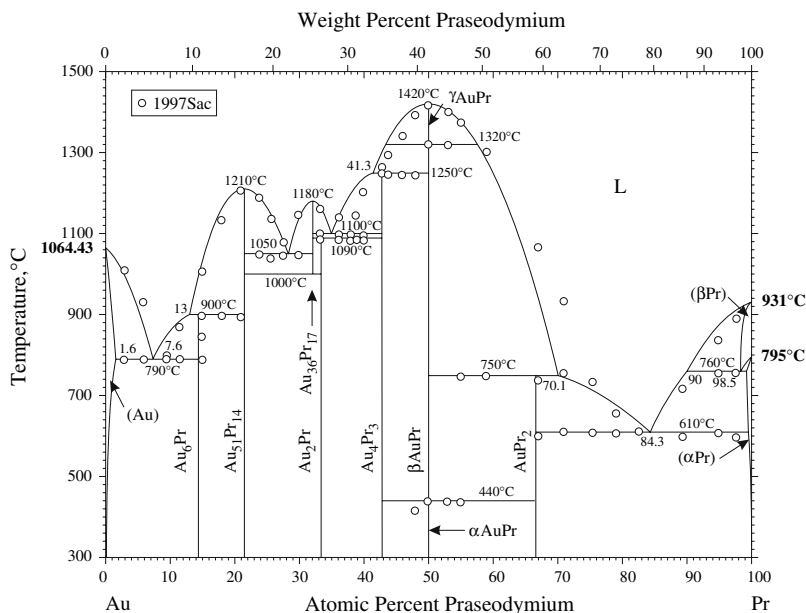
Table 1 shows Au-Pr crystal structure data.

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

Phase	Composition, at.% Pr	Pearson symbol	Space group	Strukturbericht designation	Prototype
(Au)	0 to 1.6	<i>cF4</i>	<i>Fm</i> $\bar{3}$ <i>m</i>	<i>A1</i>	Cu
Au <sub>6</sub> Pr	14.3	<i>mC28</i>	<i>C2/c</i>	...	Au <sub>6</sub> Pr
Au <sub>51</sub> Pr <sub>14</sub>	21.5	<i>hP65</i>	<i>P6/m</i>	...	Ag <sub>51</sub> Gd <sub>14</sub>
Au <sub>36</sub> Pr <sub>17</sub>	32.1	<i>tP106</i>	<i>I4/nmm</i>	...	Au <sub>36</sub> Nd <sub>17</sub>
Au <sub>2</sub> Pr	33.3	<i>oI12</i>	<i>Imma</i>	...	CeCu <sub>2</sub>
Au <sub>4</sub> Pr <sub>3</sub>	42.9	...	...	...	...
$\gamma$ AuPr	50	<i>cP2</i>	<i>Pm</i> $\bar{3}$ <i>m</i>	<i>B2</i>	CsCl
$\beta$ AuPr	50	<i>oC8</i>	<i>Cmcm</i>	<i>B<sub>f</sub></i>	CrB
$\alpha$ AuPr	50	<i>oP8</i>	<i>Pnma</i>	<i>B27</i>	FeB
AuPr <sub>2</sub>	66.7	<i>oP12</i>	<i>Pnma</i>	<i>C23</i>	Co <sub>2</sub> Si
( $\beta$ Pr)	98.5 to 100	<i>cI2</i>	<i>Im</i> $\bar{3}$ <i>m</i>	<i>A2</i>	W
( $\alpha$ Pr)	99.5 to 100	<i>hP4</i>	<i>P6<sub>3</sub>/mmc</i>	<i>A3'</i>	$\alpha$ La

## References

- 1987Gsc:** K.A. Gschneidner Jr., F.W. Calderwood, H. Okamoto, and T.B. Massalski, The Au-Pr (Gold-Praseodymium) System, in *Phase Diagrams of Binary Gold Alloys.*, H. Okamoto and T.B. Massalski, Eds., ASM International, Metals Park, OH, 1987, p 228-232
- 1997Sac:** A. Saccone, D. Maccio, M. Giovannini, and S. Delfino, The Praseodymium-Gold System, *J. Alloys Compounds*, 1997, **247**, p 134-140
- 2004Du:** Z. Du, C. Guo, and D. Lü, Thermodynamic Assessment of the Au-Pr System, *J. Alloys Compounds*, 2004, **364**, p 117-120



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