

# Co-W (Cobalt-Tungsten)

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The Co-W phase diagram in [Massalski2] was redrawn from [1986Nag]. [1999Zao] studied the  $(\alpha\text{Co})/(\alpha\text{Co}) + \text{Co}_3\text{W}$  phase boundary in detail and reported that the result was in agreement with [1986Nag] (see [2002Oka]). The effect of ferromagnetic transformation in  $(\alpha\text{Co})$  was observed only as a change of slope in the boundary. However, a thermodynamic calculation by [1989Gui] predicted the existence of a miscibility gap (Nishizawa horn) between paramagnetic and ferromagnetic  $(\alpha\text{Co})$ . [2006Ost] confirmed the prediction by atom probe measurements. Figure 1 shows the Co-W phase diagrams calculated by [1989Gui] ( $>727^\circ\text{C}$ ) and by [2006Ost] ( $<2127^\circ\text{C}$ ). [2006Ost] 'utilized' the thermodynamic model of [1989Gui] perhaps with some modifications because the phase diagrams calculated by [1989Gui] and [2006Ost] do not match. Either diagram appears to be a better presentation of the true equilibrium than the diagram of [1986Nag] in which constant solubility ranges were assigned to  $\text{Co}_3\text{W}$ ,  $\text{Co}_7\text{W}_6$ , and (W) phases in the almost entire temperature range.

The dotted line at  $422^\circ\text{C}$  was added to indicate the  $\alpha\text{Co} \leftrightarrow \epsilon\text{Co}$  allotropic transformation.

## References

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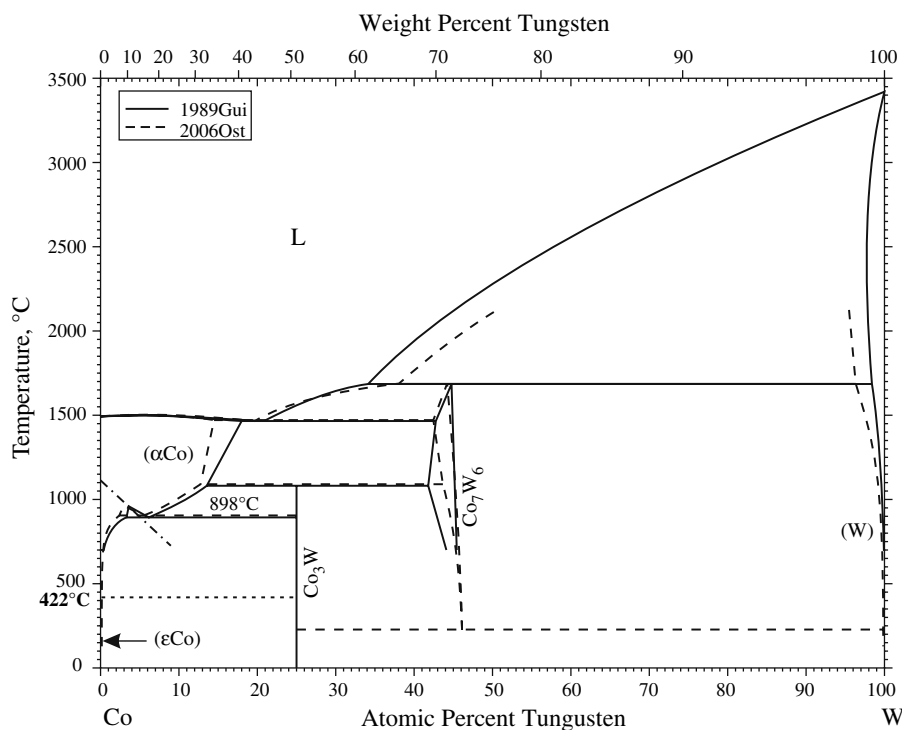


Fig. 1 Co-W phase diagram