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Effect of high energy milling parameters on WC- Co powder features, composition and thermal stability.

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The effects of high energy milling parameters (duration and environment) on WC-X Co (X=12, 17 %) powder particle size, crystallite size and phase composition was studied. Phase transformations in as- milled powders as a function of heat treatment temperature were also determined. The WC-Co powders were milled in gaseous and liquid nitrogen. The particle and crystallite sizes decreased markedly with milling time in gaseous nitrogen, compared to that in liquid nitrogen. This difference was due mainly to the cushioning effect of the liquid medium. Phase transformations were observed with increase in heat treatment temperature in the range 300-400 °C. The extent of phase change varied with particle size and original phase distribution in the as-milled powders. A mechanism for phase transformation in the as-milled and heat treated WC-Co powders will be also presented and discussed.