

A comparison of the mechanically alloyed (V,W)C and (V,W)C-Co powders

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ABSTRACT:

Milling was carried out in flowing argon but was interrupted at regular time intervals to take samples for X-ray diffraction (XRD). Because of exposure to air during the interruptions the powder was partly oxidized. The oxides formed did not appear in XRD patterns because they were of extremely fine grain size. As a result of the loss of V and W through oxidation, free carbon was also found in the final powder. The lattice parameter of the (V,W)C powder increased with milling time up to a maximum, then it decreased, which suggests that the amount of W in (V,W)C increased with milling time up to a maximum and then decreased. The crystallite size of the (V,W)C powder was calculated from the X-ray data and was found to be in the nm range (down to approximately 8 nm). Subsequent uninterrupted milling produced a powder which was free from oxides and free carbon.