

Formation and characterization of solid-solution (V,W,Ti)CN composite powder

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ABSTRACT:

We report on the synthesis of a mixture of vanadium (V), tungsten (W), titanium (Ti) and carbon (C) mixture using ball milling in argon atmosphere. Thermal analysis of the milled powder showed an exothermic reaction at approximately 700 °C in nitrogen atmosphere. As a result, the milled powder mixture was subjected to annealing in nitrogen atmosphere at 700 °C. The crystal structure of the milled and nitrided powders was analysed using X-ray diffraction technique. Our findings showed that the crystal structure of nitrided powder was comprised of the tetragonal and orthorhombic structures. Scanning electron microscopy was used to analyse the powder morphology, while the atomic force microscopy was used to validate the topography and surface textures.