

Effects of Cobalt Addition and Temperature on Microstructure and Density of W-25Cu Composites Prepared via Liquid Infiltration

Abstract

In this study, the effect of Co and sintering temperature on microstructure of W-25Cu composites prepared via copper melt infiltration has been investigated. The concentration of Co addition used ranged from 0.5 to 3wt. %. The infiltration temperatures were performed at 1150°C and 1250°C for 2 hr under vacuum. The microstructure and sintering density of W-25Cu composites are discussed. Results indicated that, the relative density (RD) and microstructure of W-25wt. % Cu were greatly affected by the addition of low Co concentration and sintering temperature. The concentration of 3 wt. % Co to tungsten-copper compact and infiltration temperature of 1250°C give high sintering density of 98.6% theoretical density (TD). The concentration of Co and infiltrating temperature have strong effects on the densification of W-Cu composite materials. The sintered compact microstructures and density were obtained using scanning electron microscope (SEM) coupled with EDX and Archimedes technique respectively.

Keywords; Densification, Microstructure, W-Cu Composites