Short Communication

Study on Preparation and Properties of Tungsten Coating Based on WC Electrolysis

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Tungsten carbide (WC) is used as an anode in molten sodium tungstate to prepare a tungsten coating. Recovery of tungsten powder from WC electrolysis has been extensively studied, but the possibility of making available Tungsten coatings is still unrealized. A theoretical analysis was first carried out, and the feasibility of electrolysis was confirmed. Subsequently, this conclusion was also verified experimentally. In this experiment, the coating was studied by regulating the cathode current density. The tungsten coatings prepared at various current densities were characterized by X-ray Diffraction (XRD), Scanning Electron Microscope-Energy Dispersive Spectroscopy (SEM-EDS), nanoindentation tests, and Laser Scanning Confocal Microscopy LSCM. The results show that at a cathode current density of 70 mA·cm⁻², an optimized tungsten coating can be obtained. The tungsten coating has a thickness of 4.1 μm and a minimum average grain size.

Keywords: Molten salt, tungsten coating, tungsten carbide recovery

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