Cu–W Thin Film Electrodeposited in an Aqueous Solution

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Cu-W thin films were electrodeposited on indium tin oxide (ITO) glass substrates in an aqueous solution using a rectangular pulse current technique in a range of frequency from 0.2 MHz to 1 MHz. The W concentration in the Cu-W thin film measured with energy dispersive X-ray spectroscopy (EDX) was dependent on an amplitude and frequency of the rectangular pulse current. The maximum W concentration in the Cu-W thin film was 9 wt. %. X-ray diffraction (XRD) revealed that the Cu-W thin film had crystallographic planes parallel to the ITO glass substrate such as (111), (200), (220), and (311) planes. Surface images of the Cu-W thin film observed with scanning electron microscope (SEM) showed an aggregation of an island called a nano cauliflower. These experimental results indicate that the Cu-W thin film was an alloy comprising copper and tungsten, and that tungsten was electrodeposited in the aqueous solution free of the iron-group element.

Keywords: Cu-W thin film; aqueous solution; megahertz; nano cauliflower; iron-group element

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