TWO-STEP ELECTROLESS SYNTHESIS OF A COPPER/SILVERCOMPOSITE FILM FOR ELECTROCATALYTIC OXIDATION OF FORMALDEHYDE

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Abstract : In this work, we report a two-step electroless plating process for preparing a copper/silver composite film on a Resin Epoxy (RE) substrate. First, silver film was deposited on RE substrate from a silvering bath. Then, copper was deposited on silver film at 95 °C from a separate solution containing copper ions and formaldehyde as reducing agent. The electrochemical reactivity of the prepared copper/silver composites was investigated towards the electrochemical oxidation of formaldehyde. Scanning electron microscopy of the composites showed a porous microstructure with uniform surface morphology. The presence of silver and copper onto the RE surface was confirmed by energy dispersive X-ray analysis. The formaldehyde oxidation peak on the copper/silver electrode is obtained at -0.3 V/SCE. The electrode showed a significant electrocatalytic activity with good repeatability and stable electrochemical response.

Keywords : copper, Electroless deposition, Formaldehyde, Silver, thin film