Wongsakorn Muthusith 2013: Novel Fabrication of Porous Copper Layers Using Electrochemical Deposition from Poly Ethylene Glycol (PEG)-Colloidal Suspension and Combustion. Master of Engineering (Materials Engineering), Major Field: Materials Engineering, Department of Materials Engineering. Thesis Advisor:
Mr. Aphichart Rodchanarowan, Ph.D. 107 pages.

The electrochemical deposition was conveniently processed and a low cost. This research focused on a novel fabrication of porous copper layers using a two-step process: the electrochemical codeposition technique and combustion. In the first step, the electrodeposition of copper was simultaneously embedded with polyethylene glycol (PEG) using copper sulfate base solution (35 g/l) containing PEG under the ultrasonication. In the second step, the obtained deposit was subject to the heat at 500 ^{o}C for 30 minutes to remove the embedded PEG in the copper deposits. The average particle size of PEG using in experiments is 100 μm in diameter. The parameters used in this study include the quantity of PEG (0.05, 0.1 and 0.2 g/ml), level of current density (1, 1.5 and 3 mA/cm^{2}), plating duration time (15, 30 and 60 min) and concentration of gelatin (250 g/l) The embedded PEG copper deposits and copper porous layers were characterized by x-ray diffractometer (XRD), Optical microscope (OM), x-ray fluorescence (XRF) and scanning electron microscope (SEM). The experimental results showed the effect of PEG quantity resulted in the formation of porous copper layers; yet the effects of current density plating duration time and concentration of gelatin are not significantly pronounced.

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