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# Electrodeposition of porous copper as a substrate for electrocatalytic material

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## Abstract

Porous copper was electrodeposited using hydrogen bubble dynamic template. Various electrolytes having  $\text{CuSO}_4$  and  $\text{H}_2\text{SO}_4$  in fixed molar ratio approximately equal to 0.3 and at temperature  $18^\circ\text{C}$  were utilized for potentiostatic electrodeposition at various cathodic potentials. After electrodeposition, electrochemical impedance spectroscopy studies were conducted in 2.5M NaCl solution at room temperature for determining electrochemically active true surface area. The surface morphologies of the deposits were analyzed using scanning electron microscope. Electrolyte with composition 0.12M  $\text{CuSO}_4$  and 0.4M  $\text{H}_2\text{SO}_4$  resulted in maximum electrochemically active true surface area due to more open structure with thick dendrite branches which was correlated to high hydrogen evolution rate.

*Keywords:* Electrodeposition, Porous copper, Hydrogen bubble dynamic template, Electrocatalyst, Electrochemical impedance spectroscopy, Scanning electron microscopy

*PACS:*

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