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## Cu-Ni NANOSTRUCTURED ELECTROCATALYSTS OBTAINED BY ELECTROCODEPOSITION

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### Abstract

A simple method to synthesize copper, nickel and Cu-Ni nanotubes in alumina membrane by direct electrochemical deposition technique is presented.

This work is divided into three main parts:

- elaboration of the nanostructured metals supported on Cu and Ni electroconductive support;
- SEM – EDX characterization of nanodeposits;
- electrochemical characterization of the nanostructured electrodes;

Cu and Cu-Ni nanostructures were obtained by deposition through an alumina membrane (AAO) that is later dissolved. The diameter of the nanorods deposited on Cu foil is about 40-150 nanometres, which is in good agreement with the AAO membrane pore size used in the electrolysis process. The nanorods were found to be vertically aligned; their collapsing was observed with the height deposited, at high current densities.

These nanostructure electrodes exhibit a high electrocatalytic activity both for oxygen reduction and carbon dioxide electroreduction to formic acid. Faradic efficiency up to 50% was obtained on (Ni-Cu)<sub>nano</sub>.

*Key words:* electrocatalyst, electrocodeposition, nanostructures

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