

**ELECTROCHEMICAL DEPOSITION  
AND CHARACTERIZATION  
OF CUPROUS OXIDE NANOWIRES**

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There has been growing interest in quasi-one dimensional nanostructure systems because of their high surface-to-volume ratios, and associated devices

Potentiostatic deposition of cuprous oxide ( $\text{Cu}_2\text{O}$ ) nanowires in polycarbonate membrane by cathodic reduction of alkaline cupric lactate solution has been investigated. These nanowires, characterized by scanning electron microscopy (Fig.1), have uniform diameters of about 150 nm and lengths are up to ten micrometers. In a first time,  $\text{Cu}_2\text{O}$  films were deposited on stainless steel and the phase composition is determined by X-ray diffraction analysis. Electrochemical quartz crystal microbalance (EQCM) is used for in situ phase analysis measurements of the thin films. Then the parameters limit for the deposition of nanowires were determined. The nanowires have been confirmed as crystalline  $\text{Cu}_2\text{O}$  by powder X-ray diffraction and selected area electronic diffraction (Fig.2).

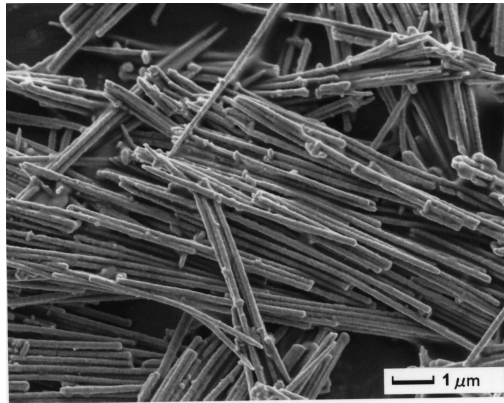


Fig.1 SEM image of cuprous oxide nanowires

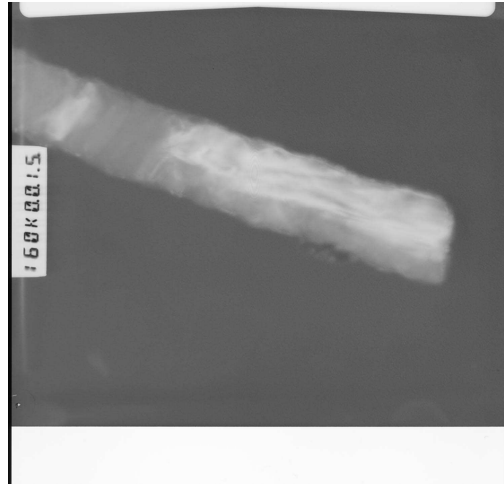


Fig.2 (a) TEM micrograph of  $\text{Cu}_2\text{O}$  nanowire

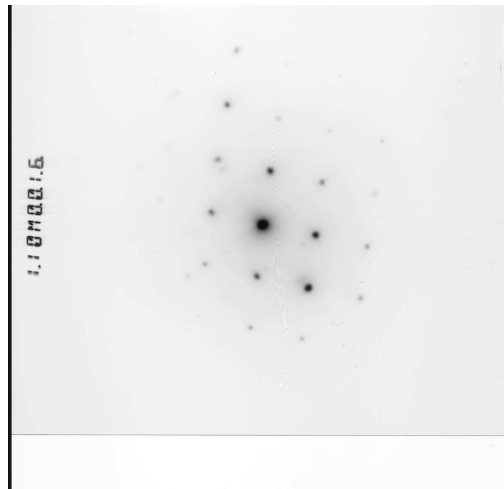


Fig 2 (b) Electron diffraction pattern for Fig 2(a).