

### Development of Cu, CuO and Cu<sub>2</sub>O Nanocrystalline Thin Films by Electroless Deposition

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Nanocrystalline Cu, CuO and Cu<sub>2</sub>O thin films were synthesized by Electroless (EL) deposition method by controlling the pH from 11 to 14 at 70° C. The crystallinity, purity, morphology and structural features of the as-synthesized films were characterized by X-ray diffraction (XRD), Field Emission Electron Microscope (FESEM), Transmission Electron Microscope (TEM). The results showed that the concentration of NaOH plays an important role for the growth of nanocrystalline Cu, CuO and Cu<sub>2</sub>O thin films having grain morphologies changing from spherical to cubic. A growth mechanism was proposed and discussed in details for the grain morphological changes during deposition.