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Synthesis of copper nanowires for application as flexible transparent conducting electrodes

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Copper nanowires (CuNWs) are a promising material for flexible transparent conductive electrodes due to their outstanding transparency and conductivity properties. Long and smooth CuNWs were successfully synthesized via a hydrothermal method and partially cleaned by n-hexane and water separation routine. The synthesized CuNWs were then deposited on a polycarbonate substrate to make a flexible transparent conducting electrode. X-ray diffraction (XRD) results revealed three diffraction peaks indexed to the face centered cubic (fcc) crystalline Cu. Scanning electron spectroscopy (SEM) showed long and smooth nanowires and energy dispersive X-ray spectroscopy (EDS) confirmed the formation of the element copper and some degree of oxygen and carbon elements were also detected. Atomic Force Microscopy (AFM) confirmed the smoothness of the CuNWs. Furthermore, aluminum (2 mol%) doped zinc oxide (AZO) layer was coated onto CuNWs to prevent a possible oxidation in air environments and the MicroTester system was used to test the flexibility and stretchability of the fabricated Cu NWs based electrodes. The yield strength, strain hardening, fracture and the young modulus of the prepared electrodes are evaluated in detail for possible application as flexible transparent electrodes

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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