

Electrical characterization of electrochemically grown single copper nanowires

Toimil Molaes ME, Höhberger EM, Schaefflein Ch, Blick RH, Neumann R, Trautmann C
APPLIED PHYSICS LETTERS 82 (2003) 2139-2141

Single- and poly-crystalline copper wires with diameters down to 30 nm are grown in etched ion-track membranes. Individual nanowires are isolated and contacted by means of optical lithography. Electronic transport properties and oxidation processes are investigated. Depending on the oxidation state, the wire resistance varies between a few hundred ohms and several megaohms, enabling its usage as metallic or semiconducting structural elements for devices on the nanometer scale.