

## **Synthesis of gold nanowires with controlled crystallographic characteristics**

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The controlled fabrication of poly- and single-crystalline Au nanowires is reported. In polycarbonate templates, prepared by heavy-ion irradiation and subsequent etching, Au nanowires with diameters down to 25 nm are electrochemically synthesized. Four-circle X-ray diffraction and transmission electron microscopy measurements demonstrate that wires deposited potentiostatically at a voltage of -1.2 V at 65°C are single-crystalline and oriented along the [110] direction. By reverse-pulse electrodeposition, wires oriented along the [100] direction are grown. The wires are cylindrical over their whole length. The morphology of the caps growing on top of poly- and single-crystalline wires is a strong indication of the particular crystalline structure of the nanowires.