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Electron Microscopy Analyses of Nanowires Electrochemically Deposited into Porous Membranes¹ HAIDONG LIU, ZHIPING LUO, ZUXIN YE, WENHAO WU, Texas A & M University — We fabricated single crystal nanowires of Zn, Sn and Pb by electrochemically depositing materials into the pores of porous anodic aluminum oxide membranes and polycarbonate membranes. We applied an *in situ* self-contacting technique to electrically contact single nanowires with macroscopic electrodes of Au, Sn, and Pb pre-fabricated on the membrane surfaces. We observed an anomalous long-range proximity effect in this nanowire/electrode system. In this talk, we describe electron microscopy methods we used to analyze the structure and the composition of the nanowires/electrode system. These included analyses of extracted nanowires using the scanning electron microscope (SEM) and the transmission electron microscope (TEM). Nanowires remaining in their original pore channels were also analyzed with TEM using samples prepared by ion-milling and ultramicrotomy. These analyses revealed that the nanowires were single crystalline. Furthermore, the interface between the nanowires and the electrodes were directly imaged. The chemical compositions of the nanowires were also confirmed by the energy dispersive spectroscopy (EDS) analyses and mappings.

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