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Freestanding Arrays of Nanowire Materials for High Rate Capability Battery Electrodes

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The rate capability of battery electrodes is highly dependent on the grain size, texture, and morphology of the electrode materials. The ability to engineer an ordered, high surface area structure of electrochemically active materials on the nanoscale can yield enhanced charge/discharge characteristics. We report the ability to fabricate freestanding nanowires of cathode materials, including MnO_2 , for lithium batteries using techniques such as templated electrolytic deposition and anodic oxidation of the metallic nanowires.