

Supplementary information

Electrochemical Synthesis of Ultrafast and Gram-Scale Surfactant-free Tellurium Nanowires by Gas-Solid Transformation and its Applications on Supercapacitor Electrode and P-doping of Graphene Transistor

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Video S1. The supplementary video presents an overview of the experimental setup as well as the electrochemical reaction which leads to the synthesis of tellurium nanowire (dark precipitate) from a bismuth telluride bulk working electrode.

Evidence of H₂Te gas: The evolution of H₂Te gas during the electrochemical reaction was verified by suspending a Si substrate above the electrolyte surface (figure S1 a,b), and the H₂Te derived tellurium was detected after the electrolysis. Three peaks of H₂Te derived tellurium in Raman spectrum located at 92.4, 121.6, and 141.1 cm⁻¹ are corresponding to E^l(transverse), A₁, and E^u(transverse) Raman-active modes, respectively. These peaks are also consistent with the Raman spectrum from pure bulk Te (figure S1 c). The SEM image of H₂Te derived tellurium on Si substrate shows a blade shape rather than nanowire shape in electrolyte solution (figure S1 d).

Figure S1. (a)(b) Two-electrode system for the Te NWs synthesis and a suspended Si substrate upon the electrolyte. (c) Raman spectra of Te bulk and H₂Te derived Te. (d) SEM image of H₂Te derived Te.