

51st GREEN Open Seminar

2016/ 9/16(Fri) 13:00~14:00

Venue : Auditorium, 1F, WPI-MANA Bldg., Namiki Site

Controllable Synthesis of Inorganic Nanowires and Their Emergent Macroscopic Nanowire Assemblies for Energy Conversion and Storage

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Abstract

With fast developing in nanoscience and nanotechnology, it has been a challenge on how to synthesize high quality nanoscale building blocks in macroscopic-scale and assembly them into macroscopic assemblies with diverse functions. In this lecture, we report the scale-up synthesis of high quality tellurium (Te) nanowires, the stability of freshly prepared ultrathin Te nanowires, their enhanced reactivity and templating effects for scale up synthesis of a family of functional one-dimensional (1D) nanomaterials including semiconductor, noble metal or alloy, carbon, and other nanocomposites. 1D metal alloys and metal chalcogenides, for examples, Pt, Pd, Pd@Pd and PtPdTe nanowires, CoSe₂/amine nanobelts and related hybrid materials are chosen to illustrate their electrocatalytic performances. In addition, a series of macroscopic assemblies of nanowires, including 2D free-standing membrane/film, and 3D nanowire networks templated from Te nanowires can also be fabricated, which exhibit enormous potential for attractive applications for energy conversion and storage, such as electrocatalysis, electrodes, supercapacitors and Lithium-ion batteries.