



Hybrid nanomaterials for energy harvesting applications (ROI #2012-16)

Description

- Novel single-walled carbon nanotube-copper sulfide nanoparticle hybrid material (SWNT-CuS)
- SWNT-CuS hybrid synthesized by a simple chemical route using linker molecule
- Hybrid material have significantly increased light absorption compared to pure single-walled carbon nanotubes
- Hybrid material can be easily fabricated into thin-films

Advantages

- More environmentally friendly and less toxic than other heavy metal nanoparticles like CdSe, CdS, PbS
- Less expensive than noble metal nanoparticles like Pt, Au, or Ag
- Hybrid material exhibits superior optical and thermal characteristics, light absorption, photocurrent and thermocurrent generation under light illumination and/or thermal irradiation.

Areas of Application

- Hybrid material has potential to enable a new type of thermoelectric generator that does not require a heat-sink or cooling components

Patent Status

- Patent pending

Publications

- Tseng et al, Optical and thermal response of single-walled carbon nanotube-copper sulfide nanoparticle hybrid nanomaterials, *Nanotechnology*, **23**, (2012), pp. 1-7.