

R & D of 1D and 2D Nanomaterials

Keywords: Graphene, Carbon nanotube, Nanowire

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Background

Our research interest is in the design, fabrication, characterization, and applications of one- and two-dimensional nanostructured materials. Current efforts are focused on graphene supercapacitors with high density of energy storage and high quality rare-earth nanowires as the next-generation electric field-induced electron-emitter.

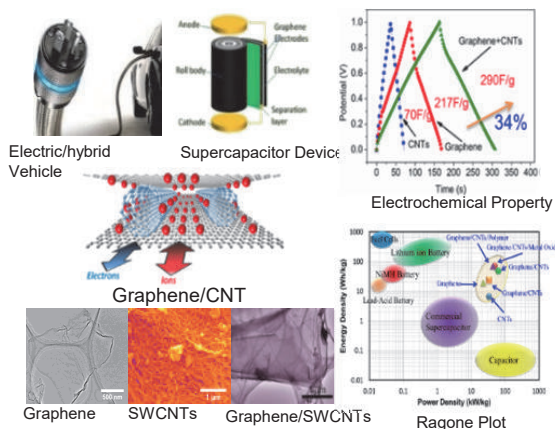
Aim

- (1) Development of graphene supercapacitors for energy storage applications.
- (2) Development of nanowire electron emission technology for electron microscopes.

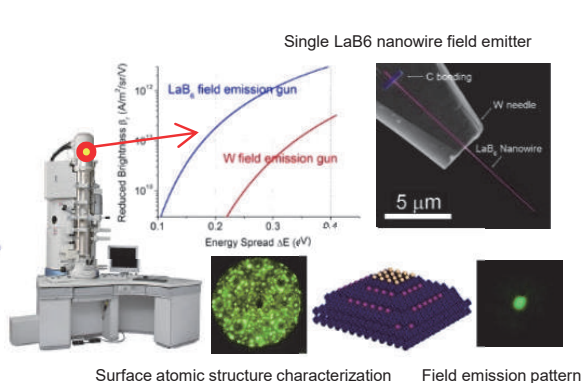
Advanced Research Topics

“Nanomaterials for Energy Storage and Electron Emission”

Graphene Supercapacitor with High Density of Energy Storage



Electron Emission Technology for Advanced Electron Microscopes



Publications

- "Hybrid graphene electrodes for supercapacitors of high energy density"; Chemical Physics Letters, 584, 124-129 (2013).
- "Graphene and carbon nanotubes composite electrodes for supercapacitors with ultra-high energy density "; Physical Chemistry Chemical Physics, 13, 17615-17624(2011)
- "Nanostructured LaB6 field emitter with lowest apical work function"; Nano Letters, 10, 3539-3544 (2010).

Applied area and future prospects

- New methods for preparation of nanomaterials
- Development of high performance electron emission technology
- Fabrication of nanotechnology-enabled devices

Issues for technology transfer

- Achieve high gravimetric and volumetric density of energy storage for graphene supercapacitors
- Improve and develop fabrication and assembly processes for industrial applications