台科大永續能源發展中心簡介

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The sustainable energy development center pursues applied research and technology for sustainable development of the community. With emphasis on the energy education, the sustainable energy development center advocates fundamental research on materials and systems, disseminates research outcomes and promotes the applications in green communities, buildings and transportation.
E∞ center advocates fundamental research on materials and systems, disseminates research outcomes and promotes the applications in portable devices, green communities, buildings and transportation.

2012 -2014
• 31 projects – Government funded
• 7 International projects
• 80 SCI papers
• 102 Conference papers
• 32 Patents applications
• 8 Grated patents
• 5 Technology transfer

∞ efforts = ∞ opportunities
Industrial cooperation

- 6 industrial projects have been successfully conducted in 2015
- > 50 since 2006
- NT$22 M technology transfer fund in 2015
research topics

Electrochemical nanotechnology
• Bimetallic nanoparticles
• Synchrotron-assisted characterization

Fuel cells
• Novel composite membranes
• Core-shell nanocatalysts
• Non-carboneous catalyst support

Computation
• Exploration of nanoscience combining theoretical and experimental works
• Establishment of a database for the design of electrocatalysts
research topics

Solar fuel and energy conversion
- Visible light-driven photocatalyst
- Photocatalytic reactor for hydrogen production
- Non vacuum process for CIGS solar cells
- Quantum dots and application in solar cells

Lithium ion batteries
- Development of new materials (cathode, electrolyte, additives)
- Study and characterization of the SEI layer
- In-situ measurement techniques

Bio-sensors
- Bimetallic nanocatalyst/glucose oxidase composite electrode
- Hydrogen peroxide detector
- Surface-enhanced Raman Scattering (SERS) for bio- and medical diagnosis
Patent-indexed research activities

**Total >70**

- Binder for cathode material
- High capacity anode
- Package process and application
- Non-flammable electrolyte
- High capacity Lithium battery
- Electrode material
- Surface modification
- Composite & making methods

**Battery & supercapacitor - >22 patents and applications**

- Chalcopryte thin film
- Photovoltaic cell
- Photoelectrode
- CIGS thin film

**Solar energy & conversion – 9 patents and applications**

- CO₂ absorbing ceramics
- Self-stablized inorganic nanocomposites
- Fluid separation device
- Nano-catalyst/enzyme composite electrode

**Fuel cells - >20 patents & applications**

- Catalytic liquid fuel
- Composite catalyst
- Polymer electrolyte membrane
- Electrode by electrophoresis
- Non-carbon catalyst support
- Mediator-type photocell

**Nanoscience – 11 patents and applications**

- Self-stablized inorganic nanocomposites
- Fluid separation device
- Nano-catalyst/enzyme composite electrode
Thanks for your attention!

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