Particles and Catalysis Research Laboratory

Specialises in harnessing solar energy for sustainable fuel production through catalysis and the development of solar batteries/capacitors for the efficient capture of sunlight for storage and on-demand release

Competitive advantage

- Over 25 years' expertise in the fields of fine particle technology, photocatalysis, and functional nanomaterials
- Vast experience in designing hetero-structured catalysts to effectively harvest solar light and translating these findings into greener manufacturing processes involving hybrid photo-electro-thermal catalysis —such as for transforming CO2 and water into valuable chemicals and energy feedstock
- State-of-the-art instruments for particle and material characterisation

Impact

- Enhanced Australian energy security by using infinite and diffusive solar energy
- Alleviate global warming by reducing the carbon footprint
- Off-grid fuel generation in remote strategic sites
- Large scale production of active and stable catalyst

Successful applications

- Australia Patent and US patent no 6558553 "Development of a stable magnetic photocatalyst" (1999) – the functionalised MNP were used for selective bio-separation, sensors, bio-imaging, water treatment processes
- Flame Spray Pyrolysis (FSP) technique to synthesis nanomaterials and highly active composite catalyst with closely controlled characteristics, and easily scalable for application in fuel cell, gas to liquid fuel production.

Capabilities and facilities

- Flame Spray Pyrolysis Process
- SSITKA – DRIFTS technique (Steady State Isotopic Transient Kinetic Analysis – Diffuse Reflectance Infrared Spectroscopy Technique)
- Photoreactor and reactor system for testing catalyst performance
- Access to Mark Wainwright Analytical Centre

Our partners

- RayGen Resources Pty Ltd
- Shenzhen Kohodo Sunshine Renewable Energy Co. Ltd
- Beijing Zhongchao Haiqi Technology Co Ltd
- CSIRO Energy
- Origin Water International Pty Ltd

More Information

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