

# **Carbon Materials for Energy Storage and Conversion**

Carbon materials are excellent candidates for energy-related applications, from batteries and supercapacitors to fuel cells and electrocatalysis. A series of carbon nanostructures, such as graphene platelets and films, can be provided, along with innovative, scalable synthesis strategies, to enable the uptake of these materials in applications.

#### Competitive advantage

- Experience in producing state-of-the-art carbon nanostructures with tuneable properties
- Expertise in innovative strategies for carbon material synthesis and functionalisation
- Diverse platforms for integrating carbon materials into energy storage/conversion systems

#### Impact

• Novel carbon materials are key to high-performance energy storage and conversion.

### Successful applications

- Rapid synthesis of a variety of graphene-based materials using microwave technology
- Growth of large-area, monolayer graphene using chemical vapour deposition strategy
- Highly conductive carbon foils made of stacked/overlapped graphene platelets
- Highly efficient carbon nanostructured electrocatalysts for water splitting
- · High-performance carbon-based electrode materials for potassium ion batteries

### **Capabilities and facilities**

- Chemical vapour deposition system for graphene growth
- Chemical laboratory equipment
- Electrochemical testing platform and battery analysis setup
- Access to advanced chemical and physical analytical techniques

## **More Information**

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