

## **Title: 2D graphitic carbon (GC) as cathode host in Lithium Sulfur Batteries**

Lithium-sulfur battery (LSB) is a very promising candidate in the next generation battery systems due to its high specific capacity (1675 mAh/g) and low cost. Novel host materials, which are designated to suppress the dissolution of lithium polysulfides (LiPS) into electrolyte, play critical roles to solve the long-term cycling problem in LSB. Inspired by the recent success of improved anchoring of lithium polysulfides (LiPS) through heteroatom doping in carbon frameworks, graphitic carbon (GC) represents as a promising host material with typical 2D layered graphitic structure with high conductivity and superior chemical properties compared to other carbon materials. The overall objectives of the project are to develop facile scalable synthetic strategies to improve the cyclic and/or rate performance of the GC/sulfur-based composite cathode, acquire knowledge and mechanism about the structure control, structure-property correlation of the sulfur cathode. All research within the components will be realized in the form of pouch cells produced at the Ford PERDC facility at Windsor.

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