

**High specific capacitance and energy density of synthesized graphene oxide based strontium sulfide nanorods for supercapacitor applications**Muhammad Faisal Iqbal<sup>1,2</sup>, Muhammad Naeem Ashiq, Aamir Razaq, Murtaza Saleem, Bushra Parveen and Mahmood-Ul-Hassan<sup>1</sup>Lahore Garrison University, Pakistan<sup>2</sup>University of the Punjab, Pakistan

High specific surface area and electrical conductivity of nanostructure metallic sulfides is very fundamental to attain high specific capacitance, energy density and power density of an electrode material for supercapacitor applications. Graphene oxide (GO) based strontium sulfide nanorods like morphology have been fabricated by employing hydrothermal method. The determined high electrical conductivity, surface area, as well as the mechanical support offered by GO makes the strontium sulfide nanorods electrochemically active electrode structure. The CV curves with well-defined redox peaks confirm the pseudocapacitive behavior of GO based strontium sulfide nanorods in 2 M KOH electrolyte. The specific capacitance and energy density has been extracted from the GCD profile as 1831.14 Fg<sup>-1</sup> and 91.56 WhKg<sup>-1</sup> at the current density of 3 mA cm<sup>-2</sup>. The electrochemical impedance also confirms the pseudocapacitive nature of strontium sulfide nanorods electrode materials. The two electrode symmetric behavior of strontium sulfide nanorods also showed excellent electrochemical behavior. Hence, the experimental results suggest that strontium sulfide nanorods is a very suitable electrode material for supercapacitor applications.

**Recent Publication**

1. Muhammad Faisal Iqbal, Mahmood Ul H, Ashiq M N, Iqbal S, Bibi N and Parveen B (2017) High specific capacitance and energy density of synthesized graphene oxide based hierarchical Al<sub>2</sub>S<sub>3</sub> nanorambutan for supercapacitor applications. *Electrochimica Acta* 246:1097-1103.
2. Muhammad Faisal Iqbal, Muhammad Naeem Ashiq, Aamir Razaq, Murtaza Saleem, Bushra Parveen and Mahmood-Ul-Hassan (2018) Excellent electrochemical performance of graphene oxide based strontium sulfide nanorods for supercapacitor applications. *Electrochimica Acta* 273(2018):136-144.
3. Muhammad Faisal Iqbal, Mahmood-ul-Hassan, Aamir Razaq, Muhammad Naeem Ashiq, Yusuf Valentino Kaneti, Azhar Alowasheer Azhar, Farhat Yasmeen, Khurram Saleem Joya and Shafqat Abbass (2018) Effect of graphene oxide thin film on growth and electrochemical performance of hierarchical ZnS nanoweb for supercapacitor applications. *Chemelectrochem* 5(18):2636-2644.
4. Muhammad Faisal Iqbal, Muhammad Naeem Ashiq, Mahmood-Ul-Hassan, Rahat Nawaz, Aneeqa Masood and Aamir Razaq (2018) Excellent electrochemical behavior of GO based aluminum sulfide nanowalls for supercapacitor applications. *Energy* 159 (2018):151-159

**Biography**

Muhammad Faisal Iqbal is the PhD scholar from Materials Growth and Simulation Laboratory, Department of Physics, University of the Punjab, Pakistan. He is working as a Senior Lecturer at Lahore Garrison University, Pakistan. He has published already nine papers in reputed journals. He is young electrochemistry in Pakistan. He also has work experience at International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Japan.

faisal.phd.physics@pu.edu.pk