**Tuning the Physiochemical Properties of 2D Materials for Energy Storage Applications**

**Dr. Chandra Sekhar Rout**

Centre for Nano & Material Sciences, Jain University, Jakkasandra Post, Kanakapura Taluk, Ramanagara District-562112, Karnataka, India

Email: \*\*csrout@gmail.com, r.chandrasekhar@jainuniversity.ac.in

**Abstract**

The ever-growing global demand of energy together with the depletion of fossil fuels makes it critical to develop sustainable and renewable energy resources. Developing relevant energy storage systems such as supercapacitors and batteries is essential to utilizing sustainable and renewable energy resources. Supercapacitors store energy in terms of both electrostatic double layer capacitance (EDLC) and pseudocapacitance. Nanostructured hybrid materials with both organic and inorganic components have attracted much attention recently due to the possibility of tailoring their dimensionality to facilitate a change in their fundamental properties including redox potential, conductivity and charge storage, in comparison with those of their bulk analogs [1-5]. In my talk, I’ll discuss the working principles and fundamental aspects of supercapacitors and the recent achievements of our research group on design of 2D layered materials and reduced graphene oxide hybrids for supercapacitor applications [1-5].

**Keywords:** Energy storage, 2D materials, Supercapacitor, Phase tuning, Defect engineering

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