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LAYERED MARIGOLD-FLOWER-LIKE CdS/MoS₂-REDUCED GRAPHENE OXIDE NANOCOMPOSITE AS AN EFFICIENT ELECTRODE MATERIAL FOR SUPERCAPACITOR

L.N. Khandare^{1*}, D.J. Late² and N.B. Chaure¹

¹*Department of Physics, Savitribai Phule Pune University, Pune, India.*

²*Centre for Nanoscience and Nanotechnology, Amity University, Mumbai, India*

**linakhandare@gmail.com*

Technological advances have become a fundamental part of everyday life, and the demand for energy-storing devices has grown exponentially. Therefore, the development of energy storage devices is needed to fulfil global energy demands. Consequently, materials and devices for energy storage have long-term clean and renewable energy sources, which are widely accessible owing to their cost-effective and environmentally friendly nature. Transition metal chalcogenides are useful as active electrode materials for enhancing the capacity for energy storage. Considering the requirement of a large surface for energy storage, we have synthesized Marigold flower-like CdS/MoS₂ nanoflowers on rGO nanosheets by simple hydrothermal synthesis. The CdS/MoS₂-rGO nanocomposite symmetric supercapacitor device exhibited increased capacitance of 102 F g⁻¹ at a current density of 0.1 A g⁻¹, and 83.4% of the capacitance was retained up to 16×10^{-3} cycles at the current density of 5 A g⁻¹. The resulting CdS/MoS₂-rGO nanocomposite can deliver excellent electrochemical performance. Supercapacitors under study demonstrated high energy storage capabilities, resulting in an efficient device for electrochemical energy storage.

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Keywords: Cadmium sulfide, Molybdenum disulfide, Supercapacitor, Symmetric device.