

Vigna Radiata Extract Assisted Sol-Gel Synthesis of Strontium Ferrite for Supercapacitor Applications

This study reports the preparation of strontium ferrite using sol-gel method with vigna radiata (moong dal) extract as a natural, plant based and eco-friendly chelating agent for supercapacitor applications. The use of plant based extract offers a cost effective and sustainable approach to material synthesis. The structural and morphological properties of the synthesized strontium ferrite were examined using x-ray diffraction (XRD) and field emission scanning electron microscope (FESEM) characterization techniques. Electrochemical performance was evaluated through cyclic voltammetry and Galvanostatic charge-discharge studies. The electrochemical properties of the prepared sample were studied using an electrochemical workstation with a three electrode setup in a 1M Na₂SO₄ electrolyte. Electrochemical analysis revealed a specific capacitance of about 765 Fg⁻¹ at a scan rate of 5 mVs⁻¹, while different capacitance values were observed at other scan rates. This work highlights the potential of green sol-gel synthesis routes in the development of energy storage materials.

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