

Synthesis and Characterization of Barium Spinel Ferrite nano material using sol gel method

BaFe₂O₄ is an emerging functional ferrite material known for its versatile magnetic, optical, and electrochemical properties. Owing to its orthorhombic spinel-like crystal structure slightly different from typical spinel structure and narrow band gap, BaFe₂O₄ has gained attention for applications in energy storage, photocatalysis, sensing, and environmentally sustainable technologies.

BaFe₂O₄ nanomaterials have attracted increasing research interest due to their multifunctional structural, optical, magnetic, and electrochemical properties, making them promising candidates for energy, sensing, photocatalytic, and environmental applications. We want a comprehensive investigation of BaFe₂O₄ nanomaterials synthesized via an eco-friendly green sol-gel route, emphasizing sustainable material development without the use of toxic chemical chelating agents. Plant-derived extracts rich in phytochemicals such as flavonoids, polysaccharides, and phenolic compounds are employed as reducing, chelating, and stabilizing agents to facilitate controlled phase formation and nanoscale morphology.

Although several studies have successfully synthesized BaFe₂O₄ through soft-chemical routes such as the Pechini method, there is still a lack of research specifically focused on plant-based green sol-gel synthesis. We have synthesized Barium Spinel Ferrite nano material and structural properties like average particle size is reported in this communication.

Author: CHANDEL, Kartikey (Central University of Himachal Pradesh)

Presenter: CHANDEL, Kartikey (Central University of Himachal Pradesh)