

Impact of Temperature Variation on Magnetic Properties of N Doped Spinal Nickel Ferrite with Graphene

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Abstract : Simple hydrothermal method to synthesize new nanocomposites consisting of nitrogen-doped graphene and NiFe₂O₄. By analyzing the X-Ray Powder Diffraction (XRD) images, we confirmed that the NiFe₂O₄ phase is pure and has a Face Centered Cubic (FCC) structure. The average size of the NiFe₂O₄ nanoparticles is approximately 40±2 nm. Additionally, we used X-ray photoelectron spectroscopy (XPS) to study the surface chemical composition and cation oxidation states of both the NiFe₂O₄ nanoparticles and the nitrogen-doped graphene/NiFe₂O₄ nanocomposites. A magnetic interaction between nitrogen doped graphene/NiFe₂O₄ was studied. Increases in hydrothermal synthesis temperature lead to the improved crystalline structure of NiFe₂O₄ nanoparticles, which improves the magnetic properties.

Keywords : nickel ferrite spinal, nitrogen doped graphene, magnetic nanocomposite, hydrothermal synthesis

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