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Synthesis and Characterization of $\text{CoFe}_{2-x}\text{Ni}_x\text{O}_4$ Magnetic Nanoparticles NICHOLAS LOMBARDO, RAHUL SINGHAL, Central Connecticut State University — The synthesis and characterization of nanomaterials has recently become a very prominent research field in materials science. At very small scales, nanomaterials exhibit properties that may be drastically different from the material at bulk, such as optoelectronic and magnetic properties. Of specific interest are the properties of Magnetic Nanoparticles (MNP). MNPs have been hypothesized to be of use in biophysics, digital storage, medical physics, and manufacturing. In this work, we have synthesized $\text{CoFe}_{2-x}\text{Ni}_x\text{O}_4$ ($x=0.1, 0.2, 0.3, 0.4, 0.5$) MNPs via co-precipitation method using acetates as precursor materials. The synthesized materials were optically characterized using Fourier Transform Infrared Spectroscopy (FTIR) and UV-visible spectroscopy techniques. The thermal characterizations were carried out using Differential Scanning Calorimetry (DSC) and thermogravimetric analysis (TGA).

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