EFFECT OF pH AND STIRRING TIME ON THE MICROSTRUCTURE AND MAGNETIC PROPERTIES OF NANOPARTICLES BARIUM HEXAFERRITE BY CO-PRECIPITATION METHOD

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Abstract

Synthesis of nanoparticles of barium hexaferrite (BaFe$_{12}$O$_{19}$) by co-precipitation method. Barium hexaferrite solution obtained from a mixture of barium nitrate and ferri nitrate hydrate with the deposition of barium ions (Ba$^{2+}$) and ferri (Fe$^{3+}$) by 5M sodium hydroxide solution. Variations of pH between 7.5, 10, and 11 also stirring time between 1-3 hours. This research studied the influence of pH and stirring time on the microstructure and magnetic properties. The results of powder were then examined by X-Ray Diffraction (XRD), Scanning Electron Microscope (SEM), and Vibrating Sample Magnetometer (VSM).

Results showed that pH strongly affected the formation of phase with the optimum point at pH 10 and stirring time is very influential on the achievement of crystal size with the smallest size of 75 nm at 3 hours stirring time.

Keywords: Barium hexaferrite, co-precipitation, pH, stirring time.