SYNTHESIS AND CHARACTERIZATION OF NANOCOMPOSITES OF MAGNETITE/GRAPHENE-OXIDE (Fe3O4/GO) BASED ON Fe3O4FROM BEACH OF GLAGAH KULON PROGO IN YOGYAKARTA

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ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF NANOCOMPOSITES OF MAGNETITE/*GRAPHENE-OXIDE* (Fe_3O_4/GO) BASED ON Fe_3O_4FROM BEACH OF GLAGAH KULON PROGO IN YOGYAKARTA

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ABSTRACT

This study aims to determine the optimum concentration of NH4OH in the Fe_3O_4 magnetite synthesis process from iron sand extract by coprecipitation method on the lattice parameters, crystal structure, size of surface morphology nanoparticles, chemical composition and magnetic properties of the synthesized nanoparticles.This study also aims to find out how to functionalize Fe_3O_4 magnetite with graphene-oxide to obtain Fe3O4 / Graphene-Oxide (Fe_3O_4 / GO) nanocomposites.In addition, this study aims to determine the magnetic and optical properties of the Fe_3O_4 / GO nanocomposite.
The research will be carried out in three stages.The first step is the synthesis of Fe_3O_4 magnetite from the extraction of Glagah Kulon Progo beach iron sand.The second step is the functionalization stage of Fe3O4 magnetite with graphene-oxide to obtain Fe3O4 / Graphene-Oxide (Fe_3O_4 / GO) nanocomposites.While the last step is the characterization of Fe_3O_4 magnetite and Fe_3O_4 / GO nanocomposite.

The concentration of NH4OH did not significantly affect the lattice parameters, crystal structure, crystal size, morphological structure and chemical composition of the magnetite Fe3O4 synthesized by the coprecipitation method, although the best result was sample 2a (variation in the concentration of NH4OH 15%). The concentration of HCl did not significantly affect the lattice parameters and crystal structure, but it did have a significant effect on the size of the magnetite Fe3O4 nanoparticles synthesized by the coprecipitation method. The concentration of HCl did not significantly affect the surface morphological structure and chemical composition of the magnetite Fe3O4 nanoparticles synthesized by the coprecipitation method. The surface morphology structure formed is quite homogeneous. While the chemical composition of the magnetite material that is formed consists of the element Fe as much as 72.42% and the element O as much as 27.58%.
GO concentration affects the lattice parameters, crystal structure and size of the synthesized Fe3O4 / GO nanocomposite. The greater the mass of GO used, the dominant peak will shift. The diffraction peak of 2θ = 35.80 ? indicates the field (311) which is characteristic of magnetite (Fe3O4) nanoparticles. As the mass of GO added got bigger, the peak decreased in intensity. The diffraction peak around 2θ = 25.60? which is the peak of graphite has increased significantly along with the increase in mass of GO. This affects the crystal parameter value, crystal structure and the size of the crystals formed.

Key word : iron-oxide, nanoparticles, magnetite, coprecipitation, nanocomposites, graphene-oxide

Kata Kunci: *iron-oxide, nanoparticles, magnetite, coprecipitation, nanocomposites, graphene-oxide*