

ABSTACT

SYNTHESIS AND CHARACTERIZATION OF MAGNETIC MATERIALS BARIUM HEXAFERITTE ($\text{BaFe}_{12}\text{O}_{19}$) USING BASIC MATERIALS BARIUM CARBONATE AND IRON SAND FROM THE SOUTHERN COASTAL AREA OF PANDEGLANG-BANTEN

By

M ARIF MUHAJIR

Synthesis and characterization of magnetic materials barium hexaferitte ($\text{BaFe}_{12}\text{O}_{19}$) using basic material barium carbonate (BaCO_3) and natural iron sand from the southern coastal area of Pandeglang-Banten was done by powder technology methods. Characterization using SEM-EDX results show ferrite purity of natural iron sand extraction at 92.15%. Synthesized magnetic materials with composition BaCO_3 and Fe_2O_3 by calculations based on stoichiometry and smooth used ball milling for 10 hours. Results by thermal analysis DTA showed the presence of a magnetic phase change in temperature 900,1000,1100 dan 1200°C. XRD characterization result sample X-900 dominated by *hematite* phase (Fe_2O_3), sample X-1000 dominated by *dibarium monoferrite* phase (Ba_2FeO_4), sample X-1100 dominated by *barium hexaferitte* phase ($\text{BaFe}_{12}\text{O}_{19}$) and sample X-1200 dominated by *pseudobrookite* phase (Fe_2TiO_5). Hysteresis curves of magnetic materials using VSM techniques shows the magnetic properties of the sample material X-1200 magnetic saturation (M_s) of 23.60 emu/g, remanensi magnetic (M_r) of 5.6066 emu/g and coercivity (H_c) of 204 Gauss.

Keywords: natural iron sand, barium hexaferitte, EDX, DTA, XRD, VSM.