

SYNTHESIS AND CHARACTERIZATION OF Fe_2O_3 BY SOL-GEL METHOD

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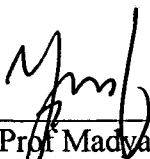
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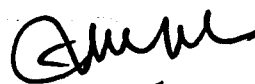
This Final Year Project Report entitled "Synthesis and Characterization of Fe₂O₃ by Sol-Gel Method" was submitted by Noor Hasibah Ridzuan, in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by



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ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF Fe₂O₃ BY SOL-GEL METHOD

The single phase of Fe₂O₃ have been prepared by sol-gel method. The powders are synthesized using Iron (III) nitrate nanohydrate, Fe(NO₃)₃.9H₂O as the starting material, absolute ethanol as the solvent and ammonia as the gelling agent. All the sol-gel products were annealed at 300°C, 500°C and 700°C for 6 hours and 24 hours respectively. The annealed products were characterized by Thermogravimetric Analysis (TGA) to find the thermal behavior, X-Ray Diffraction (XRD) to find the structural properties and to characterize the morphology by Scanning Electron Microscopy (SEM). The effects of annealing time and annealing temperature onto the phases and structural properties of Fe₂O₃ were investigated throughout this study. Thermogravimetric analysis provided insight into the decomposition process of the Iron (III) nitrate nanohydrate. The XRD analysis indicates that all the products were of rhombohedral lattice. Besides that, the particle sizes of Fe₂O₃ were increased due to the increasing of annealing temperature and annealing time. The morphology of Fe₂O₃ was nanosized.