

**GREEN SINTESIS NANOKOMPOSIT ZnO/CoFe₂O₄ MENGGUNAKAN
EKSTRAK KULIT RAMBUTAN (*Nephelium lappaceum*L.) DAN SIFAT
KATALITIKNYA TERHADAP DEGRADASI ZAT WARNA DAN LIMBAH
ZAT WARNA BATIK**

SKRIPSI SARJANA KIMIA

OLEH :

AIMI ALVINA

BP: 1310411076

Pembimbing I : Dr.Rahmayeni

Pembimbing II : Dr. Zulhadjri, M.Eng



**JURUSAN KIMIA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS ANDALAS
PADANG
2017**

ABSTRACT

GREEN SYNTHESIS OF NANOCOMPOSITES OF ZnO/CoFe₂O₄ USING RAMBUTAN (*Nephelium lappaceum L.*) PEEL EXTRACT AND THEIR PHOTOCATALYTIC ON DYE

by
Aimi Alvina (1310411076)
Dr. Rahmayeni dan Dr. Zulhadjri, M.Eng

Magnetic materials of CoFe₂O₄ using rambutan (*Nephelium lappaceum L.*) peel extract (CoE) and CoFe₂O₄ using rambutan (*Nephelium lappaceum L.*) peel extract with NaOH (CoEN) and then nanocomposite of ZnO/CoFe₂O₄ were green synthesized rambutan (*Nephelium Lappaceum L.*) using peel extract as natural ligand agent followed calcination (NCoEK) and synthesized ZnO/CoFe₂O₄ using rambutan (*Nephelium Lappaceum L.*) peel extract with NaOH followed calcination (NCoENK) by hydrothermal method. The samples were applied for the degradation of *Direct Red 81* dye and batik waste dye under solar light irradiation. Nanocomposites were characterized by *X-ray diffractometer* (XRD), Scanning Electron Microscopy-Energy Dispersive X-ray and *Vibrating Sample Magnetometer* (VSM) and Fourier Transform Infra-Red (FTIR). The XRD pattern of ZnO/CoFe₂O₄ nanocomposites showed that the highest peak of ZnO for each nanocomposite corresponding to hexagonal wurtzite structure and the peak CoFe₂O₄ corresponding to cubic structure. TEM analysis showed that morphology nanocomposite NCoEK granular-like and nanocomposite NCoENK showed hexagonal. The analysis of VSM, nanocomposite NCoEK had weak ferromagnetic properties, but nanocomposites NCoENK had paramagnetic properties. Based on examined results from the degradation of *Direct Red 81* dye obtained that ZnO/CoFe₂O₄ nanocomposites indicate higher photocatalytic activity than ZnO and CoFe₂O₄ only, reaching 99.64%. ZnO/CoFe₂O₄ nanocomposites are stable and promise as photocatalysts that can be used again (reusable photocatalyst).

Keyword : Magnetic Material ZnO/CoFe₂O₄, Photocatalyst, Hydrothermal, Direct Red 81, Batik Waste Dye