

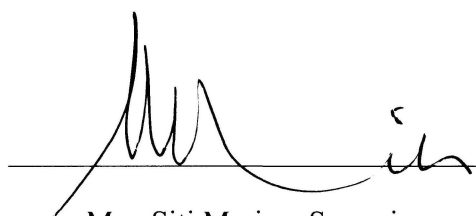
**ADSORPTION STUDIES USING Zn-Al-NO₃-LDH TO REMOVE ACIDIC AND BASIC
DYE FROM AQUEOUS SOLUTION**

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In the name of Allah,

The Most Gracious, The Most Merciful

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ABSTRACT

ADSORPTION STUDIES USING ZN-AL-NO₃-LDH TO REMOVE ACIDIC AND BASIC DYE FROM AQUEOUS SOLUTION

Layered double hydroxide (LDH) is a class of ionic lamellar solids with positively charged layers with two kinds of metallic cations and exchangeable hydrated gallery anions. This is also referred to as anionic clays and also as hydrotalcite-like compounds in the name of the polytypes of the corresponding [Zn-Al-NO₃]-LDH based mineral. Zn-Al-NO₃-LDH was synthesized with final ratio of 4:1 by co-precipitation method. Characterization of Zn-Al-NO hydrotalcite was done using Scanning Electron Microscope (SEM), XRD and FT-IR. Various experiment parameters were studied. They include the effect of contact time and initial concentration, effect of pH, effect of adsorbent dosage, effect of temperature and the effect of particle size and also the Langmuir and Freundlich Isotherm. All the parameters will affected the adsorption capacity of the LDH. For the study of contact time and initial concentration, the maximum ZAN uptake percentage for the 50 ppm Amido Black dye concentration is 99.7% for and 18.3% for 5 ppm Methylene Blue. For the effect of pH, the highest uptake percentage for both dyes is at pH 2 which is 99.2% for Amido Black and 23.1% for Methylene Blue. While for the effect of adsorbent dosage, the highest removal percentage for Amido Black was exhibited using 0.2g ZAN with the value of 99.02% while for Methylene Blue the highest uptake percentage is 24.9% using 1.5g ZAN. For effect of temperature the maximum uptake percentage for Amido Black was 98.9% while for Methylene Blue the highest uptake was 25.5% and both were done using 35°C. For the effect of particle size, maximum adsorbance was obtained using 212µm particle size with 98.9% removal of Amido Black and 32.5% removal of Methylene Blue. The study on adsorption models of Langmuir and Freundlich Isotherm showed that the adsorption was taking place on the ZAN. The characterization of the ZAN by Scanning Electron Microscope (SEM), XRD and FT-IR proved that the powder used has the properties of ZAN and dye adsorption had taken place.