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SUBMISSION FOR EVALUATION
FINAL YEAR PROJECT 2 - RESEARCH PROJECT

ADSORPTION REMOVAL OF METHYLENE BLUE USING DOLOMITE POLYMER COMPOSITE FILM

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ADSORPTION REMOVAL OF DYE METHYLENE BLUE USING DOLOMITE-POLYMER COMPOSITE FILM

NUR AQILAH BINTI HASBULLAH

Final Year Project Report Submitted in
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This Final Year Project Report entitled "Adsorption Removal of Methylene Blue using dolomite-polymer composite film" was submitted by Nur Aqilah binti Hasbullah in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry with Management in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

The release of dye-containing wastewater into the environment has become a significant environmental problem, causing adverse effects on aquatic ecosystems and humans health. In the present study, a dolomite film was studied as an economical adsorbent for methylene blue (MB) removal from aqueous solution. The adsorption was characterized by adsorption capacity (q_e) and removal efficiency (%) in relation to the initial dye concentration, contact time, and pH. adsorption capacity of MB increases with increasing initial MB concentration owing to higher concentration gradient and stronger driving force for mass transfer, but its removal efficiency decreases at high concentrations due to exhausted adsorption sites. Contact time was found to be a very important factor during the adsorption process as well. During the initial phase (1–5 min), adsorption capacity and removal were slow, which meant that there was not enough time for diffusion and surface capture. The fast adsorption took place within 10 to 30 min due to the electrostatic attachment of MB molecules on the surface of dolomite film. The equilibrium was approached at an extended contact time (45–180 min) with a maximum adsorption capacity of about 0.61 mg/g and removal efficiency of ca. 72% for 180 min. Moreover, the adsorption capacity was also found to enhance with the increase in pH 8 to 9 whereas maximum adsorption capacity (0.56 mg/ g) and removal efficiency (75%) reported at these conditions. The results suggest that adsorption was a controlling mechanism for removal of dye by dolomite film and appropriate contact time and pH must be maintained to offer optimum performance. Dolomite film has great potential as an effective and low-cost adsorbent in dye-contaminated wastewater treatments