

**PREPARATION AND CHARACTERIZATION OF  
CHITOSAN FROM RAZOR CLAM SHELL FOR  
ABSORPTION OF METHYLENE BLUE**

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**FEBRUARY 2025**

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**Final Year Project Report Submitted in  
Partial Fulfilment of the Requirements for the  
Degree of Bachelor of Science (Hons.) Applied Chemistry  
in the Faculty of Applied Sciences  
Universiti Teknologi MARA**

**FEBRUARY 2025**

This Final Year Project Report entitled **“Preparation and Characterization of Chitosan from Razor Clam Shell for Absorption of Methylene Blue”** was submitted by Nursyamimi Binti Busu in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Applied Chemistry, in the Faculty of Applied Sciences, and was approved by

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## **ABSTRACT**

### **PREPARATION AND CHARACTERIZATION OF CHITOSAN FROM RAZOR CLAM SHELL FOR ABSORPTION OF METHYLENE BLUE**

This research explores the extraction and characterization of chitosan from razor clam shells and its adsorption efficiency for methylene blue (MB) removal. The study addresses the limited availability of razor clams and investigates their potential as an alternative source of chitosan. Chitosan was successfully extracted through demineralization, deproteinization, and deacetylation, achieving a high degree of deacetylation (95.66%). Characterization using Fourier Transform Infrared Spectroscopy (FTIR) confirmed the presence of amine (-NH<sub>2</sub>) and hydroxyl (-OH) functional groups, essential for adsorption. X-ray Diffraction (XRD) analysis indicated a low crystallinity structure, while Scanning Electron Microscopy (SEM) revealed a fine, fibrous surface morphology, which enhances adsorption properties. CHNS analysis confirmed the elemental composition, validating the purity of the extracted chitosan. Adsorption studies showed 86.8% MB dye removal within 60 min, influenced by hydrogen bonding and electrostatic interactions. The study concludes that razor clam shells are a sustainable and effective source of high-quality chitosan, offering significant potential for wastewater treatment applications.

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