

**SYNTHESIS OF CHITOSAN VIA
BIOLOGICAL DEACETYLATION OF
CHITIN BIOPOLYMER**

NUR AIN BINTI AHMAD KAMAL

**BACHELOR OF CHEMICAL ENGINEERING
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By

NUR AIN BINTI AHMAD KAMAL

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ABSTRACT

Chitosan is a natural, safe, and inexpensive biopolymer derived from chitin, the main component of arthropod exoskeletons and fungal cell walls. It is the second most abundant biopolymer after lignocellulosic biomass. Chitosan by deacetylation process by chemical synthesis is polluting, while conventional biological route (using selective bacteria and enzyme) is too complicated to be performed in a household setting. In this study, chitosan was extracted by autochthonous fermentation of prawn shell waste where salt concentration was varied at 2.5% w/v, 5.0% w/v and 7.5% w/v. At the end of autochthonous fermentation, the fermented prawn shell was characterised in term of chitosan yield, degree of deacetylation by Fourier Transform Infrared Spectroscopy (FTIR) and crystallinity index by X-ray Diffractometry (XRD). FT-IR spectra and XRD revealed that fermentations at 2.5% w/v, 5.0% w/v and 7.5% w/v of salt concentration from 14 days and 28 days produced chitosan having degree of deacetylation (DDA) above 70%. XRD analysis revealed that fermented prawn shell had crystallinity index of above 90% at 020 phase (CrI_{020}). From these results, it can be concluded that autochthonous fermentation was a viable method to produce high yield chitosan and a good quality of chitosan from prawn shell waste.