Thesis Title	Study on Kinetics of Chitin-Chitosan Processing
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Abstract

This thesis is aimed to study kinetics of chitin-chitosan processing consisting of three steps: deproteination, demineralization and deacetylation. In deproteination step, the concentration of NaOH solution and reaction temperature play dominant role in removing protein. Increasing NaOH concentration or temperature decrease the protein content in deproteination process. Alkaline concentration is more potent in affecting the residual protein content at low temperature. Deproteination appears to have the third-order reaction kinetics. The apparent rate constant (k) is 3.7016×10^{-4}-1.7184×10^{-3} $(dm^3/mol)\cdot(min.\cdot\%w)^{-1}$ and the activation energy is 62.73 kJ/mol. Demineralization step followed the second-order reaction kinetics. The influence of HCl concentration was more pronounced in decreasing the residual calcium content than temperature. The demineralization rate constant in overall range is almost the same value 1.30461 $(dm^3/mol)^{0.5050}\cdot(min^{-1}\cdot\%w^{-0.5362})$ and the acitvation energy is very low. In deacetylation step, apparently temperature and alkaline concentration dramatically affect the rate of reaction. The degree of N-acetylation decreased mainly with increasing temperature or NaOH concentration, but the concentration of alkali had more influence on the degree of N-acetylation at lower temperature. The chain may be degraded and cleavaged under severe conditions. The reaction was observed to be first-order when using low alkaline concentration condition and the third-order when using high alkaline concentration condition. The apparent rate constant ranged from 0.0264-0.2524 hr^{-1} and 3.125×10^{-4}-1.254×10^{-3} $(\%w)^2\cdot hr^{-1}$, respectively.

The respective activation energies are 109.203 kJ/mole (reaction controlled) and 41.133 kJ/mole (diffusion controlled).

Keywords : Chitin / Chitosan/ Deproteination / Demineralization / Deacetylation/ Rate Constant / Activation Energy