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## EFFECTS OF LOW - FREQUENCY ULTRASOUND ON HETEROGENOUS DEACETYLATION OF CHITIN

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### Abstract

The effects of low frequency ultrasound to the heterogeneous deacetylation of chitin from the shell of white shrimp (*Penaeus vannamei*) were examined. The deacetylation process was carried out in the range of NaOH concentrations from 35% to 65% (w/w) with and without the ultrasound in the frequency of 37 kHz, RMS=300W. The chitosan obtained was characterized in the degree of deacetylation, solubility, FT-IR and X-ray diffraction. The results showed that the behaviors of the deacetylation in two cases, with and without ultrasound, were similar but the ultrasound enhanced the deacetylation rate and therefore reduced the time of the reaction to get the same degree of deacetylation. The role of ultrasound in the process showed more clearly in the low concentration of sodium hydroxide, below 45% (w/w). At the higher concentration of sodium hydroxide, the influence of ultrasound on facilitating deacetylation decreased significantly, however, ultrasound was still keeping on its improving effect on the solubility of the chitosan obtained. The data from FT-IR and X-ray diffraction did not show any considerable change in structure of both kinds of chitosan. This study showed the potential of using low frequency ultrasound in enhancing the deacetylation of chitin for reducing the chemical consumption.

Key words: ultrasound, chitin, chitosan, heterogeneous deacetylation

### 1. Introduction

Chitosan, one of the derivatives of chitin by deacetylation in different degrees, has the most applicable potential in many areas such as food, pharmaceuticals,

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