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Preparation of Chitosan with Various Molecular Weight and Its Effect on Depolymerization of Chitosan with Hydrogen Peroxide using Conventional Technique

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Abstract : Depolymerization of chitosan with hydrogen peroxide (H_2O_2) using conventional techniques has been carried out by varying the molecular weight of chitosan. This study was aimed to determine the optimum conditions of chitosan depolymerization and the effect of molecular weight on the preparation of oligochitosan. Chitosan was produced with different molecular weights in 5% acetic acid with variations of heating time for 2, 12, 24 and 24 h. The molecular weight of chitosan was determined by the viscometry method. Chitosan produced from commercial chitin had the molecular weight of 13.30×10^4 (CC-2), 12.02×10^4 (CC-12), 7.75×10^4 (CC-24) and 4.35×10^4 g / mol (CC-120) for 2, 12, 24, and 120 h of heating time, respectively. The results indicated that the properties of produced chitosan are affected by heating time. The longer the heating time, the lower the molecular weight of chitosan would be. Furthermore, chitosan was depolymerized by varying the concentration of H_2O_2 , temperature, and depolymerization time using conventional techniques. The depolymerization process of chitosan with H_2O_2 was influenced by H_2O_2 concentration and heating temperature where the optimum conditions of depolymerization of chitosan using H_2O_2 were obtained for CC-12 when the process was conducted using H_2O_2 concentration of 4%; at $30^\circ C$, for 4 h to give the corresponding oligochitosan with the molecular weight of 4.2×10^3 in 97.57% yield.

Keywords : *chitosan, hydrogen peroxide, molecular weight, oligochitosan.*

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