URN etd-0407109-183706-388
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Statistics This thesis had been viewed 49 times. Download 0 times.
Department
Year 2002
Semester 2
Degree Master
Type of Document Master's Thesis
Language zh-TW.Big5 Chinese
Title Preparation and Characterization of Chitosan and Its Related Materials
Date of Defense 0000-00-00
Page Count 0

Keyword
Chitosan
PANI
Blend
PVA
film
gelatin
degree of deacetylation

Abstract
In this study, the characterization and preparation of chitosan with different degree of deacetylation (DD), the polymerization of aniline in the chitosan solution, and the preparation and characterization of chitosan/polyvinyl alcohol (PVA) and chitosan/ PVA/gelatin blend films are studied. Thermal gravimetric analysis (TGA) method and solid nuclear magnetic resonance (13C-NMR) are conducted to determine the degree of deacetylation of chitosan. From the result of TGA, the weight loss % of chitosan (△Y) was linear with the degree of deacetylation of chitosan. In this study, a 23 factorial experimental design is also applied to study the influence of three important experiment factors (the concentration of NaOH solution, reaction time, and reaction temperature), independent variables, on the DD of the β-chitin.

The polymerization of aniline in the chitosan solution are prepared by using two different initiators, ammoniam peroxodisulfate (APS) and cerium ammonium nitrate (CAN). The results illustrate that the conductivity and the solubility in chloroform of this copolymer decreased when the amount of chitosan increased. From the result of TGA, the weight loss of ES type polyaniline (PANI) was linear with the amount of chitosan.

The chitosan/PVA and chitosan/PVA/gelatin blend films with various blend ratios are prepared by solution blend method. The thermal properties of the blend films are examined by differential scanning calorimetry (DSC), thermal gravimetric analysis (TGA), and dynamic mechanical analysis (DMA). The DMA results show that the chitosan/PVA films are partial miscible. From the results of TGA, the thermal decomposition of chitosan/PVA/gelatin blend films is increased with the amount of gelatin increased. The melting temperature (Tm) of the chitosan/PVA/gelatin blend film is also increased with the amount of gelatin increased. The result shows that the GA 50% has the highest mechanical strength. The structural characteristics of the blend films are examined by Fourier transform infrared (FTIR) and X-ray diffraction (XRD). From the results of XRD, it shows that chitosan has a significant effect on the crystallization of PVA. The Tm of chitosan/PVA blend films is decreased with the amount of chitosan increased.
Advisory Committee Cheng-Ho Chen - advisor

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Date of Submission 2003-06-10