

عنوان مقاله:

Preparing chitosan-Polypyrrole nanocomposite film and evaluation of its mechanical, electrical, and antimicrobial properties

محل انتشار:

هفتمین همایش بین المللی مطالعات میان رشته ای در صنایع غذایی و علوم تغذیه ایران (سال: 1402)

تعداد صفحات اصل مقاله: 14

نویسندگان:

Behzad mohammadi - Department of Food Science and Technology, Afagh Higher Education Institute, Urmia, Iran

sajad pirs - Department of Food Science and Technology, Faculty of Agriculture, Urmia University, Urmia, Iran

Forough Mohtarami - Department of Food Science and Technology, Faculty of Agriculture, Urmia University, Urmia, Iran

maryam heydari - PhD student, Department of Food Science and Industry, Varamin Pishva Branch, Islamic Azad University, Varamin, Iran

خلاصه مقاله:

In this study, chitosan-Polypyrrole film was prepared with a combination of different concentrations of Polypyrrole and various synthesis times to produce antimicrobial and biodegradable packaging film. The physical, electrical, and mechanical properties of the films were investigated. The interaction between chitosan and Polypyrrole was confirmed by Fourier transform infrared spectroscopy (FTIR) and X-ray diffraction patterns. The size and morphology of the synthesized particles were examined by scanning electron microscopy. The results indicated that the synthesized Polypyrrole particles had a spherical shape (45-111 nm). The antimicrobial and antifungal activity of the films against *Aspergillus niger* fungi (antifungal area: 61.46 mm²) and *Escherichia coli* bacteria (antimicrobial area: 126.26 mm²) increased with increasing the concentration of Polypyrrole. The results obtained from the study of the effect of Polypyrrole on the electrical conductivity of the chitosan film showed that increasing the Polypyrrole concentration and synthesis time resulted in decreased electrical resistance of the film, for which the film with the highest Polypyrrole concentration and the highest synthesis time had the lowest resistance. According to the mechanical property results, tensile strength (TS) and elastic modulus were increased due to the addition of the Polypyrrole to the polymer matrix. The chitosan blank film had a lower TS than nanocomposites. As the final results, the chitosan-Polypyrrole film has good electrical conductivity, indicating that the produced film could be used in intelligent food packaging.

کلمات کلیدی:

Chitosan, Polypyrrole, conducting polymer, nanocomposite, biodegradability

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1930898>

