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Title: Preparation and Characterization of Soy Protein Based Edible/Biodegradable Films

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:: Table of Contents

:: Full Text

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Abstract: Soy Proteins Isolate (SPI) based films were prepared. The various factors affecting the formation of these films were studied by measuring the physical (thickness and surface density), chemical (moisture content and water solubility), optical (light transmission and color), mechanical (tensile strength and elongation at break) and barrier (water vapor and oxygen permeability) properties and examination of the ultrastructure of the prepared films. The proper pH value for preparing soy protein film with good mechanical and barrier properties was 10. Addition of PEG_{400} as a plasticizer at 60% of SPI weight gave better film properties comparing with other used plasticizers. Cross-linking of soy protein film by adding formaldehyde or glutaraldehyde at different level into film forming solution improved the tensile and barrier properties of the obtained films. The appropriate amount of formaldehyde, which gave good mechanical and barrier properties, was 0.3 mg/100 mL film forming solution. Combination of SPI with starch caused noticeable improvement in mechanical and barrier properties of plain SPI film and the best results were obtained at 70/30 w/w ratio of SPI/starch. The examination of soy protein-based films by scanning electron microscopy was measured. Moreover, the IR spectra of these films were obtained and the characteristic IR bands for these spectra were assigned.

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Soy protein films, plasticizers, co-plasticizers, edible films and biodegradable films