

Title Shape memory properties of soy protein isolate/chitosan edible films
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Abstract

Introduction: Recently, the polymeric materials of good environmental acceptability have received increasing attention. Modern packaging materials have been developing in intelligent properties which are shape memory, self diagnosis, adaptive, self restoration and so on. In this paper, the intelligent properties-shape memory properties of Soy Protein Isolate/Chitosan edible films were investigated. **Materials and Methods:** Soy Protein Isolate (SPI) was obtained from Harbin Hi-tech Soy CC. Chitosan were obtained from Jinan Haidebei Marine Bioengineering CC. Pyruvic Acid and Glycerin was obtained from Changchun Chemicals Ltd. The SPI was modified by heating. The Chitosan was modified by Pyruvic Acid. The c were studied by the change of pH and temperature. **Results and discussion:** The main contents of this paper are as follows: First, the shape memory property is affected by pH: The curve of expanding rate (1.2-96.5%) made an explanation for the flexibility principle of the films, the expanding recovery rate is almost 99%; The most important factor for water-preserve rate (2.4-5.8) is the SPI content (33.3-66.7%), the next is glycerol content (1-3%) and pH (1-5), the drying temperature (50-70°C) has less effect; the most important factor for deformation preserve rate (79-95%, mostly more than 95%) is drying temperature, the next is glycerol content and the SPI content, the pH has less effect. Second, the shape memory property is affected by temperature: the experiment results showed that the deformation recovery rate is affected by the SPI content (33.3-83.3%), glycerol content (1-2%) and recovery temperature (70-90°C). The deformation recovery rate is more than 95%. Shape memory properties of soy protein isolate/chitosan edible films cal be realized. The SPI and chitosan form the big molecule polymer, the SPE is solid phase and the chitosan is reversible phase. So, the shape memory properties can be achieved by the change of pH and temperature.