

Continuous soy protein films by twin and single screw extrusion

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Abstract

Previous work in the processing of soy protein films at Clemson University has demonstrated that a mixture of soy protein isolate and glycerol could be compression molded to produce thin transparent films. The objective of this research project was to determine the conditions that would enable the processing of these soy protein films on a continuous basis by the use of single and twin-screw extruders. Soy protein isolate was used as the biopolymer with glycerol and water as plasticizing agents. To blend the components, a mixture of water, soy protein, and glycerol was extruded through a twin-screw extruder at a temperature of 110°C and approximately 25 N*m of torque. The aggregated strand was pelletized and fed into a single-screw extruder and processed through a sheet die at 135°C. Various mixtures of water, soy protein, and glycerol were used in the experiment, and it was found that the mixtures that contained less than 10 wt. % water and 25 wt. % glycerol extruded poorly through the twin-screw extruder because of slip-stick at the extruder outlet. The film that was produced was approximately 3mm thick and had a brownish yellow color; the large thickness of the film was primarily due to the limitation of the sheet die that was used throughout the research.

See also:

- [Film and sheet pinning techniques to promote heat transfer](#)

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