

# DEVELOPMENT AND CHARACTERIZATION OF COMPATIBLE CELLULOSE AND CELLULOSE BLENDED WITH SOY PROTEIN MEMBRANES USING A NOVEL SOLVENT SYSTEM

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**Introduction.** A new environmentally friendly solvent system has been developed to make cellulose and cellulose blend membranes. Current industrial methods for making cellulose membranes are relatively expensive, use toxic or dangerous solvents, and have environmental concerns regarding hazardous waste production.

**Results and Discussion.** It was determined there was a need to see if this novel system could be used for membrane production, we were successful. These membranes were produced, and they were characterized, and found to have physical properties comparable with current cellulose membranes. We then used these results to attempt the development of blend materials, with unique properties. We developed these membranes with pure cellulose and blended with soy protein to make a composite membrane with unique properties. These compatible blends of protein with cellulose had never been accomplished before. The methods of characterizing these materials are also useful in determining compatibility of polymers with one another in a solid system. We discovered these new blend materials have interesting chemical and physical characteristics, and adding these biomaterials remains compatible at the macro and micro level with cellulose. These materials were then characterized and found to have similar physical properties compared to conventional cellulose membranes.

**Conclusions.** A new solvent dissolution system was discovered for cellulose, and cellulose blended with soy protein, the resulting polymer membranes were comparable in physical properties to conventionally produced cellulose membranes.

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