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Natural Deep Eutectic Solvent-Assisted Pectin Extraction from Pomelo Peel Using Sonoreactor: Experimental Optimization Approach

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Abstract

Background: Natural deep eutectic solvents (NADESs) can be used for extracting a wide range of biomaterials, such as pectin. This study introduces a new generation of natural solvents for pectin extraction which could replace the conventional solvents in the food industry. Methods: In this study, NADESs were used for pectin extraction from pomelo (*Citrus grandis* (L.) Osbeck) peels using a sonoreactor. Definitive screening design (DSD) was used to screen the influence of time, temperature, solid/liquid ratio, and NADES/water ratio on the pectin yield and degree of esterification (DE). Results: The primary screening revealed that the best choices for the extraction were choline chloride-malonic acid (ChCl:Mal) and choline chloride-glucose-water (ChCl:Glc:W). Both co-solvents yielded 94% pectin and 52% DE after optimization at 80 degrees C, with 60 min of sonication, pH < 3.0, and a NADES-to-water ratio of 1:4.5 (v/v). Morphological screening showed a smooth and compact surface of the pectin from ChCl-Mal where glucose-based pectin had a rough surface and lower DE. Conclusions: NADESs proved to be promising co-solvents for pectin extraction with a high degree of esterification (>55%).

Keywords

Author Keywords: [pectin](#); [natural deep eutectic solvent](#); [Citrus grandis](#); [definitive screening design](#); [pomelo](#); [extraction](#)
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