The Optimization of Supercritical CO_2 Extraction on Polyphenol Extraction from Plant Materials by Response Surface Methodology.

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Abstract

Polyphenols exist in plants cell commonly and have several bioactivities such as antioxidation, cytoprotectivity, antibacterial, antitumor, antiviral, anticancer, etc. Due to its bioactivities, plants extracts are always considered good materials for dietary supplements. Supercritical CO_2 extraction is a novel extraction method that can extract polyphenols from plants cell that are environmentally friendly, nontoxic, and inflammable. However, supercritical CO_2 extraction shows different properties by changing its conditions, including pressure, temperature, flow rate, and co-solvents, which influence its extraction efficiency. In order to obtain the best supercritical CO_2 extraction conditions, the response surface methodology (RSM) could be an ideal method to optimize extraction conditions by predicting the extract yields under several conditions. In this study, three plants materials were studied to optimize supercritical CO_2 extraction with RSM: tea scrape, oats and sea buckthorn leaf. According to the results, RSM could optimize the process of supercritical CO_2 extraction by obtaining the best conditions in various materials. Overall, RSM has the potential to optimize supercritical CO_2 extraction in the food industry.

References

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