

Cellulose Extraction from Olive Stones for Biomedical Application

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Résumé :

Cellulose is a natural polymer found in abundance in olive stones. Various extraction techniques were used to isolate cellulose from olive stones, including microwave-assisted extraction (MAE), conventional heating extraction (CHE), hot water extraction (HWE), and ultrasound-assisted extraction (UAE). These techniques consisted in alternating acid treatment with hydrochloric acid (HCl), alkaline treatment with sodium hydroxide (NaOH), and bleaching with hydrogen peroxide (H₂O₂) [1,2].

Higher extraction yields were obtained by using MAE and CHE methods as compared to HWE and UAE ones, together with reduced reaction time and amount of solvent used. NMR and FT-IR analyses conformed the chemical structure of extracted cellulose, while revealing the presence of residual lignin. Celluloses extracted by MAE and CHE present higher crystallinity index and better thermal properties as compared to those by HWE and UAE. It is concluded that MAE and CHE are promising techniques to extract cellulose from olive stones in the context of the circular economy, thus paving the way for scaling and possible applications in the health and pharmaceutical sectors.

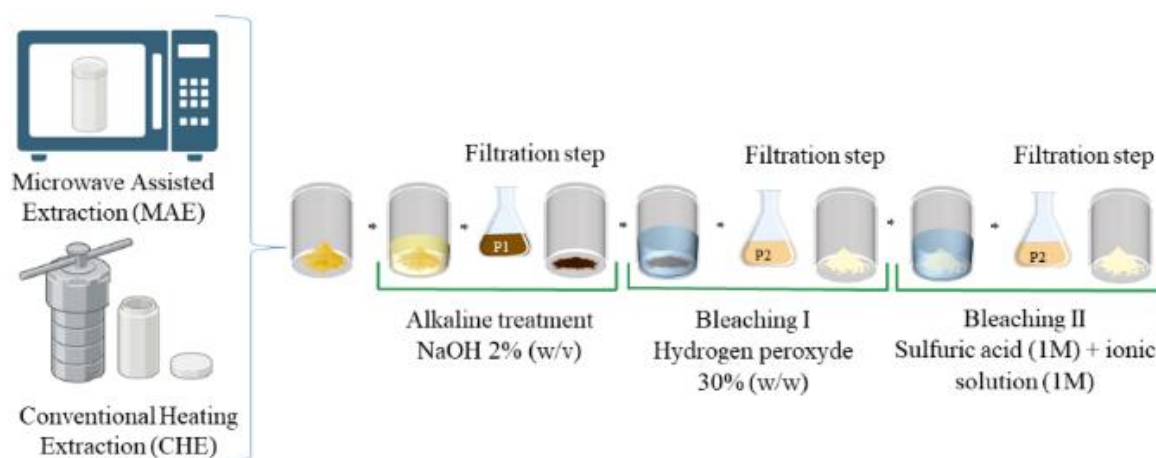


Figure 1. Schematic presentation of cellulose extraction processes : conventional heating extraction (CHE) and microwave-assisted extraction (MAE)

Références :

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