以新穎環保的深共熔溶劑製備幾丁質及其特性

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摘要

全球每年產生的蝦蟹廢棄物產量大約為 6-8 百萬噸，造成了嚴重的環境問題和大量的資源浪費。蝦殼由三種主要成分組成，即蛋白質(30-40%)、礦物質(30-50%)和幾丁質(20-30%)，同時還有少量的脂質和色素，是幾丁質商業化生產的主要材料。目前從原料中提取幾丁質的方法有化學、生物法、離子液體(ionic liquid, IL)和深共熔溶劑(deep eutectic solvents, DESs)，其中 DESs 是一種成本低、易於合成、對環境有好的萃取方法。利用不同種類的深共熔溶劑，通過加熱攪拌溶解與微波輻射，從蝦殼、龍蝦殼中萃取幾丁質，測量其性質特性，與化學法製備之幾丁質做比較，並評估 DESs 可回收使用性。結果顯示由 DESs 萃取的幾丁質形態、結晶度和熱穩定性與傳統化學方法製備的幾丁質相當，均起到脫礦、脫蛋白的作用。其中氯化膽鹼/蘋果酸(CCMA)的水解能力最高，得到較低分子量(91 KDa)；氯化膽鹼/丙二酸(CCMnA)萃取的幾丁質純度高(93%)，脫蛋白效果最好。氯化膽鹼/乳酸(CCLA)獲得的幾丁質純度高達 98%，且可多次回收，同時不降低幾丁質萃取的能力。DESs 溶劑具有獨特的多功能特性，可在一個步驟中將幾丁質與礦物質和蛋白質分離，且可回收再利用，因此被認為是一種從蝦殼中萃取幾丁質的快速、高效和綠色的零廢物處理方法，並能根據萃取出不同特性的幾丁質做出合適多樣的應用。

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