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Fungal chitosan for potential application in piezoelectric energy harvesting: Review on experimental procedure of chitosan extraction

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Abstract

Fungal chitosan is one of the piezoelectric biomaterials that can be used in energy harvesting. Fungal biomass offers a sustainable source for chitosan, as an alternative to crustacean-based chitosan. However, the fungal chitosan yield is relatively lower than other conventional sources of chitosan. Therefore, this study aims to review different experimental procedures for the chemical extraction of chitosan from biomass. The selection of the most effective extraction method using Preference Ranking Organization Method for the Enrichment of Evaluations and Geometrical Analysis for Interactive Decision Aid (PROMETHEE-GAIA), a systematic multiple criteria analysis based on ranking and section of alternatives (i.e. different extraction methods). PROMETHEE-GAIA was performed as the critical and comprehensive discussion in this paper. The PROMETHEE-GAIA analysis showed that the microwave-assisted organic acid-alkaline treatment extraction method showed the highest ranking for the most effective fungal chitosan method due to positive response from the chitosan yield, degree of deacetylation, toxicity and temperature. © 2022 THE AUTHORS

Author Keywords

Chitin; Chitosan; Deacetylation; Fungi; Piezoelectric; PROMETHEE

Index Keywords

Acetylation, Alkalinity, Chemical analysis, Energy harvesting, Extraction, Fungi, Piezoelectricity; Deacetylation, Experimental procedure, Extraction method, Fungal chitosans, Geometrical analysis, Interactive decision aidss, Piezoelectric, Piezoelectric energy harvesting, Preference ranking, PROMETHEE; Chitosan

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