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Johari, M.A.^a, Ali, F.^a, Azmi, A.S.^a, Anuar, H.^b, Jamaluddin, J.^c, Hasham, R.^d

Microencapsulation of *Acalypha indica* Linn. Extracts Using Chitosan-Polycaprolactone Blends
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^a Department of Chemical Engineering and Sustainability, Kulliyah of Engineering, International Islamic University Malaysia, Kuala Lumpur, 50728, Malaysia

^b Department of Manufacturing and Materials Engineering, Kulliyah of Engineering International Islamic University Malaysia, Kuala Lumpur, 50728, Malaysia

^c Department of Chemical Engineering, Faculty of Chemical and Energy Engineering, Universiti Teknologi Malaysia, Johor, Johor Bahru, 81310, Malaysia

^d Department of Bioprocess and Polymer Engineering, Faculty of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, Johor, Johor Bahru, 81310, Malaysia

Abstract

Polymer encapsulation is commonly adopted in drug delivery systems to form encapsulation that can assist in delivering active compounds to the targeted area. *Acalypha indica* (AI) crude extract was obtained from AI plants through ultrasound-assisted extraction. It is naturally unstable in the external environment and, thus, needs to be encapsulated to protect against volatility. Herein, this study emphasized the development of the encapsulations of AI extracts using a chitosan-polycaprolactone (PCL) blend by emulsion-solvent evaporation and freeze-dried methods. Four parameters for AI encapsulation were studied by fixing one parameter at a time. The percentage of encapsulation efficiency (EE%) was recorded as a response for each parameter. The study proceeded with central composite design (CCD) as the response surface methodology (RSM) optimization tool to study the interactions between the factors. Central points were taken from the preliminary data obtained in one-parameter experiments. The validation was carried out with two data of the highest and lowest EE% suggested by CCD. The highest EE% recorded was 98.70%, and the lowest EE% was 87.80%. The results showed a difference between predicted and experimental values at a percentage lower than 7.5%. Fourier Transform Infrared Spectroscopy (FTIR), scanning electron microscopy (SEM), particle size analyzer, and zeta potential were used to analyze the properties of selected microencapsulated samples. Overall, the encapsulation of AI extracts was successful and has the potential to be used in drug delivery. © Universiti Putra Malaysia Press.

Author Keywords

Acalypha indica Linn; central composite design; chitosan; microencapsulation; polycaprolactone

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Correspondence Address

Ali F.; Department of Chemical Engineering and Sustainability, Malaysia; email: fathilah@iiium.edu.my

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