

Experimental and modeling studies on microwave assisted extraction of xanthonenes from roots of *Securidaca longepedunculata*

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Abstract

Microwave-Assisted Extraction (MAE) has been developed to extract xanthonenes from roots of *Securidaca longepedunculata* Fresen. The influence of several independent variables such as extraction (irradiation) time, microwave power and liquid to solid ratio has been studied under varying conditions using one-factor-at-a-time analysis to obtain an optimal extraction. The xanthonenes concentration–time data were analysed using a second order kinetic model to determine extraction constant. A diffusion model was utilized to determine diffusion coefficient taking into account of both washing and diffusion phases together. Solvent-to-liquid ratio and microwave power experimental data at different conditions were fitted with a Gaussian model. The maximum xanthonenes content of 2550 µgEDMX/gP is obtained at extraction time of 83s, microwave power of 624 W and liquid solid ratio 0,93g/20 mL. The experimental profiles are fitted into a two-parameter modified first-order kinetic model and a three-parameter modified exponential model and checked using the goodness-of-fit criterion. The kinetic and gaussian models proved that the extraction process was based on the second-order extraction model as the experimentally done. The second-order model was satisfactorily applied, with very high coefficients of correlation ($R^2 = 0.9861$), showing that it perfectly described the process.

Biography

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Publications

1. Sequential extraction of quercetin-3-O-rhamnoside from *Piliostigma thonningii* Schum. leaves using microwave technology
2. Multi-Response Optimization in the Formulation of a Topical Cream from Natural Ingredients

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