

عنوان مقاله:

Effect of Amplitude of Ultrasound-Assisted Solvent Extraction and Extraction Temperature on the Kinetics, Thermodynamics, Antioxidant and Antimicrobial Activity of Ocimum basilicum L. Extract

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خلاصه مقاله:

In this study, the effect of three amplitudes of Ultrasound-Assisted Solvent Extraction (UASE) (0, 20 and 40%; 100W, 30 kHz; the 0% treatment serving as control) on kinetics, thermodynamic, rosmarinic acid content, total phenolics, antioxidant activity, and antimicrobial activity of Ocimum basilicum L. (basil) extract at different temperatures (25, 35 and 45°C) was evaluated. Increases in ultrasound amplitude and temperature increased yields and biological activities of extracts. The highest rosmarinic acid content, total phenolics, antioxidant and antimicrobial activity were obtained for samples treated with UASE at 40% amplitude and 45°C. The kinetics of extraction were evaluated based on a second order mechanism. Increases of amplitude and temperature significantly increased saturated extraction Capacity (Cs), initial extraction rate (h), and rate constant of extraction (k). The thermodynamic aspects of the extraction process showed that samples treated with UASE at 40% amplitude had higher activation Energy (Ea), frequency factor (A), enthalpy (ΔH^{++}) and entropy (ΔS^{++}) than control. UASE at 40% amplitude and control did not significantly differ in thermodynamic parameters. Results also showed very good linear relationships with high correlation coefficients between Ea and ΔH^{++} and, A and ΔS^{++} . Therefore, ultrasound can affect thermodynamic aspects and kinetics of extraction of basil extract and improve its biological activity.

کلمات کلیدی:

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