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A review of the effect of UAE optimization parameters on antioxidant activity

Elshreef H.S.[a], Mirghani M.E.S.[b], Sulaiman S.[a], Jami M.S.[a]

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[a] Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University Malaysia, P.O BOX 10, Kuala Lumpur, 50728, Malaysia

[b] International Institute for Halal Research and Training, International Islamic University Malaysia, P.O BOX 10, Kuala Lumpur, 50728, Malaysia

Abstract

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Abstract

Optimization of Ultrasound-assisted extraction parameters is necessary to determine the optimum level of the parameters , including solvent-to-material ratio, power, extraction time, solvent concentration, temperature, and pH. This review focuses on the UAE parameters ' effects on the antioxidant activity , their interactions, and the best method of examining antioxidant activity to respond to the UAE 's optimization . It was determined that the optimal extraction time is 15 minutes, and any duration longer than that could result in reduction of antioxidant activity . The temperature effect is important, wherein antioxidant activity decreases significantly when the extraction temperature is higher than 45 °C. Increasing the solvent concentration beyond 50% decreased the antioxidant activity . No increase in antioxidant activity was observed with a solvent/sample ratio greater than 40 ml/g. Increased ultrasound power leads to increased antioxidant compounds, especially in the range of ultrasound power, such as 50 to 150 W. However, higher ultrasound power creates free hydroxyl radicals that destroy the antioxidant compound. With an increase in pH, the radical scavenging activity increases significantly. It should, however, be at a near-neutral level, such as pH 6. Comparative literature has shown that optimizing UAE contributes to enhanced antioxidant activity and enhances resource conservation, such as energy and chemicals.

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Mirghani, M.E.S.; International Institute for Halal Research and Training, International Islamic University Malaysia, P.O BOX 10, Kuala Lumpur, Malaysia; email:elwathig@iium.edu.my

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