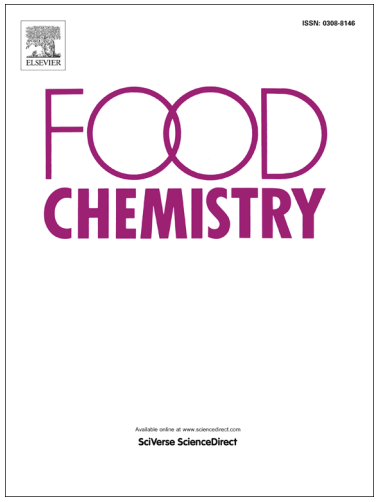

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Optimal extraction and fingerprinting of carotenoids by accelerated solvent extraction and liquid chromatography with tandem mass spectrometry

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ABSTRACT

Accelerated solvent extraction (ASE) is applied for the extraction of carotenoids from orange carrot and the extraction parameters were optimized. Two carotenoids, lutein and β-carotene, are selected as the validation process. Hildebrand solubility parameters and dielectric constant of solvents were taken into consideration in selecting solvent mixture. The effects of various experimental parameters, such as temperature, static time, drying agent etc., on the ASE extraction efficiency are investigated systematically. Interactions among the variables were also studied. Furthermore, two carotenoids were analysed and characterized by LC-ESI MS. The study concluded that Hildebrand solubility parameter approach may be applicable for less polar bioactive molecules like carotenoids. The properties of solvent and extraction temperature are found to be the most important parameters affecting the ASE extraction efficiency of thermolabile natural compounds.

Keywords: Accelerated Solvent Extractor, Liquid Chromatography-Mass Spectrometry, Hildebrand solubility parameters, Carotenoid