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A new method of UA_CPE coupled with spectrophotometry for the faster and cost-effective detection of proline in fruit juice, honey, and wine

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Abstract

The study developed a new method for proline detection in honey, wine and fruit juice using ultrasound assisted-cloud point extraction (UA-CPE) and spectrophotometry. Initially, a quaternary complex was built, containing proline, histamine, Cu(II), and fluorescein at pH 5.5. Samples were treated with ethanol-water mixture before extraction and preconcentration, using an ultrasonic bath for 10 min at 40 °C (40 kHz, 300 W). After the optimization of variables affecting extraction efficiency, good linearity was obtained between 15 and 600 µg L⁻¹ with sensitivity enhancement factor of 105. The limits of detection and quantification were 5.7 and 19.0 µg L⁻¹, respectively. The recovery percentage and relative standard deviations (RSD %) were between 95.3 and 103.3%, and 2.5 and 4.2%, respectively. The accuracy of the method was verified by the analysis of a standard reference material (SRM 2389a).

Keywords: Ultrasound assisted-cloud point extraction, spectrophotometry, proline, honeys, wines, fruit juices

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