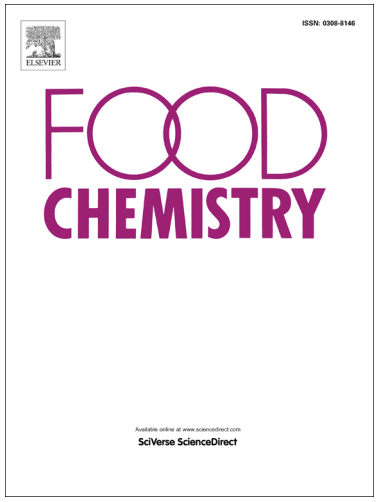

Improving the extraction of L-phenylalanine by the use of ionic liquids as adjuvants in aqueous biphasic systems

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Improving the extraction of L-phenylalanine by the use of ionic liquids as adjuvants in aqueous biphasic systems

Running title：Extraction of L-Phe with ILs-ATPS

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ABSTRACT

Polyethylene glycol (PEG) is widely used in the polymer-salt systems. However, the low polarity of the PEG-rich phase limits the application of aqueous biphasic systems (ABS). To overcome this disadvantage, a small quantity of ionic liquid (IL) was used as an adjuvant in ABS to enlarge the polarity range. Therefore, an innovative study involving addition of 4 wt% imidazolium-based ILs to the PEG 600/ NaH_2PO_4 ABS, aiming at controlling the phase behavior and extraction ability, was carried out. The phase diagrams, the tie-lines and the partitioning behavior of L-phenylalanine and ILs were studied in these systems. The results reveal that L-phenylalanine preferentially partitions for the PEG-rich phase. The addition of 4 wt% IL to ABS controls the partitioning behavior of L-phenylalanine, which depends on the type of IL employed. Moreover, it is verified that increasing temperature lead to a decrease in the partition coefficient of L-phenylalanine.

Keywords: Aqueous biphasic systems; Ionic liquids; Polyethylene glycol; L-phenylalanine