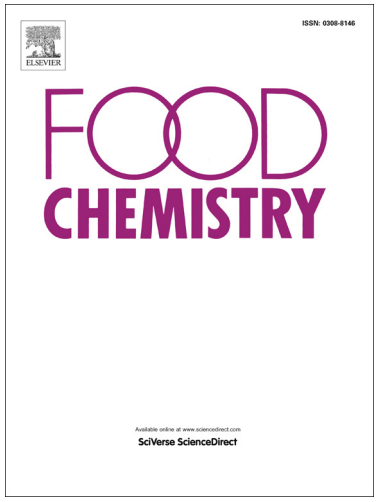

Short communication

Polymer incompatibility as a potential tool for polyphenol recovery from olive mill wastewater

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Polymer incompatibility as a potential tool for polyphenol recovery from olive mill wastewater

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Abstract

Experiments were designed and preformed in consideration of polymer type (proteins, i.e. caseinate and ovalbumin, and polysaccharides, i.e. alginate and methylcellulose), charge character and polysaccharide concentrations, intended to understand how the polymer properties determine both phase separation and polyphenol partitioning from olive mill wastewater (OMW). The highest yield of polyphenols (Y_{BP} = 92.9 %) was achieved in an aqueous two-phase system (ATPS) using an ovalbumin-methylcellulose system (OMCS) in comparison to ATPS with caseinate-alginate system (CAS; Y_{BP} = 85.8 %) or caseinate methylcellulose system (CMCS; Y_{BP} = 74 %). The performance of CMCS for the ATPS partitioning of polyphenols in OMW was found to depend on the addition of salt (sodium chloride). The use of centrifugation as assistive technology appears to be necessary for the polyphenol partitioning in ATPS using OMCS. In contrast to these polymer systems, CAS caused a rapid ATPS without resorting to centrifugation and salt, mainly because of strong electrostatic repulsion between alginate and caseinate. In this regard, CAS in phase-separated OMW obtained a