ISGC 2019
May 13th - 17th

N°449 / OC
TOPIC(s) : Alternative solvents / Waste valorization

Ionic liquids as alternative solvents under the scope of biomass valorization

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PURPOSE OF THE ABSTRACT

In a scenario where the search for new pigments and new antioxidants of bio-based origin is a major concern for some sectors, there is a real demand for the development of improved downstream processes able to recover the large plethora of natural colorants available nowadays. Carotenoids are lipophilic compounds and are such an example of natural pigments with a large range of commercial applications, namely in human health. Included in the class, the all-trans-?-carotene, all-trans-lycopene and the uncommon all-trans-?-carotene are three examples of carotenoids possessing very high antioxidant activity present in the fruits of the Amazonian tree Bactris gasipaes. One of the major drawbacks associated is the lack of efficient and low-cost downstream processes capable of recovering hydrophobic bioactive compounds from the biomass, while maintaining their structure and activity. In this work, an optimization study regarding the efficient extraction and purification of these three carotenoids from the fruit biomass was developed. Here, different ethanolic and aqueous solutions of different surface-active ionic liquids (ILs) and common surfactants were evaluated for the carotenoids extraction. Included in the set of solvents are ILs from the imidazolium, ammonium and phosponium families, and cationic common surfactants. Moreover, and for the best solvent, the solid-liquid ratio, concentration, and time of extraction were the conditions optimized. In the end, and after proper optimization, the efficiency of the proposed process will be demonstrated, as well as its environmental impact considering the carbon footprint as the main output.

FIGURES

FIGURE 1

FIGURE 2

KEYWORDS

IONIC LIQUIDS | SURFACTANTS | AMAZONIAN FRUITS | CARBON FOOTPRINT

BIBLIOGRAPHY