

Solvent Extraction in Ionic Liquids: Structuration and Aggregation Effects on Extraction Mechanisms

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Abstract : A promising challenge in solvent extraction is to replace the conventional organic solvents, with ionic liquids (IL). Depending on the extraction systems, these new solvents show better efficiency than the conventional ones. Although some assumptions based on ions exchanges have been proposed in the literature, these properties are not predictable because the involved mechanisms are still poorly understood. It is well established that the mechanisms underlying solvent extraction processes are based not only on the molecular chelation of the extractant molecules but also on their ability to form supra-molecular aggregates due to their amphiphilic nature. It is therefore essential to evaluate how IL affects the aggregation properties of the extractant molecules. Our aim is to evaluate the influence of IL structure and polarity on solvent extraction mechanisms, by looking at the aggregation of the extractant molecules in IL. We compare extractant systems that are well characterized in common solvents and show thanks to SAXS and SANS measurements, that in the absence of IL ion exchange mechanisms, extraction properties are related to aggregation.

Keywords : solvent extraction in Ionic liquid, aggregation, Ionic liquids structure, SAXS, SANS

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