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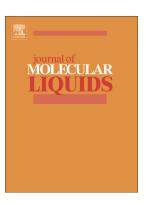
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CCEPTED MANUSCRIPT

Construction of Two-Ionic Liquid-Based Aqueous Two-Phase Systems for

Extraction of Pyritinol Hydrochloride

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ABSTRACT

Aqueous two-phase systems (ATPSs) are of great significance for the extraction of

drugs and biomolecules. In this work, we constructed two-ionic liquid (IL)-based

quaternary ATPSs (IL_{Pri} + IL_{Adi} + K₂HPO₄) for extracting pyritinol hydrochloride

(PHC), where IL_{Pri} (primary IL) was used to form the ATPSs, and IL_{Adi} (adjuvant IL)

was used to improve performance of the ATPSs. Using the two-IL-based ATPSs, the

extraction efficiency (E) of PHC can reach up to ~100% when only a very small

amount of ILs are used. The results of conductivity and dynamic light scattering

(DLS) indicate that the simultaneous application of two ILs increases the effective

specific surface area of the IL aggregates, then enhances the interaction between PHC

and IL aggregates, and thus improves the E of the PHC. The multi-site

cooperative-interactions between PHC and IL aggregates are the dominant driving

force for the transfer of PHC to the IL-rich top phase and are the main reason for the

improvement of E. This study provides a way to construct various quaternary ATPSs

with specific functions for efficiently extracting and separating drugs and

biomolecules.

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