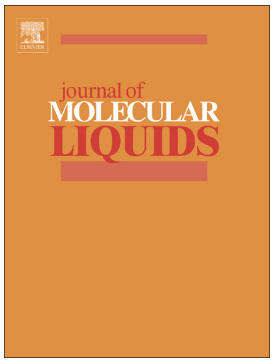

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Construction of Two-Ionic Liquid-Based Aqueous Two-Phase Systems for Extraction of Pyritinol Hydrochloride

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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_{Adj} + K_2HPO_4) for extracting pyritinol hydrochloride (PHC), where IL_{Pri} (primary IL) was used to form the ATPSs, and IL_{Adj} (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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