



Research Article



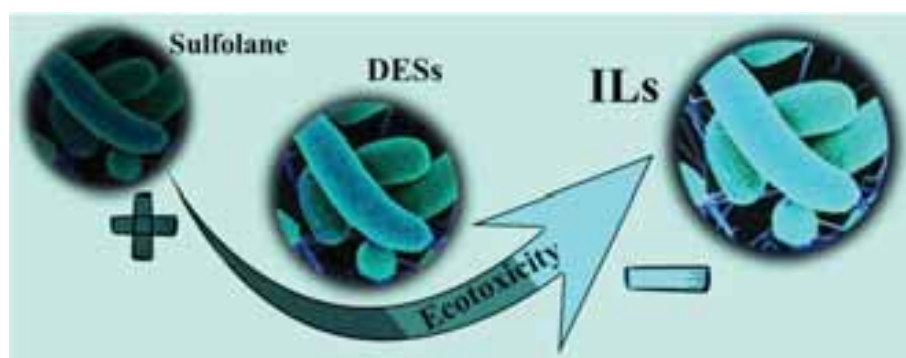
Ecotoxicity evaluation towards *Vibrio fischeri* of imidazolium- and pyridinium-based ionic liquids for their use in separation processes

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Abstract

The non-volatility character of the ionic liquids makes them environmentally attractive to new separation processes development, but their water solubility emphasizes the importance of the study of their impact on the aquatic environment. The present work reports the toxicity of 24 imidazolium- and pyridinium-based ionic liquids through *Vibrio fischeri* inhibition basic test. The toxicity-structure relationship of the ionic liquids has been studied through the anion and cation core, the cation alkyl chain length, and the presence of functional groups on the cation alkyl chain. Ionic liquids whose chemical structure includes pyridinium cations, long cation alkyl chains, and bis(trifluoromethylsulfonyl) imide ([Tf₂N]) anions present the highest toxicity. Finally, considering ionic liquids as potential solvents for the aromatic/aliphatic separation process, their toxicity has been compared to that of sulfolane, which is the current organic solvent used in this kind of process. Most of the studied ionic liquids can be classified as harmless or practically harmless; meanwhile, only four of them present a slightly or moderately toxicity, the same than that of sulfolane. The present study suggests that not only the atmospheric pollution would be decreased, but the aquatic impact as well by using ionic liquids as alternative solvents.



Keywords Ionic liquids · Ecotoxicity · *Vibrio fischeri* · Inhibition · Microtox[®] test

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