

## Spent Paint Solvent Recoveries by Ionic Liquids: Potential for Industrial Application

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**Abstract :** The recovery of industrially valuable organic solvents from liquid waste, generated in chemical processes, is economically crucial to countries which need to import organic solvents. In view of this, the main objective of this study was to determine the ability of selected ionic liquids, namely, 1-ethyl-3-methylimidazolium ethylsulphate, [EMIM] [ESO4] and 1-ethyl-3-methylpyridinium ethylsulphate, [EMpy][ESO4] to recover aromatic components from spent paint solvents. Preliminary studies done on the liquid waste, received from a paint manufacturing company, showed that the aromatic components were present in the range 6 - 21 % by volume. The separation of the aromatic components was performed with the ionic liquids listed above. The phases, resulting from the separation of the mixtures, were analysed with a Gas Chromatograph (GC) coupled to a FID detector. Chromatograms illustrate that the chosen ZB-Wax-Plus column gave excellent separation of all components of interest from the mixtures, including the isomers of xylene. The concentrations of aromatics recovered from the spent solvents were found to be the % ranges 13-33 and 23-49 respectively for imidazolium and pyridinium ionic liquids. These results also show that there is a significant correlation between  $\pi$ -character of ionic liquids and the level of extraction. It is therefore concluded that ionic liquids have the potential for macro-scale recovery of re-useable solvents present in liquid waste emanating from paint manufacture.

**Keywords :** synthesis, ionic liquid, imidazolium, pyridinium, extraction, aromatic solvents, spent paint organic solvents

**Conference Title :** ICLMMP 2016 : International Conference on Liquid Matter Modern Problems

**Conference Location :** Singapore, Singapore

**Conference Dates :** January 07-08, 2016