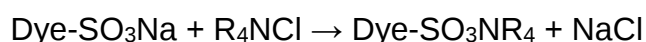


The authors are grateful to the reviewer for their time, valuable comments and suggestions which helped to improve this manuscript.

Our responds to reviewer questions/comments:

In this work, authors have claimed to separate polluted water containing anionic dyes using ionic liquids. The authors claim this to be an ion exchange mechanism rather than a simple extraction. I have some serious reservations regarding the study as below.

Dear reviewer, the ion exchange process was documented by comparison of NMR spectra of starting ionic liquid and ion pair Dye-SO₃NR₄ produced by ion exchange between:



The equilibrium of this reaction is completely shifted to the insoluble ion pair Dye-SO₃NR₄ in case, if R = long lipophilic alkyl chain.

In addition, you can observe differences in octan-1-ol/water partition coefficients (log P_{ow}) comparing acid dye and prepared and separated ion pairs (see Figure 3).

1) Is benzalkonium chloride and aq. Poly (dialkyldimethylammonium) chloride are ILs? Same applied to many other 'ILs' used in the study. Please provide melting points for EACH!

Benzalkonium chloride includes in room temperature ionic liquid classification (see for example the article: M.A. Deyab, Y.M. Moustafa, M.I. Nessim, Nesreen A. Fatthallah, Noha M. Asaad Bagato: New series of ionic liquids based on benzalkonium chloride derivatives: Synthesis, characterizations, and applications. Journal of Molecular Liquids 313 (2020) 113566.

There is quite problematic to find melting points of room temperature ionic liquids, in many cases, the melting point was not determined.

Poly (dialkyldimethylammonium) chloride is the polymerized IL (during polymerization, the formation of N,N-dimethylpyrrolidinium chloride skeleton is documented).

2) How can ILs perform 'ion exchange' without solid resin support to hold on to either ion? Upon dissolution into ILs, any ionic compound generates four possible ionic species with similar affinity, which is not the case for the 'extraction' mechanism.

You are right, the simple mixing of equimolar quantities of Dye-SO₃Na with R₄NCl produces the mixture of 2 cations and 2 anions.

However, if sparingly soluble ionic liquid R₄NCl is used, the same process conducted in aqueous solution is accompanied by precipitation process of insoluble ion pair Dye-SO₃NR₄ (usually in the form of tarry like matter). The inorganic ions (Na⁺ and Cl⁻) remain in aq. solution. This is the principle of described anionic dyes separation.