

Ionic liquids are promising "green" candidates for reaction over traditional VOCs. However, which of the following is not a green IL?

A. 1-Butyl-3-methylimidazolium chloride

**B. Butyl-3-methylimidazolium hexafluorophosphate**

C. Butyl-3-methylimidazolium methyl sulfate

D. Butyl-3-methylimidazolium acetate

Ionic liquids are ionic compounds which exist in the liquid state at temperatures below 100. They are promising green candidates for solvents in industry, specifically pharmaceuticals, however there are several limitations which must be overcome.

Ionic liquids have the advantage of being not being flammable, having low volatility, low vapour pressures, and can often be recycled. All of which abide by the Twelve Principles of Green Chemistry, however the disposal of ionic liquids is generally the problem. For example, ionic liquids based on  $\text{BF}_4$  and  $\text{PF}_6$  salts can decompose in the presence of water to form HF. This makes them more difficult to dispose of. Luckily, research is being conducted to replace these fluorinated anions with more benign alternatives, such as sulfonates and acetates.

References:

- 1) Recent advances in ionic liquids: green unconventional solvents of this century: part I, Green Chemistry Letters and Reviews, 2011, 4, 289-310.
- 2) Ionic Liquids--Solvents of the Future? Science, 2003, 792-793.
- 3) Ionic liquids in Green Chemistry, Green Chemistry, 2011, 225.