STUDY ABOUT IONIC LIQUIDS TO GREEN CHEMISTRY AND APPLICATIONS

[*]Gutti.Pavan, M.Nagaraju Goud ,

*Department of Biochemistry , Mumbai university, Maharashtra-04

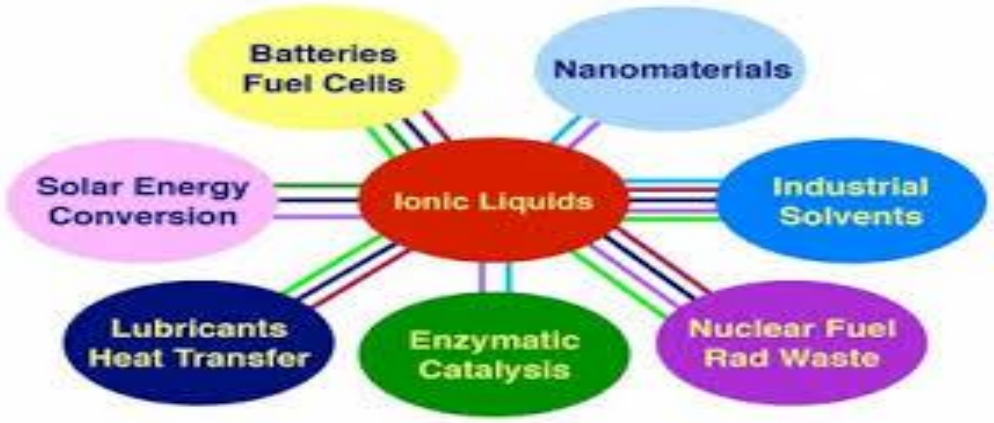
Department of Chemistry , Govt city college Hyderabad-53

guttipavan123@gmail.com

1.ABSTRACT

Ionic liquids have emerged as an environmentally friendly alternative to the **volatile** organic solvents. Being designer solvents, they can be modulated to suit the reaction conditions, therefore earning the name “task specific ionic liquids.” Though primarily used as solvents, they are now finding applications in various fields like catalysis, electrochemistry, spectroscopy, and material science to mention a few.The present review is aimed at exploring the applications of ionic liquids in catalysis as acid, base, and organocatalysts and as soluble supports for catalysts. An ionic liquid (IL) is a salt in the liquid state. In some contexts, the term has been restricted to salts whose melting point is below some arbitrary temperature, such as 100 °C (212°F). While ordinary liquids such as water and gasoline are predominantly made of electrically neutral molecules, ionic liquids are largely made of ions and short-lived ion pairs. These substances are variously called liquid electrolytes,ionic melts, ionic fluids, fused salts, liquid salts,or ionic glasses.They are known as"solvents of the future"as well as "designer solvents Ionic liquids are described as having many potential applications.They are powerful solvents and electrically conducting fluids (electrolytes).Salts that are liquid at near-ambient temperature are important for electric battery applications, and have been considered as sealants due to their very l**o**w vapor pressure.

KEY WORDS : Ionic liquids , liquid electrolytes , ambient temperature



2.Introduction :

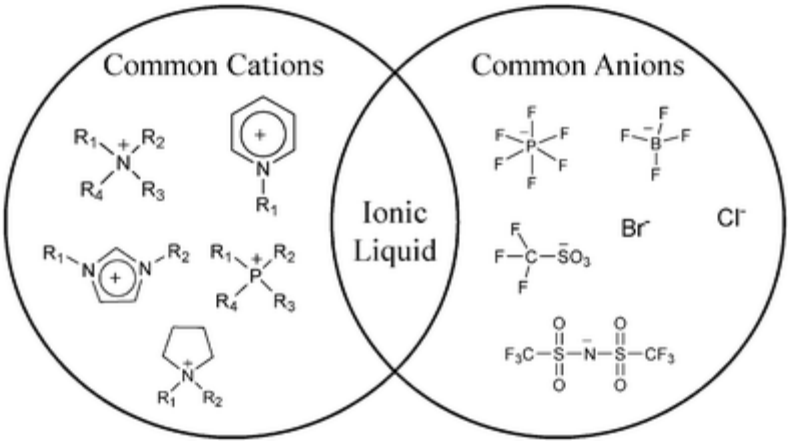
Chemistry brought about medical revolution by invention of certain drugs of antibiotics. Its also increase quality of life on earth by discovery of drugs plastics , cosmetics & Other materials

A part from this ill effects of chemistry also become pounced which was causing pollution of land water & atmosphere .so to reduce this effects a new chemistry called Green chemistry was pronounced .in green chemistry chemical synthesis are made of certain a friendly environment with nature .In this synthesis schemes are designed in such way that there is a least pollution to the the environment . In this method reactions can be carried out by choosing starting materials , solvents &catalysis care fully. In this method most of the reactions should be carried out in aq.phase.

Particularly we use certain solvents like benzene , THF,DMSO many more to carry out many reactions which is turns cause a ill effects on environment &human effects so in place of this organic solvents ionic liquids has been used in green chemistry so by using there ionic liquids health hazards will going to reduce by increasing yield of the reactions & reducing the toxicity

3.HISTORY :

Firstly ETHANALAMMONIUM was reported by S.Gabriel &j.Weiner in 1888 .another ionic liquid ETHYL AMMONIUM NITRATE was reported by Paul walden which was a room temp ionic liquid . its based on alkyl substituted imidazalium and pyridinium cations with halides halogeno aluminate anions.



4.APPLICATIONS :

Ionic liquids has many applications in chemistry, other filed .

- Recognizing that approximately 50% of commercial pharmaceuticals are organic salts, ionic liquid forms of a number of pharmaceuticals have been investigated. Combining a pharmaceutically active cation with a pharmaceutically active anion leads to a Dual Active ionic liquid in which the actions of two drugs are combined.
- Its can extract specific compounds from plants for pharmaceutical, nutritional and cosmetic applications, such as the anti-malarial drug artemisinin from the plant *Artemisia annua*
- The IL1-butyl-3-methylimidazolium chloride has been investigated as a non-aqueous electrolyte media for the recovery of uranium and other

metals from spent nuclear fuel and other sources Protonated betaine bis (trifluoromethanesulfonyl) imide has been investigated as a solvent for uranium oxides.Ionic liquids, N-butyl-N-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide and N-methyl-N-propylpiperidinium bis(trifluoromethylsulfonyl)imide, have been investigated for the electrodeposition of europium and uranium metals respectively.

- ILs can aid the recycling of synthetic goods, plastics, and metals. They offer the specificity required to separate similar compounds from each other, such as separating polymers in plastic waste streams. This has been achieved using lower temperature extraction processes than current approaches and could help avoid incinerating plastics or dumping them in landfill.
- Ionic liquids have been proposed as an absorbent in carbon capture. They have various advantages over traditional absorbents, such as the currently dominant amine-based technologies. 1-Butyl-3-methylimidazolium hexafluorophosphate is one example of a proposed CO_2 absorbent.
- It was used in biomass utilisation. In this bio mass utilisation the ionic liquids are mainly used dissolve cellulose as ell as remove as reduce the lignin content lingo cellulose
- These ionic liquids are coupled with charged species such as lie based an polar solvents are frequency used for dissolving callouse .
- Ionic liquids have certain properties like non-flammability and relatively high ionic conductivity their properties were use full for safely of EDLCS
- Ionic liquids are menially used in separation techniques .in IL S chromatography either TLC ,HPLC ILCS are applied as mobile phase additives as they seen too viscous &be used as a pear solvents.

- The dil. From mixed with anther low viscosity solvents they revealed this dual nature responsible for selectivity to words ionic &non-ionic analytics
- IL S have been used in CE
- The main aim is of this modifications is EOF provoked Solana greys on the inner surface of SC

5.SAFETY

Ionic liquids' low volatility effectively eliminates a major pathway for environmental release and contamination. However, this property is distinct from toxicity. Ionic liquids' aquatic toxicity is as severe as or more so than many current solvents.[53][54][55] Mortality isn't necessarily the most important metric for measuring impacts in aquatic environments, as sub-lethal concentrations change organisms' life histories in meaningful ways. Balancing VOC reductions against waterway spills (via waste ponds/streams, etc.) requires further research. Ionic liquids' substituent diversity simplify the process of identifying compounds that meet safety requirements.

Ultrasound can degrade solutions of imidazolium-based ionic liquids with hydrogen peroxide and acetic acid to relatively innocuous compounds

Despite low vapor pressure many ionic liquids are combustible and therefore require careful handling Brief exposure (5 to 7 seconds) to a flame torch can ignite some Ionic liquids. Complete combustion is possible for some Ionic liquids.

6.Conclusion :

Thus from we are supposed to say that ionic liquid played a major role in green chemistry .That has many applications in separations filed , biomass utilisation 7energy steerage capacity in cells ,this ILS are used to increase the yield of the product by maximum utilisations of staring materials. in certain reactions rapidly done ionic liquids the rate of formations products in certain reactions increased by using ionic liquids in place of organic solvents.

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