Bipolar Membrane Electro Dialysis and Ion Exchange Technology – Precursor Production for the Synthesis of novel Ionic Liquids –

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Ionic liquids (ILs) have received a great increase in attention in the fields of engineering during the last decade due to their unique properties. The applications range from electrochemistry, sensors, analysis, separation techniques to catalysis and reaction engineering. For large scale applications halide-free ionic liquids are preferred due to disposal options and corrosion problems. Furthermore it is most important to realize low production costs and environmentally compatible ways of synthesis.

This poster will present a new, interesting way to a multitude of high-quality halogen-free ILs using hydroxide-based precursors like 1-ethyl-3-methylimidazolium hydroxide ([EMIM][OH]). Different technical approaches for the precursor-production will be discussed: One of the methods that are applicable for the production of aqueous solutions of imidazolium hydroxides is the ion exchange via commercially available anion exchange resins. Another technology is electro dialysis using bipolar membranes (Fig 1). Furthermore, the physico-chemical properties of the novel ILs produced by carrying out reactions between the hydroxide-based intermediates and different commercially available acids, e.g. hexafluoroacetylacetonate, will be discussed in detail.

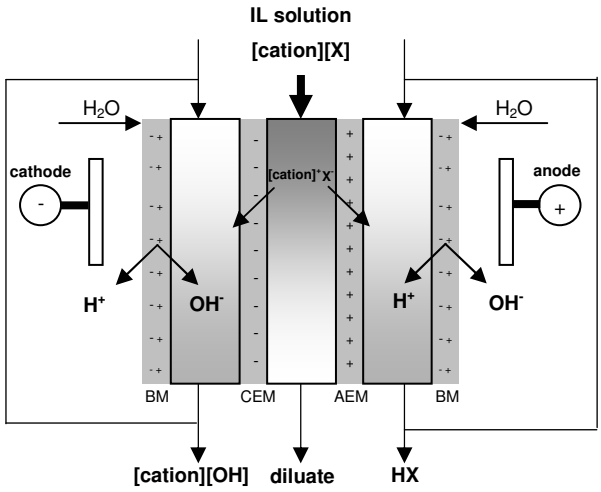

Fig. 1 precursor production via bipolar membrane electro dialysis