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Facile Synthesis of Imidazolium Based Ionic Liquids with Organic Anions: Preparation, Characterization, Antimicrobial Activity and Toxicity Studies

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Abstract: A facile synthesis of ionic liquids with organic anions is reported. The synthesis of 1-methylimidazolium lactate (MIM lactate) [2], bis-(1-methylimidazolium) succinate (Bis-(MIM) succinate) [3] and 1-methylimidazolium stearate (MIM stearate) [4] was done through Bronsted acid-base neutralization reaction. Theoretical modeling of optimal geometries using MMFF94 function in Avogadro software showed relatively stable ionic liquid products with Bis-(MIM) Succinate as the most stable. Characterization studies through ¹H NMR, LCMS and FTIR spectroscopy were done. Spectroscopic data for [2], [3], and [4] provided evidence for successful synthesis. Antimicrobial activity study through Paper-disc diffusion assay showed only [4] exhibiting significant antimicrobial activity against gram negative bacteria, *Escherichia coli* and *Pseudomonas aeruginosa*. Toxicity assay studies through Brine shrimp lethality assay showed [2] and [3] as toxic and [1] and [4] as weakly toxic. Further studies on the synthesis of more ionic liquids with organic anions, their characterization, bioactivities and other applications are recommended.

Key Words: ionic liquids, imidazolium