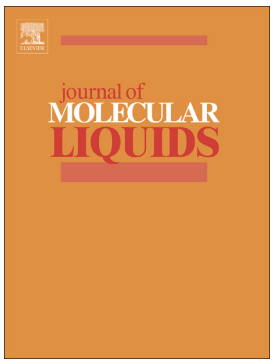

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PII: S0167-7322(17)33343-3
DOI: doi:10.1016/j.molliq.2017.10.141
Reference: MOLLIQ 8104

To appear in: *Journal of Molecular Liquids*

Received date: 25 July 2017
Revised date: 29 October 2017
Accepted date: 30 October 2017

Please cite this article as: Amir Sada Khan, Asma Nasrullah, Zahoor Ullah, A.H. Bhat, Ouahid Ben Ghanem, Nawshad Muhammad, Mamoon Ur Rashid, Zakaria Man , Thermophysical properties and ecotoxicity of new nitrile functionalised protic ionic liquids. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Molliq(2017), doi:10.1016/j.molliq.2017.10.141

Thermophysical Properties and Ecotoxicity of New Nitrile Functionalised Protic Ionic Liquids

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Abstract

In this present research, five nitrile functionalised imidazolium based protic ionic liquids (PILs) by varying alkyl chain length of anions were synthesised. The synthesised ILs were characterized with nuclear magnetic resonance spectroscopy (NMR) and elemental analyser (CHNS). Various thermophysical such as refractive index, density, viscosity and thermal stability were measured over wide temperature range. From the density experimental data, different volumetric properties were estimated using well established empirical equations. Moreover, the effect of temperature and increase of alkyl substitutions attached to anion has been evaluated for the studied properties. The toxicity (EC_{50}) of the synthesized ILs have been assessed against three human pathogenic bacteria i.e, *Aeromonas hydrophila* A97 (AH), *Escherichia coli* E149 (EC), and *Staphylococcus aureus S244* (SA) in light to identify the influence of increasing alkyl substitution of the anion moiety on the overall toxicity of PILs.

Keywords: Nitrile functionality; protic ionic liquids; thermophysical properties; alkyl chain length; ecotoxicity