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PII: S0167-7322(18)32558-3  
DOI: doi:[10.1016/j.molliq.2018.07.028](https://doi.org/10.1016/j.molliq.2018.07.028)  
Reference: MOLLIQ 9349  
To appear in: *Journal of Molecular Liquids*  
Received date: 18 May 2018  
Revised date: 6 July 2018  
Accepted date: 7 July 2018

Please cite this article as: Mzukisi Matandabuzo, Peter A. Ajibade , Synthesis and surface functionalization of multi-walled carbon nanotubes with imidazolium and pyridinium-based ionic liquids: Thermal stability, dispersibility and hydrophobicity characteristics. Molliq (2018), doi:[10.1016/j.molliq.2018.07.028](https://doi.org/10.1016/j.molliq.2018.07.028)

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**Synthesis and surface functionalization of multi-walled carbon nanotubes with imidazolium and pyridinium-based Ionic Liquids: Thermal stability, dispersibility and hydrophobicity characteristics**

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**Abstract**

Functionalized multi-walled carbon nanotubes (MWCNTs) were synthesized by simple chemical method, and dispersed using imidazolium and pyridinium-based ionic liquids (ILs). The as-synthesized ILs-MWCNT composites were studied using FTIR spectroscopy, scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), thermogravimetric analysis (TGA), and solubility in different polar and non-polar solvents. Spectroscopic and microscopy analyses confirmed the formation of the ILs-MWCNT composites with new functionalities. Spectra studies showed graphitic and carboxylic groups in the pure MWCNTs. MWCNTs SEM images showed entangled bundles, while ILs-MWCNTs showed debundled composites with increased diameter and unaltered MWCNTs morphology. TGA indicates that the MWCNTs are thermally stable which could be ascribed to *Van der Waals* and non-covalent interactions within the composites matrices. Solubility studies indicates the ILs-MWCNT composites are hydrophobic behaviour, insoluble in water and other polar solvents.

**KEYWORDS:** Carbon nanotubes; ionic liquids; imidazolium; pyridinium; functionalization.

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