

Accepted Manuscript

Title: Excited State Intramolecular Proton Transfer in 1,8-Dihydroxy-9,10-anthraquinone Dye: Revealing Microstructures in $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$ Series of Ionic Liquid Solvents

Authors: Vijay Beniwal, Anil Kumara, Haridas Pal



PII: S1010-6030(17)31257-1
DOI: <https://doi.org/10.1016/j.jphotochem.2017.09.073>
Reference: JPC 10920

To appear in: *Journal of Photochemistry and Photobiology A: Chemistry*

Received date: 24-8-2017
Revised date: 27-9-2017
Accepted date: 28-9-2017

Please cite this article as: Vijay Beniwal, Anil Kumara, Haridas Pal, Excited State Intramolecular Proton Transfer in 1,8-Dihydroxy-9,10-anthraquinone Dye: Revealing Microstructures in $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$ Series of Ionic Liquid Solvents, *Journal of Photochemistry and Photobiology A: Chemistry* <https://doi.org/10.1016/j.jphotochem.2017.09.073>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Excited State Intramolecular Proton Transfer in 1,8-Dihydroxy-9,10-anthraquinone Dye: Revealing Microstructures in $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$ Series of Ionic Liquid Solvents

Vijay Beniwal,^a Anil Kumar^a and Haridas Pal^{b,*}

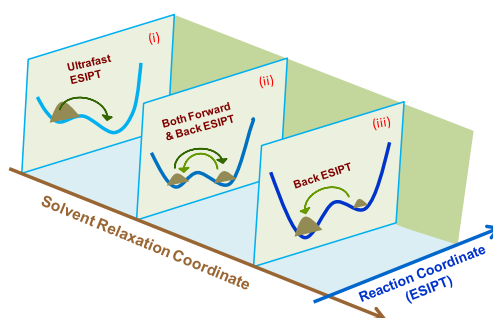
^aPhysical and Material Chemistry Division, CSIR-National Chemical Laboratory, H. J. Bhabha Road, Pune-411 008, India; (E-mail: beniwalvijay1@gmail.com (VB) & a.kumar@ncl.res.in (AK))

^bRadiation & Photochemistry Division, Bhabha Atomic Research Centre,

Mumbai 400085, India; (E-mail: hpal@barc.gov.in)

*Corresponding Author

Graphical Abstract



Highlights

- The ESIP process of 18DHAQ dye in 1-alkyl-3-methylimidazolium ($[C_n\text{mIm}]^+$) based ionic liquid (IL) solvents, $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$, with $n = 2, 4, 6, 8$ and 10 , display noteworthy modulations in the relative emission intensities for normal (N^*) and tautomeric (T^*) forms.
- Observed results reveal the microstructure formations in the $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$ series of the IL solvents.
- More extensive microstructures are inferred as the alkyl chain length of the $[C_n\text{mIm}]^+$ cations of IL solvents is gradually increased.
- The small differences between the results in $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$ series of ILs are understandably due to the dissimilar size, shape and basicity of the $[\text{NTf}_2]^-$ and $[\text{BF}_4]^-$ anions of the two series of IL solvents.
- To the best of our knowledge, this is the only study involving ESIP process to realize microstructure formations in neat IL solvents based on the $[C_n\text{mIm}]^+$ cations.

Abstract:

Excited state intramolecular proton transfer (ESIP) in 18-dihydroxy-9,10-anthraquinone (18DHAQ) dye has been investigated in two series of 1-alkyl-3-methylimidazolium ($[C_n\text{mIm}]^+$) based ionic liquid (IL) solvents, $[C_n\text{mIm}][\text{NTf}_2]$ and $[C_n\text{mIm}][\text{BF}_4]$, with $n = 2, 4, 6, 8$ and 10 , using steady-state (SS) and time-resolved (TR) fluorescence studies. In both the IL series, fluorescence intensity for tautomer (T^*) form gradually decreases relative to normal (N^*) form with increasing n value for $[C_n\text{mIm}]^+$ cations. Observed results suggest microstructure formation and its consequent

Download English Version:

<https://daneshyari.com/en/article/4753755>

Download Persian Version:

<https://daneshyari.com/article/4753755>

[Daneshyari.com](https://daneshyari.com)