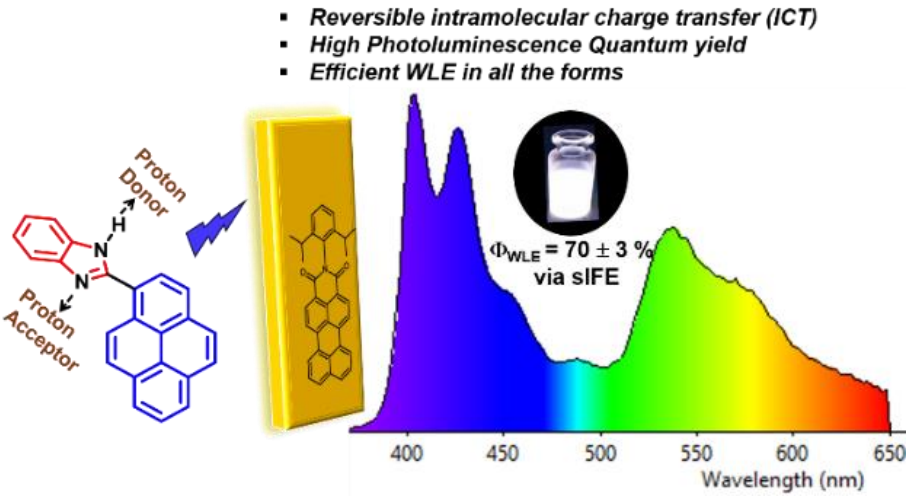
Poster Presentation
Inter-Disciplinary Explorations in Chemistry (I-DEC 2018)

Unsurpassed efficiency of white light emission using secondary inner filter effect between organic fluorophores

Himanshu Aggarwal, Aasheesh Srivastava*
Department Chemistry, IISER Bhopal
Bhauri, Bhopal Bypass Road, Bhopal – 462066, Madhya Pradesh, INDIA
(E-mail: himanshu92@iiserb.ac.in, Asri@iiserb.ac.in)

Abstract: Efficient conversion of incident radiation into white light emission (WLE) is needed for lighting applications.[1] However, achieving pure and efficient WLE simultaneously is of greater challenge in organic fluorophores. Majority of the reported WLE systems rely on the spatial proximity and optimised orientation of the fluorophores.[2] However, this approach has limited efficiency and requires additional additives to keep the fluorophores proximal. To overcome these limitations of the traditional WLE systems, we opined on a non-irradiation energy conversion approach[3] to produce WLE with high efficiency. We chose 1-pyrenyl-2-benzimidazole (PyBIM) and perylene monoimide (PMI) as the organic fluorophores for achieving pure and efficient WLE. Investigations showed an efficient Secondary inner filter effect was operative in between the fluorophores. PyBIM can be easily protonated ($PyBIM^+$) as well as deprotonated ($PyBIM^-$) in a reversible manner. In all these forms efficient WLE was achieved with unsurpassed efficiencies of up to 70 ± 3% with CIE coordinates of 0.33, 0.33 corresponding to pure white light.[4]



References and Notes:

1. Kido, J.; Kimura, M.; Nagai, K. *Science*. **1995**, *267*, 1332-1334.
2. Zhang, X.; Rehm, S.; Safont-Sempere, M, M.; Würthner, F. *Nat. Chem.* **2009**, *1*, 623-629.
3. Gabor, G.; Walt, R, D. *Anal. Chem.* **1991**, *63*, 793-796.
4. Aggarwal, H.; Kumar, R.; Srivastava, A. *Chem. Comm.* Just accepted.