

5,5'-DIARYL-2,2'-BYPYRIDINE FLUOROPHORES: STUDIES ON THE INFLUENCE OF THEIR STRUCTURAL ENVIRONMENT ON THE PHOTOPHYSICAL PROPERTIES

Taniya O.S.,^a Kovalev I.S.,^a Rahman M.,^a Santra S.,^a Zyryanova G.V.,^b Kopchuka D.S.,^b Majee A.,^d Chupakhina O.N.,^b Charushina V.N.^b

^a Ural Federal University, Yekaterinburg, Russian Federation,
e-mail: olgataniya@yandex.ru

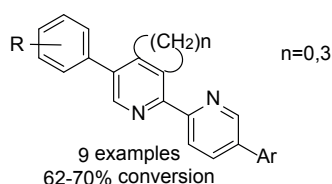
^b I. Ya. Postovskiy Institute of Organic Synthesis, Yekaterinburg, Russian Federation

^c Central University of Punjab, City Campus, India

^d Visva-Bharati (A Central University), Santiniketan, India

2,2'-Pyridines are common components for “push-pull” fluorophores¹, photosynthesizers for the solar cells² as well as non-linear optics (NLO) - devices³, depending on the structural environment in the bipyridine core.

Recently we prepared new 5,5'-diaryl-2,2'-bipyridines (Table 1) by means of the “1,2,4-triazine methodology”, and the starting 1,2,4-triazines were easily obtained by the heterocyclization reaction between 5-bromopyridine-2-carbaldehyde and isonitrosoacetophenone hydrazones with the following aza-Diels-Alder reaction and Suzuki cross-coupling. Next, the influence of the nature of the substituents in the 2,2'-bipyridine core on the photophysical properties of these “push-pull” fluorophores in various solvents was investigated.



#	R	n	Ar	λ_{abs} , nm	λ_{em} , nm	Φ^a , %	$\Delta\mu$, D
1	4-MeO	3	4-(Ph ₂ N)C ₆ H ₄	301,355	500	60,5	14,28
2	H	3	3-MeOC ₆ H ₄	314	358,370	21,7	2,80

^aFluorescence quantum yields were measured in degassed CH₃CN solution using quinine sulfate as standard

Based on the obtained results for the fluorophores 1-2 the positive solvatochromism was observed and further confirmed based on the Lippert-Mataga equation⁴. Besides, dipole moment changes for the fluorophores were calculated. The prevalence of the ICT-state over LA-state depending on the type of fluorophore was discussed.

References

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