CURRICULUM VITAE

Dr. Ramakrishna Bodapati,

E-109, Prof. Samar K. Das,
School of Chemistry
University of Hyderabad
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Sex: Male | Date of birth: 3nd June, 1989| Nationality: Indian

Education and Training

10/2018- 08/2022 Research Associate

Supervisor: Prof. Samar K. Das
E-110, School of Chemistry,
University of Hyderabad,
Hyderabad, India.
"Worked on Thienylpyrrole Based Organic Sensitizers (D-π-A) with donor units of Dithiafulvenyl"

11/2012-10/2018 Ph.D

Supervisor:**Prof. Samar K. Das**
E-110, School of Chemistry,
University of Hyderabad,
Hyderabad, India.
Thesis title: "Organic- and Inorganic- π-Conjugated Donor-Acceptor Systems based on 2,2′-Bipyridine Derivatives: Synthesis, Photophysical Studies and Computation"

3/2012-11/2012Technical Assistant

Central Instrumentation facility, Pondicherry University, Puducherry, India.
Worked as 400 MHz NMR Operator

8/2009-5/2011 Master of Science (Chemistry)

Supervisor: Prof. P. SambasivaRao
Department of chemistry, Pondicherry University, Puducherry, India.

CGPA: 7.19 out of 10.00 (First Class)

Thesis title: "*EPR, Optical and IR Studies of Cu(II), Mn(II) Doped in* $[ZnNi][SO_4]_2 .7H_2O$"

8/2006-4/2009 Bachelor of Science (Mathematics, Physics and Chemistry)

Andhra Pradesh Residential Degree College (APRDC), Nagarjuna Sagar.

Acharya Nagarjuna University, Guntur, India.

Percentage: 69.22%

Academic Achievements

- Awarded Senior Research Fellowship (**SRF**) by Council of Scientific and Industrial Research, New Delhi (22nd November 2014 – 21st November 2017).
- Awarded Junior Research Fellowship (**JRF**) by Council of Scientific and Industrial Research, New Delhi (22nd November 2012 – 21st November 2014).
- Secured **All India 131th rank** in Council of Scientific and Industrial Research, National Eligibility Test (**CSIR–NET**), June 2012.

Doctoral course work (2013)

Research Proposal(3 credits)
Chemistry Pedagogy (3 credits)
Instrumentation methods (Analytical techniques, 3 credits)
Main Group and Inner Transition elements(3 credits)
Organic reactions and Mechanisms(3 credits)

List of Publications

1. Carbazole-based π-conjugated 2,2'-bipyridines, a new class of materials: photophysics, NLO properties and computation.**Ramakrishna. B**, Dey. G. R, Gunjan. R, Jovan Jose. K. V,Krishnakanth. K. N, Rao. S. V, Das. S. K. *Dyes and Pigments,***2021**, *185*, 108932. **(Q1 journal, I.F. 4.889)**
2. Mononuclear Ru(II) Complexes of an Arene and Asymmetrically Substituted 2,2`-Bipyridine Ligands: Photophysical and NLO Properties including Computation on NMR Spectral Studies.**Ramakrishna. B**, Sahoo, C. Mahesh. G, Das. S. K.*Inorg. Chem.* **2019**, *58 , 11470−11479***(Q1 journal, I.F. 5.165)**
3. Asymmetrically Substituted and π-Conjugated 2,2′-Bipyridine Derivatives: Synthesis, Spectroscopy, Computation, and Crystallography.**Ramakrishna. B,** Sarma. M, Kanakati. A, Das. S. K., *J. Org. chem*, **2015,***80* (24), 12482-12491. **(Q1 journal, I.F. 4.354)**

4. Synthesis, Photophysical and Electrochemical Properties of Donor-Acceptor Type Hydrazinyl Thiazolyl Coumarins. G. Kumar, G. T. Reddy, **Ramakrishna. B**, Das. S. K. N. C. Gangi Reddy *New J. Chem.*,**2020,***44*, 7007-7016. **(Q1 journal, I.F. 3.591)**
5. Protonation of qunioxaline-tetrathiafulvalene (TTF) based derivatives: substituent effect on chargetransfer complexes. Kishore. R, **Ramakrishna. B**, Kashanna, J, Jami. A. K,. *Int.*
   J. Nanotechnol. **2021,** *18*, 388-399. **(Q3 journal, I.F. 0.53)**
6. A Functional Molecular System of Bis(pyrazolyl)pyridine Derivatives: Photo-physics, Spectroscopy, Computation and Ion Sensing.Naik. I. K, **Ramakrishna. B**, Sarkar. R, Mondal. N, Das. S. K. ACS Omega. **2018**, 3, 3022−3035.**(Q1 journal, I.F. 3.512)**
7. A Functional Zn(II) Metallacycle Formed from an N-Heterocyclic Carbene Precursor: A Molecular Sensor for Selective Recognition of Fe^{3+} and IO^{4-} Ions. Kumar. G, Guda. R, Husain. A, **Ramakrishna. B**, Das. S. K.*Inorg. Chem.* **2017**, *56,* 5017–5025**(Q1 journal, I.F. 5.165)**
8. Cyclometalated Iridium(III) Complexes Containing 4,4′-π-Conjugated 2,2′-Bipyridine Derivatives as the Ancillary Ligands: Synthesis, Photophysics, and Computational Studies. Sarma. M, Chatterjee. T, **Ramakrishna. B**, Krishnakanth. K. N, Hamad. S, Venugopal Rao. S, Das. S. K. *Inorg. Chem.***2016**, *55 (7),* 3530-3540.**(Q1 journal, I.F. 5.165)**
9. Curcumin based Pyrazole-thiazole Hybrids as Antiproliferative Agents: Synthesis, Pharmacokinetic, Photophysical Properties and Docking Studies. Rambabu. P, Ramu. G, Ramesh. G, **Ramakrishna B**, Prabhakar. M, Mamatha. K, *(submitted to Journal of Molecular Structure)*
10. Thiozole assisted Anthracene Derivatives as Potential Anti-Cancer Agents: Synthesis, Characterization Photo Physical and Molecular Docking Studies. Rambabu. P, Ramu. G, **Ramakrishna. B**, Ahmad. H, Prabhakar. M, Girijesh. K, Mamatha. K, *(to be communicated)*
11. Emrgence of a New Iron(II) Complex Conjugated Bis(pyrazolyl)pyridine Derivative. Naik. I. K, **Ramakrishna. B**, Sarkar. R, Das. S. K.*(to be communicated)*

Poster and Oral presentations

- **Oralpresentation**,"*Asymmetrically Substituted and π-Conjugated 2,2'-Bipyridine Derivatives: Synthesis, Spectroscopy, Computation, and Crystallography* " ChemFest-

2017, 14th Annual In-House Symposium, School of Chemistry, University of Hyderabad, 4th-5th March, 2017.

- **Oral presentation**, "*A Series of Mononuclear Ruthenium(II) Complexes of an Arene and Asymmetrically Substituted 2,2`-Bipyridine Ligands: Tuning Photophysical including NLO Properties*" Dr. K. V. Rao Scientific Society" Young scientist award-2018, at Hyderabad, India.
- **Poster Presentation,** "Cyclometalated Iridium(III) Complexes Containing 4,4′-π-Conjugated 2,2′-Bipyridine Derivatives as the Ancillary Ligands: Synthesis, Photophysics, and Computational Studies" Modern Trends in Inorganic Chemistry-2015 (MTIC- XV) held at department of chemistry, Jadavpur University, India, 3rd-5th December, 2015.
- **Poster Presentation**, "*Tuning the Fluorescence Behavior of Mono-substituted π-Conjugated 2,2'-Bipyridine Derivatives: Experimental and Theoretical Assessments*" The First Indo-Taiwan symposium on Recent Trends in Chemical Sciences-2014, School of Chemistry, University of Hyderabad, India.17th-18th November, 2016

Technical skills and Experince

- Worked as Technical Assistant, has operated ***FT*-NMR**spectrometer for one year at Central Instrumentation Facility, at Pondicherry University.
- Handling **NMR** spectrometer (*Bruker 400 MHz*).
- Operating **IR** spectrophotometer (*Perkin Elmer*®).
- Handling **UV-Vis** absorption and **Fluorescence** spectrophotometer.
- Handling **LS-MS**spectrophotometer
- Handling **HPLC**spectrophotometer
- Expertise in the preparation and purification of organic compounds in milligram to gram scales and Technical writing.

Teaching

- 2018: Guidance provided to undergraduate student on **"Synthesis and Characterization of Donor-Acceptor Organic Molecules"**
- 2017: Guidance provided to undergraduate student on **"Design and study on Photophysical Properties ofDonor-Acceptor based Metal Complexes"**
- 2016: Guidance provided to undergraduate student on **"Quenching of Bipyridyl Ligand Fluorescence by Transition Metal"**

Research interests

- Interested in the synthesis of different kinds of organic molecules, which have wide

range of applications

Reference

1. **Prof. Samar Kumar Das**

   School of Chemistry
   University of
   HyderabadHyderabad, India–
   500046. Telephone no.: +91
   9959425259
   E-mail: skdas@uohyd.ac.in,samar439@gmail.com

2. **Prof. M. Periasamy**

   School of Chemistry
   University of Hyderabad
   Hyderabad, India– 500046.
   Telephone no.: +91 9949093904
   E-mail: mpsc@uohyd.ac.in,mariappan.periasamy@gmail.com

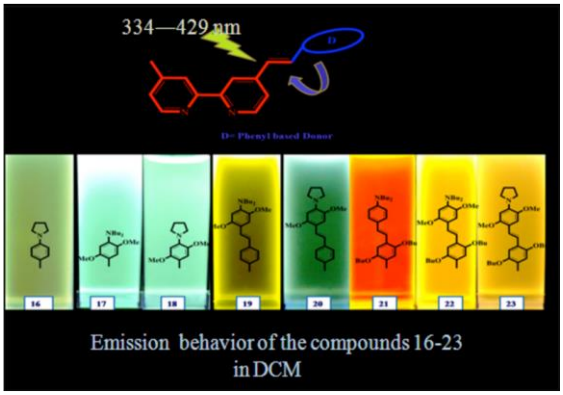
Summary of research work for doctoral degree

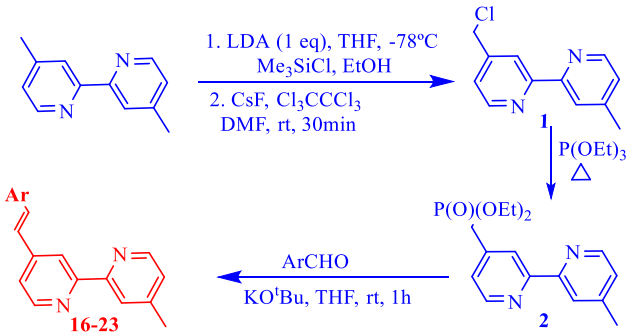
The thesis work entitled as **"Organic- and Inorganic- π-Conjugated Donor-Acceptor Systems based on 2,2′-Bipyridine Derivatives: Synthesis, Photophysical Studies and Computation"** has been described as four chapters:

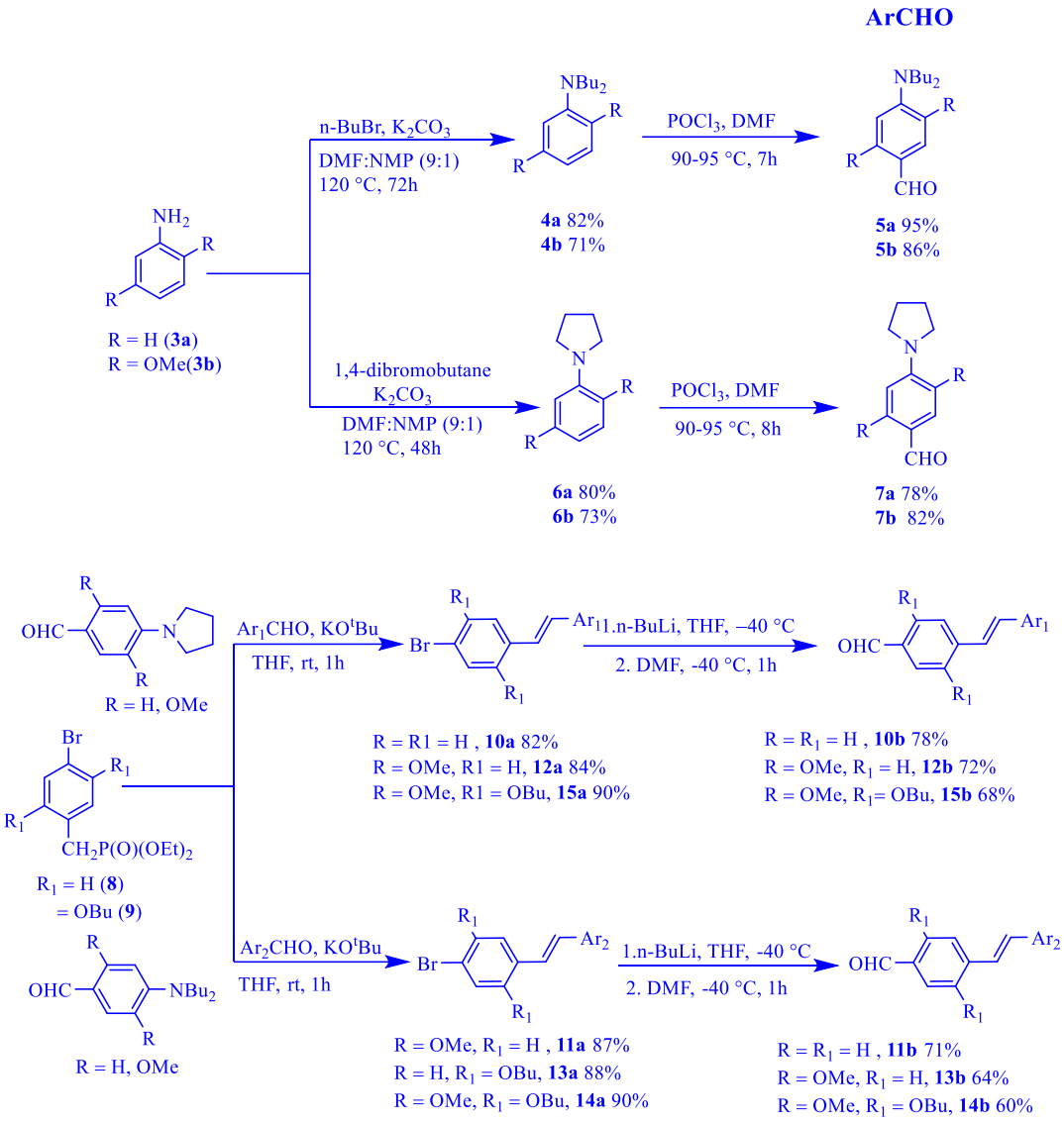
Chapter 1. An Introduction to the Chemistry of Conjugated-2,2′-Bipyridine Chromophores

The entire chapter has described the fundamental concepts of bipyridines and the general approach towards the extended π-conjugated-2,2′-bipyridine derivatives. This chapters gives an idea about the synthetic protocol to synthesize the donor acceptor based symmetrically substituted 2,2`-bipyridyl chromophores. Generally, the conjugated 2,2`-bipyridiyl chromophores have attracted a great attention due to their applications in multi-displinary areas. This chapter mainly deals with the architecture of the extended π- conjugated donor acceptor (DA) type 2,2`-bipyridine chromophores and the photophysical applications. Such bipyridine chromophores are highly fluorescent and their photophysical behavior is easily tuned through the proper choice of donor terminal moiety. All the known donor acceptor molecules are mainly characterized by intramolecular charge transfer (ICT) from donor molecular orbitals to acceptor molecules.

Chapter 2. Asymmetrically Substituted and π-Conjugated 2,2′-Bipyridine Derivatives: Synthesis, Spectroscopy, Computation, and Crystallography

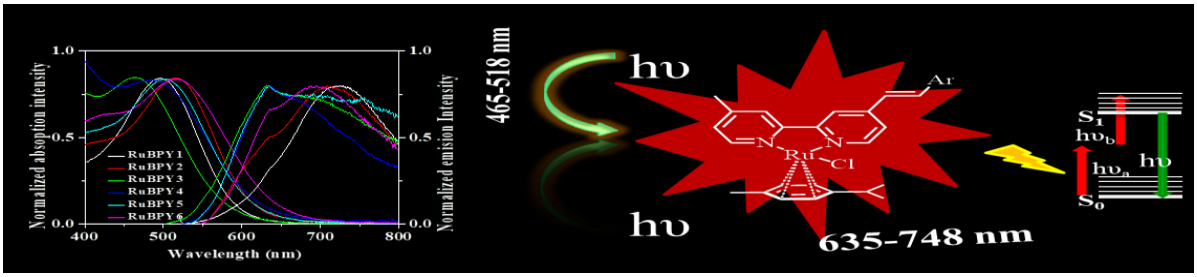


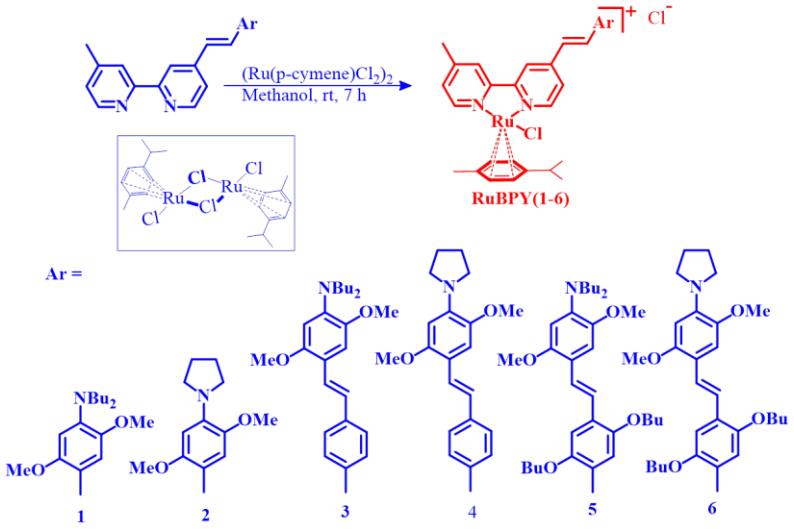




This chapter describes a new series of asymmetrically mono-substituted styryl- and bistyryl-2,2′- bipyridine chromophores (**16–23**), exhibited All the chromophores are administered by the intramolecular charge transfer from the donors to the acceptor units. The emissive behavior of all the chromophores has been demonstrated with four of the compounds showing solid-state emission that provides a doorway for solid-state lighting processes.The synthesize of DA chromophore commenced by the monophosponate derivative of 4,4`-dimethyl-2,2`-bipyridine, and variety of aryl aldehydes by *via* Horner–Wadsworth–Emmons (HWE) reaction. The aryl aldehydes were synthesized in two different methods, as shown in the scheme.These results have been corroborated by DFT and TD-DFT computation both in gas phase and in solution phase.

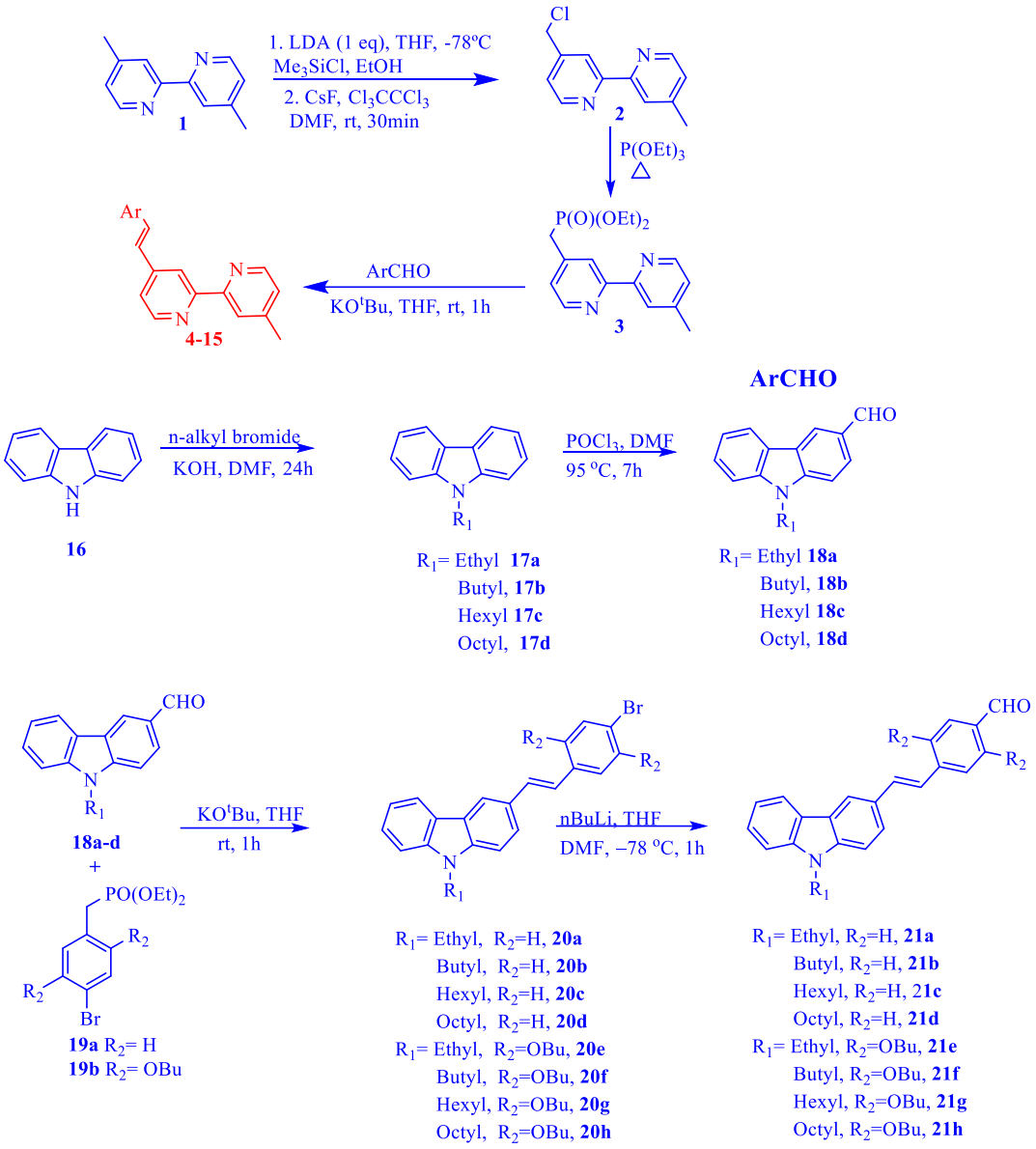
Chapter 3. A Series of Mononuclear Ruthenium (II) Complexes of an Arene and Asymmetrically Substituted 2,2`-Bipyridine Ligands: Tuning Photophysical Including NLO Properties





In this chapter, by using monosubstituted 2,2`-bipyridine asymmetric ancillary ligands with different electron donor moieties, we successfully designed the piano-stool type ruthenium(II) complexes **(RuBPY 1-6)**. The complexes characterized by NMR analysis, well supported by isotopic pattern of mass spectra. The absorption spectra of all the synthesized complexes exhibit a broad structureless feature with two bands in the visible region (350−650 nm). The synthesized complexes exhibit NIR emission in the solid state also. The two-photon absorption studies on the synthesized complexes reveal that values of the absorption cross-section are found to be quite notable and lie in the range of 3-28 GM in the femtosecond case.

Chapter 4. Tuning the Fluorescence Behavior of Carbazole Mono-substituted π-Conjugated 2,2'-Bipyridine Derivatives: Synthesis and Photophysical Properties



This chapter demonstrates a new series of carbazole mono substituted-π-conjugated-2,2'-bipyridine derivatives with A−A−π−D architecture, having carbazole as the donor moiety and bipyridine core as the acceptor. This system has been designed and synthesized through Horner-Wadsworth-Emmons (HWE) reaction and well characterized by ^{1}H, ^{13}C NMR spectroscopy, HRMS and CHNS analysis. The target chromophores have been incrementally extended through π-linkers and varied by changing the nature of the donor moieties. The photophysical behavior of the title chromophores was studied by solution state UV-visible- and fluorescence-spectral studies. The lowest energy absorption bands in the range of 370-415 nm, observed in all the

chromophores are due to an intra-molecular charge transfer between the donor and acceptor moieties. The system exhibits intense fluorescence in solution at room temperature. We have observed that the emissive behavior is highly sensitive to solvent polarity

Research Work as Research Associate

As a research associate, I have planned and synthesized the donor-acceptor type molecules for the application of photovoltaics. This synthesis involves key reactions like Sonogashira coupling, Buchwald coupling and condensation relations etc.