Curriculum Vitae

(Dr. Sudhakar Kolanu)

Personal Details:

Name : Dr. Sudhakar Kolanu
Current : SERB-NPDF at University of Hyderabad
Res. Address : Pragatinagar, Ramanthapur,
Hyderabad-500013, Telangana, India.
Phone: +91 9160567368.
Email : kolanusudhakar@gmail.com
Web links : Google Scholar, ResearchGate

Objective

To secure a challenging research position in a pharma company to live my passion of learning and researching in the field of synthetic organic chemistry.

Education & Research

Jan 2020 – July 2022	**SERB National Postdoctoral Fellow** School of Chemistry, University of Hyderabad	▪ Synthesis of series of chloro-corroles ▪ Synthesis of mixed hetero halo-corroles and their spectral characterization.
Aug 2015 – June 2019	**Postdoctoral Fellow** Technion-Israel Institute of Technology, Haifa, **Israel**.	▪ Synthesis of selective CF_3- corroles. ▪ Synthesis of selective Iodo- corroles.
Dec. 2014 – Aug. 2015	**Research Associate** CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad, India	▪ Synthesis of Phenothiazine-Boran Dipyrromethane (BODIPY), Benzothiazole-Boran Dipyrromethane (BODIPY) based compounds
July 2009 – Oct. 2014	**Doctor of Philosophy (Ph.D.)** *Subject: Chemistry* Supervisor: Dr. Giribabu Lingamallu CSIR-IICT, Hyderabad, India Thesis: *Corrole based Donor-Acceptor systems and as sensitizers for a Dye-Sensitized Solar Cell Applications.*	▪ Synthesis of formyl/carboxy corroles. ▪ Substitution of electron poor/rich groups on corroles at β- and meso positions. ▪ Triphenylamine, BODIPY at meso position and Pyrene, Fluorene, Anthraquinone at β-position of corroles.
June 2005 – May 2007	**Master of Science (M.Sc.)** *Subject: Chemistry* Osmania campus, Osmania University, Hyderabad, India.	▪ 1st year: Organic, Molecular spectroscopy, Inorganic & Physical chemistry. ▪ 2nd year: spectroscopy and Inorganic Chemistry.
June 2000 – May 2003	**Bachelor of Science (B.Sc.)** Kakatiya Degree college, Nalgonda. Affiliated with Osmania University, Hyderabad, India.	▪ Subjects: Chemistry, Botany and Computer applications.

Fellowships/Achievements

- **SERB National Postdoctoral Fellowship (NPDF)** from University of Hyderabad, India
- **Postdoctoral fellowship** from Technion-Israel Institute of Technology**, Israel**
- **Research Associate fellowship** from CSIR-Indian Institute of Chemical Technology, India
- Selected as **Junior Research Fellowship** (JRF) from CSIR-UGC conducted a test in Dec. 2008.
- Qualified test conducted by **Graduate Aptitude Test for Engineering** (GATE) from all over India in 2009.

Research Interests

- Synthesis of Heterocyclic compounds and development of synthetic new methodologies for target compounds.
- Interested to adopt C-C bond coupling reactions and multi-step synthesis to reach target products.
- Designing synthetic routes which are cost-effective synthetic methodologies in laboratory conditions.
- Structural characterization of new compounds with various spectroscopic methods, like ^{1}H NMR, ^{13}C NMR, MS, IR Spectroscopy. And also interested in spectrophotometric and electrochemical studies.

Research expertise

- Reactions performed throughout my research work by multi-step synthesis of Organic chromophores, functional corroles *via* oxidative cyclicisation reaction, condensation reactions, Vilsmeier-Haack formylation, $NaBH_4$ reduction, Wittig Horner reaction, Schiff's base condensation, Halogenation reactions with NBS/NIS, Sonogashira coupling reaction, stille coupling, Pratos' reaction, Grignard reagent, Esterification with DCC/DMAP, Trifluoromethylation reactions, Metallation and demetallation of corrole metal complexes.
- Introduced a new synthetic methodology to convert 3-formyl corrole to 3-carboxylic acid corroles by using with mild reducing agent hydroxylamine hydrochloride and phthalic anhydride.
- Developed a new facile one-pot methodology for synthesis of iodinated metallo corroles with high yields.
- Adopted efficient nucleophilic substitution reaction methodology to convert iodo to CF_3 group substituted on corroles gold(III), cobalt(III), and copper(III) complexes.
- Expertise in illustration of structural characterization of corroles in terms of ^{1}H & ^{19}F NMR, MS, IR, X-ray crystal structure.
- Well performance in computational calculations of DFT geometry optimization in ground states, generation of MOs, spin density plots, electrostatic potential maps. TD-DFT studies in excited states for absorption spectra with Gaussian E9.0 software.

Handling:

- Expertise in handling ^{1}H NMR, ^{19}F NMR, UV-Visible NIR absorption spectrophotometer and Spectrofluoremeter, time-correlated single photon counting (TCSPC) by spectrofluorimeter set up and Electrochemical station to operated cyclic voltammogram and bulk electrolysis.

Instruments, Software, and websites used/operated

- **Instruments:** Glove box, Bruker DPX 200, Avance 300 and 400 (robot) for ^{1}H & ^{19}F NMR spectra, CH Instruments electrochemical station, Jasco HPLC with spectrofluorimeter, Shimadzu UV-3600 (Japan), Fluorolog-3 (Horiba Jobin Yvon, U.S.A.) spectrofluorimeter.
- **Software**: ChemDraw ultra12, MestReNova 5.3.1, Originpro 8.5, Mercury CSD 3.9, Diamond 3.2k, EndNote x7, Gaussian 09W, Gaussview 5, GaussSum 3.0, WinSCP 5.11.3, MS office 365, Nitro PDF professional, Topspin 4.0, FlurEssence V3.
- **Websites**: Researchgate, Google scholar, web of science, LinkedIn, SciFinder, CCDC, Sci-Hub, cccbd(NIST).

Publications

1. **K. Sudhakar**, A. Mizrahi, M. Kosa, N. Fridman, B. Tumanskii, M. Saphier, Z. Gross, "Effect of Selective CF_3 Substitution on the Physical and Chemical Properties of Gold Corroles" *Angew.Chem. Int.Ed.* **2017**, 56, 9837 –9841. (Impact factor: 12.102)
2. M. Soll[#], **K. Sudhakar**[#], N. Fridman, A. Müller, B. Röder, Z. Gross, "One-Pot Conversion of Fluorophores to Phosphorophores" *Org. lett.* **2016**, *18*, 5840. (# equal contribution) (Impact factor: 6.492)
3. **K. Sudhakar**, A. Mahammed, N. Fridman, Z. Gross, Trifluoromethylation for affecting the structural, electronic and redox properties of cobalt corroles *Dalton Trans* **2019** , 48, 4798-4810 (Impact factor: 4.1)

4. **K. Sudhakar**, S. Gokulnath, L. Giribabu, G. N. Lim, T. Trâm, F. D'Souza, "Ultrafast Photoinduced Charge Separation Leading to High-Energy Radical Ion-Pairs in Directly Linked Corrole–C_{60} and Triphenylamine–Corrole-C_{60} Donor–Acceptor Conjugates" *Chem. Asian J.* **2015**, 10, 2708-2719. (Impact factor: 3.692).

5. **K. Sudhakar,** Pradeepta K Panda Tuning Proton Reduction Efficiencies of Copper Corrole in Electrocatalysis *via* Multiple β-Chloro Substitution *ACS applied energy materials* (submitted) **2022.** (Impact factor: 6.905).

6. X Zhan, W Lee, **K Sudhakar**, D Kim, A Mahammed, DG Churchill, Z Gross Solvent Effects on the Phosphorescence of Gold (III) Complexes Chelated by β-Multisubstituted Corroles *Inorganic Chemistry* **2021** 60 (12), 8442-8446 (Impact factor: 5.165).

7. **K. Sudhakar**, A. Mahammed, C. Qiu-Cheng, N. Fridman, B. Tumanskii, Z. Gross, Copper complexes of CF_3-substituted corroles for affecting redox potentials and electrocatalysis. *ACS applied energy materials* **2020**, 3, 2828-2836 (Impact factor: 5.763).

8. X Zhan, **K. Sudhakar**, S Fite, QC Chen, W Lee, DG Churchill, Z Gross, Clean Ar–Me conversion to Ar-aldehyde with the aid of carefully designed metallocorrole photocatalysts *Photochemical & Photobiological Sciences* 2020, 19 (8), 996-1000 (Imp. factor: 2.83).

9. **K. Sudhakar**, A. Mahammed, N. Fridman, Z. Gross, "Iodinated cobalt corroles" *J. Porphyrins Phthalocyanines* **2018**, *21*, *900-907*. (Impact factor: 1.397).

10. **K. Sudhakar**, L. giribabu, "Triphenylamine corrole dyads: Synthesis, characterization, and substitution effect on photophysical properties" *J. Chem. Sci*. **2017**, *129*, *223-237*. (Impact factor: 1.235).

11. L. Giribabu, K. Jain, **K. Sudhakar**, N. Duvva, R. Chitta, "Light-induced intramolecular electron and energy transfer events in rigidly linked boron-dipyrromethene: Corrole Dyad" *J. Luminescence* **2016**, *177*, 209-218. (Impact factor: 2.732).

12. D. Badgurjar, **K. Sudhakar**, K. Jain, V. Kalantri, Y. Venkatesh, N. Duvva, P. R. Bangal, R. Chitta, L. Giribabu, "Ultrafast Intramolecular Photoinduced Energy Transfer Events in Benzothiazole–Borondipyrromethene Donor–Acceptor Dyads" *J. Phys. Chem. C* **2016**, 120, 16305-16321. (Impact factor: 4.484).

13. **K. Sudhakar**, L. Giribabu, P. Salvatori, F. D. Angelis, "Triphenylamine-functionalized corrole sensitizers for solar-cell applications" *Phys. status solidi A* **2015**, *212*, 194-202. (Impact factor: 1.795).

14. L. Giribabu, **K. Sudhakar**, "Photoinduced intramolecular reactions in triphenylamine–corrole dyads" *J. Photochemistry and Photobiology A, Chemistry* **2015**, *296*, 11-18. (Impact factor: 2.891).

15. N. Duvva, **K. Sudhakar**, D. Badgurjar, R. Chitta, L. Giribabu, "Spacer controlled photo-induced intramolecular electron transfer in a series of phenothiazine-boron dipyrromethene donor-acceptor dyads" *J. Photochemistry and Photobiology A, Chemistry* **2015**, *312*, 8-19. (Impact factor: 2.891).

16. **K. Sudhakar**, R. K. Kanaparthi, Ch. K. Kumar, L. Giribabu, "Synthesis and Photophysical Properties of a Novel Corrole-Anthraquinone-Corrole Molecular System," *J. Luminescence* **2014,** 153, 34-39**.** (Impact factor: 2.732).

17. L. Giribabu, **K. Sudhakar**, R. K. Kanaparthi, G. Sabapathi, "Intramolecular Photoinduced Reactions in Corrole-Pyrene and Corrole-Fluorene Bichromophoric Systems" *J. Photochemistry and Photobiology A,* Chemistry **2014,** 284, 18-26. (Impact factor: 2.891)**.**

18. P. Salvatori,A. Amat, M. Pastore, **K. Sudhakar**,L. Giribabu, F. De Angelis, "Corrole Dyes: the Crucial Role of the Dye/Semiconductor Energy Level Alignment", *Comput. Theor. Chem.* **2014,** 1030, 59-66. (Impact factor: 1.443).

19. L. Giribabu, **K. Sudhakar**, V. Velkannan, "Phthalocyanines: potential alternative sensitizers to Ru(II) polypyridyl complexes for dye-sensitized solar cells" *Current Science.* **2012,** 102, 991-1000. (Impact factor: 0.883).

20. **K. Sudhakar**, V. Velkannan, L. Giribabu, "Synthesis, electrochemical, photophysical properties of β-carboxy triaryl corroles", *Tetrahedron Lett.* **2012,** *53*, 991-993**.** (Impact factor: 2.125).

Book Chapter

1. L. Giribabu, **K. Sudhakar**, Ch. V. Kumar, "Low-Cost and Durable Tetrapyrrolic Sensitizers For Sensitization Of Nanocrystalline TiO_2" *Light Harvesting Nanomaterials*, Bentham ebooks **2015**, 21-54 ((Impact factor: 2.963)

Conference and Symposium

- **Poster presentation** at the 84th Annual Meeting of the Israel Chemical Society held on Feb. 12-13, 2019 at David Intercontinental Hotel, Tel-Aviv, Israel. **Sudhakar Kolanu**, Atif Mahammed, Zeev Gross, "Trifluoromethylation affecting cobalt corroles for electrocatalysis"
- **Poster presentation** in 10th International Conference on Porphyrins and Phthalocyanines (ICPP-9) held on July 1-6, 2018, Munich, Germany. **Sudhakar Kolanu**, Atif Mahammed, Zeev Gross "Electrocatalysis by Selectively Functionalized Metallocorroles"
- **Poster presentation** at the 83rd Annual Meeting of the Israel Chemical Society held on Feb. 13-14, 2018 at David Intercontinental Hotel, Tel-Aviv, Israel. **Sudhakar Kolanu**, Amir Mizrahi, Zeev Gross, "Selective CF_3 Substituted Gold(III)corroles for Electrocatalysis"
- **Oral presentation** in skype mini-symposium of Prof. Gross-prof. Bender collab. - Introduction: people & working projects. **Sudhakar Kolanu**, Zeev Gross, "Selective CF_3 Substituted Metallo Corroles for Electrocatalysis" held on Nov. 26th, 2017 at Technion –Israel Institute of Technology, Haifa, Israel.
- **Participated** in Conference in Honor of Prof. Ehud Keinan's 70th birthday, Chemistry and Beyond held on Oct. 19th, 2017, at Technion –Israel Institute of Technology, Haifa, Israel.
- **Participated** in ICS Symposium in Honor Wolf Prize Laureate, Robert G. Bergman, Organometallics and C-H Activation held on June 8th, 2017, at Technion –Israel Institute of Technology, Haifa, Israel.
- **Poster presentation** at the 82nd Annual Meeting of the Israel Chemical Society held on Feb. 13-14, 2017 at David Intercontinental Hotel, Tel-Aviv, Israel. **Sudhakar Kolanu**, Matan soll, Zeev Gross "One-pot Conversion of Fluorophores to Phosphorophores"
- **Participated** in National Natural Science Foundation of China - Israel Science Foundation (NSFC-ISF) workshop on Frontiers Molecular Design: Synthesis and Catalysis held on Nov. 15-16, 2016 at Technion-Israel Institute of Technology, Haifa, Israel.
- **Poster presentation** at 9th International Conference on Porphyrins and Phthalocyanines (ICPP-9) held on July 3-8, 2016, Nanjing, China. **Sudhakar Kolanu**, Giribabu Lingamallu, Zeev Gross "Corrole Based Donor-Acceptor Systems"
- **Participated** in ICS Symposium in Honor of the 2014 Wolf Prize Laureate, Chi-Huey Wong, held on June 1, 2016, at Technion –Israel Institute of Technology, Haifa, Israel.
- **Poster presentation** at the 81st Annual Meeting of the Israel Chemical Society held on Feb. 9-10, 2016 at David Intercontinental Hotel, Tel-Aviv, Israel. **Sudhakar Kolanu**, Zeev Gross "Corrole Based Donor-Acceptor Systems for Dye-Sensitized Solar Cells (DSSC) Applications"
- **Oral presentation** on in COST Action CM1202 Postdoc career meeting on Dec. 7-9, 2015, at Leibniz Institute of Photonic Technology, Jena, Germany. **Sudhakar Kolanu**, Zeev Gross "Corrole Based Donor-Acceptor Systems for Dye-Sensitized Solar Cells (DSSC) Applications"

References

Dr. Lingamallu Giribabu
(principal scientist)
(Ph.D. supervisor)
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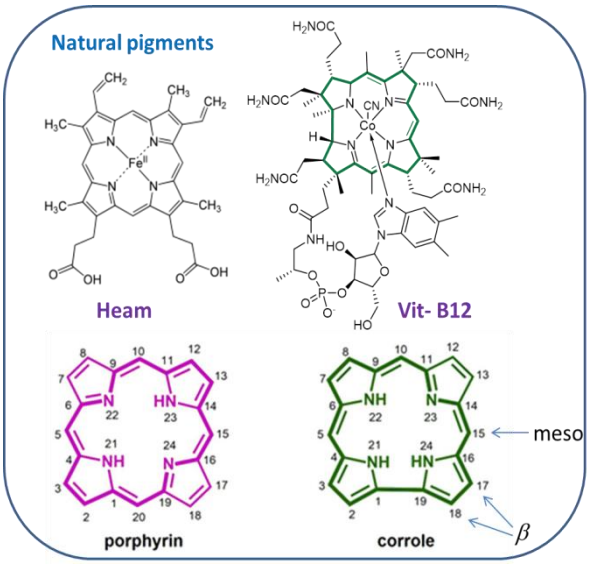
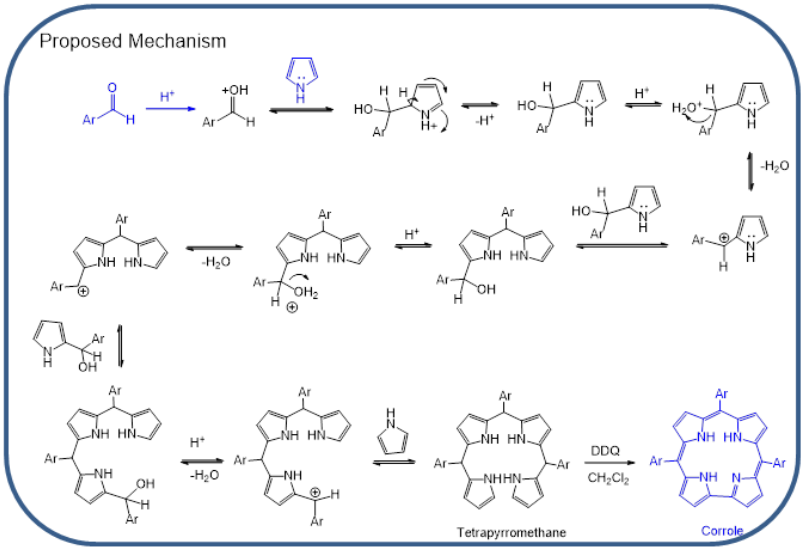
(Sudhakar Kolanu)

Introduction: Corroles are aromatic tetrapyrrolic compounds, structurally resembles with porphyrins except one -meso carbon less, adjacent two pyrroles are connected directly.[1] corroles tri-anionic ligand which stabilizes high oxidized metals.[2] Free base corroles and its metallo derivatives are involved in many applications: mimicking natural photosynthesis, catalyzes, sensors, bioimaging, photodynamic therapy and solar cells. Synthesis of A3-type corroles by condensation reaction between aryl aldehyde and pyrroles in presence of acid and A2B, ABC-type corroles were obtained starting from dippyrromethane synthesis, which reacts with various aldehydes to procured unsymmetrical corroles. Selective functionalisation obtained by post synthesised base corrole upon functionalization with reacting groups.

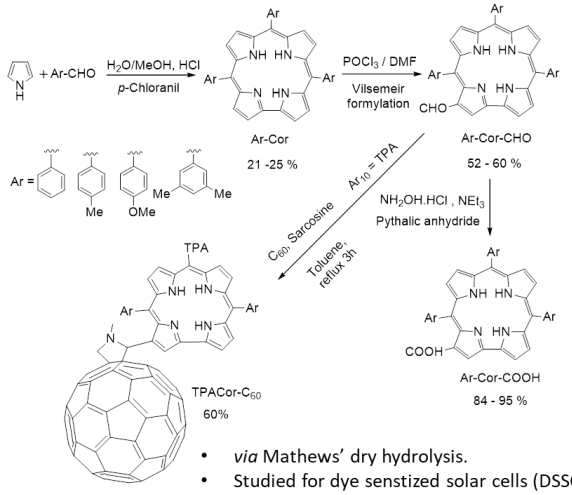
My research work is mainly focused on selective functionalization at β-pyrrole of corroles which are used in various photodriven and electrocatalytic applications.

Ph. D. work:





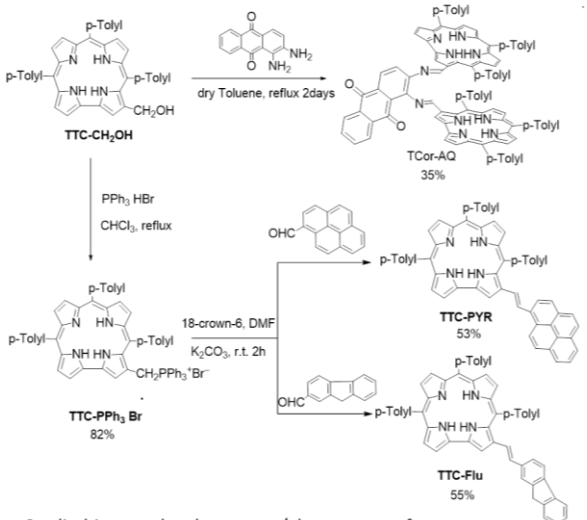
1a. Synthesis of β-carboxy triarylcorroles A_3**-type -**β**-substitution**
1b. Synthesis of TPA-Corrole-Fullerene A_2B**-type -**β**-substitution**



- *via* Mathews' dry hydrolysis.
- Studied for dye senstized solar cells (DSSC)

1. *Tetrahedron Letters* **2012,** 53, 991-993.
2. *Compututional & Theoretical Chemistry* **2014,** 1030, 59-66.
3. *Physica status solidi A* **2015**, *212*, 194-202.
4. *Chem. Asian J.* **2015**, 10, 2708-2719

2. Synthesis of tritolyl-Corrole-Pyrene and tritolyl-Corrole-Fluorene
3. Synthesis of bis-corrole-anthraquinone A_3**-type** β**-substituted corrole**



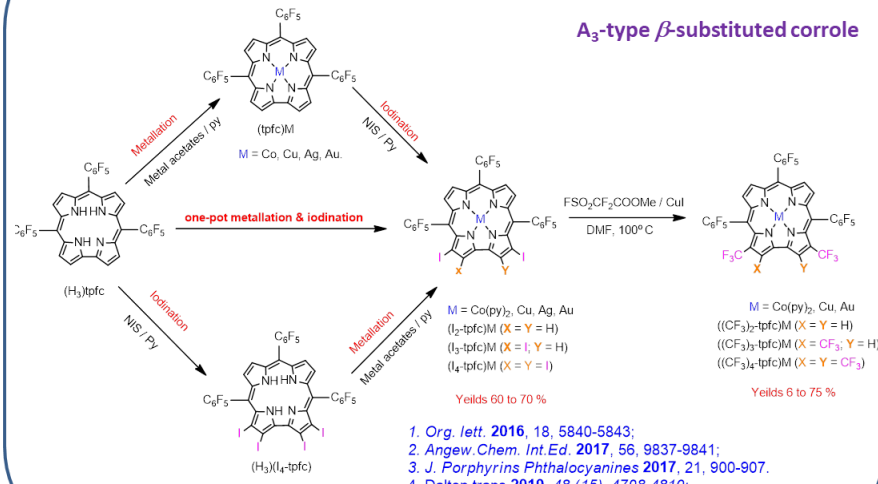
- Studied intramolecular energy/electron transfer process.

1. *J. Luminescence* **2014,** 153, 34-39
2. *J. Photochemistry and Photobiology A,* Chemistry **2014,** 284, 18-26

Postdoctoral work:

4. One-pot synthesis of iodination and metalation of corroles.
5. Synthesis trifluoromethylation of copper, cobalt, gold corroles

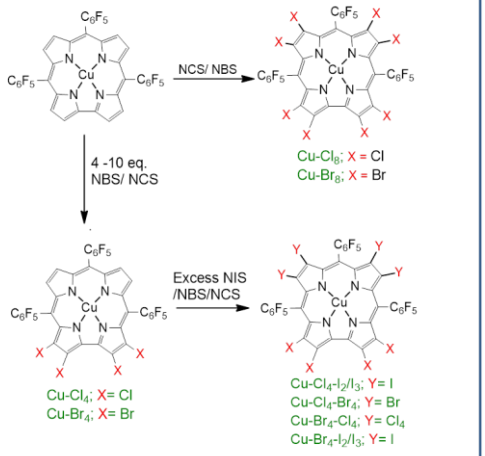
A_3-type β-substituted corrole



1. *Org. lett.* **2016**, 18, 5840-5843;
2. *Angew.Chem. Int.Ed.* **2017**, 56, 9837-9841;
3. *J. Porphyrins Phthalocyanines* **2017**, 21, 900-907.
4. Dalton trans **2019**, *48 (15), 4798-4810;*
5. *ACS Appl. Energy Mater.* ***2020***, *3, 2828-2836;*
6. *Photochem. Photobiol. Sci.*,***2020***, *19, 996-1000;*

6. Series of β-chloro copper corroles in Electrocatalytic HER and multi-hetero halocorroles.

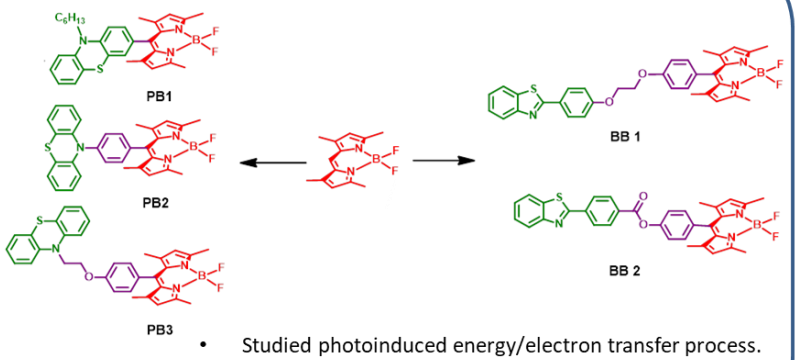
A_3-type β-substituted corrole



- Studied Electrocatalytic Hydrogen evolution reactions

1. *ACS applied energy materials 2022 (submitted).*
2. *Bromocopper corroles (manuscript under preparation).*

7. Synthesis of BODIPY-Phenothiazine/Benzothaizole



- Studied photoinduced energy/electron transfer process.

1. J. Photochemistry and Photobiology A, Chemistry 2015, 312, 8-19.
2. J. Phys. Chem. C 2016, 120, 16305-16321.