

Dr. THAKSEN JADHAV (Ph. D.)

Position : Post-doctoral fellow, KAUST, Saudi Arabia
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Education

Ph. D. (Organic Chemistry; 2012-2017) Thesis Title: Tetraphenylethylene Luminogens: Design, Synthesis and Applications
Advisor: Prof. Rajneesh Misra, Discipline of Chemistry, Indian Institute of Technology (IIT) Indore, India

M. Sc. (Organic Chemistry; 2008-2010) **First Class**
Nowrojee Wadia College, Pune (University of Pune)

B. Sc. (Chemistry; 2005-2008) **First Class with Distinction**
Ananthrao Thopte College, Bhor (University of Pune)

Research Experience

Mar 2020: Post-doctoral fellow at **King Abdullah University of Science and Technology (KAUST)**, Saudi Arabia with **Distinguished Prof. Dr. Nikos Hadjichristidis**:

I am interested in design and synthesize polymers for a circular economy with vitrimeric properties and for that using dynamic covalent chemistry.

Aug 2017- Aug 2019: Post-doctoral fellow at **McGill University**, Canada with **Dr. Dmitrii Perepichka**:

Learned about design and synthesis principles of covalent organic frameworks (COFs), which are nothing but highly ordered crystalline organic polymers. Proposed and successfully executed a new method for the synthesis of highly stable and conjugated COFs and recently published in prestigious journal *Angewandte Chemie International Edition* Title: 2D Poly(arylene vinylene) Covalent Organic Frameworks via Aldol Condensation of Trimethyltriazine, DOI: 10.1002/anie.201906976 (2019). Along with that learned about stable radical building blocks and its properties. Successfully synthesized Triangulene polychlorotriphenylmethyl based radical motifs, and studied their electronic and spin properties.

Jan 2012-July 2017: Research Scholar at **Indian Institute of Technology Indore (IITI)**, India with **Dr. Rajneesh Misra**

Title of Thesis: *Tetraphenylethylene Luminogens: Design, Synthesis and Applications*

The main aspects of my thesis work encompass development of tetraphenylethylene (TPE) derivatives for application as mechanosensors, OLEDs as well as other solid-state applications. The TPE substituted phenanthroimidazoles displayed excellent mechanochromism as well as OLED property. The concept of mechanochromism had been established earlier although the mechanochromism of phenanthroimidazoles was pioneered by our group and has been cited 110 times. The research on phenanthroimidazole was extended to study the structure property relations by synthesizing different positional isomers as well as introducing various electron donating or withdrawing groups. I further continued development of molecules for mechanosensors as well as OLEDs attaching TPE with a wide range of moieties such as pyrazole, benzothiazole,

benzothiazole with excellent colour switching. In the tenure of my doctoral research, I had developed sensors for poisonous ions such as cyanide or fluoride using BODIPY and triarylboranes.

2010-2011: Research Associate at **Jubilant Chemsys, Noida, India** (Contract research organization (CRO)):

Job Description: *synthesized various potential anticancer drug molecules for Eli Lilly and Company.*

Skills and Abilities

- ❖ Problem solving and critical thinking aptitude
- ❖ Multifaceted and goal-driven professional with hands-on experience in laboratory and research work
- ❖ Excellent communication and presentation skills
- ❖ Willing to take on challenging tasks that demand critical thinking and innovation
- ❖ Excellent team leadership, the capacity to work both independently and as part of a cross-functional team
- ❖ Aptitude to accept feedback and passion for contentious improvement
- ❖ Skilled at managing multiple complex projects simultaneously (research initiatives, project reviews and report finding)

Experimental, Analytical and Instrument Handling Skills

- ❖ **Synthetic Domain:** Multistep synthesis of small organic and organometallic compounds; organic electronics and functional dyes, syntheses and characterization of 2D covalent organic frameworks (COFs)/Polymers. Developing new methodologies for synthesis of COFs/Polymers.
 - **Sensitive reagents:** ter-butyl lithium, n-butyl lithium, TiCl₄, LiAlBH₄, Grignard reagent, DIBAL-H, H₂, Pd/C, NaBH₄, AlCl₃, POCl₃
 - **Cross-coupling reactions:** Suzuki-Miyaura, Sonogashira, Stille, Hartwig-Buchwald
 - **Special conditions:** dry atmosphere, inert atmosphere, low temperature
 - **Microwave** assisted synthesis
- ❖ **Purification Domain:** Column chromatography, flash chromatography and crystallization techniques
- ❖ **Analysis Domain:**
 - **Characterization techniques:** NMR of ¹H, ¹³C, ¹⁹F; ²D NMR sequences used: NOE, COSY, Mass Spectroscopy, High-performance liquid chromatography(HPLC), FT-IR spectroscopy: attenuated total reflectance, Elemental analysis.
 - **XRD techniques:** single crystal X-ray diffraction, powder X-ray diffraction
 - **Surface area measurements:** Brunauer–Emmett–Teller (BET) measurements were performed to calculate specific surface area of materials and further studied gas adsorption properties
 - **Photophysical properties:** Skilled in sample preparation and handling of solution and solid phase Uv-Vis absorption and fluorescence spectroscopy.
 - **Electron Paramagnetic Resonance (EPR):** Studied radical building blocks for unpaired electrons.
 - **Thermal stability study:** Thermogravimetric analysis (TGA), and Differential scanning calorimetry (DSC).
 - **Electrochemistry:** Cyclic voltammetry (CV), differential pulse voltammetry (DPV) and spectroelectrochemistry.
 - **Morphology study:** Experience in scanning electron microscopy (SEM), dynamic light scattering (DLS), single crystal X-ray spectroscopy.

- **Theoretical calculations:** Experienced in density functional theory (DFT) calculations using Gaussian 09
- ❖ **Theoretical/Computational approach:** Experienced in density functional theory (DFT) calculations using Gaussian 16
- ❖ **Software Handling:** Microsoft office, Origin, Mercury, ACD, Top-spin, ChemDraw, scifinder

Awards

1. **Fonds de Recherche du Québec Nature et Technologies (FRQ-NT): Post-doctoral fellowship Jun 2018**
2. **Award of International Travel Grant, SERB, DST, Government of India, Faraday Discussion,** South China University of Technology, Guangzhou, China 2016.
3. **Best oral presentation: Frontier Areas in Chemical Sciences 2017** (National conference), Yashavantrao Chavan Institute of Science, Satara, India (27-28th Jan, 2017).
4. **Best poster: Aggregation Induced Emission: Faraday Discussion,** South China University of Technology, Guangzhou, China (18-20th Nov, 2016).
5. **University Grant Commission (India): Senior research Fellowship (SRF)** Jan 2014-Dec 2017.
6. **University Grant Commission (India): Junior research Fellowship (JRF)** Jan 2012-Dec 2013.

Research Publications

❖ During Post-doctoral research:

1. **Thaksen Jadhav,** Yuan Fang, Cheng-Hao Liu, Afshin Dadvand, Ehsan Hamzehpoor, William Patterson, Antranik Jonderian, Robin S. Stein, Dmitrii F Perepichka,* *J. Am. Chem. Soc.*, **2020**, doi.org/10.1021/jacs.0c01990.
2. **Thaksen Jadhav,** Yuan Fang, William Patterson, Cheng-Hao Liu, Ehsan Hamzehpoor, Dmitrii F Perepichka,* *Angewandte Chemie International Edition*, **2019**, 58, 13753–13757.

❖ During Ph. D. Tenure:

3. **Thaksen Jadhav,** Jeong Min Choi, Jivan Shinde, Jun Yeob Lee,* Rajneesh Misra,* *Journal of Material Chemistry C*, **2017**, 5, 6014–6020.
4. **Thaksen Jadhav,** Bhausaheb Dhokale, Yuvraj Patil, Shaikh M. Mobin, Rajneesh Misra,* *Journal of Physical Chemistry C*, **2016**, 120, 24030–24040.
5. **Thaksen Jadhav,** Jeong Min Choi, Bhausaheb Dhokale, Shaikh M. Mobin, Jun Yeob Lee,* Rajneesh Misra,* *Journal of Physical Chemistry C*, **2016**, 120, 18487–18495.
6. **Thaksen Jadhav,** Jeong Min Choi, Jun Yeob Lee,* Bhausaheb Dhokale, Rajneesh Misra,* *Organic Electronics*, **2016**, 37, 448–452.
7. **Thaksen Jadhav,** Bhausaheb Dhokale, Rajneesh Misra,* *Journal of Material Chemistry C*, **2015**, 3, 9063-9068 (Highlighted as inside front cover).

8. **Thaksen Jadhav**, Bhausaheb Dhokale, Shaikh M. Mobin, Rajneesh Misra,* *Journal of Material Chemistry C*, **2015**, 3, 9981-9988.
9. **Thaksen Jadhav**, Rajneesh Misra,* S. Biswas, G. D. Sharma,* *Physical Chemistry Chemical Physics*, **2015**, 17, 26580-26588.
10. **Thaksen Jadhav**, Bhausaheb Dhokale, Shaikh M. Mobin, Rajneesh Misra,* *RSC Advances*, **2015**, 5, 29878-29884.
11. **Thaksen Jadhav**, Bhausaheb Dhokale, Yuvraj patil, Rajneesh Misra,* *RSC Advances*, **2015**, 5, 68187-68191.
12. **Thaksen Jadhav**, Ramesh Maragani, Rajneesh Misra,* V. Sreeramulu, D. Narayana Rao, Shaikh M. Mobin, *Dalton Transactions*, **2013**, 42, 4340-4342.
13. Rajneesh Misra,* **Thaksen Jadhav**, Bhausaheb Dhokale, Shaikh M. Mobin, *Dalton Transactions*, **2015**, 44, 16052-16060.
14. Rajneesh Misra,* **Thaksen Jadhav**, Dustin Nevenon, Ellen M. Monzo, Shaikh M. Mobin, and Victor N. Nemykin, *Organometallics*, **2017**, 36, 4490-4498.
15. Rajneesh Misra,* **Thaksen Jadhav**, Bhausaheb Dhokale, Shaikh M. Mobin, *Chemical Communications*, **2014**, 50, 9076-9078.
16. Rajneesh Misra,* **Thaksen Jadhav**, Bhausaheb Dhokale, Prabhat Gautam, Rekha Sharma, Ramesh Maragani, Shaikh M. Mobin, *Dalton Transactions*, **2014**, 43, 13076-13086.
17. Rajneesh Misra,* **Thaksen Jadhav**, Shaikh M. Mobin, *Dalton Transactions*, **2014**, 43, 2013-2022.
18. Rajneesh Misra,* **Thaksen Jadhav**, Shaikh M. Mobin, *Dalton Transactions*, **2013**, 42, 16614-16620.
19. Anupama Ekbote, Si Hyun Han, **Thaksen Jadhav**, Shaikh M. Mobin, Jun Yeob Lee, Rajneesh Misra,* *Journal of Material Chemistry C*, **2018**, 6, 2077-2087.
20. Anupama Ekbote, **Thaksen Jadhav**, Rajneesh Misra,* *New Journal of Chemistry*, **2017**, 41, 9346-9353.
21. Yuvraj Patil, **Thaksen Jadhav**, Bhausaheb Dhokale, Holger Butenschön, Rajneesh Misra,* *ChemistrySelect*, **2017**, 2, 415 - 420.
22. Bhausaheb Dhokale, **Thaksen Jadhav**, Yuvraj Patil, Rajneesh Misra,* *Dyes and Pigments*, **2016**, 134, 164-170.
23. Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, Rajneesh Misra,* *Dalton Transactions*, **2016**, 45, 1476-1483.
24. Yuvraj Patil, **Thaksen Jadhav**, Bhausaheb Dhokale, Rajneesh Misra,* *Asian Journal of Organic Chemistry*, **2016**, 5, 1008-1014.
25. Yuvraj Patil, **Thaksen Jadhav**, Bhausaheb Dhokale, Rajneesh Misra,* *European Journal of Organic Chemistry*, **2016**, 4, 733-738.
26. Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, Rajneesh Misra,* *RSC Advances*, **2015**, 5, 57692-57699.
27. Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, Rajneesh Misra,* *Journal of Organic Chemistry*, **2015**, 80, 8018-8025.
28. Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, Rajneesh Misra,* *Dalton Transactions*, **2015**, 44, 15803-15812 (Highlighted as inside front cover).
29. Rajneesh Misra,* Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, *Dalton Transactions*, **2014**, 43, 4854-4861.
30. Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin and Rajneesh Misra,* *Chemical Communications*, **2014**, 50, 9119-9121.
31. Rajneesh Misra,* Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, *New Journal of Chemistry*, **2014**, 38, 3579-3585.
32. Rajneesh Misra,* Ramesh Maragani, **Thaksen Jadhav**, Shaikh M. Mobin, *New Journal of Chemistry*, **2014**, 38, 1446-1457.
33. Rajneesh Misra,* Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, *Organometallics*, **2014**, 33, 1867-1877.
34. Satya Narayan Sahu, Maneesh Kumar Gupta, **Thaksen Jadhav**, Pratik Yadav, Surjeet Singh, Rajneesh Misra,* Ramendra Pratap,* *RSC Advances*, **2014**, 4, 56779-56783.
35. Rajneesh Misra,* Prabhat Gautam, **Thaksen Jadhav**, Shaikh M. Mobin, *Journal of Organic Chemistry*, **2013**, 78, 10, 4940-4948.
36. Rajneesh Misra,* Bhausaheb Dhokale, **Thaksen Jadhav**, Shaikh M. Mobin, *Dalton Transactions*, **2013**, 42, 13658-13666.

37. Maragani Ramesh, **Thaksen Jadhav**, Shaikh M. Mobin, Rajneesh Misra,* *RSC Advances*, **2013**, 3, 2889-2892.
38. Maragani Ramesh, **Thaksen Jadhav**, Shaikh M. Mobin and Rajneesh Misra,* *Tetrahedron*, **2012**, 68, 7302–7308.

Mentoring Experience: (during Ph.D. and Post-doctorate)

- ❖ During Ph.D.: Two Ph.D. students were trained for first one year and published 6 publications as co-authors.
- ❖ During Ph.D.: One project student was mentored for one year and successfully completed the project.
- ❖ During Post-doctorate: One undergrad was mentored one year.

Poster Presented

1. **Thaksen Jadhav**, Rajneesh Misra,* **Frontier Areas in Chemical Sciences 2017**, Yashavantrao Chavan Institute of Science, Satara, India (27-28th Jan, 2017); Oral presentation (**Awarded for best Oral presentation**).
2. **Thaksen Jadhav**, Dhokale, B., Rajneesh Misra,* **Aggregation Induced Emission: Faraday Discussion**, South China University of Technology, Guangzhou, China (18-20th Nov, 2016); Poster presented (**Awarded for best poster**).
3. **Thaksen Jadhav**, Dhokale, B., Rajneesh Misra,* **8th Asian Photochemistry conference (APC-2014)**, Trivandrum, India (10-13th Nov, 2014); Poster presented.
4. **Thaksen Jadhav**, Dhokale, B., Rajneesh Misra,* **Frontier Lecture Series in Chemistry (FLSC-2014)**, Indore, India (30-31st Jan, 2014); Poster presented.

Seminars/Workshops Participated

1. Workshop on Introduction to Gaussian: Theory and practice Delhi, India (6-10th Jan, 2014), Organized by
2. Workshop on Laboratory Health and Safety Workshop, IIT Indore, India (4th April 2014).
3. International Winter School on “Organic Electronic Materials and Devices” (OMED-2013), NITK Surathkal, Mangalore, India (19-21th Dec, 2013).
4. Workshop on Introduction to Gaussian: Theory and practice Delhi, India (17-21th Dec, 2012).

References

- 1) **Prof. Dr. Rajneesh Misra (Thesis supervisor)**, Discipline of Chemistry, Indian Institute of Technology-Indore
Email- rajneeshmisra@iiti.ac.in
- 2) **Prof. Dr. Dmitrii F. Perepichka**, Department of Chemistry, McGill University, Canada
Email- dmitrii.perepichka@mcgill.ca