

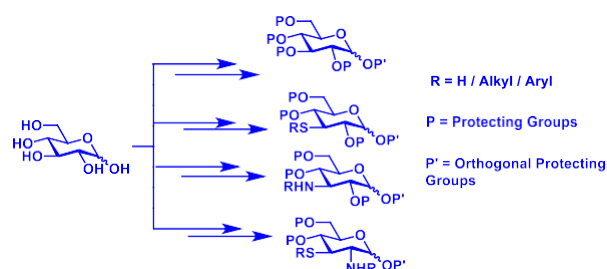
Professional Experience

Research Associate Crude & Fuel Research Laboratory Hindustan Petroleum Green R&D Centre, Bengaluru.		Nov 2023 - Present
Research Project	<ul style="list-style-type: none"> Reduction of Cracking in Vacuum heater in Diesel Tank (Vacc-Pro) Static Dispersant Additives for ATF/ADF Development of a Novel Demulsifiers for Upstream Applications in Refineries. 	
Laboratory Support	<ul style="list-style-type: none"> Involved in developing novel synthesis protocols Formulation of Standard Operating Procedures (SOPs) Update the all work protocol using LIMS and ELN 	
Testing/Instruments Proficiency	<ul style="list-style-type: none"> 300 mL PARR Reactor for synthesis of sulphone polymer using SO₂ gas. AC D2887 & D7213 SIMDIS HT & LT Electrical Conductivity of Aviation and Distillate Fuels using conductivity meter (D2624) FT-IR NMR 500 MHz Bruker and JEOL CHNS, GPC-MS, PetraMax (X-ray elemental analysis), GC/GC, LCMS 	

National Postdoctoral Fellow (NPDF) C/o Prof. N. Jayaraman, Chair, Department of Organic Chemistry Indian Institute of Science (IISc), Bangalore – 560 012.		Dec 2022 – Nov 2023
Research Project	Synthesis and Studies of Custom-Designed Cyclic Oligosaccharides	

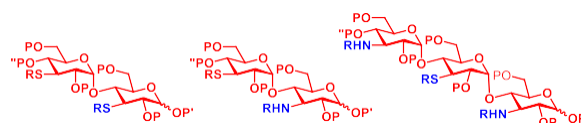
Project Expertise

This research proposal aims to synthesize new custom-made synthetic small-ring cyclic oligosaccharides. Motivation to the work arises from recent demonstrations that cyclic oligosaccharides constituted with modified monomers exhibit altered conformational features of the monomers and, as a result, the macrocyclic properties of the cyclic oligosaccharides. An area of importance in the synthesis is the cyclic oligosaccharides possessing more than one type of monomers constituting the macrocycle. The underlying basis to synthesize monomers having more than type sugar monomers is the modulation of the macrocyclic cavity and hydrophilicity-hydrophobicity-driven surface area properties.



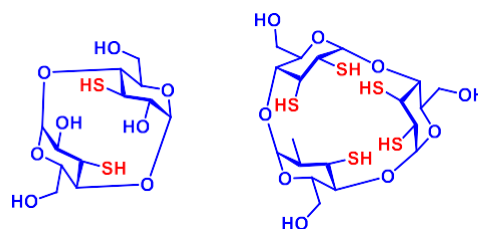
Objectives of Research

- Synthesis of sugar monomers having hetero-atom modifications at C-2, C-3 and C-6 carbons of a pyranoside. The heteroatom modifications are to include either nitrogen or sulfur or deoxy carbon at one or more of the above carbons;
- Synthesis of di- and trisaccharide monomers, possessing the donor and acceptor functionalities in the monomers;
- Cyclo-oligomerization of the designed monomers to secure the cyclic oligosaccharides and
- Studies of host-guest encapsulation properties of new synthetic cyclic oligosaccharides.



Deliverables

Development of synthetic methods to prepare chemically-modified cyclic oligosaccharides through cycloglycosylation approach. Synthesis of new types cyclic oligosaccharide macrocycle, with varied substituents at carbons of each monosaccharide constituting the macrocycle. Studies of encapsulation abilities of the new cyclic oligosaccharides and evaluation of the thermodynamic parameters governing the complexations of chosen guest molecules.



Laboratory Support

- Involved in developing novel synthesis protocols for carbohydrate chemistry.
- Group Presentation on every week.
- Maintain the record of chiral HPLC and GC
- Maintain accounts and chemical details

Testing/Instruments Proficiency

- Chiral HPLC (High-Performance Liquid Chromatography)
- HRMS (High Resolution Mass Spectrometry)
- NMR (500 & 800 MHz)
- CD (Circular Dichroism)
- GC (Gas Chromatography)

Assistant Professor

Department of Chemistry
Sadakathullah Appa College, Tirunelveli, Tamilnadu – 625 021

June 2018 - Oct 2022

- Success stories of students who have excelled under your guidance.
- Mentoring or coaching initiatives that have helped other teachers improve their practice.
- Contributions to school-wide initiatives or committees that have led to positive changes.
- Handled various practical's like, Organic Synthesis, Gravimetric Analysis, Semi-Micro Analysis, etc.,

CSIR – SRF (Senior Research Fellow)

School of Chemistry
Madurai Kamaraj University, Madurai

Oct 2017 – Mar 2018

Research Expertise

- Designed and executed synthetic routes for the preparation of target compound from commercially available starting materials.
- Implemented modern synthetic methodologies including palladium-catalysed cross-coupling reactions and organometallic chemistry.

Project Expertise

Quinolinium Modified β -Cyclodextrin: An Ionic Ligand with Cu (I) for Sustainable in A3 Coupling and Metal-Free Tandem Cyclization of Three-Component Coupling Reaction of Aldehydes, Amines, and Alkynes in Aqueous Media

Finalise the work and communicate into the paper

Technical Assistant

DST-PURSE Scheme
School of Chemistry
Madurai Kamaraj University, Madurai

July 2012 – Oct 2014

Testing/Instruments Handling

- NMR Spectroscopy (400 MHz)
- Thermo Feet Mass Spectrometry (GC-MS, LC-MS).
- HPLC (High-Performance Liquid Chromatography)

Educational Qualifications

Doctor of Philosophy (Ph.D.)

Under the guidance of Prof. K. Pitchumani

Department of Green and Sustainable Chemistry,

School of Chemistry

Madurai Kamaraj University, Madurai.

Dec 2014 - Aug 2018

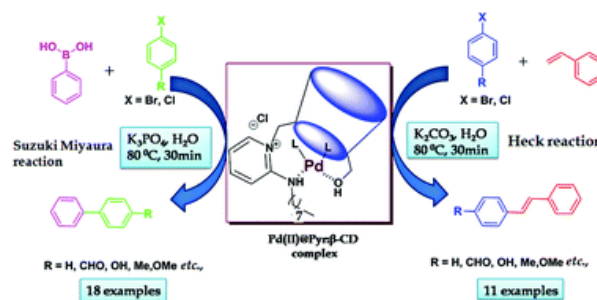
Research Project

Host-Guest Chemistry: Utility of Modified Cyclodextrin in Organic Transformations

Research Expertise

Pyridinium Modified β -Cyclodextrin: An Ionic Supramolecular Ligand for Palladium acetate in C-C Coupling Reactions in Water

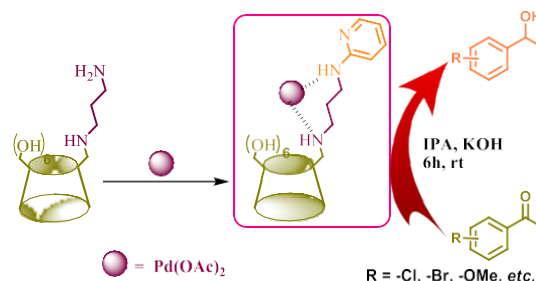
An ionic Pd(II) complex stabilized by a water soluble pyridinium modified β -cyclodextrin having an N-octyl side chain was prepared and characterized by NMR, mass spectrometry, FT-IR spectroscopy, UV-Visible spectroscopy and DLS (dynamic light scattering). The resulting Pd(II)@Pyr- β -CD complex showed very good catalytic activity in Suzuki-Miyaura and



Heck C-C coupling reactions in an environmentally benign water medium. Good to excellent yields were obtained for the coupling of various aryl halides including chlorides with phenylboronic acid/styrene using a catalytic amount of Pd(II)@Pyr- β -CD. This homogeneous catalyst can be reused and recycled more than six times with only marginal loss of its catalytic activity.

Water Soluble Palladium Complex bearing Pyridinyl-di-amine Modified β -Cyclodextrins as a Catalyst for Hydrogenation Reaction

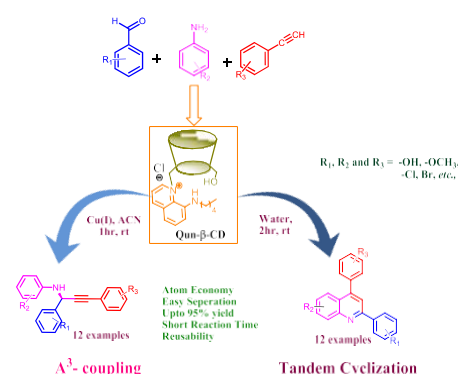
The synthesis of a water soluble Pd(II) complex bearing N'-(pyridin-2-yl)propane-1,3-diamine modified β -cyclodextrin (Pd(II)@PyPDA- β -CD) is reported. The synthesised Pd(II)@PyPDA- β -CD, characterized by NMR, Mass, FT-IR, UV-Vis spectroscopies and molecular modelling studies, is used as an environmentally benign, efficient and reusable



homogeneous catalyst in the transfer hydrogenation reaction of aromatic ketones to secondary alcohols using isopropanol as a green reducing agent, under mild reaction conditions. This homogeneous catalyst can be recycled more than six times with only marginal loss in its catalytic activity. A plausible mechanism for the hydrogenation reaction is also proposed. The simplicity of catalyst preparation, its stability, substrate selectivity, easy recovery and regeneration designate possible utilization of this catalytic system in a multitude of catalytic reactions and industrial processes.

Quinolinium Modified β -Cyclodextrin: An Ionic Ligand with Cu (I) for Sustainable in A³ Coupling and Metal-Free Tandem Cyclization of Three-Component Coupling Reaction of Aldehydes, Amines, and Alkynes in Aqueous Media

An ionic Cu(I) complex (Cu(I)@Qun- β -CD), stabilized by water soluble quinolinium modified β -cyclodextrin (Qun- β -CD) with an 8-N-pentyl side chain, was prepared and characterized by ESI-Mass, NMR and UV-Visible spectroscopies and also molecular modelling studies. The synthesized Cu(I)@Qun- β -CD was found to be highly efficient in promoting A³-coupling reaction of various aldehydes, amines and terminal alkynes to yield propargylamines via C-H activation in acetonitrile medium. The prepared Qun- β -CD (C) alone, without any metal ion, follows a different course



exhibiting excellent catalytic efficiency in an intramolecular tandem cyclisation reaction of the same reagents to yield quinolines via C-H activation in aqueous medium. In both the three-component, room temperature, atom economical reactions, the catalyst was recycled more than six consecutive cycles without any loss in its activity.

Laboratory Skills	<ol style="list-style-type: none"> 1. Proficient in synthetic organic reagents towards acetylation, glycosylation <i>etc.</i>, various techniques including inert atmosphere reactions, column chromatography, and HPLC purification. 2. Experience with modern synthetic methods such as transition metal-catalyzed reactions, heterocycle synthesis, and asymmetric synthesis. 3. Strong analytical skills for compound characterization using NMR, IR, MS, and other spectroscopic techniques. 4. Familiarity with laboratory automation and software tools for reaction monitoring and data analysis.
Testing/Instruments Proficiency	<ul style="list-style-type: none"> ▪ NMR Spectroscopy (300 MHz, 500 MHz) ▪ Mass Spectrometry (GC-MS, LC-MS) ▪ HPLC (High-Performance Liquid Chromatography) ▪ Gas Chromatography (GC-FID, GC-MS) ▪ UV-Vis Spectrophotometry ▪ FT-IR Spectroscopy ▪ Fluorescence Microscopes
Data Analysis Software's	<ul style="list-style-type: none"> ▪ X'Pert High Score Plus (Version 5.0) ▪ Origin Pro (Version 10.0) ▪ Gaussian and Gauss View ▪ Chem Draw (Current version) ▪ Scifinder ▪ Simulation packages: Insight II, Tripose, Hyperchem, Spartan and Gaussian (Current Version)

Master of Science (M.Sc.,) Department of Chemistry Manonmaniam Sundaranar University Tirunelveli, Tamilnadu.		April 2010 - Mar 2012
Project	Synthesis, Studies, Characterisation, Docking and Antimicrobial Activity Studies for Novel Coumarin Derivatives.	
Publication details	<ul style="list-style-type: none"> ▪ This work was published in Indian Journal of Pharmaceutical Research (Open Access Journal) 	

Bachelor of Science (B.Sc.,) Jamal Mohamed College Trichy, Tamilnadu.		April 2007 - Mar 2010
Project	Water Analysis using various charcoals	

Awards and Honors

1. **National Postdoctoral Fellow (NPDF)**, from DST-SERB, New Delhi, India on 2022.
2. **INSA Visiting Scientist**, from Indian National Science Academy (INSA), India on Sep 2021.
3. **CSIR SRF** (Senior Research Fellow), Madurai Kamaraj University, Madurai, on Oct 2017.
4. **TNSCST student research project**, TNSCST, TamilNadu, India, on 2020.
5. **“Young Achiever Awards 2019”** from INSc (Institute of Scholar), Bangalore on May 2019.
6. **Best Poster Award** in “National Symposium on Newer Horizons in Chemistry” at Manonmaniam Sundaranar University, Tirunelveli, contribute paper entitled with “Synthesis, Characterization and Biological Activity of Coumarin Derivatives” (II prize was awarded) on 2012.

1. M. Muthu Kathija, S. Muthusamy, **R. Imran Khan**, M. Sheik Muhideen Badhusa, K. Rajalakshmi, V. Rama, Y. Xu. 'Photocatalytic degradation of methylene blue dye using biogenic copper oxide nanoparticles and its degradation pathway analysis', *Inorganic Chemistry Communications*, **2023**, 161, 111929, **Impact factor: 3.8**.
2. P. Mohammed Yusuf Ansari, R. M. Muthukrishnan, **R. Imran Khan**, C. Vedhi, K. Sakthipandi, S. M. Abdul Kader. Green synthesis of copper oxide nanoparticles using *Amaranthus dubius* leaf extract for sensor and photocatalytic applications. *Chemical Physics Impact*, **2023**, 7, 100374. **Impact factor: 2.2**.
3. P. Mohammed Yusuf Ansari, R. M. Muthukrishnan, **R. Imran Khan**, C. Vedhi, S. M. Abdul Kader, Green synthesis of copper oxide nanoparticles using *Amaranthus Caudatus* leaf extract and its non-enzymatic glucose sensor application, *Applied Physics A*, **2023**, 743, 1-12, **Impact factor: 2.7**.
4. N Mohamed Faizee, C Joel, **R Imran Khan**, MSM Badhusa, Beta vulgaris extract assisted green synthesis of ZnO nanoparticles: antimicrobial and nano priming studies, *Inorganic and Nano-Metal Chemistry*. **2023**, 1-10, **Impact factor: 1.7**.
5. **R. Imran Khan** and K. Pitchumani, Quinolinium Modified β -Cyclodextrin: An Ionic Ligand towards Sustainable A³-Coupling and Tandem Cyclisation Reactions of Aldehydes, Amines and Alkynes, *Molecular Catalysis*. **2022**, 519, 112151, **Impact factor: 5.089**.
6. MSM Badhusa, C Joel, **R. Imran Khan**, N Vijayakumar, Green Synthesis and Characterization of Fe Doped ZnO Nanoparticles and their Interaction with Bovine Serum Albumin, *Journal of Indian Chemical Society*. **2021**, 11, 100197, **Impact factor: 0.284**.
7. **R. Imran Khan** and K. Pitchumani, Water Soluble Palladium Complex bearing Pyridinyl-di-amine Modified β -Cyclodextrin as a Catalyst for Hydrogenation Reaction, *ACS Sustainable Chem. Eng.* **2018**, 6, 16130–16138, **Impact factor: 9.224**.
8. **R. Imran Khan**, A. Ramu and K. Pitchumani, Design and one-pot synthesis of a novel pyrene based fluorescent sensor for selective "turn on" and naked eye detection of Ni²⁺ ions, and live cell imaging, *Sensors and Actuators B: Chemical* **2018**, 266, 429–437, **Impact factor: 9.221**.
9. **R. Imran Khan** and K. Pitchumani, Pyridinium Modified β -Cyclodextrin: An Ionic Supramolecular Ligand for Palladium acetate in C-C Coupling Reactions in Water, *Green Chem.*, **2016**, 18, 5518-5528, **Impact factor: 9.80**.
10. **R. Imran Khan** and Kasi Pitchumani, β -Cyclodextrin included coumarin derivatives as selective fluorescent sensors for Cu²⁺ ions in HeLa cells, *RSC Adv.*, **2016**, 6, 20269-20275, **Impact factor: 4.036**.
11. SDS Parveen, BS Kumar, SR Kumar, **R. Imran Khan**, K Pitchumani, Isolation of biochanin A, an isoflavone, and its selective sensing of copper(II) ion, *Sensors and Actuators B, Chemical* **2015**, 221, 75, **Impact factor: 9.221**.
12. R. Manoj kumar, M. M. Alanazi, R. Imran Khan, R. B. Ajmal, M. Syed Ali Padusha, Sarkar M. A. Kawsar, J. Masood Khan, A. M. Sajith, Ethylene-Di-Amine Modified β -Cyclodextrin Catalyzed Green Synthesis of Pyrimidones and Its In Silico Study against E. coli Receptor, **2024**, <https://doi.org/10.20944/preprints202312.2306.v2>.

Conference Participated**'Presented in International Conferences**

1. Participated as delegate and presented a poster presentation in the "1st International Conference on Life, Chemical, and Health Sciences (ICLCHS)" from 24-26th October 2019, organized by Department of Life Sciences Ramaiah College of Arts, Science College of Arts, Science and Commerce in collaboration with Karnataka Science and Technology Academy, Department of IT, BT, and Science and Technology, Government of Karnataka.
2. Presented a paper in 13th Eurasia Conference on Chemical Science, Bangalore, India, held at Indian Institute of Science, Bangalore, at December- 14-18, 2014.
3. Poster presented in "Second International conference on Advances Materials Chemistry at The Interfaces of Energy, Environment and Medicine" at Manonmaniam Sundaranar University, Tirunelveli, contribute paper entitled with "Biomimetic Catalysis by Cu(I) complex of Ethylene-di-amine Modified β -Cyclodextrin in Synthesis of Benzoxazole Derivatives via Phenol and benzylamine Coupling.

4. Academic and interaction sessions during the 5th Science Conclave/Inspire Internship Program a congregation of Nobel Laureates and Eminent Scientists an MHRD - DST initiative at IIIT Allahabad, India during December 08-14, 2012.
5. Presented the paper in the “Young Scientist Conference” as a part of "India International Science Festival - 2020" held at Biswa Bangala Convention Centre, Kolkata during November 5-8, 2019 and also presented a paper on the theme Frontier areas of Research.

Presented in National Conferences

1. Presented a poster in “21st CRSI National Symposium in Chemistry” - 2017 held at CSIR – Indian Institute of Chemical Technology, Hyderabad, India.
2. Presented a paper in the *National Symposium on Newer Horizons in Chemistry* held on 09 March 2012 at Manonmaniam Sundaranar University.
3. Poster presented in “*National Symposium on Newer Horizons in Chemistry*” at Manonmaniam Sundaranar University, Tirunelveli, contribute paper entitled with “Synthesis, Characterization and Biological Activity of Coumarin Derivatives” (II prize was awarded)

Declaration

I affirm that the information provided in this resume is accurate and complete to the best of my knowledge. I understand that any false statements may result in disqualification from the hiring process.

References

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Postdoctoral Mentor
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Department of Organic Chemistry
Indian Institute of Science (IISc),
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Dr. Amrutha M S

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Personal Details

- DOB: 11/12/1989
- Nationality: Indian
- Meritorious Status: Married
- Languages: English, Tamil and Arabic.
- Current Address: Channasandra, Near Adams Academy, Whitefield, Bengaluru.