

Dr. Ganesan Mani

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Web site: <https://sites.google.com/view/organometallics-lab/home>; Cell: 9434745674

Research Area: Organometallic and Main Group compounds bearing novel pincer and NHC ligands for different types of catalysis

Professional Degrees and Research Experience

Jan. 2020 Professor, Department of Chemistry, IIT-Kharagpur. India.
2013 – Dec. 2019 Associate Professor, Department of Chemistry, IIT-Kharagpur. India.
2007 - 2013 Assistant Professor, Department of Chemistry, IIT-Kharagpur. India.
2006 - 2007 Senior Scientist, Nanoco Technologies Ltd. Manchester, U. K.;
Quantum dots syntheses and characterizations.
2004 - 2006 Postdoctoral Fellow, Western Michigan University, U.S.A;
Mentor: Prof. S. Obare, Metal nanoparticles synthesis and applications.
2002 - 2004 Postdoctoral Fellow, Texas A&M University, College Station, U.S.A;
Mentor: Prof. F. P. Gabbai, Olefin polymerization and Main Group Chemistry.
2000 - 2002 Postdoctoral Fellow, Purdue University, West Lafayette, U.S.A;
Mentor: Prof. R. A. Walton, Multiple bonded Re-Re compounds.
1999 - 2000 Postdoctoral Fellow, University of Ottawa, Ottawa, Canada;
Mentor: Prof. S. Gambarotta, Lanthanides and early transition metals.
1992 - 1999 Ph. D. Advisor: Prof. S. S. Krishnamurthy. Indian Institute of Science, Bangalore.
1990 - 1992 M. Sc., Chemistry, I-Class, Dept. of Chem., Bharathidasan University, India.
1987 - 1990 B. Sc., Chemistry, I-Class with distinction, A. V. C. College, Mayiladuthurai, India.

No. of Ph.D. students completed solely under my guidance: 13

No. of publications: 65

No. of patent: 3

No. of book chapter: 1

Publication List

65. Mondal, P.; Dutta, P.; Mani, G. Molybdenum(0)-Catalyzed Tandem Cyclization Reactions of Aminoalkynes with Diketones for Multiply Substituted Azaheterocycles, *J. Org. Chem.* **2026**, <https://doi.org/10.1021/acs.joc.6c01148>
64. Gupta, R.; Kumar, A.; and Mani, Dipyrromethane–diphosphines: nickel and palladium complexes as catalysts for the selective hydroboration of CO₂ to methoxyborane under mild conditions with mechanistic study. *RSC Adv.* **2026**, <https://doi.org/10.1039/d6ra04348h>

63. Kumar, K.; Gupta, R.; Mani, G. The Hydroboration of CO₂ with 9-BBN to Methoxyborane Catalyzed by Pincer Carbene Palladium(II) and Nickel(II) Thiolates with High Turnover Numbers. *Organometallics*, **2026**, *45*, 410–423. doi.org/10.1021/acs.organomet.5c00354
62. Mondal, M.; Mani, G. Synthesis and Structural Characterizations of Self-Assembled Silver(I) Complexes of the Pyrazole Ligands: Effect of anion and VT NMR Study. *Polyhedron*, **2026**, *284*, 117910. doi.org/10.1016/j.poly.2025.117910.
61. Dutta, P.; Mondal, P.; Khatua, K.; Mani, G. The Tandem Reaction of Aminoalkynes Catalyzed by Copper Salts for Azaheterocycles: Product Selectivity by Temperature and X-ray Structure of an Iminium Ion. *J. Org. Chem.* **2025**, *90*, 11245–11256; 10.1021/acs.joc.5c01181.
60. Kumar, A.; Gupta, R.; Mani, G. The DMSO-Catalyzed CO₂ Reduction with 9-BBN as a Source for the Selective N-Formylation, Room Temperature N-Methylation of Amines, N-Hydroxymethylation of Heterocycles, and C–N Couplings. *J. Org. Chem.* **2025**, *90*, 10316–10331; <https://pubs.acs.org/doi/full/10.1021/acs.joc.5c00965>.
59. Mondal, P.; Dutta, P.; Mani, G. Mo(0) carbonyl complexes bearing the bis(3,5-dimethylpyrazole) ligand: Catalysis of the regioselective [2+2+2] cycloaddition of terminal alkynes to synthesize 1,3,5-isomer. *Dalton Trans.*, **2025**, *54*, 2654-2663. 10.1039/D4DT02725F
58. Kumar, A.; Gupta, R.; Subramaniyan, V.; Mani, G. DMSO-catalyzed CO₂ reduction with 9-BBN: selective formation of either formoxy- or methoxyborane under mild conditions and C-methylenation of indoles. *Catal. Sci. Technol.*, **2025**, *15*, 678-688. 10.1039/D4CY01327A
57. Debnath, S.; Giri, S.; Mani, G. Selective synthesis of the missing tiara-like Ni₁₀, Ni₅ and Ni₆ thiolates by the C-S bond cleavage of bis(thioether) molecules with DFT study. *Dalton Trans.*, **2024**, *53*, 14875-14886. DOI: 10.1039/D4DT02047B.
56. Mondal, M.; Mani, G. Copper(I) Complexes Bearing the Pyrrole-Bridged S,N and N-Donor Ligands as Catalysts for the Tandem Hydroamination-Alkynylation: Effect of Anions on Product Formation, *Dalton Trans.*, **2024**, *53*, 13996 - 14010; DOI: 10.1039/D4DT01937G
55. Gupta, R.; Kumar, A.; and Mani, G. Dipyrromethane–diphosphine: the effect of meso substituents on the formation of nickel complexes and on their performance in the transfer hydrogenation of ketones, *Dalton Trans.* **2023**, *52*, 18332-18341.
54. Kumar, A.; Gupta, R.; and Mani, G. PCP Pincer Carbene Nickel(II) Chloride, Hydride, and Thiolate Complexes: Hydrosilylation of Aldehyde, Ketone, and Nitroarene by the Thiolate Complex, *Organometallics* **2023**, *42*, 732–744.
53. Panigrahi, D.; Mondal, M.; Mani, G. Four- and five-coordinate nickel(II) complexes bearing new diphosphine-phosphonite and triphosphine-phosphite ligands: catalysts for N-alkylation of amines. *RSC Adv.*, **2022**, *12*, 4510-4520.
52. Jha, V. K.; Das, S.; Subramaniyan, V.; Guchhait, T.; Dakua, K. K.; Mishra, S.; Mani, G. Synthesis, structural characterization, and bonding analysis of two-coordinate copper(I) and silver(I) complexes of the pyrrole-based bis(phosphinimine): new metal-pyrrole ring π interactions, *Dalton Trans.*, **2021**, *50*, 8036-8044.
51. Panigrahi, D.; Subramaniyan, V.; Mani, G. Synthesis and Structural Characterizations of Pd(II) Complexes Bearing the New Hexahydropyrimidine and Tetrahydropyrimidinium Based Bis(pyrazole) Ligands with DFT Studies, *J. Mol. Struct.*, **2021**, *1231*, 129949.

50. Kumar, R.; Guchhait, T.; Subramaniyan, V.; Schulzke, C.; Mani, G. Versatility of the bis(iminopyrrolylmethyl)amine ligand: tautomerism, protonation, helical chirality, and secondary coordination sphere with halogen bonds in the formation of copper(II) and nickel(II) complexes *Dalton Trans.*, **2020**, *49*, 13840, DOI: 10.1039/D0DT02964E.
49. Subramaniyan, V.; Kumar, A.; Mani, G. New Spiro-borane and Spiro-borate Derived from Dipyrromethane and their H/D Exchange Properties, *Polyhedron*, **2020**, *186*, 114612. <https://doi.org/10.1016/j.poly.2020.114612>.
48. Das, S.; Subramaniyan, V.; Mondal, M.; Mani, G. Synthesis, X-Ray Structures, and Fluxional Properties of Symmetrical, Asymmetrical Binuclear and Cubane Type Copper(I) Complexes Bearing the Pyrrole-Based P, N-Hetero Donor Ligand, *ChemistrySelect*, **2020**, *5*, 5006-5012. <https://doi.org/10.1002/slct.202001312>
47. Jana, D.; Guchhait, T.; Subramaniyan, V.; Kumar, A. Mani, G. Mannich Reaction of Pyrrole and Dimethylpyrrole with Monoamines and Diamines, *Tetrahedron Lett.*, **2019**, *60*, 151247. doi.org/10.1016/j.tetlet.2019.151247
46. Kumar, R.; Guchhait, T.; Subramaniyan, V.; Mani, G. Mixed Ligand Cu(II) Complexes: Square Pyramidal vs Trigonal Bipyramidal with the Pyrrole-based Dipodal Ligand Having Hydrogen Bond Acceptors, *J. Mol. Struct.*, **2019**, *1195*, 1-9.
45. Subramaniyan, V.; Kumar, A.; Govindaraj, A.; Mani, G. Crystal Structure and DFT Analyses of a Penta-coordinated PCP Pincer Nickel(II) Complex. *Acta Cryst.* **2019**, *C75*, 734–739.
44. Das, S.; Subramaniyan, V.; Mani, G. Nickel(II) and Palladium(II) Complexes Bearing an Unsymmetrical Pyrrole-based PNN Pincer and their Norbornene Polymerization Behaviors Versus the Symmetrical NNN and PNP Pincers, *Inorg. Chem.*, **2019**, *58*, 3444–3456.
43. Mani, G.; Subramaniyan, V. *Homoleptic and Heteroleptic Copper(I) Complexes Bearing Diimine-Diphosphine Ligands*, Chapter 8 in 'Copper(I) Chemistry of Phosphines, Functionalized Phosphines and Phosphorus Heterocycles' Edited by Balakrishna, M. S., Elsevier Publications, **2019**, 237-258.
42. Subramaniyan, V.; Dutta, B.; Govindaraj, A.; Mani, G. Facile Synthesis of Pd(II) and Ni(II) Pincer Carbene Complexes by the Double C–H Bond Activation of a New Hexahydropyrimidine-Based Bis(phosphine): Catalysis of C–N Couplings, *Dalton Transactions*, **2019**, *48*, 7203 - 7210 (**invited article for the New Talent: Asia Pacific themed issue of Dalton Transactions**)
41. Jana, O.; Mani, G. Enantiomers and Structural Isomers of Sodium and Palladium Complexes Bearing *ortho*-Bis(3,5-dimethylpyrazolylmethyl)phenolate: Fluxional Property and Highly Active Catalysts for Norbornene Polymerization. *Inorg. Chem.* **2018**, *57*, 7735-7747.
40. Kumar, S.; Jana, O.; Subramaniyan, V.; Mani, G. The 'Reverse Transmetalation' Reaction of the Pyrrole-Based PNP Pincer Ni(II) Complexes: X-ray Structures of Binuclear Silver(I) and Thiocyanate Nickel(II) Complexes. *Inorg. Chim. Acta.* **2018**, *480*, 113.
39. Subramaniyan, V.; Mani, G. Synthesis, Reactions, and Structures of Heterocycle-Tethered Boranes and Their Precursors, *Organometallics*, **2018**, *37*, 127–135.
38. Jana, O.; Mani, G. New types of Cu and Ag clusters supported by the pyrrole-based NNN-pincer type ligand, *New J. Chem.*, **2017**, *41*, 9361-9370.

37. Jha, V. K.; Mani, G.; Davuluri, Y. R.; Anoop, A. The pyrrole ring η^2 -hapticity bridged binuclear tricarbonyl Mo(0) and W(0) complexes: catalysis of regioselective hydroamination reactions and DFT calculations, *Dalton Trans.*, **2017**, 46, 1840-1847.
36. Guchhait, T.; Mani, G.; Schulzke, C. Synthesis and structural characterization of anion complexes with azacalix[2]dipyrrolylmethane: effect of anion charge on the conformation of the macrocycle *Dalton Trans.* **2016**, 45, 11781 - 11790.
35. Kumar, R.; Paul, T.; Jana, J.; Mani, G. Regioselective Mannich bases of pyrrole-2-carbaldehyde and binuclear copper(II) complexes of bis(iminopyrrolyl) ligand containing the piperazine ring *Inorg. Chim. Acta.* **2016**, 445, 70-78.
34. Kumar, S.; Mani, G. Synthesis and structural characterization of chromium(III) complexes bearing 3,5-dimethylpyrazolate ligand *Polyhedron*, **2015**, 99, 47-52.
33. Jana, D.; Das, S.; Mani, G. Self Assembled Macrobicycle and Tricycle Cages Containing Pyrrole Rings by Dynamic Covalent Chemistry Method. *J. Incl. Phenom. Macrocycl. Chem.* **2015**, 82, 461-470.
32. Guchhait, T.; Barua, B.; Biswas, A.; Basak, B.; Mani, G. Synthesis and structural characterization of silver(I), copper(I) coordination polymers and a helicate palladium(II) complex of dipyrrolylmethane-based dipyrazole ligands: the effect of *meso* substituents on structural formation *Dalton Trans.*, **2015**, 44, 9091-9102.
31. Kumar, R.; Mani, G. Exhibition of the Brønsted acid–base character of a Schiff base in palladium(II) complex formation: lithium complexation, fluxional properties and catalysis of Suzuki reactions in water *Dalton Trans.*, **2015**, 44, 6896–6908.
30. Ghorai, D.; Mani, G. Unsubstituted quinoidal pyrrole and its reaction with oxygen, charge transfer and palladium(II) complexes via DDQ oxidation *RSC Adv.*, **2014**, 4, 45603-45611.
29. Ghorai, D.; Mani, G. Single-Step Substitution of all the α , β -Positions in Pyrrole: Choice of Binuclear versus Multinuclear Complex of the Novel Polydentate Ligand *Inorg. Chem.*, **2014**, 53, 4117–4129.
28. Kumar, S.; Mani, G.; Dutta, D.; Mishra, S. Structural Diversity of Copper(I) Complexes Formed by Pyrrole- and Dipyrrolylmethane-Based Diphosphine Ligands with Cu–X $\cdots$ HN Hydrogen Bonds *Inorg. Chem.* **2014**, 53, 700–709.
27. Jana, D.; Mani, G.; Schulzke, C. Synthesis of Novel Polyazacryptands for Recognition of Tetrahedral Oxoanions and Their X-ray Structures *Inorg. Chem.* **2013**, 52, 6427–6439.
26. Guchhait, T.; Jha, V. K.; Mani, G. The *syn* and *anti* isomers of the porphyrinogen-like precursor of calix[4]phyrin: isolation, X-ray structure, anion binding and fluoride-ion-mediated proton–deuterium exchange studies *Org. Biomol. Chem.*, **2013**, 11, 2818-2826.
25. Kumar, S.; Mani, G.; Mondal, S.; Chattaraj, P. K. Pyrrole-Based New Diphosphines: Pd and Ni Complexes Bearing the PNP Pincer Ligand *Inorg. Chem.*, **2012**, 51, 12527-12539.
24. Guchhait, T.; Mani, G.; Schulzke, C.; Anoop, A. A Tripyrrolylmethane-Based Macrobicyclic Triazacryptand: X-ray Structure, Size-Selective Anion Binding, and Fluoride-Ion-Mediated Proton–Deuterium Exchange Studies *Inorg. Chem.*, **2012**, 51, 11635–11644.
23. Kumar, R.; Guchhait, T.; Mani, G. Synthesis and X-ray Structures of Novel Macrocycles and Macrobicycles Containing *N,N*-Di(pyrrolylmethyl)-*N*-methylamine Moiety: Preliminary Anion Binding Study *Inorg. Chem.*, **2012**, 51, 9029–9038.

22. Ghorai, D.; Kumar, S.; Mani, G. Mononuclear, helical binuclear palladium and lithium complexes bearing a new pyrrole-based NNN-pincer ligand: fluxional property *Dalton Trans.*, **2012**, 41, 9503-9512.
21. Guchhait, T.; Mani, G. Dipyrrolylmethane-based Macrobicyclic Azacryptand: Synthesis, X-ray Structures, Conformational and Anion Binding Properties *J. Org. Chem.*, **2011**, 76, 10114-10121.
20. Ghorai, D.; Mani, G. Synthesis and structural characterization of Pd(II) complexes containing 2,6-bis[(dimethylamino)methyl]-4-methylphenolate ligand *Inorg. Chim. Acta.*, **2011**, 372, 412-416.
19. Mani, G.; Guchhait, T.; Kumar, R.; Kumar, S. Macrocyclic and Acyclic Molecules Synthesized from Dipyrrolylmethanes: Receptors for Anions, *Org. Lett.* **2010**, 12, 3910–3213.
18. Mani, G.; Jana, D.; Kumar, R.; Ghorai, D. Azatipyrrolic and Azatetrapyrrolic Macrocycles from the Mannich Reaction of Pyrrole: Receptors for Anions, *Org. Lett.* **2010**, 12, 3212–3215.
17. Ganesan, M.; Freemantle, R. G.; Obare, S. O., Monodisperse Thioether- Stabilized Palladium Nanoparticles: Synthesis, Characterization, and Reactivity, *Chem. Mater.*, **2007**, 19, 3464-3471.
16. Ganesan, M.; Gabbai, F.P. Synthesis, structure and catalytic properties of [Cp*Cr(C₆F₅)(Bn)(THF)] toward ethylene in the presence of AlEt₃ *J. Organomet. Chem.* **2005**, 690, 5145-5149.
15. Ganesan, M, Krishnamurthy S. S, Nethaji M., Di- and tri-nuclear molybdenum–palladium complexes bearing strong π -acceptor “P–N–P” ligands, MeN{P(OR)₂}₂ (R = CH₂CF₃ or Ph). *J. Organomet. Chem.* **2005**, 690, 1080-1091.
14. Ganesan, M.; Gabbai, F.P. [Cp*Cr(C₆F₅)(Me)(Py)] as a Living Chromium(III) Catalyst for the "Aufbaureaktion" *Organometallics*, **2004**, 23, 4608-4613.
13. Ganesan, M.; Gabbai, F.P. A neutral chromium(III) catalyst for the living "Aufbaureaktion" *Angew. Chem. Int. Ed. Engl.* **2004**, 43, 2263-2266.
12. Ganesan, M.; Fanwick, P.E.; Walton, R.A. The synthesis of the triply bonded tetramethyl complex Re₂(CH₃)₄(μ -dppm)₂ and its reaction with CO to afford Re₂(μ -CH₂)₂(CO)₄(μ -dppm)₂. *J. Organomet. Chem.* **2003**, 671, 166-171.
11. Ganesan, M.; Fanwick, P.E.; Walton, R.A. Reaction of the bis(iminophosphoranyl)methane ligand CH₂(Ph₂P=NsiMe₃) with nickel(II) halides and the structural characterization of ligand fragmentation products, *Inorg. Chim. Acta.* **2003**, 346, 181-186.
10. Ganesan, M.; Shih, K.Y.; Fanwick, P.E.; Walton, R.A. Complexation of the triply-bonded dirhenium(II) complex Re₂Cl₄(μ -dppm)₂ (dppm = Ph₂PCH₂PPh₂) by up to three acetylene molecules, *Inorg. Chem.* **2003**, 42, 1241-1247.
9. Ganesan, M.; Fanwick, P.E.; Walton, R.A. The synthesis and structural characterization of the μ -sulfur dioxide complex Re₂(μ -SO₂)(μ -Cl)Cl₄(μ -dppm)₂, *Inorg. Chim. Acta.* **2003**, 343, 391-394.
8. Ganesan, M.; Fanwick P.E.; Walton R.A. A Novel Example of the Reductive Cyclization of a Diyne at a Re-Re Triple Bond: The Reaction of Re₂Cl₄(μ -dppm)₂ with 1,7-Octadiyne, *Organometallics*, **2003**, 22, 870-872.
7. Ganesan, M.; Kapoor P.N.; Fanwick P.E.; Walton R.A. The first examples of triply bonded dirhenium(II) complexes that contain β -diketonate ligands, *Inorg. Chem. Commun.*, **2002**, 5, 1073-1077.

6. Ganesan, M.; Bérubé C.D.; Gambarotta S.; Yap G.P.A. Synthesis of Samarium and Ytterbium Complexes with 2,5-Dimethylpyrrole: The Effect of the Alkali Cation on the Bonding Mode of Divalent Lanthanide Centres, *Organometallics*, **2002**, *21*, 1707-1713.
5. Ganesan, M.; Lalonde M. P.; Gambarotta S.; Yap G.P.A. Isolation and Characterization of Linear Polymeric $\{[1,1\text{-H}_{10}\text{C}_6(\alpha\text{-C}_4\text{H}_3\text{N})_2]_2\text{Sm}[\text{Na}(\text{THF})]_2\}_n$: A 30-Electron Species with a $(\eta^5\text{-Cp})_4\text{Ln}$ Type Structure, *Organometallics*, **2001**, *20*, 2443-2445.
4. Ganesan, M.; Gambarotta S.; Yap G.P.A. Highly Reactive Sm(II) Macrocyclic Clusters: Precursors to N_2 Reduction, *Angew. Chem. Int. Ed.* **2001**, *40*, 766-769.
3. Dube T.; Ganesan, M.; Conoci S.; Gambarotta S.; Yap G.P.A. Tetrametallic Divalent Samarium Cluster Hydride and Dinitrogen Complexes, *Organometallics*, **2000**, *18*, 3716-3721.
2. Ganesan, M.; Krishnamurthy, S. S.; Nethaji, M.; Raghuraman, K. *Phosphorus, Sulfur and Silicon*, **1999**, *147*, 355-355.
1. Ganesan, M.; Krishnamurthy, S.S.; Nethaji, M. Reductive carbonylation route to Co(0) and Co(I) carbonyl complexes containing bridging, chelating and cleaved diphosphazanes. Structures of $[\text{Co}(\text{CO})\{\text{P}(\text{OR})_2(\text{NHMe})\}_2\{\text{P}(\text{O})(\text{OR})_2\}\{\text{P}(\text{H})(\text{OR})_2\}]$ ($\text{R} = \text{CH}_2\text{CF}_3$, $\text{R} = \text{CH}_2\text{CH}_3$), $[\text{Co}_2(\text{CO})_2\{\text{m-MeN}\{\text{P}(\text{OR})_2\}_2\}_3]$ ($\text{R} = \text{CH}_2\text{CF}_3$), and $[\text{Co}(\text{CO})\{\text{h}_2\text{-MeN}\{\text{P}(\text{OR})_2\}_2\}_2][\text{CoCl}_3(\text{OC}_4\text{H}_9)]$ ($\text{R} = \text{Ph}$) *J. Organomet. Chem.* **1998**, *570*, 247-254.

Patent

1. G. Mani, and S. Kumar, D. Ghorai, T. Guchhait, Pyrrole-based Diphosphines and their Oxidized Products. Intellectual Property India. Patent No. 317093. Dated 30/07/2019.
2. Ganesan Mani, and Ashok Kumar, A METHOD FOR CONVERSION OF CARBON DIOXIDE TO METHANOL AND FORMIC ACID. **2025**, Patent filed, 202431036465, 08-05-2025, India
3. Gabbai, F.P.; Mani, G; Pope, D.S.; Brown, J.D.; Wharry, D.L.; Hulburt, P.K. Catalyst composition, method of making same and its use in olefin oligomerization or polymerization. US 6833464 B2, 2004.

Completed Sponsored Research Projects

1. ISRD, Sponsoring Agent: IIT-Kharagpur, 2007, 5 lakhs.
Principal Investigator: Dr. G. Mani
2. Synthesis and structural characterization of organolanthanide complexes and their applications (Sponsoring Agent: DST, New Delhi, India Rs. 39.00 Lakhs).
Principal Investigator: Dr. G. Mani.
3. Olefin Polymerization by Organolanthanide Catalysts (Sponsoring Agent: CSIR, New Delhi, India Rs. 15.00 Lakhs). Principal Investigator: Dr. G. Mani.
4. Trivalent and Divalent Lanthanide Complexes Bearing Macrocyclic Ligands for Activation of CO_2 and Catalyses. (Sponsoring Agent: DST, New Delhi, Rs. 39 lakhs, from May 2013). Principal Investigator: Dr. G. Mani. (received 'excellent' comment)
5. Group 10 Metal Complexes Bearing New NNN-Pincer Ligands for C-C Coupling Reactions. (CSIR from May 2013, Rs. 19 lakhs). Principal Investigator: Dr. G. Mani.
6. Design and Synthesis of Novel Pincer Ligands and Their Metal Complexes; Sponsoring Agent: Reliance Industries Ltd., India. Rs. 30.7 lakhs. Principal Investigator: Dr. G. Mani.

7. Transition Metal Complexes of Bidentate Pyrrole-based P- and N-Donor Ligands with Wide Bite Angles for Catalysis Reactions. Sponsoring Agent: DST, New Delhi, ~Rs. 41 lakhs, from Dec. 2016). Principal Investigator: Dr. G. Mani.
8. New Pyrrole Ring Bridged Phosphorus Containing Macrocycles with H-Bonding Functionality for Catalytic Conversion of CO₂, and New Unsymmetrical NHC Phosphine, and Sulfonyl Pincer Metal Complexes for Polymerization of Polar Norbornenes. Sponsoring Agent: DST, New Delhi, Rs. 32,71,400, from Dec. 2021. Principal Investigator: Dr. G. Mani.
9. Complexes Containing Functionalized Pincer and Ambiphilic Ligands for Conversion of CO₂ to valuable products without H₂ Under Homogeneous and Heterogeneous Conditions, STARS, Ministry of Education, Indian Institute of Science, MoE-STARS/STARS-2/2023-0130, Rs. 35 lakhs, From Dec. 2023; PI: G Mani.

Courses taken

- (1) 1ST YEAR CHEMISTRY;
- (2) 1ST YEAR CHEMISTRY LAB;
- (3) CHEMISTRY OF MAIN GROUP ELEMENTS: RING, CHAINS, CLUSTERS;
- (4) CHEMISTRY OF 3D ELEMENTS;
- (5) INORGANIC CHEMISTRY III;
- (6) INORGANIC MATERIALS FOR INDUSTRIAL APPLICATION;
- (7) PREPARATORY CHEMISTRY;
- (8) INORGANIC CHEMISTRY LABORATORY I;
- (9) INORGANIC QUANTITATIVE ANALYSIS.

At the postgraduate level:

- (1) PRINCIPLES OF ORGANOMETALLICS & BIOINORGNIC CHEMISTRY;
- (2) ORGANOMETALLICS;
- (3) SPECIAL TOPICS IN MAIN GROUP CHEMISTRY;
- (4) METAL COMPLEXES IN CATALYSIS & MATERIAL SCIENCE;
- (5) ADVANCED INORGANIC CHEMISTRY LABORATORY.