

Curriculum Vitae

Full Name: Debashis Chakraborty, Dr.rer.nat., FIAAM

Address: Professor
Department of Chemistry
Indian Institute of Technology Madras
Chennai-600036, Tamil Nadu
India



Phone: +91 44 2257 4223

Mobile: +91 9445636593

E-mail: dchakraborty@iitm.ac.in

Orcid ID: 0000-0002-9938-8556

Scopus ID: 57193812712

Google Scholar: <https://scholar.google.co.in/citations?user=Ew4eclUAAAAJ&hl=en>

Biography

Debashis Chakraborty was awarded Dr.rer.nat. degree from the University of Göttingen in 2000 under the mentorship of Professor Dr. Dr. h.c.mult. Herbert W. Roesky. He pursued his initial postdoctoral career at the University of Idaho in the area of Fluorine Chemistry. After about a year he moved over as a joint postdoc between Colorado State University and the Dow Chemical Company. He returned to India in 2003 and worked as a corporate research Group Leader in two prime pharmaceutical companies before joining as a faculty in the Department of Chemistry at Indian Institute of Technology Madras in 2005. The Organometallics and Polymer Chemistry group is headed by him. The major research focus of this group lies in the areas of organometallics for polymer synthesis, homogeneous catalysis, CO₂ sequestration and water activation. He has published over 100 research publications in various reputed refereed international journals and has 12 patents awarded to his credit. He is a Fellow of the International Association of Advanced Materials (FIAAM) since 2022 and has been recognized for the outstanding societal contributions of his research endeavors in the 33rd Edition of Marquis Who's Who in the world. He is a member of Asia-Pacific Association of Scientific Research Singapore and Asian Polymer Association.

Educational Profile

Dr.rer.nat. University of Göttingen, Germany, 2000

M. Sc. Indian Institute of Technology Madras, 1996

B. Sc. University of Poona, Fergusson College, 1993

Title of Doctoral Thesis: New Synthetic Routes for Organometallic Phosphonates, Peroxides and Fluorides

Mentor: Prof. Dr. Dr. h.c. mult. Herbert W Roesky

Institute for Inorganic Chemistry, University of Göttingen, 37077D Germany

Research

(A) Work Experience

1. Indian Institute of Technology Madras, India

(a) Research Interests

Organometallic Chemistry for Polymer Synthesis and Catalysis, Homogeneous Catalysis, CO₂ Sequestration, Chemical Process Development and Heterogeneous Catalysis

(b) Research Summary

In my independent career as an Academic Faculty, I have worked in a variety of research areas which include the applications of organometallic compounds of main-group and transition metals and simple metal salts as suitable catalysts for processes that include the following:

1. Transition metal organometallic compounds and metal salts were used as suitable catalysts for the ring-opening polymerization reaction of cyclic esters and lactides with the goal of understanding the relationships between the pendant ancillary ligand(s) on the metal center upon the polymerization behaviour and characteristics.
2. Metal-free ring-opening polymerization catalysts for cyclic esters and lactide polymerization using phosphorus(V) compounds.
3. Synthesis of new non-metallocene pre-catalysts for olefin polymerization.
4. Synthesis of catalysts for the ring-opening copolymerization reactions of epoxides with CO₂ and anhydrides.
5. Demonstrated the use of simple metal salts as catalysts for various organic transformations.

2. Biocon India Limited, India

The primary work in research was to device a non-infringing process for the manufacture of Insulin per USFDA standards.

3. Piramal Healthcare Limited, India

Process development for the synthesis of active pharmaceutical ingredients like Ketoconazole, Fluconazole and CoQ10.

4. Colorado State University- Dow Chemical Company Midland MI, USA

Synthesis of new organometallic catalysts towards the polymerization of styrene, epoxides and lactides. Synthesis of new organometallic cocatalysts for olefin polymerization.

5. University of Idaho, USA

Gained rich experience in organofluorine chemistry.

(B) Research Publications in Refereed International Journals

105. Iodine and alkali metal alkoxides: A simple and versatile catalyst system for fully alternating polyesters synthesis from phthalic anhydride and epoxides

Anjaneyulu Kummari, Sreenath Pappuru, Sourav Singha Roy, **Debashis Chakraborty***
Polym. Chem. **2022**, *13*, 4684-4691.

104. Decolorization and degradation of reactive orange 16 by *Bacillus stratosphericus* SCA1007

Kriti Akansha, Ajar Nath Yadav, Manish Kumar, **Debashis Chakraborty**, Shashwati Ghosh Sachan*
Folia Microbiologica **2022**, *67*, 91-102.

103. Determination of polylactide microstructure by homonuclear decoupled ¹H NMR spectroscopy

Sourav Singha Roy, Sriparna Sarkar, **Debashis Chakraborty***
Chem. Rec. **2021**, *21*, 1968-1984.

102. Homoleptic titanium and zirconium complexes exhibiting unusual O_{iminol}-metal coordination: application in stereoselective ring-opening polymerization of lactide

Sagnik K. Roymuhury, Mrinmay Mandal, **Debashis Chakraborty***, Venkatachalam Ramkumar
Polym. Chem. **2021**, *12*, 3953-3967.

101. Benzoxazole phenoxide ligand supported group IV catalysts and their application for the ring-opening polymerization of *rac*-lactide and ϵ -caprolactone

Sreenath Pappuru, Venkatachalam Ramkumar, **Debashis Chakraborty***
Polym Adv Technol. **2021**, *32*, 3392-3401.

100. Macrocycles in dual role: ancillary ligands in metal complexes and organocatalysts for the ring-opening polymerization of lactide

Sourav Singha Roy, Sriparna Sarkar, **Debashis Chakraborty***
J. Incl. Phenom. Macrocycl. Chem. **2021**, *100*, 1-36.

99. Co₂O₃ and MnO₂ as inexpensive catalysts for the ring-opening polymerization of cyclic esters

Mrinmay Mandal*, **Debashis Chakraborty***
J. Polym. Res. **2021**, *28*, 52-60.

98. Zirconium and hafnium complexes bearing Salen ligands for the polymerization of ethylene

Mrinmay Mandal*, **Debashis Chakraborty***
Polym. Sci. Ser. B **2020**, *62*, 597-601.

97. Metal-free semi-aromatic polyester as nanodrug carrier: A novel tumor targeting drug delivery vehicle for potential clinical application

Piyush Kumar Gupta, Surya Kant Tripathi, Sreenath Pappuru, Siva Chander Chabattula, Kavitha Govarthanan, Santosh Gupta, Bijesh Kumar Biswal, **Debashis Chakraborty**, Rama Shanker Verma*

Mater. Sci. Eng. C **2020**, *107*, 110285-110296.

96. Salen complexes of zirconium and hafnium: synthesis, structural characterization and polymerization studies

Mrinmay Mandal, Venkatachalam Ramkumar, **Debashis Chakraborty***

Polym. Chem. **2019**, *10*, 3444-3460. (Cover Page Article)

95. Metal-free Lewis pair catalyst synergy for fully alternating copolymerization of norbornene anhydride and epoxides: Biocompatible tests for derived polymers

Anjaneyulu Kummari, Sreenath Pappuru, Piyush Kumar Gupta, **Debashis Chakraborty***, Rama Shanker Verma

Mater. Today Commun. **2019**, *19*, 306-314.

94. Decolorization and degradation of methyl orange by *Bacillus stratosphericus* SCA1007

Kriti Akansha, **Debashis Chakraborty**, Shashwati Ghosh Sachan*

Biocatal. Agric. Biotechnol. **2019**, *18*, 101044-101050.

93. Self-assembled dual-drug loaded core-shell nanoparticles based on metalfree fully alternating polyester for cancer theranostics

Piyush Kumar Gupta, Sreenath Pappuru, Santosh Gupta, Bamadeb Patra, **Debashis Chakraborty***, Rama Shanker Verma*

Mater. Sci. Eng. C **2019**, *101*, 448-463.

92. Enhancing the anti-cancer therapeutic efficacy by optimizing molecular weight of metal-free fully alternating semi-aromatic polyester as nano-drug carriers

Piyush Kumar Gupta, Santosh Gupta, Sreenath Pappuru, Siva Chander Chabattula, **Debashis Chakraborty**, Rama Shanker Verma*

J Drug Deliv Sci Technol **2019**, *51*, 101-114.

91. Progress in metal-free cooperative catalysis for the ring-opening copolymerization of cyclic anhydrides and epoxides

Sreenath Pappuru, **Debashis Chakraborty***

Eur. Polym J. **2019**, *121*, 109276-109287.

90. Fully alternating and regioselective ring-opening copolymerization of phthalic anhydride with epoxides using highly active metal-free Lewis pairs as a catalyst

Anjaneyulu Kummari, Sreenath Pappuru, **Debashis Chakraborty***

Polym. Chem. **2018**, *9*, 4052-4062.

89. Group 4 metal complexes containing the salalen ligands: Synthesis, structural characterization and studies on the ROP of cyclic esters

Debashis Chakraborty*, Bijja Rajashekhar, Mrinmay Mandal, Venkatachalam Ramkumar
J. Organomet Chem. **2018**, *871*, 111-121.

88. Palladium complexes containing imino phenoxide ligands: synthesis, luminescence, and their use as catalysts for the ring-opening polymerization of *rac*-lactide

Mrinmay Mandal, Manuela List, Ian Teasdale, Guenther Redhammer, **Debashis Chakraborty**, Uwe Monkowius*
Monatsh Chem **2018**, *149*, 783-790.

87. Nb and Ta benzotriazole or benzoxazole phenoxide complexes as catalysts for the ring-opening polymerization of glycidol to synthesize hyperbranched polyglycerols

Sreenath Pappuru, **Debashis Chakraborty***, Venkatachalam Ramkumar
Dalton Trans. **2017**, *46*, 16640-16654.

86. Homoleptic Zr and Hf Complexes of Imino/Bis(imino) phenoxide Scaffolds: Synthesis, Structural Characterization and Their Catalytic Activity in the ROP of Cyclic Esters

Bijja Rajashekhar, Mrinmay Mandal, **Debashis Chakraborty***, Venkatachalam Ramkumar
ChemistrySelect **2017**, *2*, 8408-8417.

85. Synthesis and characterization of curcumin loaded PLA-Hyperbranched polyglycerol electrospun blend for wound dressing applications

Govindaraj Perumal, Sreenath Pappuru, **Debashis Chakraborty***, A. Maya Nandkumar, Dillip Kumar Chand, Mukesh Doble*
Materials Science and Engineering C **2017**, *76*, 1196-1204.

84. Ring-opening copolymerization of maleic anhydride or *L*-Lactide with *tert*-butyl glycidyl ether by using efficient Ti and Zr benzoxazolesubstituted 8-Hydroxyquinolate catalysts

Sreenath Pappuru, **Debashis Chakraborty***, Venkatachalam Ramkumar, Dillip Kumar Chand*
Polymer **2017**, *123*, 267-281.

83. Synthesis and structural characterization of titanium and zirconium complexes containing half-salen ligands as catalysts for polymerization reactions

Mrinmay Mandal, Uwe Monkowius, **Debashis Chakraborty***
New J. Chem. **2016**, *40*, 9824-9839.

82. Zwitterionic complexes of group 4 metal chlorides containing bis(imino)phenoxide scaffold: synthesis, characterization and polymerization studies

Debashis Chakraborty*, Eswara Rao Chokkapu, Mrinmay Mandal, Ravikumar R. Gowda, Venkatachalam Ramkumar
ChemistrySelect **2016**, *1*, 5218-5229.

81. Cadmium acetate as a ring opening polymerization catalyst for the polymerization of *rac*-lactide, ϵ -caprolactone and as a precatalyst for the polymerization of ethylene

Mrinmay Mandal, Uwe Monkowius, **Debashis Chakraborty***
J Polym Res **2016**, *23*, 220.

80. Copper(II) complexes with imino phenoxide ligands: synthesis, characterization, and their application as catalysts for the ring-opening polymerization of *rac*-lactide

Mrinmay Mandal, Kerstin Oppelt, Manuela List, Ian Teasdale, **Debashis Chakraborty***, Uwe Monkowius*

Monatsh Chem **2016**, *147*, 1883-1892.

79. Group 4 alkoxide complexes containing [NNO]-type scaffold: synthesis, structural characterization and polymerization studies

Dipa Mandal, **Debashis Chakraborty***, Venkatachalam Ramkumar, Dillip Kumar Chand*

RSC Adv. **2016**, *6*, 21706-21718.

78. Zwitterionic niobium and tantalum complexes with bidentate aminophenol scaffolds: synthesis, structural characterization and use in the ring opening polymerization of lactides

Sagnik K. Roymuhury, **Debashis Chakraborty***, Venkatachalam Ramkumar

RSC Adv. **2016**, *6*, 48816-48826.

77. Group 4 complexes of salicylbenzoxazole ligands as effective catalysts for the ring-opening polymerization of lactides, epoxides and copolymerization of ϵ -caprolactone with *L*-lactide

Sreenath Pappuru, **Debashis Chakraborty***, J. Vijaya Sundar, Sagnik K. Roymuhury, Venkatachalam Ramkumar, Vinodh Subramanian*, Dillip Kumar Chand*

Polymer **2016**, *102*, 231-247.

76. Group 4 complexes bearing bis(salphen) ligands: Synthesis, characterization and polymerization studies

Mrinmay Mandal, **Debashis Chakraborty***

J. Polym. Sci. Part: A **2016**, *54*, 809-824.

75. Group 4 metal complexes of Trost's semi-crown ligand: Synthesis, structural characterization and studies on the ring-opening polymerization of lactides and ϵ -caprolactone

Bijja Rajashekhar, Sagnik K. Roymuhury, **Debashis Chakraborty***, Venkatachalam Ramkumar

Dalton Trans. **2015**, *44*, 16280-16293.

74. Aluminium complexes bearing N,O-aminophenol ligands as efficient catalysts for the ring opening polymerization of lactide

Sagnik K. Roymuhury, **Debashis Chakraborty***, Venkatachalam Ramkumar

Eur. Polym. J. **2015**, *70*, 203-214.

73. Magnesium complexes of the N, O polydentate scaffold: synthesis, structural characterization and polymerization studies

Swarup Ghosh, P. K. S. Antharjanam, **Debashis Chakraborty***

Polymer **2015**, *70*, 38-51.

72. Zwitterionic group 4 aminophenolate catalysts for the polymerization of lactides and ethylene

Sagnik K. Roymuhury, **Debashis Chakraborty**,* Venkatachalam Ramkumar
New J. Chem. **2015**, *39*, 5218-5230.

71. Synthesis and characterization of group 4 metal alkoxide complexes containing imine based bis-bidentate ligands: effective catalysts for the ring opening polymerization of lactides, epoxides and polymerization of ethylene

Sagnik K. Roymuhury, **Debashis Chakraborty**,* Venkatachalam Ramkumar
Dalton Trans. **2015**, *44*, 10352-10367.

70. Gallium and indium complexes containing the bis(imino)phenoxide ligand: synthesis, structural characterization and polymerization studies

Swarup Ghosh, Ravikumar R. Gowda, Rajamony Jagan, **Debashis Chakraborty***
Dalton Trans. **2015**, *44*, 10410-10422.

69. Zr(IV) complexes containing salan-type ligands: Synthesis, structural characterization and role as catalysts towards the polymerization of ϵ -caprolactone, *rac*-lactide, ethylene, homopolymerization and copolymerization of epoxides with CO₂

Mrinmay Mandal, **Debashis Chakraborty**,* Venkatachalam Ramkumar
RSC Adv. **2015**, *5*, 28536-28553.

68. Imino(phenoxide) Compounds of Magnesium: Synthesis, Structural Characterization, and Polymerization Studies

Swarup Ghosh, **Debashis Chakraborty**,* Venkatachalam Ramkumar
J. Polym. Sci. Part: A **2015**, *53*, 1474-1491.

67. Kinetic investigation on the highly efficient and selective oxidation of sulfides to sulfoxides and sulfones with *t*-BuOOH catalyzed by La₂O₃

Mrinmay Mandal, **Debashis Chakraborty***
RSC Adv. **2015**, *5*, 12111-12122.

66. Air-stable palladium(0) phosphine sulfide catalysts for Ullmann-type C-N and C-O coupling

Arpi Majumdar, Rigini Singh,* Mrinmay Mandal, T. Madhu Babu, **Debashis Chakraborty***
J. Organomet Chem. **2015**, *781*, 23-34.

65. A new class of MPV type reduction in group 4 alkoxide complexes of salicylaldiminato ligands: Efficient catalysts for the ROP of lactides, epoxides and polymerization of ethylene

Debashis Chakraborty*, Dipa Mandal, Venkatachalam Ramkumar, V. Subramanian,* J. Vijaya Sundar
Polymer **2015**, *56*, 157-170.

64. Group 1 salts of the imino(phenoxide) scaffold: Synthesis, structural characterization and studies as catalysts towards the bulk ring opening polymerization of lactides

Swarup Ghosh, **Debashis Chakraborty***, Babu Varghese

Eur. Polym. J. **2015**, *62*, 51-65.

63. 9-Fluorenamethanol: an internal electron donor to fine tune olefin polymerization activity

Edwin S. Gnanakumar, Eswara Rao Chokkapu, Shrikant Kunjir, T. G. Ajithkumar, P. R. Rajamohanan, **Debashis Chakraborty**, Chinnakonda S. Gopinath*
Dalton Trans. **2014**, *43*, 9143-9151.

62. Co(II) and Mn(II) catalyzed bulk ring-opening polymerization of cyclic esters

Bijja Rajashekhar, **Debashis Chakraborty***
Polym Bull. **2014**, *71*, 2185-2203.

61. Group (IV) complexes containing the benzotriazole phenoxide ligand as catalysts for the ring-opening polymerization of lactides, epoxides and as precatalysts for the polymerization of ethylene

Sreenath Pappuru, Eswar Rao Chokkapu, **Debashis Chakraborty***, Venkatachalam Ramkumar
Dalton Trans. **2013**, *42*, 16412-16427.

60. Silver nitrate catalyzed N-arylation of amines and O-arylations of phenols and alcohols

Rima Das, Mrinmay Mandal, **Debashis Chakraborty***
Asian. J. Org. Chem. **2013**, *2*, 579-585.

59. BiCl₃ catalyzed carbon-carbon cross-coupling of organoboronic acids with aryl iodides

Payal Malik, Desna Joseph, **Debashis Chakraborty***
Appl. Organometal Chem. **2013**, *27*, 519-522.

58. Imino phenoxide complexes of Niobium and Tantalum as catalysts for the polymerization of lactides, ε-caprolactone and ethylene

Tanmoy Kumar Saha, Mrinmay Mandal, Madhu Babu Thunga, **Debashis Chakraborty***, Venkatachalam Ramkumar
Dalton Trans. **2013**, *42*, 10304-10314.

57. MgCl₂·6CH₃OH: A Simple Molecular adduct and its influence as Porous Support for Olefin Polymerization

Edwin S. Gnanakumar, Ravikumar K Gowda, Shrikant Kunjir, Thalasseril G. Ajithkumar, Pattuparambil, Ramanpillai Rajamohanan, **Debashis Chakraborty**, Chinnakonda S. Gopinath*
ACS Catal. **2013**, *3*, 303-311.

56. Hydrogen phosphates: Self-initiated organocatalysts for the controlled ring-opening polymerization of cyclic esters

Payal Malik, **Debashis Chakraborty***
Inorg. Chim Acta. **2013**, *400*, 32-41.

55. Imino phenoxide complexes of group 4 metals: synthesis, structural characterization and polymerization studies

Tanmoy Kumar Saha, Mrinmay Mandal, **Debashis Chakraborty***, Venkatachalam Ramkumar
New. J. Chem. **2013**, *37*, 949-960.

54. Synthesis, structural and spectroscopic characterization of thiophosphorodiamidates and effect of ZnCl₂ on the hydrolysis of the P–N bond

Payal Malik, **Debashis Chakraborty***

Polyhedron **2013**, *52*, 831-836.

53. Catecholate complexes of zirconium: synthesis, spectroscopic characterization and polymerization studies

Tanmoy Kumar Saha, **Debashis Chakraborty***

Polym. Intl. **2013**, *62*, 1507-1516.

52. AgOTf catalyzed hydration of terminal alkynes

Rima Das, **Debashis Chakraborty***

Appl. Organomet Chem. **2012**, *26*, 722-726.

51. MgCl₂·6C₆H₁₁OH: A High Mileage Porous Support for Ziegler–Natta Catalyst

Edwin S. Gnanakumar, K. S. Thushara, Ravikumar R. Gowda, Sumesh K. Raman, T. G. Ajithkumar, P. R. Rajamohanam, **Debashis Chakraborty**, Chinnakonda S. Gopinath*

J. Phys. Chem. C **2012**, *116*, 24115-24122.

50. La₂O₃ catalyzed C–C coupling of aryl iodides and boronic acids

Payal Malik, **Debashis Chakraborty***

ISRN Organic Chemistry **2012**, 1-5.

49. Silver catalyzed C–C and C–S coupling of aryl halides and thiols with boronic acids

Rima Das, **Debashis Chakraborty***

Tetrahedron Lett. **2012**, *53*, 7023-7027.

48. Bi₂O₃ catalyzed asymmetric oxidation of sulfides

Payal Malik, **Debashis Chakraborty***

Tetrahedron Lett. **2012**, *53*, 5652-5655.

47. I₂-TEMPO as an efficient oxidizing agent for the one-pot conversion of alcohol to amide using FeCl₃ as catalyst

Rima Das, **Debashis Chakraborty***

Catal Commun. **2012**, *26*, 48-53.

46. Bi(III) catalyzed C–S cross-coupling reaction

Payal Malik, **Debashis Chakraborty***

Appl. Organomet Chem. **2012**, *26*, 557-561.

45. AgOTf catalyzed transesterification of β -ketoesters

Rima Das, **Debashis Chakraborty***

Appl. Organomet Chem. **2012**, *26*, 140-144.

44. A new methodology for the oxidation of sulfides with Fe(III) catalysts

Debashis Chakraborty*, Payal Malik, Vinod Kumar Goda
Appl. Organomet Chem. **2012**, *26*, 21-26.

43. Alkoxides of group 4 metals containing the bis(imino)phenoxide ligand: synthesis, structural characterization and polymerization studies

Tanmoy Kumar Saha, Bijja Rajashekhar, **Debashis Chakraborty***
RSC Adv. **2012**, *2*, 307-318.

42. Ceric ammonium nitrate catalyzed Oxidation of Aldehydes and Alcohols

Ravikumar R. Gowda, **Debashis Chakraborty***
Chinese. J. Chem. **2011**, *29*, 2379-2384.

41. 1,1'-Binaphthyl-2,2'-diyl benzylphosphoramidate

Ravikumar R. Gowda, Venkatachalam Ramkumar, **Debashis Chakraborty***
Acta. Cryst. Sec E. **2011**, *E67*, o3310-o3310.

40. Copper acetate catalyzed bulk ring opening polymerization of lactides

Ravikumar R. Gowda, **Debashis Chakraborty***
J. Mol. Cat.: A **2011**, *349*, 86-93.

39. Controlled hydrolysis of [Ti(O-2,4,6-Br₃C₆H₂)₂(O-*i*Pr)₂]₂: synthesis, structural characterization and studies on bulk polymerization of cyclic esters and lactide

Ravikumar R. Gowda, **Debashis Chakraborty***, Venkatachalam Ramkumar
Inorg. Chem Commun. **2011**, *14*, 1777-1782.

38. Silver triflate catalyzed acetylation of alcohols, thiols, phenols and amines

Rima Das, **Debashis Chakraborty***
Synthesis **2011**, 1621-1625.

37. Fe(III) catalyzed synthesis of primary amides from aldehydes

Ravikumar R. Gowda, **Debashis Chakraborty***
Eur. J. Org. Chem. **2011**, 2226-2229.

36. Salen complexes of zirconium and hafnium: synthesis, structural characterization, controlled hydrolysis, and solvent-free ring-opening polymerization of cyclic esters and lactides

Tanmoy Kumar Saha, Venkatachalam Ramkumar, **Debashis Chakraborty***
Inorg. Chem. **2011**, *50*, 2720-2722.

35. La₂O₃ catalyzed oxidation of alcohols

Ravikumar R. Gowda, **Debashis Chakraborty***
Int. J. Org. Chem. **2011**, *1*, 41-46.

34. Phosphoroamidate compounds of 1,1'-Bi-2-naphthol: synthesis, structural characterization and solvent-free ring-opening polymerization of ϵ -caprolactone and L-lactide

Ravikumar R. Gowda, **Debashis Chakraborty***, Venkatachalam Ramkumar
Inorg. Chim Acta. **2011**, *372*, 88-93.

33. Mohr's salt catalyzed oxidation of aldehydes with *t*-BuOOH

Debashis Chakraborty*, Chandrima Majumder, Payal Malik
Appl. Organomet Chem. **2011**, *25*, 487-490.

32. Cu(II) bromide catalyzed oxidation of aldehydes and alcohols

Rima Das, **Debashis Chakraborty***
Appl. Organomet Chem. **2011**, *25*, 437-442.

31. Silver nitrate catalyzed oxidation of sulfides

Rima Das, **Debashis Chakraborty***
Synthesis **2011**, 277-280.

30. Aryloxy and benzyloxy compounds of zirconium: Synthesis, structural characterization and studies on solvent-free ring-opening polymerization of ϵ -caprolactone and δ -valerolactone

Ravikumar R. Gowda, **Debashis Chakraborty***, Venkatachalam Ramkumar
J. Organomet Chem. **2011**, *696*, 572-580.

29. Zinc acetate as a catalyst for the bulk ring opening polymerization of cyclic esters and lactide

Ravikumar R. Gowda, **Debashis Chakraborty***
J. Mol. Cat.: A **2010**, *333*, 167-172.

28. *p*-Tolylmethanaminium cyclohexane-1,2-diyl phosphate

Ravikumar R. Gowda, Venkatachalam Ramkumar, **Debashis Chakraborty***
Acta. Cryst. Sec E. **2010**, *E66*, o3049-o3049.

27. Cu(II)-catalyzed oxidation of sulfides

Rima Das, **Debashis Chakraborty***
Tetrahedron Lett. **2010**, *51*, 6255-6258.

26. Aryloxy and benzyloxy compounds of hafnium: Synthesis, structural characterization and studies on solvent-free ring-opening polymerization of ϵ -caprolactone and δ -valerolactone

Ravikumar R. Gowda, **Debashis Chakraborty***, Venkatachalam Ramkumar
Polymer **2010**, *51*, 4750-4759.

25. Bi₂O₃ catalyzed oxidation of alcohols with *t*-BuOOH

Payal Malik, **Debashis Chakraborty***
Synthesis **2010**, 3736-3740.

24. Triethylammonium 1,1'-binaphthyl-2,2'-diyl phosphate

Ravikumar R. Gowda, Venkatachalam Ramkumar, **Debashis Chakraborty***

Acta. Cryst. Sec E. **2010**, *E66*, o1625-o1625.

23. Bi₂O₃ catalyzed oxidation of aldehydes using *t*-BuOOH

Payal Malik, **Debashis Chakraborty***

Tetrahedron Lett. **2010**, *51*, 3521-3523.

22. Bis(imino)phenoxide complexes of zirconium: synthesis, structural characterization and solvent-free ring-opening polymerization of cyclic esters and lactide

Tanmoy Kumar Saha, Bijja Rajashekhar, Ravikumar R. Gowda, Venkatachalam Ramkumar, **Debashis Chakraborty***

Dalton Trans. **2010**, *39*, 5091-5093.

21. New phosphoroamidate compounds: synthesis, structural characterization and studies on ZnCl₂ assisted hydrolysis of the P-N bond

Payal Malik, **Debashis Chakraborty***, Venkatachalam Ramkumar

Polyhedron **2010**, *29*, 2142-2148.

20. Silver nitrate-catalyzed oxidation of aldehydes to carboxylic acids by H₂O₂

Debashis Chakraborty*, Ravikumar R. Gowda, Payal Malik

Tetrahedron Lett. **2009**, *50*, 6553-6556.

19. New aryloxy and benzyloxy derivatives of titanium as catalysts for bulk ring-opening polymerization of ϵ -caprolactone and δ -valerolactone

Ravikumar R. Gowda, **Debashis Chakraborty***, Venkatachalam Ramkumar

Eur. J. Inorg. Chem. **2009**, 2981-2993.

18. Environmentally benign process for bulk ring opening polymerization of lactones using iron and ruthenium chloride catalysts

Ravikumar R. Gowda, **Debashis Chakraborty***

J. Mol. Cat.: A **2009**, *301*, 84-92.

Work highlighted in *Nature India*, **2009**, March issue.

17. Tris(pentafluorophenyl)aluminum: Synthesis, Reactivity and Polymerization Studies

Debashis Chakraborty*

Synthesis and Reactivity in Inorganic, Metal-Organic, and Nano-Metal Chemistry **2007**, *37*, 685-695.

16. Catalytic ring-opening polymerization of propylene oxide by organoborane and aluminum Lewis acids

Debashis Chakraborty, Antonio Rodriguez, Eugene Y.-X. Chen*

Macromolecules **2003**, *36*, 5470-5481.

15. Chiral amido aluminum and zinc alkyls: a synthetic, structural, and polymerization study

Debashis Chakraborty, Eugene Y.-X. Chen*

Organometallics **2003**, *22*, 769-774.

14. First isolation and structural characterization of triarylaluminum-water and -methanol complexes

Debashis Chakraborty, Eugene Y.-X. Chen*
Organometallics **2003**, *22*, 207-210.

13. Chlorobis(pentafluorophenyl)alane: synthesis, crystal structure and polymerization studies

Debashis Chakraborty, Eugene Y.-X. Chen*
Inorg. Chem Commun. **2002**, *5*, 698-701.

12. Telechelic poly(ϵ -caprolactone) and poly(lactic acid)s by chiral and achiral chelating diamide aluminum and zinc catalysts

Debashis Chakraborty, Eugene Y.-X. Chen*
Polymeric Materials Science and Engineering **2002**, *86*, 334-335.

11. Neutral, three-coordinate, chelating diamide aluminum complexes: catalysts/initiators for synthesis of telechelic oligomers and high polymers

Debashis Chakraborty, Eugene Y.-X. Chen*
Organometallics **2002**, *21*, 1438-1442.

10. Neutral olefin polymerization activators as highly active catalysts for ROP of heterocyclic monomers and for polymerization of styrene

Debashis Chakraborty, Eugene Y.-X. Chen*
Macromolecules, **2002**, *35*, 13-15.

9. Nucleophilic trifluoro- and difluoromethylations of substituted aromatic aldehydes with Ruppert's and Deoxofluoro reagents

Singh, R. P., Chakraborty, D., Shreeve, J. M.*
J. Fluorine Chem. **2001**, *111*, 153-160.

8. Synthesis and structural characterization of functionalized dimeric aluminophosphonates and a monomeric gallophosphonate anion

Debashis Chakraborty, Sabine Horchler, Ralph Krätzner, Saji P. Varkey, Jiri Pinkas, Herbert W. Roesky*, Isabel Usón, Mathias Noltemeyer, Hans-Georg Schmidt
Inorg. Chem. **2001**, *40*, 2620-2624.

7. Application of n -Bu₄NHF₂ as a fluorinating agent for the preparation of fluoroanions: synthesis and crystal structure of the anions $[t$ -BuPO₃AlF₂]₂²⁻, [PhPO₃AlF₂]₂²⁻, and [(O-*i*-Pr)₃Ti(μ -F)₂(μ -O-*i*-Pr)Ti(O-*i*-Pr)₃]⁻

Debashis Chakraborty, Sabine Horchler, Herbert W. Roesky*, Mathias Noltemeyer, Hans-Georg Schmidt
Inorg. Chem. **2000**, *39*, 3995-3998.

6. Synthesis and structure of organic-soluble binuclear molecular phosphonates of tantalum, molybdenum and tungsten

Olexandr I. Guzyr, Rolf Siefken, **Debashis Chakraborty**, Herbert W. Roesky*, Markus Teichert
Inorg. Chem. **2000**, *39*, 1680-1683.

5. Metal alkoxides as versatile precursors for group 4 phosphonates: synthesis and X-ray structure of a novel zirconium phosphonate

Debashis Chakraborty, Vadapalli Chandrasekhar, Manish Bhattacharjee, Ralph Krätzner, Herbert W. Roesky*, Mathias Noltemeyer, Hans-Georg Schmidt
Inorg. Chem. **2000**, *39*, 23-26.

4. Synthesis and structural characterization of the first organosoluble mononuclear siloxane and silylamide of molybdenum and tungsten

Rolf Siefken, Markus Teichert, **Debashis Chakraborty**, Herbert W. Roesky*
Organometallics **1999**, *18*, 2321-2325.

3. Reactions of trialkyl phosphates with trialkyls of aluminum and gallium: new route to alumino- and gallophosphate compounds via dealkylsilylation

Jiri Pinkas, **Debashis Chakraborty**, Yu Yang, Ramaswamy Murugavel, Mathias Noltemeyer, Herbert W. Roesky*
Organometallics **1999**, *18*, 523-528.

2. First structurally characterized organometallic chloro oxo-peroxo compounds of molybdenum and tungsten

Debashis Chakraborty, Manish Bhattacharjee, Ralph Krätzner, Rolf Siefken, Herbert W. Roesky*, Isabel Usón, Hans-Georg Schmidt
Organometallics **1999**, *18*, 106-108.

1. Novel organic-soluble molecular titanophosphonates with cage-structures comparable to titanium-containing silicates

Mrinalini G. Walawalkar, Sabine Horchler, Stefan Dietrich, **Debashis Chakraborty**, Herbert W. Roesky*, Martina Schäfer, Hans-Georg Schmidt, George M. Sheldrick, Ramaswamy Murugavel
Organometallics **1998**, *17*, 2865-2868.

(D) List Patents

12. Metal-free polyester based nano-drug carrier

Piyush Kumar Gupta, Anjaneyulu Kummari, Santosh Gupta, **Debashis Chakraborty**, Rama Shanker Verma
Indian Pat. Appl. 2019, IN 201841019915 A 20191129. (Approved)

11. Metal-free approach and method for synthesis of polyesters

Piyush Kumar Gupta, Anjaneyulu Kummari, Santosh Gupta, **Debashis Chakraborty**, Rama Shanker Verma
Indian Pat. Appl. 2019, IN 201841019916 A 20191129. (Approved)

10. Catalysts for Poly(lactide) synthesis and uses thereof

Debashis Chakraborty, Swarup Ghosh, Venkatachalam Ramkumar

US Patent 2018, US 20160053048 A1.

9. A process for the preparation of biopolymers

Debashis Chakraborty, Mrinmay Mandal
Indian Pat. Appl. 2016, IN 2014KO01271 A 20160610.

8. Catalysts for poly(lactide) synthesis and uses thereof

Debashis Chakraborty, Swarup Ghosh, Venkatachalam Ramkumar
Indian Pat. Appl. 2015, IN 2013CH01338 A 20150116. (Approved)

7. Catalysts for poly(lactide) synthesis and uses thereof

Debashis Chakraborty, Swarup Ghosh, Venkatachalam Ramkumar
PCT Int. Appl. 2014, WO 2014155213 A2 20141002. (Approved)

6. Metal free catalysts for the ring opening polymerization of cyclic esters and lactide

Debashis Chakraborty, Payal Malik, Ravikumar R. Gowda, Venkatachalam Ramkumar
Indian Pat. Appl. 2013, IN 2011CH04568 A 20130628. (Approved)

5. Metal free catalysts for the ring opening polymerization of cyclic esters and lactide

Debashis Chakraborty, Payal Malik, Ravikumar R. Gowda, Venkatachalam Ramkumar
Indian Pat. Appl. 2013, IN 2011CH04571 A 20130628. (Approved)

4. Group 4 metal aryloxy compounds

Ravikumar R. Gowda, Venkatachalam Ramkumar, **Debashis Chakraborty**
Indian Pat. Appl. 2012, IN 2011CH01376 A 20121026. (Approved)

3. Group 4 metal aryloxy compounds used as polymerization catalyst in lactide polymerization

Ravikumar R. Gowda, Venkatachalam Ramkumar, **Debashis Chakraborty**
Indian Pat. Appl. 2012, IN 2010CH02550 A 20120622. (Approved)

2. A method for synthesis of polymers and copolymers

Ravikumar R. Gowda, **Debashis Chakraborty**
Indian Pat. Appl. 2011, IN 2009CH03099 A 20110624. (Approved)

1. Polymerization Process Using a Highly Active Catalyst

Eugene Y.-X. Chen, Debashis Chakraborty
PCT Int. Appl. 2003, WO 2003000750 A1 20030103.

(E) Research Guidance

1. Ph. D. Level

Student	Year	Title of Thesis
Ravikumar R. Gowda	2010	Cyclic ester and lactide polymerization by activated monomer mechanism: progress, challenges and opportunities

Payal Malik	2012	Synthesis, structural characterization of phosphoramidates, thiophosphoramidates, arylhydrogenphosphates and their role as catalyst towards the ring opening polymerization of cyclic esters
Rima Das	2012	Silver mediated catalytic transformations of organic molecules
Tanmoy Kumar Saha	2013	Imino phenoxide complexes of group 4 metals: synthesis, structural characterization and polymerization studies
Swarup Ghosh	2015	Main group complexes containing imino(phenoxide) scaffold: synthesis, structural characterization and polymerization studies
Bijja Rajashekhar	2016	Homoleptic complexes of group 4 metals: synthesis, structural characterization and studies on the ring opening polymerization of cyclic esters
Sagnik K. Roymuhury	2016	Ring opening polymerization of lactide using group 4 metals containing bi-, tri- and tetradentate scaffolds
Mrinmay Mandal	2016	Group 4 complexes bearing half-salen, salen, salan and salphen ligands: synthesis, characterization and polymerization studies
Dipa Mandal	2016	Group 4 complexes of [NNO], [OO] and [NO]-type donor ligands: synthesis, structural characterization and polymerization studies
Sreenath Pappuru	2017	Ring-opening homo and copolymerization studies of monomers using group 4 metal complexes containing benzotriazole and benzoxazole ligands
Kriti Aakansha	2020	Process development for decolorization and degradation of azo dyes by microorganisms
Anjaneyulu Kummari	2020	Lewis pair catalysts in polymer synthesis: new routes towards the synthesis of fully alternating polyesters and hyperbranched polyglycerols

2. M. Sc. Level

Student	Year	Title of Thesis
Dhruba Sarkar	2006	Schiff base complexes of Fe(III): synthesis, characterization and polymerization studies
M. Kumaravel	2006	Synthesis and characterization of Schiff base complexes of molybdenum
Sandip Mukherjee	2007	Alkoxides and aryloxides of Ti(IV): synthesis, characterization and polymerization studies

B. Rajashekhar	2008	Formation of phosphonic acid anion through metal assisted hydrolysis of the P-N bond
P. Sudarsanam	2009	Cationic ring-opening polymerization of ϵ -caprolactone using phosphonic acid initiators
Vinod Kumar Goda	2011	Fe(III) catalyzed oxidation of sulfides
Sashidhar Reddy	2012	Lactide polymerization using a chiral iminophenolate of Zr
Ajay Kumar Jana	2012	Iminophenolate compound of Ga: synthesis, characterization and studies on bulk polymerization of lactides
Abhijit Mondal	2013	Zr(IV) complexes containing salan type ligand: synthesis, structural characterization and polymerization studies
Apurba Teye	2017	Ring-opening co-polymerization studies using binuclear Co, Ni, Cu and Zn complexes containing bis-benzoxazole phenoxide ligands
Suman Das	2017	Ring-opening co-polymerization studies using bimetallic Ni and Zn complexes containing benzoxazole phenoxide ligands
Lunthinglien Chiru	2019	Metal free catalysts for the copolymerization of epoxides with anhydrides
Koushik Roy	2022	Synthesis of PLA using Zn(II) catalysts containing unsymmetrical phenoxy-imine ligands with thiophen-2-ylmethanimine side arms
Ajay Mishra	2022	Ring-opening polymerization catalysts of Ti(IV) derived from phenoxy imine ligands containing a furan-2-ylmethanimine side arm

(F) List of Third Party Funding

1. Title: Improved methodology for potassium chlorate production

Agency: Vaigai Industries, Tamil Nadu

Duration: August 2005-Jan 2006

Amount = Rs. 500000

2. Title: Metallo- Phosphoramides and Phosphonates: Synthesis, Structural Characterization and Some Exploratory Investigations

Agency: Department of Science and Technology

Duration: April 2006-March 2009

Amount = Rs.1920000

3. Title: Dialkylhypophosphonates and Pyrophosphonic acids: New Precursors to Metallophosphonate Derivatives

Agency: Council of Scientific and Industrial Research

Duration: June 2006-May 2009

Amount = Rs. 960000

4. Title: Group 4 metal complexes derived from Schiff's base and amide ligand scaffolds: synthesis, characterization and polymerization studies

Agency: Department of Science and Technology

Duration: April 2010-March 2013

Amount = Rs. 3760000

5. Title: Polymerization of Cyclic Esters using Activated Monomer Mechanism

Agency: Council of Scientific and Industrial Research

Duration: December 2010-December 2013

Amount = Rs. 1020000

6. New Catalysts for Sustainable Polymers and Copolymers

Agency: University Grants Commission India and Israel Science Foundation

Duration: September 2018-April 2022

Amount = Rs. 15000000

7. Process for biodegradable soaps and detergents (Consultancy Project)

Agency: Mahaveer Surfactants International Pvt. Ltd

Duration: June 2022-July 2023

Amount = Rs. 1200000

(G) Laurels

1. Biography selected for inclusion in Marquis "Who's Who in the world" 2016, 33rd Edition in 2015 for outstanding contributions in research related to societal needs.

2. Admitted as Fellow of International Association of Advanced Materials in 2022.
(See Appendix for relevant certificates)

(H) Regular reviewer for premier journals of RSC, ACS, Elsevier, Springer and CRC press.

Teaching Activities

(A) Courses Taught

1. Undergraduate level (B. Tech. (all branches of engineering); Integrated M. S. (Physics and Biological Sciences))

(i) CY 101 Microscopic and Macroscopic Structure of Chemical Systems (Average class size = 150)

(ii) CY 1010 Chemistry I (Physical & Theoretical Chemistry) (Average class size = 150)

(iii) CY 1020 Chemistry II (Inorganic Chemistry) (Average class size = 150)

(iv) CY 1050 Macromolecules as Engineering Materials (Average class size = 60)

(v) CY 1001 B. Tech. Chemistry (Old Syllabus) (Average class size = 200)

(vi) CY 1001 Chemistry: Structure, Bonding & Reactivity (Average class size = 90 or 500)

(vi) CY 1002 UG Chemistry Lab (Average class size = 100)

(vii) CY 1051 Chemistry II (Spectroscopy in Chemistry) (Average class size = 100)

2. Postgraduate level (M. Sc. and Ph. D.)

- (i) CY 5020 Concepts in Inorganic Chemistry (Average class size = 70)
- (ii) CY 5530 Chemistry of Main Group Elements (Average class size = 70)
- (iii) CY 6650 Chemistry of Macromolecules (Average class size = 50)
- (iv) CY 6019 Spectroscopy-Applications in Organic and Inorganic Chemistry (Average class size = 100)
- (v) CY 6110 Inorganic Chemistry Practicals II (Inorganic Synthesis) (Average class size = 70)
- (vi) CY 5011 Chemistry of Transition Metals & Bioinorganic Chemistry (Average class size = 70)
- (vii) CY 5012 Main Group Chemistry and Spectroscopic Characterization of Inorganic Compounds (Average class size = 70)
- (viii) CY 5019 Organometallic Chemistry (Average class size = 70)
- (ix) CY 5022 Inorganic Laboratory (Average class size = 35)

3. Preparatory Course for Economically weak and Backward Social Status Students (Average class size = 25)

- (i) Preparatory Course Theory I
- (ii) Preparatory Course Theory II
- (iii) Preparatory Course Practical

(B) Produced content for many courses in the national digital platform