



Dr. Biswajit Deb
Assistant Professor



Area of Research Interest:

Broad Area: Inorganic Chemistry

Sub Area: Organometallic Chemistry and Catalysis

- Synthesis and characterization of new / novel transition metal complexes of symmetrical / unsymmetrical functionalized phosphines and nitrogen donor ligands for developing potential catalysts in organic synthesis.
- Synthesis of 'Hemilabile' metal complexes.
- Activation of small molecules like CO, H₂, O₂, CH₃I, C₂H₅I, I₂ etc.
- Catalytic carbonylation, hydroformylation and hydrogenation reactions to generate value added products.

List of Publications:

Total papers published: 22

1. Activation of molecular oxygen by iridium(I) carbonyl complexes of *ortho*-substituted triphenylphosphane; **Biswajit Deb**, *J. Science Forum*, 4 (2015) 1-5
2. A new polymeric sodium complex of vanillin : Synthesis, characterisation and antibacterial activity; S. P. Purkayastha, B. Das, K. G. Bhattacharyya and **Biswajit Deb**, *J. Indian Chem. Soc.*, 91 (2014) 1-6.
3. Synthesis of cationic rhodium(I) and iridium(I) carbonyl complexes of tetradentate P(CH₂CH₂PPh₂)₃ ligand: An implication of steric inhibition and catalytic hydroformylation reaction; K. Saikia, **Biswajit Deb**, D. K. Dutta, *J. Mol. Cat. A: Chemical* 381 (2014) 188– 193.
4. Catalytic transfer hydrogenation by ruthenium carbonyl complexes of phosphine based ligands; **Biswajit Deb** and P. K. Choudhury, *J. Science Forum*, 3 (2012) 132-136
5. Chelate and trans effect of P,O donor phosphine ligands on rhodium catalyzed carbonylation of methanol; D. K. Dutta, **Biswajit Deb**, G. Hua and J. D. Woollins, *J. Mol. Cat. A: Chemical*, 353– 354 (2012) 7-12.
6. Palladium complexes of P,P and P,S type bidentate ligands : Implication in Suzuki-Miyaura cross-coupling reaction; K. saikia, **Biswajit Deb**, B. J. Borah, P. P. Sarmah, D. K. Dutta, *J. Organomet. Chem.*, 696 (2012), 4293–4297.

7. Phosphine based ligand promoted iridium catalysed carbonylation of methanol; **Biswajit Deb**, D. K. Dutta, *J. Science Forum*, 2 (2011) 54-59
8. Rhodium(I) carbonyl complexes of tetradentate chalcogen functionalized phosphines, $[P'(X)(CH_2CH_2P(X)Ph_2)_3]$ {X = O, S, Se}: Synthesis, reactivity and catalytic carbonylation reaction; **Biswajit Deb**, P. P. Sarmah, K. Saikia, A. L. Fuller, R. A. M. Randall, A. M. Z. Slawin, J. D. Woollins, D. K. Dutta, *J. Organomet. Chem.* 696 (2011) 3279–3283.
9. Potential rhodium and ruthenium carbonyl complexes of phosphine-chalcogen (P-O/S/Se) donor ligands and catalytic applications; D. K. Dutta, **Biswajit Deb**, *Coord. Chem. Rev.*, 255 (2011) 1686–1712.
10. Synthesis, reactivities and catalytic carbonylation of rhodium(I) carbonyl complexes containing isomeric acetylpyridine ligands; B. J. Borah, **Biswajit Deb**, P. P. Sarmah, K. Saikia, P.P. Khound, D.K. Dutta, *Inorg. Chim. Acta*, 370 (2011) 117–121.
11. Electron rich Vaska type complexes *trans*-[Ir(CO)Cl(2-Ph₂PC₆H₄COOMe)₂] and *trans*-[Ir(CO)Cl(2-Ph₂PC₆H₄OMe)₂] : Synthesis, characterization and reactivity, D. K. Dutta, **Biswajit Deb**, B. J. Sarmah, J. D. Woollins, A. M. Z. Slawin, A. L. Fuller, R. A. M. Randall, *Eur. J. Inorg. Chem.* (2011) 835- 841.
12. Rhodium(I) carbonyl complexes of quinoline carboxaldehyde ligands and their catalytic carbonylation reaction, P. P. Sarmah, **Biswajit Deb**, B. J. Borah, A. L. Fuller, A. M. Z. Slawin, J. D. Woollins, D. K. Dutta, *J. Organomet. Chem.* 695 (2010) 2603-2608.
13. Influence of phosphorus and oxygen donor diphosphine ligands on the reactivity of rhodium(I) carbonyl complexes; **Biswajit Deb** and D. K. Dutta; *J. Mol. Cat. A: Chemical*, 326 (2010) 21–28. (*Editor's Choice Paper*).
14. Synthesis of dicarbonylruthenium(II) complexes of functionalized P,S chelating diphosphine ligands and their catalytic transfer hydrogenation; **Biswajit Deb**, P. P. Sarmah and D. K. Dutta, *Eur. J. Inorg. Chem*, (2010) 1710-1716.
15. Dicarbonyl iridium(I) complexes of pyridine ester ligands and their reactivity towards various electrophiles; D. Bora, **Biswajit Deb**, Amy. L. Fuller A. M. Z. Slawin, J. D. Woollins, D. K. Dutta, *Inorg. Chim. Acta*, 363 (2010) 1539-1546.
16. Dicarbonylrhodium(I) complexes of benzoyl pyridine ligands: Synthesis, reactivity and catalytic carbonylation reaction; B. J. Borah, **Biswajit Deb**, P. P. Sarmah and D. K. Dutta, *J. Mol. Cat. A: Chemical*, 319 (2010) 66-70.

17. Dicarbonylruthenium(II) complexes of diphosphine ligands and their catalytic activity; **Biswajit Deb**, B. J. Borah, B. J. Sarmah, B. Das and D. K. Dutta, *Inorg. Chem. Commun.*, 12 (2009) 868–871.
18. Synthesis, molecular and crystal structure of a new dicarbonylruthenium(II) complex containing a xantphos dioxide chelating ligand; **Biswajit Deb**, and D. K. Dutta, *Polyhedron*, 28 (2009) 2258-2262.
19. Dicarboxylrhodium(I) Complexes of Chalcogen Functionalized Tripodal Phosphines, [CH₃C(CH₂P(X)Ph₂)₃] {X = O, S, Se} and their reactivity; D. K. Dutta, J. D. Woollins, A. M. Z. Slawin, A. L. Fuller, **Biswajit Deb**, P. P. Sarmah, M. G. Pathak and D. Konwar, *J. Mol. Cat. A: General*, 313 (2009) 100–106.
20. Rhodium carbonyl complexes containing pyridine carboxylic acid ligands : Reactivity towards various electrophiles and catalytic activity; D. K. Dutta, P. Chutia, B. J. Sarmah, B. J. Borah, **Biswajit Deb** and J. D. Woollins, *J. Mol. Cat. A: Chemical*, 300 (2009) 29-35.
21. Synthesis, Characterization and Thermal studies of ruthenium(II) carbonyl complexes of functionalized tripodal phosphine chalcogen donor Ligands [CH₃C(CH₂P(X)Ph₂)₃], where (X= Se, S, O); **Biswajit Deb**, B. J. Sarmah, B. J. Borah and D. K. Dutta; *Spectrochim. Acta Part A*, 72 (2009) 339-342.
22. Dicarboxylrhodium(I) complexes of pyridine alcohol ligands and their catalytic carbonylation reaction; B. J. Sarmah, B. J. Borah, **Biswajit Deb** and D. K. Dutta, *J. Mol. Cat. A: Chemical* 289 (2008) 95-99.

Patents: 02

1. An improved process for the carbonylation of methanol by rhodium carbonyl complexes; D. K. Dutta, B.J. Borah, **Biswajit Deb**.
Indian Patent Filed: No. 01582NF2010 (0102 DEL2011, Dated 17-01-2011)
2. Rhodium metal complexes and an improved process for the carbonylation of methanol; D. K. Dutta, **Biswajit Deb**, J. D. Woollins.
Indian Patent Filed: No. 0022NF2010 (0681 DEL 2010, Dated 26-04-2010)