

Anil Kumar Chandrakar

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Education

July 2004- April 2007

Indian Insitute of Technology, Roorkee

Ph.D., Chemical Engineering

Supervisor: Dr. Shri Chand & Dr. M. R. Maurya

July 2002- July 2004

Indian Insitute of Technology, Roorkee

M. Tech., Chemical Engineering, CGPA: 7.95/10

Supervisor: Dr. V. K. Agarwal

Sep. 1995- June 1998

Govt. Engineering College, Raipur

B.E., Chemical Engineering, Percentage: 67.5%

Research Experience

- **Doctoral Research, Department of Chemical Engineering, Indian Institute of Technology, Roorkee, (July 2004 – April 2007)**

Thesis: “Catalytic Activities of Metal Complexes Immobilized in Zeolite-Y ”

- Heterogeneous catalysts have played a key role in the development of industrial processes for chemical industry. Immobilization of homogeneous catalyst in nano cavity of zeolites provides additional characteristic properties such as activity, selectivity, thermal stability and reusability of the catalysts. In recent years zeolite encapsulated metal complexes (ZEMC) have provided the opportunity to develop catalytic process for the selective oxidation, alkylation, dehydrogenation, cyclization, amination, acylation, isomerization and rearrangement of various substrates and are able to produce intermediates as well as most industrial products.
- We have encapsulated copper, nickel and vanadium complexes of Schiff bases in the super cages of zeolite–Y and characterized by using various techniques, such as, AAS/ICP, SEM, TGA/DTA, XRD, Electronic and IR. Their catalytic activities have been tested for the liquid phase oxidation of phenol, styrene, methyl phenyl sulfide, diphenyl sulfide, cyclohexene and cyclohexane with TBHP and H₂O₂ as oxidant using a batch reactor. The obtained oxidation

products have been analyzed by GC and their identities have been confirmed using GC-MAS.

- **Masters Research, Department of Chemical Engineering, Indian Institute of Technology, Roorkee (July 2002 – July 2004)**

Thesis: “Simulation of Catalytic Distillation Column”

- The investigation pertains to a theoretical study of simulation of multi component catalytic distillation column. In this investigation Amberlyst-15 catalyst has been used as catalyst. The reaction kinetics was assumed to be heterogeneous. It also includes a solution technique for the solution of the model. Further, the comparisons of the model were made with data of Tim Popken (2001). Finally, the effect of design variables namely; reflux ratio, feed tray location, start of reactive section, catalyst size and height of catalyst bed on the plate of reactive section were studied.
- The model developed was validated by comparing the composition profile in the liquid phase and variation of methanol conversion with the reflux with data of Tim Popken (2001). The comparison shows good agreement with the experimental result with maximum deviation of 17.1%.

List of Publications

1. M.R. Maurya, **A.K. Chandrakar** and S. Chand, “Oxidation of phenol, styrene and thioanisole with H₂O₂ catalysed by VO(IV) and Cu(II) complexes of 2-aminomethylbenzimidazole based ligand encapsulated in zeolite-Y” , *J. Mol. Catal. A: Chem.*, **263** (2006) 227–237.
2. M.R. Maurya, **A.K. Chandrakar** and S. Chand, Oxovanadium (IV) and copper(II) complexes of 1,2-diaminocyclohexane based ligand encapsulated in zeolite-Y for the catalytic oxidation of styrene, cyclohexene and cyclohexane, *J. Mol. Catal., A: Chem.*, **270** (2007) 225-235.
3. M.R. Maurya, **A.K. Chandrakar** and S. Chand, Zeolite-Y encapsulated metal complexes of oxovanadium (IV),copper(II) and nickel(II) for the oxidation of styrene, cyclohexane and methyl phenyl sulfide, *J. Mol. Catal., A: Chem.*, **274** (2007) 192-201.
4. M.R. Maurya, **A.K. Chandrakar** and S. Chand, Oxidation of methyl phenyl sulfide, diphenyl sulfide and styrene by oxovanadium (IV) and copper(II) complexes of NS donar ligand encapsulated in zeolite-Y, *J. Mol. Catal., A: Chem.*, **278** (2007) 12-21.
5. **A.K. Chandrakar**, V. K. Agarwal , S. Chand and Dr. K. L. Wasewar, “Modeling and simulation of catalytic distillation column for esterification of acetic acid with methanol” *International J. of Chem. Reactor Engg.*, **5** (2007) A81.

6. M.R. Maurya, **A.K. Chandrakar** and S. Chand, "Oxidation of phenol, styrene and thioanisole with H₂O₂ catalysed by VO(IV) and Cu(II) complexes of 2-aminomethylbenzimidazole based ligand encapsulated in zeolite-Y", National Symposium on Modern trends in Chemical Sciences 2006, Kurukshetra University, KuruKshetra.
7. J. K. Pandey, A. Chandrakar and B. Munshi "CFD simulation of combustion of methane in cylindrical combustor" National Symposium on Reaction Engineering 2010, NIT, Raipur.

Experience

Industry/Institute	Post	Period
The D. M. C. C. Ltd, Kumahari (C.G.)	Apprentice Engineer Trainee	May 1999-May 2000
I. T. M., Gwalior, M.P.	Lecturer	August 2000- November 2001
I. T., G.G.U., Bilaspur (C.G.)	Assistant professor	June 2007- Till date