ADVANCED TRANSITION METAL CHEMISTRY

PROF. M S BALAKRISHNA
Department of Chemistry
IIT Bombay

PRE-REQUISITES : 12th Grade Chemistry Knowledge

INTENDED AUDIENCE : All UG, PG, PhD students, college lecturers and all chemistry researchers

INDUSTRY SUPPORT : This course is very useful for those working in pharmaceutical industries. This course will become one of most popular courses in Chemistry

COURSE OUTLINE :

This course on "Chemistry of Transition Metals" focuses mainly on coordination chemistry, classification of ligands with special emphasis on structure and bonding concepts. 18 Electron rule and its importance in coordination and organometallic compounds. Reactions such as oxidative addition and reductive elimination, important in catalysis, are discussed in detail. Metal-ligand and metal-metal multiple bonding, trans effect in square planar complexes are also included in the discussion.

ABOUT INSTRUCTOR :

Prof. M S Balakrishna joined the department of chemistry in 1996. Taught Transition metal chemistry, coordination chemistry, interpretative molecular spectroscopy, organometallic chemistry of main group elements to UG, PG and Ph.D. scholars. Research interests: Main group and transition metal chemistry, organophosphorus chemistry, homogeneous catalysis and biological applications of copper(I) complexes. Published 210 research papers, five book chapters, edited a book on copper(I) complexes of phosphines (Elsevier) and has delivered more than 500 invited lectures. Balakrishna has supervised 23 PhD students, several M.Sc. students and postdoctoral fellows.

COURSE PLAN :
Week 1: General introduction to Periodic Table and introduction to Transition Elements
Week 2: Coordination chemistry
Week 3: Bonding concepts
Week 4: Bonding concepts continued
Week 5: 18 electron rule
Week 6: Metal-Metal multiple bonding
Week 7: Classification of ligands
Week 8: Classification of Ligands
Week 9: Preparatory methods/Trans Effect/Methods of characterization of metal complexes
Week 10: Oxidative addition and reductive elimination reactions
Week 11: Important applications of transition elements and their complexes
Week 12: Revision and conclusions