INDUSTRIAL INORGANIC CHEMISTRY

PROF. DEBASHIS RAY

Department of Chemistry

IIT Kharagpur

INTENDED AUDIENCE: B. Sc and M. Sc students of Chemistry(Honours), M.Sc. In Pure Chemistry/Applied Chemistry/Analytical Chemistry/Industrial Chemistry

INDUSTRIES APPLICABLE TO: Indian Chemical Council; National Peroxide Ltd.; All Chemicals & Fertilizers Companies; All Dyes & Chemicals Companies; BASF India Ltd.; Tata Chemicals Ltd.; Hindustan Unilever Ltd.; Cochin Minerals and Rutile Limited; Union Carbide India Limited; Rashtriya Chemicals & Fertilizers Ltd.; Aditya Birla Chemicals India Ltd.; EI Dupont India Pvt. Ltd.; Ultramarine & Pigments Ltd.; Phillips Carbon Black Ltd.;

COURSE OUTLINE:

Chemical Industries are the prime factors to convert the raw materials into desired products that we use in our day-to-day life. This has brought a tremendous change in the way the things operate. It is very important for us to understand the importance of the chemical industry which has touched all our facets of life.Chemical Industries are the principal areas of any country used to convert the raw materials into desired products that we use in our day-to-day life. This has brought an enormous change in the way the things operate. It is very important for us to understand the importance of the chemical industry which has touched all our aspect of life like agriculture, environment, food, hygiene, catalysis, construction etc. It has also significantly used in re-cycling industries to curb the usage of virgin products. The proposed course will cover all these aspects in relation to the developments at the international level.

ABOUT INSTRUCTOR:

Prof. Debashis Ray is an M. Sc. (Gold Medalist) from Burdwan University in 1985 and did his Ph. D.from IACS (degree from Jadavpur University) in 1989 and in faculty roll of IIT Kharagpur from 1990. Specialization: Inorganic Chemistry, Coordination Chemistry, Bioinorganic Chemistry, Analytical Chemistry.Received INSA YS Medal in 1994 and CRSI Bronze Medal in 2007. PHE Dept..

COURSE PLAN:

Week 1 : Introduction; Importance of the chemical industry; Primary inorganic materials; Bulk and comodities chemicals; Fine and speciality chemicals; Water and hydrogen; H2O2 and inorganic peroxido compounds.

Week 2 : Nitrogen and nitrogen compounds; Phosphorus and its compounds; Sulfur and sulfur compounds.

Week 3 : Halogen and halogen compounds; Applications of iodine and iodine compounds.

Week 4 : Mineral fertilizers; Nitrogen fertilizers, ammonium nitrate and urea; Phosphorous containing fertilizers.

Week 5 : Potassium containing fertilizers; Economic importance of fertilizers

Week 6 : Metals and their compounds; Metallic lithium and its compounds; Metallic sodium, sodium borates; Potassium and its compounds, KOH and K2CO3.

Week 7 : Alkaline earth metals and its compounds; Beryllium and magnesium; Calcium, strontium and barium; Manganese, manganese compounds and their applications

Week 8 : Industry important organo-silicon compounds, industrial silicone products.

Week 9 : Inorganic solid, zeolites and catalysts, inorganic fibers; Construction materials; Enamel and ceramics.

Week 10 : Carbon modifications, diamond, graphite, carbonization and graphitization; Glassy and foamed carbon; carbon black.

Week 11 : Fillers - synthetic and natural, applications; Metallic hard materials.

Week 12 : Inorganic pigments; TiO2, lithopone, ZnS, ZnO and Fe2O3; Corrosion protection pigments; Luminescent and magnetic pigments; Conclusions.