



# INDUSTRIAL INORGANIC CHEMISTRY

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Department of Chemistry  
IIT Kharagpur

**TYPE OF COURSE** : Rerun | Core/Elective | UG/PG  
**COURSE DURATION** : 12 weeks (18 Jan'21 - 09 Apr'21)  
**EXAM DATE** : 25 April 2021

**INTENDED AUDIENCE** : B.Sc and M.Sc Chemistry Indian Chemical Council; National Peroxide Ltd.; All Chemicals & Fertilizers

**INDUSTRIES APPLICABLE TO** : Companies; All Dyes & Chemicals Companies; BASF India Ltd.; Tata Chemicals etc

**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.

**ABOUT INSTRUCTOR :**

The Instructor is an M. Sc. (Gold Medalist) from Burdwan University and did his Ph. D. from Indian Association for the Cultivation of Science, Kolkata and in faculty of IIT Kharagpur since 1990. He is skilled and specialized in synthetic and structural coordination, model bioinorganic chemistry, analytical chemistry and coordination triggered self-assemblies. Recipient of INSA-YS medal, CRSI bronze medal. Visiting fellow in Indiana University, Oxford University and MPI, Muelheim, Germany.

**COURSE PLAN :**

- Week 01** : Introduction; Importance of the chemical industry; Primary inorganic materials; Bulk and commodities chemicals; Fine and speciality chemicals; Water and hydrogen; H<sub>2</sub>O<sub>2</sub> and inorganic peroxido compounds.
- Week 02** : Nitrogen and nitrogen compounds; Phosphorus and its compounds; Sulfur and sulfur compounds.
- Week 03** : Halogen and halogen compounds; Applications of iodine and iodine compounds.
- Week 04** : Mineral fertilizers; Nitrogen fertilizers, ammonium nitrate and urea; Phosphorous containing fertilizers.
- Week 05** : Potassium containing fertilizers; Economic importance of fertilizers.
- Week 06** : Metals and their compounds; Metallic lithium and its compounds; Metallic sodium, sodium borates; Potassium and its compounds, KOH and K<sub>2</sub>CO<sub>3</sub>.
- Week 07** : Alkaline earth metals and its compounds; Beryllium and magnesium; Calcium, strontium and barium; Manganese, manganese compounds and their applications.
- Week 08** : Industry important organo-silicon compounds, industrial silicone products.
- Week 09** : 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; TiO<sub>2</sub>, lithopone, ZnS, ZnO and Fe<sub>2</sub>O<sub>3</sub>; Corrosion protection pigments; Luminescent and magnetic pigments; Conclusions.