

Elective Paper II (Group A)

Bioinorganic and Supramolecular Chemistry:

60 hrs.

I. Metal Storage Transport and Biomineralization

5 hrs.

Ferritin, transferring and siderophores.

II. Calcium in Biology

6 hrs.

Calcium in living cells, transport and regulation, molecular aspects of intramolecular processes, extracellular binding proteins.

III. Metalloenzymes

20 hrs.

Zinc enzymes – carboxypeptidase and carbonic anhydrase. Iron enzymes – catalase, peroxidase and cytochrome P-450. Copper enzymes – superoxide dismutase. Molybdenum oxatransferase enzymes – xanthine oxidase. Coenzyme vitamin B₁₂.

IV. Metal – Nucleic Acid Interactions

6 hrs.

Metal ions and metal complex interactions, Metal complexes –nucleic acids.

V. Metals in Medicine

5 hrs.

Metal deficiency and disease, toxic effects of metals, metals used for diagnosis and chemotherapy with particular reference to anticancer drugs.

VI. Supramolecular Chemistry

18 hrs.

Concepts and language.

- (A) Molecular recognition: Molecular receptors for different types of molecules including arisonic substrates, design and synthesis of coreceptor molecules and multiple recognition.
- (B) Supramolecular reactivity and catalysis.
- (C) Transport processes and carrier design.
- (D) Supramolecular devices. Supramolecular photochemistry, supramolecular electronic, ionic and switching devices.

Some example of self-assembly in supramolecular chemistry.

Books Suggested:

1. Principles of Bioinorganic Chemistry, S.J.Lippard and J.M.Berg. University Science Books.
2. Bioinorganic Chemistry, I.Bertini, H.B.Gray, S.J.Lippard and J.S.Valentine. University, Science Books.
3. Inorganic Biochemistry vols I and II. Ed. G.L.Eichhorn, Elsevier.
4. Progress in Inorganic Chemistry, Vols 18 and 38 ed. J.J.Lippard, Wiley.
5. Supramolecular Chemistry, J.M.Lehn, VCH.