CHEM 103 Inorganic Chemistry in Living Systems

Summary:

In chem 103, you will study the basic principles of metal ions and coordination chemistry applied to the study of biological systems. The course focuses a lot on metal chelation. HEME and cytochrome p450 are covered more than a number of times.

Prerequisites: Chemistry 3A or 112A. Chemistry majors can only count 2 of the 3 units towards their Allied Subject requirement

Topics:

- Intro to Metals in Biology, Inorganic Chemistry Basics (Electronic Configuration, Nomenclature, Lewis Structures, VSEPR, etc)
- Bonding and Molecular Orbital Theory for Small Molecules
- Coordination Chemistry Fundamentals (Ligands, Geometries, Hard-Soft Concept, Chelate and Macrocyclic Effects, Electron Counting, etc)
- Crystal Field Theory and Applications of Crystal Field Theory (Magnetism, Absorption Spectroscopy, Reactivity)
- Aqueous Coordination Chemistry: Principles and Applications to Biological Systems
- Structural Roles for Metals in Biology (Gene Expression, Signaling)
- Metallohydrolases
- Oxygen Binding and Transport
- Electron Transfer, Water and Oxygen Catalysis in Photosynthesis and Respiration
- Oxygen Catalysis, Metals in Medicine

Workload

6 problem sets
2 midterms
1 final

Time commitment: 3 hours of lecture per week, 6 hours per problem set (and committing the solutions to memory)

Choosing the course:

When to take:
This class is predominantly juniors and seniors (upper div.) This class is usually not a time vacuum nor a difficult weeder course, but some people struggle with certain aspects a lot more than others. You can take this during a more rigorous semester. If you find yourself hitting a wall, seek help as soon as possible.

TIPS/Comments:

The material taught on the first day is fair game. Were random fun facts provided about each metal? Yes? You can bet they will show up on the midterms AND the final. Work through any and all problems and possible variations of the problems to understand how the rules work. Office hours were very helpful.

This course is necessary for the B.S. Chemical Biology degree.

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