



SUBJECT DATASHEET

Semester:	2010/11/1
Subject:	Chemistry of Biocoordination
Code:	VEMKOKB213B
Responsible department:	Department of Organic Chemistry
Responsible department code:	MKOK
Responsible lecturer:	dr. József Kaizer

Educational objectives:

Educational Objectives: Correlation of function, structure and actual reactivity of inorganic elements in organisms.

Detailed content of the subject:

Contents: Week: 1. Historical Background, Current Relevance and Perspectives 2. Principles of Coordination Chemistry Related to Bioinorganic Research 3. Thermodynamic and Kinetic Aspects 4. Properties of Biological Molecules: proteins, amino acids... 5. Occurance and Availability of Inorganic Elements in Organisms, Biological Functions of Inorganic Elements 6. Cobalamins Including Vitamin and Coenzyme B12 7. Metals at the Center of Photosynthesis 8. The Dioxygen Molecule: Uptake, and Storage (Hemoglobin, Myoglobin, Hemerythrin) 9. Catalysis Through Hemoproteins (Cytochromes) 10. Iron-Sulfur and Other Nonheme Iron Proteins 11. Uptake, Transport and Storage of an Essential Element as Exemplified, Nickel-Containing Enzymes 12. Copper-Containing Proteins (Oxidases, Reductases, Oxygenases) 13. Mo-, V-, and Cr-Containing Proteins. Zinc: Functions and the Enzymatic Catalysis of Hydrolysis or Condensation Reactions 14. Function and Transport of Alkali and Alkaline Earth Metal Cations 15. Chemotherapy with Metallic Compounds

Requirements:

Examination Requirements and Questions: The written test for the students involves the main areas of basic bioinorganic chemistry such as nomenclature, classification, the knowledge of basic proteins, reactions of enzymes, and mechanistic aspects of bioinorganic reactions. The student has to reach a 50% result to get passed the course. The individual questions can be viewed on previous exam sheets. On every occasion new questions are posed.

Required and suggested references:

W. Kaim, B. Schwederski: Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, John Wiley & Sons, Chichester, New York, Brisbane, Toronto, Singapore, 1991. S. Otsuka, T. Yamanaka: Metalloproteins, Elsevier, Tokyo, 1988. Kőrös E.: Bioszervetlen kémia, Gondolat kiadó, Budapest, 1980. I. Bertini, H.B. Gray, S.J. Lippard, J.S. Valentine: Bioinorganic Chemistry, University Science Books, Sausalito, 1994. A.X. Trautwein: Bioinorganic Chemistry, Wiley-VCH, Weinheim, 1997.