

Speciation of metals in the environment

(Prof. Ewa M. Cukrowska – 15 lectures)

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Pollution is the most serious of all environmental problems and poses a major threat to the health and well-being of people and global ecosystems. Other environmental problems are either wholly or partly caused by pollution; these include global warming, climatic change and the loss of biodiversity. The study of metal binding by naturally occurring complexants is of primary importance in understanding their behaviour and fate in aquatic system. However, rigorous theoretical interpretation is not yet possible.

This module provides an introduction to the principles of metallic pollutant-orientated environmental chemistry. The main groups of inorganic and organic metal compounds are covered and the principles relating to their nature, sources, transport, fate, environmental behaviour and effects on targets. It examines the three factors – composition, chemical processes, and perturbations caused by natural and anthropogenic activities. The module includes speciation chemistry in the environment, environmental problem solving and its evaluation by experimental measurements and computer modeling.

Course outline:

- transport of pollutants in the environment
- sources of pollutants
- toxicology and ecotoxicology
- bioavailability and bioaccessibility
- chemical speciation in the environment:
 - acid-base equilibria
 - redox eq., pH-Eh diagrams
 - complex formation and stability
 - precipitation equilibria
- modeling of environmental processes:
 - field measurements
 - analytical chemistry
 - computer modeling
 - predictions made on environmental modeling

Assumed background: Knowledge of the principles of physical, inorganic, organic and analytical chemistry. Understanding of the relationships between chemistry and the environment.

Termin	Dzień tygodnia	Godzina	Miejsce
20.05.2013	Poniedziałek	9.15 – 12.00	Minicentrum Konferencyjne (Luwr)
21.05.2013	Wtorek	9.15 – 12.00	Minicentrum Konferencyjne (Luwr)
22.05.2013	Środa	9.15 – 12.00	Minicentrum Konferencyjne (Luwr)
23.05.2013	Czwartek	9.15 – 12.00	Minicentrum Konferencyjne (Luwr)
24.05.2013	Piątek	9.15 – 12.00	Minicentrum Konferencyjne (Luwr)