

ECTS – Arkusz przedmiotu

Kod	AGH-STC-10C-322-s	Nazwa przedmiotu	Basics of Environmental Chemistry				
Prowadzący przedmiot	Prof. dr hab. Janusz Gołaś						
Osoby prowadzące zajęcia	Dr inż. Mariusz Macherzyński						
Klasa przedmiotu	ogólny		Rodzaj przedmiotu	obieralny			
Wydział	Energetyki i Paliw						
Kierunek	Technologia chemiczna						
Rodzaj studiów	S		Stopień studiów	pierwszy	Semestr	III	
Rodzaje zajęć*	Suma	Wykłady	Ćwiczenia	Laboratoria	Seminaria	Projekty	ECTS
Liczba godzin	30	15	-	15	-	-	2
WWW							
Uwagi							
Cel przedmiotu - zdobyte umiejętności							
Streszczenie przedmiotu							
<p>Knowledge in general chemistry and basic organic chemistry should be a prerequisite to this course.</p> <p>During the course the students should get fundamental knowledge on main components of the environment and their chemical composition. A course gives the foundation to understanding of the behaviour and the migration of chemical substances in the environment, chemical correlations between main components of the environment and chemical cycles of elements. Groups of contaminants both organic (CFCs, PCBs, PAHs, dioxins, BTX, POCs) and inorganic (heavy metals like mercury, lead, cadmium and arsenium as examples and their compounds), main sources of their emission and chemical effects of their presence in the environment are discussed. Phenomena of acid rain, greenhouse effect, smog and ozone layer are presented. Chemistry of water and aqueous solutions is discussed. Chemistry of soil, sediments and atmosphere. Chemistry of bioprocesses like respiration and photosynthesis. Fuels and their sources. Environmental consequences of energy production and consumption.</p>							
Warunki uczestnictwa w przedmiocie							
Forma zaliczenia przedmiotu							
Zasada wystawiania oceny końcowej							
Program wykładów							
<p>Introduction to environmental chemistry. Environment and its components. Chemical composition of outer layers of the planet Earth. Chemical composition of the crust, hydrosphere and atmosphere. Biosphere, its composition and range. Ecosystems. Cycles of carbon, nitrogen and oxygen in nature.</p>							
Program pozostałych zajęć (ćwiczenia, laboratoria, projekty, seminaria)							
<p>1. RULES AND STANDARD OPERATING PROCEDURES IN THE CHEMICAL LABORATORY. 2. BASIC WATER PARAMETERS @ ANALYSES: odour, pH, Eh, electrolytic conductivity, oxygenation. 3. MAIN INORGANIC COMPONENTS IN SURFACIAL WATERS: fast concentration tests of NO_3^-, NO_2^-, PO_4^{3-}, NH_4^+ and Fe. 4 ISOLATION OF HUMINE ACIDS FROM SOIL Isolation of humine acids from soils. Calculation of the mass of humine acids per mass unit of soil. 5. DETERMINATION OF THE SPECIFIC SURFACE AREA OF HUMINE ACIDS</p>							

Spectrophotometric determination of the extinction coefficient of the prepared solutions and calculating the specific surface area of humine acids colloid.

6. DETERMINATION OF THE SUM OF POLYPHOSPHATES IN WASHING POWDER

Making model solutions. Spectrophotometric determination of phosphates.

7. REPETITION AND ASSESSMENT LABORATORY

Bibliografia

1) Environmental Chemistry, Peter O'Neill, Chapman & Hall, UK, 1993 (second edition)

2) Environmental Chemistry, Colin Baird, W.H. Freeman and Company, N.Y. 1998

3) Environmental Chemistry, A Modular Approach, Ian Williams, John Wiley & Sons,Ltd, 2005

4) Elements of Environmental Chemistry, Ronald A. Hites, Wiley-Interscience, A John Wiley & Sons,Inc., Publications, 2007

5) An Introduction to Environmental Chemistry, J.E.Andrews, P.Brimblecombe,T.D.Jickells, P.S.Liss, B.J.Reid,

Blackwell Publishing, Second Edition 2004,

6) Chemistry Linus Pauling, Peter Pauling

Optional books for Polish students (in Polish)

1) Robert T. Morrison, Chemia organiczna, Wyd. Nauk. PWN, Warszawa 1994

2) Lech Pajdowski, Chemia ogólna, Wyd. Nauk. PWN, Warszawa 1999

3) Peter O'Neill , Chemia środowiska, Wyd. Nauk.PWN 1998

***Rodzaje zajęć: ćwiczenia – ćwiczenia audytoryjne, lektoraty, zajęcia wf, laboratoria – ćwiczenia laboratoryjne, zajęcia praktyczne, zajęcia terenowe, seminaria – seminaria, konwersatoria, projekty – ćwiczenia projektowe, prace kontrolne i przejściowe.**