UCL Université catholique de Louvain

LFSAB1309

2013-2014

Chemistry

5.0 credits	30.0 h + 20.0 h	2q

Teacher(s) :	Godard Pierre ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	The course is articulated around three themes : First theme : atom structure, chemical bonds and reactions (1.5 ECTS) in view to understand the concepts of ionic and covalent bonding and their influence at the level of the structure of the matter, the notion of electronegativity and also the acid-base concept. Second theme :chemical thermodynamics bases mainly oriented to the second principle (1,5 ECTS) which allows formalising in a rigorous framework the intuitive notions of order and disorder, of free energy (and its relation with reaction equilibrium). The notions of perfect gases and real gases, the reaction equilibrium in gazeous phase are also developped. Third theme : the equilibrium in aqueous phases (2 ECTS), in view of the quantification of the acid-base equilibrium, the concepts of solubility and of chemical precipitation, and more particularly the notions of electrochemistry in view to develop and understand the phenomenon of corrosion and its prevention.are studied.
Aims :	To learn and understand the basic concepts in chemistry : atoms, molecules, chemical and electrochemical reactions with illustrative examples. To learn and understand the basic concepts governing the equilibrium and non equilibrium in chemical reactions. To learn how to model the real world : to know how to bridge the gap between the concrete reality and abstraction, between individual cases and general laws, to go from qualitative to quantitative determinations. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Content :	Content : atomic structure and periodic organization of atoms and periodicity of atomic properties,; concepts of mole, chemical compounds and chemical equations, notions of ionic bonding and ionic compound ; influence of ionic bonding on the structure ; acid-base concepts ; covalent bond and electronegativity ; perfect and real gases, absolute temperature scale, enthalpy and entropy of reaction and their variation in chemical reactions in gazeous phase, free energy and its relation with the reaction equilibrium ; solubility and chemical precipitation, redox equilibrium, corrosion and protection against corrosion. The teaching will consist in magistral courses illustrated by examples mainly from industrial applications and also in exercises conceived to develop the concepts presented in the courses and to understand a series of chemical phenomena occuring in the every day life.
Other infos :	Evaluation : written exam with theoretical questions (50% of the quotation) and with the practical resolution of some exercices (50% of the quotation) in order to verify the good understanding of the different concepts developped in the course. Workfiles for each part available in printed version. Reference book : P. Atkins and L. Jones, Chemistry : Molecules, matter and change published by Freeman and Company (New York) Supervision by the teacher.
Cycle and year of study :	> Bachelor in Engineering : Architecture
Faculty or entity in charge:	LOCI