CHM1112 General Chemistry

[22.5h+22.5h exercises] 3 credits

This course is taught in the 1st semester

Teacher(s): Jean-Paul Declercq
Language: French
Level: First cycle

Aims

Understanding the fundamental concepts of general chemistry. Structure and properties of matter, chemical reactions, and importance of chemistry in many fields.

Main themes

- Structure of matter - Structure of atoms- The periodic table
- Nomenclature of inorganic compounds. Chemical equations, reaction stoichiometry - Important reactions in inorganic chemistry
- Atomic structure of many-electron atoms
- Chemical bonds - Lewis structures, resonance, hybridization and molecular geometry.
- Thermochemistry - The rates of reactions
- Illustrations will be taken from daily life, from industrial applications and from the living world.

Content and teaching methods

Fundamental concepts of chemistry. Introduction to the periodic table.
Elements of nomenclature. Stoichiometry, concentration. The gas laws, introduction to the kinetic model of gases. Energy, heat, thermochemistry; the first law of thermodynamics, enthalpy.
Quantal description of atomic and molecular structure, orbitals. Chemical bonds: ionic bonds, covalent bonds, intermolecular bonds. Molecullar geometry, hybridization of orbitals. Chemical kinetics, the rate and the mechanism of reactions, influence of catalysis.
Chemical equilibrium, predicting the direction of reaction; equilibrium constant and the law of mass action. Chemical reactions in solution, strong and weak electrolytes. Acid-base reactions, pH and concentration of hydronium ions; titrations. Solubility and precipitation, the solubility product, the common-ion effect, the effect of pH on solubility, selective precipitation.
Oxidation and reduction, redox equations. Introduction to electrochemistry, electrochemical cells and electrolysis.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Support: syllabus supplied by DUC (Diffusion Universitaire Ciaco).

Other credits in programs

MAFY11BA	Première année polyvalente en sciences mathématiques et physiques	(3 credits)
PHYS12BA	Deuxième année de bachelier en sciences physiques	(3 credits)
SINF12BA	Deuxième année d'études de bachelier en sciences informatiques	(3 credits)