



FSAB1301 Chemistry 1

[30h+30h exercises] 6 credits

This course is taught in the 2nd semester

Teacher(s): Sophie Demoustier, Pierre Godard (coord.), Roger Legras, André Schanck
Language: French
Level: First cycle

Aims

- Develop and understand the basic concepts in chemistry: atoms, molecules and chemical reactions.
 - Understand the concepts of energy conservation, internal energy and enthalpy, reaction heat, formation enthalpy and bonding energy.
 - Understand the notion of ionic bond and the consequence on the structure of ionic compounds
 - Understand the notion of covalent bond, resonance effect and functional group.
- At the end of this teaching, the student will be able to speak the language of the chemists and the thermodynamicians in view to understand a part of the world organization and to converse with specialists of the field.

Main themes

Scope of activity (main themes)

First theme:

Atom structure, periodicity of atomic properties, notions specific to the chemistry language (2 ECTS)

Second theme:

Introduction to thermodynamics: first principle (1 ECTS) - in this theme, the notions of state variables, energy conservation, internal energy, enthalpy, reaction heat will be particularly emphasized from an rigorous and mathematical approach.

Third theme:

Chemical bonds and reactions (3 ECTS) - This important theme concerns the understanding of the ionic bond and its influence on the structure, the acid-base concept, the covalent bond and some essential notions such as the electronegativity, the resonance, the main functional groups intervening mainly in the field of organic chemistry.

Content and teaching methods

The content of the teaching is summarized as following: atom structure, periodic organization of elements and periodicity of atomic properties; notions of mole, compounds and chemical equations; material systems and state variables; simple material balance; first thermodynamics principle; ionic bond; relationship between ionic bond and structure; acid-base reactions; notions of covalent bond, electronegativity, resonance and functional groups; some typical organic reactions.

Content and teaching methods

content: atomic structure, periodic organization of atoms and periodicity of atomic properties; concept of mole, chemical compounds and chemical equation; material system and state variables; simple material balancing; first law of thermodynamics; ionic bonding; relationship between ionic bonding and structure; acid-base reaction; concept of covalent bonding; electronegativity, resonance and functional group; some typical organic reactions
 method of teaching: ex-cathedra courses, homework, problem sets, exercises.

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

The evaluation has 2 components: an intermediary evaluation during the quadrimester and a final exam at the end of the quadrimester (written exam). The final mark is a combination of the scores in these two evaluations
 - Workfiles for each of the parts (available on the website and in printed version); Reference book: University Physics (Freedman and Young)

Other credits in programs

FSA11BA	Première année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(6 credits)	Mandatory
FSA12BA	Deuxième année de bachelier en sciences de l'ingénieur, orientation ingénieur civil	(6 credits)	