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Politecnico di Torino

Academic Year 2009/10 (first time established in A.Y.1999/00)

01LQNDR, 01LQNAX, 01LQNJA

Chemistry for engineers

1st degree and Bachelor-level of the Bologna process in Mechanical Engineering - Vercelli (I FACOLTA' DI INGEGNERIA)
1st degree and Bachelor-level of the Bologna process in Civil Engineering - Vercelli (I FACOLTA' DI INGEGNERIA)
1st degree and Bachelor-level of the Bologna process in Electronic And Computer Engineering - Vercelli (III FACOLTA' DI INGEGNERIA)

Teacher	Status	SSD	Les	Ex	Lab	Years Stability
Bodoardo Silvia	RC	CHIM/07	40	16	4	0

SSD	CFU	Activities	Area context
CHIM/07	6	A - Di base	Fisica e chimica

Objectives of the course

Aim of this course is to give the bases for the comprehension and the interpretation of chemical phenomena so that the student will be able to handle chemical arguments which he will encounter in the following courses and during his professional life.

Expected skills

At the end of this corse, the student will be able to evaluate the chemical characteristics of materials, and to understand some simple industrial chemical process.

Prerequisites

It is considered as a prerequisite all chemical , physical and mathematical knowledges of high school level.

Syllabus

The Components of Matter
Stoichiometry of Formulas and Equations
The Major Classes of Chemical Reactions
Gases and the Kinetic-Molecular Theory
Thermochemistry: Energy Flow and Chemical Change
Atomic Structure
Electron Configuration and Chemical Periodicity
Models of Chemical Bonding
The Shapes of Simple Molecules
Theories of Covalent Bonding
Intermolecular Forces: Liquids, Solids, and Phase Changes
The Properties of Solutions
The Main-Group Elements:
Organic Compounds and the Atomic Properties of Carbon
Kinetics: Rates and Mechanisms of Chemical Reactions
Equilibrium: The Extent of Chemical Reactions
Acid-Base Equilibria
Ionic Equilibria in Aqueous Systems
Thermodynamics: Entropy, Free Energy
Electrochemistry: Chemical Change and Electrical Work

Laboratories and/or exercises

In classroom
Names and Formulas of Compounds - Molecular Masses from Chemical Formulas - Mole-Stoichiometry of Chemical Reactions in Solution - Oxidation Numbers - Balancing Redox Equation - Gas Law Problems - Stoichiometry of Thermochemical Equations, Hess's Law of Heat Summation 'Equilibrium ' Acids and bases ' Faraday law- Application of Nernst law

In lab:
- Gas law, determination of $CaCO_3$ content using HCl solutions 'water electrolysis ' Daniel Cell ' pH determination

Bibliography

M.H. Silberberg
Principles of General Chemistry
Mc Graw-Hill Edition

Revisions / Exam

The exam will be in written form with some question on general chemistry, some exercices and some open questions. If requested an oral exam will be attended.

Programma definitivo per l'A.A.2009/10

BACK

m@il