UCLouvain

lchm1321

2023

Analytical chemistry 1

5.00 credits	40.0 h	Q1

Teacher(s)	Dupont Christine ;Garcia Yann ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	It is recommended to have acquired the knowledge and skills developed in the teaching units: LCHM1111 Chimie générale LCHM1211 Chimie générale 2 LPHY1101 Physique 1 LPHY1102 Physique 2
Main themes	At first, the course brings the student to a good knowledge in solution thermodynamics and to the quantitative prediction of their behaviour. Activity and standard state concepts must be used in a reasonable way at this stage. The different classes of reactions are then developed in order to rigorously exploit basic operations in quantitative chemical analysis. The study of gravimetry and titration allows illustrating fundamental bases of operating modes. Theoretical aspects of chromatographic separation methods as well as an introduction to spectrochemical analysis are given. Finally, theoretical bases and applications of potentiometry to an analytical problem are described. The student is here sensitised to important concepts such as electrode potentials, reference electrode, indicator electrode, and to the correspondence of an electrochemical circuit to the needs of analysis as well as analytical performances. The care specific to potentiometric methods is also outlined.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 This course focuses on current methods of quantitative chemical analysis. It brings the student to practice a classical reasoning in quantitative chemical analysis and to strengthen his basic knowledge in this field. This project includes the familiarisation with the resolution methodology of a full analytical problem, starting from sampling to the evaluation and discussion of results. The cluster that also comprises CHM 1322 ensures a basic formation in analytical chemistry for the program in chemical sciences. This formation not only provides an excellent practice on analytical techniques, but also allows the student to develop schemes and analysis methods in a rigorous way, relying on physical chemistry concepts and an analytical thinking.
Evaluation methods	Tests during the semester (20%) - Written exam (80%)
Teaching methods	Lectures / exercise sessions (after preparation of exercises made available online). Some classes could be given remotely depending on the pandemic situation.
Content	Introduction - Chemical analysis and information (analysis performances, experimental error and its treatment) - Aqueous solutions of electrolytes (ionic strength, activity coefficient, chemical potential) Introduction to spectroscopy (phenomena, devices, quantitative exploitation) - precipitation and gravimetry - volumetry - redox reactions - potentiometry (indicator and reference electrodes, membrane potential, complex sensors) Introduction to chromatography (theory)
Inline resources	LCHM1321 Moodle website and LCHM1321 Teams
Bibliography	Skoog and West
Faculty or entity in charge	CHIM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Chemistry	CHIM1BA	5		🔍