UCLouvain

lbir1346

2019

Surface and colloid chemistry

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

3 credits	30.0 h	Q2

Teacher(s)	Dupont Christine ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	General physics, General chemistry, Introduction to thermodynamics *The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.*
Main themes	Overview of colloidal systems and interfaces Kinetic theory of colloidal systems: concepts, applications Surface energy: concepts, applications Adsorption: concepts, applications Charged interfaces: physico-chemical models Interactions between surfaces: concepts, applications
Aims	1 At the end of the course, the student will be able to: - Rephrase the concepts which allow understanding physico-chemical phenomena involving dispersed systems and interfaces (surfaces, colloids, nanometer-scale and supramolecular systems), and their impact on the behavior of such systems at the macroscale; - Evaluate the consequences of these phenomena, based on realistic numerical values; - Establish links between phenomena occurring at different scales (nano, micro, macro); - Explain phenomena observed in daily life or in typical bioengineering applications (materials, food, living systems, soils and environment, chemical industries, biotechnology) on the basis of concepts developed in the course; - Predict the behavior of simple systems. - - - - *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".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** During the semester: tests on limited parts of the course (25% of final grade). At the end of the semester: written exam, including an open book question (75% of final grade).
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Lectures illustrated by experimental observations and mixed with the resolution of numerical exercises.
Content	Introduction: overview of colloidal systems and interfaces. Kinetic theory of colloidal systems: sedimentation, centrifugation, diffusion, Brownian movement. Surface energy: surface tension, Laplace equation, wetting - capillarity - adhesion - cohesion - dispersion, porosimetry, illustrations. Adsorption from solution: properties of monolayers, adsorption, Gibbs equation, Langmuir isotherm, illustrations. Properties of charged surfaces: origin of charge, physical and chemical models of the double layer, interactions between particles and stability of colloidal systems.
Inline resources	website on the Moodle platform
Bibliography	voir site Moodle du cours

Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Bioengineering	BIR1BA	3	LBIR1221 AND LCHM1211A	
Master [120] in Environmental Bioengineering	BIRE2M	3		
Advanced Master in Brewing Engineering	BRAS2MC	3		
Additionnal module in Chemistry	LCHIM100P	3		