UCLouvain

lchm2130

2021

Inorganic chemistry II and Exercises

6.00 credits	30.0 h + 45.0 h	Q1

Teacher(s)	Devillers Michel ;Hermans Sophie (compensates Devillers Michel) ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	The course will concern the fundamental concepts in coordination chemistry considering electronic aspects (spectra and magnetic properties), structural aspects (isolobal analogy) and reactivity (reaction mechanisms). Practical exercises will cover : - the synthesis and purification of transition metal coordination compounds - the mastery of principal characterisation technique (principally spectroscopic) of inorganic compounds.
Learning outcomes	**At the end of this learning unit, the student is able to :** This course aims at covering the principal basic concepts in coordination chemistry. Practical exercises will concern the synthesis and study of physico-chemical properties of transition metals coordination compounds. 1 **Prerequisite** : Molecular symmetry and crystal structures (CHM 1251A). Basics of molecular spectroscopy (CHM 1251B). Booklet including the copy of the transparencies used by the teacher
Evaluation methods	The examination is a written + oral exam during the session. The final note also comprises a contribution from the evaluation of practical labs (synthesized products + written reports)
Teaching methods	Theoretical course in auditorium and practical laboratories in teaching labs.
Content	The course will cover the following aspects : 1. General properties of coordination compounds: electronic spectroscopy and magnetic properties, description in the frame of the molecular orbital theory. 2. Reaction mechanisms in coordination chemistry. Ligand substitution reactions (octahedral complexes, square-planar complexes: trans effect). Electron transfer reactions. 3. Organometallic chemistry complements: isolobal analogy. 4. Molecular polyhedra in inorganic chemistry: the metal-metal bond, boranes structure, metallic clusters. 5. Bioinorganic chemistry. The practical laboratories cover manipulations among the following themes : 1. Synthesis and spectroscopic characterisation of Vanadium complexes. 2. Synthesis and spectroscopic characterisation of Cr(III) complexes. 3. Synthesis and spectroscopic characterisation of Ni(II) complexes. 4. Synthesis of luminescent compounds. 5. Separation of optical isomers of Co(III) complexes. 6. Kinetics of cis-trans isomerization. 7. The Job method. 8. Ambidentates ligands and linkage isomerism.
Inline resources	The visual support used by the teacher is available on Moodle.
Bibliography	Supports : - "Inorganic Chemistry : principles of structure and reactivity", J. Huheey, E. Keiter, R. Keiter, 4th ed., Harper and Collins, 1993. - Autres références bibliographiques conseillées au début de l'enseignement. - Copie des transparents utilisés par l'enseignant, disponibles sur Moodle. - Pour les exercices pratiques : manuel de laboratoire

Other infos	**Background** : General chemistry notions Molecular symmetry and crystal structures Fundamentals of theoretical chemistry and molecular spectroscopy. Inorganic chemistry I (CHM 1331).
Faculty or entity in charge	CHIM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Chemistry	CHIM2M	6		🔍
Master [60] in Chemistry	CHIM2M1	6		🔍