

Code: QI346								
Name in English Coordination Chemistry								
Name in Portuguese: Química de Coordenação								
Name in Spanish: Química de Coordinación								
Type of course: Weekly								
Evaluation and approval criteria: Grade and frequency								
Characteristics: Regular								
Frequency: 75%								
Period Type / Offering Period: Semi-annual / All periods								
Requires Exam: Yes								
Vectors								
T	L	P	O	PE	OE	SL	WEEKS	CREDITS
2	-	-	-	-	-	2	15	2
Occurrence in curriculum: 05, 50								
Pre requirement: QI146 or QI145								
Summary: Coordination compounds. Bonding Theories applied to coordination compounds. Introduction to electronic spectroscopy. Tanabe-Sugano diagram. Reaction mechanisms substitution and electron transfer reactions.								
<p>Program: Coordination compounds of d and f blocks: coordination number, structure, nomenclature, isomerism. Bonding theories: bonding field and molecular orbitals for octahedral, tetrahedral and square geometries in d-block complexes. Jahn-Teller effect. Spectrochemical series. Nephelauxetic effect. Types of Bonding in f-block complexes. Magnetic properties of d and f coordination compounds. Introduction to electronic spectroscopy of d and f ion complexes (Russel-Saunders coupling, spectroscopic terms and selection rules). Interpretation of electronic spectra and determination of ligand field parameters (10 Dq and B), Orgel and Tanabe-Sugano diagrams; Metal-ligand and ligand-metal charge transfer spectra in d and f ion compounds; Thermodynamic aspects (formation constants, chelate effect and redox potentials). Macrocyclic ligands. Mechanisms of substitution reactions in octahedral and square complexes. Labile compounds and inert compounds. Trans effect and influence. Oxidation-reduction reactions: external sphere and internal sphere mechanisms.</p>								
Basic Bibliography								
1) MIESSLER, G. L.; TARR, D. A. Inorganic Chemistry . 4th ed., Harlow : Pearson, 2011. 1213p.								
2) HUHEEY, J. E.; KEITER, E. A.; KEITER, R. L. Inorganic Chemistry: Principles of Structure and Reactivity . 4th ed. New York: Harper Collins, 1993. 964p.								
3) HOUSECROFT, C. E.; SHARPE, A. G. Inorganic Chemistry . 4th ed. Upper Saddle River: Prentice-Hall, 2012. 754p.								
Complementary Bibliography								
1) SHRIVER, D. F.; ATKINS, P. W.; LANGFORD, C.H. Inorganic Chemistry . 2nd. ed. Oxford: Oxford University Press, 1994. 819p.								
2) JONES, C. J.; A química dos Elementos dos Blocos d e f . Porto Alegre : Bookman, 2002. 184p.								
3) NICHOLLS, D. Complexes and First-Row Transition Elements . New York : Elsevier, 1975. 215p.								

- 4) TOMA, H. E. **Química de coordenação, organometálica e catálise**. 2 ed. São Paulo: Blucher, 2016. 337p.
- 5) WILKINSON, G. **Comprehensive coordination chemistry: the synthesis, reactions, properties & applications of coordination compounds**. Oxford: Pergamon, 1987, 7 vol.