



PROGRAMS AND BIBLIOGRAPHY

Subject	
Code	Name
QI345	Coordination Chemistry

Vector
OF:S-5 T:002 P:000 L:000 O:002 D:000 HS:004 SL:002 C:004 AV:N EX:S FM:75%

Pre requirement
QI145

Summary
Coordination compounds. Chemical bond theories applied to coordination compounds. Introduction to electronic spectroscopy: Tanabe-Sugano diagrams. Mechanism classifications of ligand exchange and electron transfer reactions.

Program
Coordination compounds (d and f elements): coordination number; molecular structure, nomenclature and isomerism. Chemical bond theories. Ligand field, molecular orbitals of octahedral, tetrahedral and square-planar complexes of d elements Spectrochemical Series. Nephelauxetic and Jahn-Teller effects Nature of chemical bonds of f elements complexes. Magnetic properties of coordination compounds Interpretation of electronic spectra of d and f complexes : Russel-Saunders coupling, spectroscopic terms, Selection rules and intensities, determination of ligand field parameters (10 Dq and Racah parameter - B), ligand to metal and metal to ligand charge transfers (d and f complexes). Thermodynamic Considerations (formation constants, chelate effect and redox potentials). Macrocyclic Ligands Ligand exchange reactions in octahedral and square-planar complexes. Thermodynamic and kinetic considerations. Classification of Mechanisms. Trans effect and Trans influence Electron transfer reactions: mechanisms of inner and outer spheres reactions.

Bibliography

Textbooks

- G. L. Miessler, D. A. Tarr. Inorganic Chemistry. 4th ed., Harlow : Pearson, 2011. 1213p.
- J. E. Huheey, E. A. Keiter, R. L. Keiter. Inorganic Chemistry: Principles of Structure and Reactivity. 4th ed. New York : Harper Collins, 1993. 964p.
- C. E. Housecroft, A. G. Sharpe. Inorganic Chemistry. 4th ed. Upper Saddle River. NJ : Prentice-Hall, 2012. 754p.

Supplemental Readings

- D. F. Shriver, P. W. Atkins, C.H. Langford. Inorganic Chemistry. 2nd. ed. Oxford : Oxford University Press, 1994. 819p.
- C. J. Jones. A química dos Elementos dos Blocos d e f. Porto Alegre : Bookman, 2002. 184p.
- D. Nicholls. Complexes and First-Row Transition Elements. New York : Elsevier, 1975. 215p.
- Textbooks and reference materials selected by the Professor.

Evaluation criteria

For grading policy, see: Regimento Geral de Graduação, Seção I – Normas Gerais, Capítulo V – Da Avaliação do Aluno na Disciplina. Students are required to attend 75 % of the lectures. For further details, see: Regimento Geral de Graduação, capítulo VI, seção X, artigo 72.