

VEER NARMAD SOUTH GUJARAT UNIVERSITY M.Sc.-I (CHEMISTRY)

PROPOSED SYLLABUS TO BE EFFECTIVE FROM JUNE 2018

PAPER-I (Inorganic Chemistry)

Max. Marks: 100 (External – 70 + Internal – 30)

Total Periods: 45

SEMESTER-II

UNIT-1 ELEMENTS OF MAGNETOCHEMISTRY:

12 Periods

Definitions of magnetic properties, type of magnetic bodies, the source of paramagnetism, diamagnetism and pascal's constant, Example of pascals constant.

Curie and Curie-Weiss law, Magnetic Properties of transition elements.

Determination of magnetic susceptibility:

(a) Gouy method (b) Faraday method (c) Null deflection method.

Application of magnetic susceptibility measurements, Temperature independent paramagnetism (TIP), Orbital contribution to magnetic moment.

UNIT-II: METAL π -COMPLEXES

11 Periods

Metal carbonyls: Introduction, classification of metal carbonyls, structure and bonding, vibrational spectra studies for bonding and structure elucidation. Preparation of metal carbonyls by (1) Direct synthesis and (2) From metal compounds.

preparation Properties and structure of $\text{Ni}(\text{CO})_4$, $\text{Fe}_2(\text{CO})_9$ and $\text{Co}_2(\text{CO})_8$, 18-electron rule and EAN of metal carbonyls.

Metal Nitrosyls: Introduction, coordination compounds of metal nitrosyls, preparation properties of nitrosyl compounds like nitrosyl halides, nitrosyl cyanides, hydroxides and nitrosyl aquo compounds Complex of NO^+ iron, EAN and structures of nitrosyls.

UNIT-III: Inorganic polymers

11Periods

Definition of polymers and their depiction. Characteristic of inorganic polymer.

Characterization of inorganic polymers (physical properties) by molecular weight, number average and weight average.

Structural features of polymers: (1) Backbone bonding (2) Branching and cross-linking (3) Chemical and stereochemical variability

Classification of inorganic polymer, synthesis, properties, structures uses and application of polyphosphazenes and polysiloxanes.

UNIT- IV: COORDINATION COMPOUNDS

11 Periods

Classification of coordination compounds, Werner's theory of coordination,

Electronic interpretation of coordination compounds, Factors effecting the formation of complex ions, Detection of complex ion in solution,

Chelation, Factors influencing the stability of metal chelates, Importance of chelates, Role of metal chelates in living system

Inner complexes and polynuclear complexes, Determination of composition of complex ions.

Reference Book: (For semester –II)

- (1) Magneto chemistry by R. L. Carlin.
- (2) Elements of Magnetochemistry by A. Syamal and R. L. Dutta, Affiliated East-West press, New Delhi, 1993.
- (3) Introduction to metal pi-complex chemistry by M. Tsusui, M. Ichikwa, K. Mori, Plenum press, New York.
- (4) Introductory polymer chemistry by G. S. Mishra, Wiley Eastern Ltd., 1993.
- (5) Phosphorous-Nitrogen Compounds, H. R. Allock, Academic, New York, 1972.
- (6) Advanced in Inorganic Chemistry by S. K. Agarwal, Keemtilal, Pragati prakashan, Meerut.
- (7) Coordination Chemistry by Ajaykumar, Aaryush Education publication, Third publication.
- (8) Principles of inorganic chemistry by Puri, Sharma and Kalia, Vishal publication Co. Jalandhar, Delhi.
- (9) Coordination Chemistry by Gurdeep Chatwal, M. S. Yadav, Himalaya Publishing House.
- (10) Inorganic Polymers by Prof. G. R. Chatwal, Himalaya Publishing House.