

BS23MN1CH1
BSC Semester- 1 (Minor)
General Chemistry

Unit 1

Recapitulation of basics of Organic Chemistry

Hybridization, Shapes of molecules, Electronic Displacements: Inductive, Electromeric, resonance and Mesomeric effects, hyper conjugation, Dipole moment; Hydrogen bonding (Applications to be discussed with relevant topics) Homolytic and Heterolytic fission with suitable examples. Curly arrow rules, formal charges; Electrophiles and Nucleophiles; Types, shape and relative stability of Carbocations, Carbanions and Free radicals. Introduction to types of organic reactions: Addition, Elimination and Substitution reactions.

Unit 2

Periodicity of Elements

Brief discussion of the following properties of the elements, with reference to s & p-block and the trends shown: (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table. (b) Atomic and ionic radii (c) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization enthalpy and trends in groups and periods. (d) Electron gain enthalpy and trends in groups and periods. (e) Electronegativity, Pauling's/ Allred Rochow's scales.

Unit 3

Gaseous State

Kinetic theory of gases, Maxwell-Boltzmann's distribution of velocities, Ideal gas laws, Deviation from ideal gas laws, Ideal and real gases, Reasons for deviation from ideal gas laws, Compressibility factor, van der Waals equation of state, Critical phenomena. (Numerical problems expected wherever necessary)

SEMESTER I (Chemistry Practical for Minor)

Preparation of standard solution of Succinic Acid, Oxalic Acid (Hydrated & Anhydrous)

(1) Succinic Acid/Oxalic Acid \rightarrow NaOH

(2) Succinic Acid/Oxalic Acid \rightarrow KOH

(3) Oxalic Acid (Hydrated & Anhydrous) \rightarrow NaOH

(4) Oxalic Acid (Hydrated & Anhydrous) \rightarrow KOH

(5) Determination of the amount of calcium carbonate in chalk using standard HCl and NaOH solutions (back-titration)

Reference books (Theory)

1. Morrison, R. T. and Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt Ltd. (Pearson Education). 2012
2. Finar, I. L. *Organic Chemistry (Volume 1)*, Dorling Kindersley (India) Pvt Ltd. (Pearson Education).
3. Lee, J.D. *Concise Inorganic Chemistry ELBS*, 1991.
4. Douglas, B.E. and McDaniel, D.H. *Concepts & Models of Inorganic Chemistry*, Oxford, 1970
5. Atkins, P. W. & Paula, J. de *Atkin's Physical Chemistry 10th Ed.*, Oxford University Press (2014).
6. Castellan, G. W. *Physical Chemistry 4th Ed.* Narosa (2004).
7. Puri B. R., Sharma L. R. & Pathania M. S. *Principles of Physical Chemistry*, Vishal Publishing Company, 2008

Reference Books (Practical)

1. 'Vogel's Textbook of Macro and Semi Micro Qualitative Inorganic Analysis', Orient Longman Ltd. 5th Ed.
2. 'Vogel's Textbook of Quantitative Chemical analysis' Revised by G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denney, ELBS (English Language Book Society) Longman. 5th Ed.
3. 'Analytical Chemistry' by Dhruba Charan Dash, PHI Learning Private Ltd, New Delhi, 2011.
4. 'Analytical Chemistry' by Gary D. Christian, 4th Ed., John Wiley & Sons.
5. 'Advanced Practical Inorganic Chemistry' by Gurdeep Raj, Goel Publishing House, Meerut, 9th Ed.