

Smt Sindhutai Jadhao Arts and Science Mahavidyalaya, Mehkar

B.Sc. I SEMESTAR I

CHEMISTRY

Topic	Link for Material
Unit-1	
Polarisation-Definition,polarising power,polarizability.Effect of polarization on nature of bond.Fajan's rules of polarisation and its applications.	https://youtu.be/R0AAIcfn1s
Covalent bonding-Directional nature of covalent bond. Hybridisation, types of hybridisation to explain geometries of NH ₄ ⁺ ion, PCI ₅ , SF ₆ and IF ₇ .	https://youtu.be/43h67Ey6oEs
Intermolecular forces-Dipole-dipole, dipole-induced-dipole, induced dipole-induced dipole interactions (keesom, Debye and London dispersion forces). Ion - dipole interactions.	https://youtu.be/664YicsoYkg
Acids and Bases-Theory of solvent systems and Lux-Flood concept of acids and bases.Hard and soft acids and bases.Pearsons HSAB or SHAB principle with important applications.	https://youtu.be/2jjkfJlb2V4
	https://youtu.be/52-IIryZxLA
	https://youtu.be/xkAl_o2OxhA
Unit-2	
P-Block Elements-Comparative study of 16th and 17th group with special reference to iodine. Interhalogen compounds, structure and bondings. Introduction to fluorocarbons elements with reference to electronic configuration, ionisation energy and oxidation states. Oxidising properties of halogens with reference to oxidation potential. Basic properties of halogens	https://youtu.be/SPo3CgIHEJI
Noble Gases-Inertness of noble gases.Compounds of noble gases-only structure and bonding in XeF ₂ , XeF ₄ ,XeF ₆ ,XeOF ₄ ,XeO ₂ F ₂ ,XeO ₃ and XeO ₄	https://youtu.be/4u5fBqDDYho
Nonaqueous Solvents-Requirements of a good solvent.Water as an universal solvent. Physical properties of solvents namely liquid range,dielectric constant, dipole moment, heat of vaporisation and solubility behaviour. Classification of solvents. Reactions in liquid ammonia (acid base, precipitation, redox, solvolysis and complexation reactions), solutions of metals in liquid ammonia. Merits and demerits of liquid ammonia as a solvent	https://youtu.be/55pjXVeaB7I
	https://youtu.be/fB7_rvIeKtw
Unit-3	
Halogen Derivatives A] Alkyl Halides: Synthesis of ethyl bromide from ethane and ethylene. Reactions of ethyl bromide (Substitution and elimination). Mechanism of SN ₁ , SN ₂ and E ₁ , E ₂ reactions. Elimination verses substitution.	https://youtu.be/tPuDGI66koQ

Alkenyl Halides: Synthesis and reactions of vinyl, allyl and benzy chlorides. Comparison of reactivity of vinyl an allyl chloride.	https://youtu.be/nMbGuizgPH4
Aryl Halides: Synthesis and reactions of Chloro benzenes, Mechanism of Nucleophilic (benzyne) substitution reaction, comparison of reactivity of chlorobenzene and benzyl chloride.	See above Video
Unit-4	
Alcohols, Phenols, Ethers and Epooxides: A] Alcohols: Synthesis and reactions of benzyl alcohol, Ethylene glycol and Glycerol. Mechanism of Pinacol-Pinacolone rearrangement.	https://youtu.be/tiBr9rpeRfQ
Phenols: Classification and nomenclature of phenols. Methods of formations a) from Cumene, b) from benzene. Acidic character, Comparative acidic strength of alcohols and phenols. Reaction of Phenols. Electrophilic aromatic substitution. a) Acetylation, b) Carboxylation (Kolb's reaction), c) Fries Rearrangement (With mechanism), d) Claisen Rearrangement, e) Gatterman Synthesis, f) Hauben-Hoech reaction, g) Reimer – Tiemann reaction.	https://youtu.be/F44Tf
Ethers: Introduction, synthesis and reactions of diethyl ether. Relative reactivities of alcohols and ethers.	https://youtu.be/pUF1Rnhapso
Epoxides: Synthesis of ethylene oxide and styrene oxide (onemethod). Ring opening of styrene oxide catalysed by acid and alkali.	https://youtu.be/6X8IRyRQwk8
Unit- 5	
Crystalline state Crystalline and amorphous solids, Law of constancy of interfacial angles, Symmetry in crystals, Plane of symmetry, axis of symmetry, and angle of symmetry, Elements of symmetry in cubic crystals, law of symmetry, Space lattice, Crystal lattice, Unit cell and Lattice planes , Law of rational indices, Weiss and Miller indices of a lattice planes, Calculation of inter planer distance(dhkl) from Miller indices(hkl) in a cubic system. Seven crystal systems and fourteen Bravais lattices, Bravais lattices of cubical system Simple cubic crystal(scc), body centered cubic(bcc) and face centred cubic(fcc) Calculation of number of constituent units in scc, bcc and fcc, Ratio of inter planer distances for 100, 110 and 111 lattice planes in scc, bcc, fcc (no geometrical derivation)	https://youtu.be/zbofISN8m6I
Derivation of Bragg's equation for X-ray diffraction, Bragg's Xray spectrometer method for the determination of crystal structure of NaCl and KCl, Anomalous behaviour of KCl towards X-ray , Numericals	https://youtu.be/PDwqff62_3E
Unit-6	
	https://youtu.be/yHgxXkIXnMA

<p>Chemical Kinetics and Catalysis Explanation of terms like rate of reaction, order of reaction and molecularity. Definition with one example of zero, first and second order reactions, Half life period of a reaction</p>	<p>https://youtu.be/_NDwpx23dIM</p>
<p>Derivation of the rate constant (k) of first and second reaction with equal initial concentration and different initial concentration of reactants, Characteristics of second order reactions. Determination of order of reaction – Method of integration, graphical method, equifractional change method, Ostwald's isolation method and vant Hoff differential method</p>	<p>https://youtu.be/COv9ouQMAaQ</p>
<p>Effect of temperature on reaction rate, Arrhenius equation, Activation energy and its determination using Arrhenius equation.</p>	<p>https://youtu.be/8NGcAUOSkX0</p>
<p>Definition of catalyst, characteristics of catalysed reaction, Homogeneous and Heterogeneous catalysis with example of each. Explanation of heterogeneous catalysis on the basis of adsorption theory. Catalytic promoters, poisons & Numericals.</p>	<p>https://youtu.be/YTx_WMtUaJ4</p>