

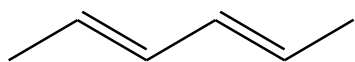
UV Spectroscopy

- 1) The Ultraviolet Region (UV) of electromagnetic spectrum extend from :
a) 0 to 200 nm **b) 4 to 400 nm** c) 40 to 4000 nm d) 400 to 800 nm
- 2) Which of the following is an Auxochrome ?
a) -N=O b) -NO₂ c) -N=N- **d) -OH**
- 3) Which of the following is Chromophore ?
a) -SO₃H **b) -NO₂** c) -NH₂ d) -OH
- 4) Certain groups which produce the colour are called as -----
a) Auxochrome **b) Chromophore** c) A dye d) None of these
- 5) Certain groups which are not produces the colour themselves but are able to intensify the colour when present with chromophore is called as -----
a) Auxochrome b) Chromophore c) A dye d) None of these
- 6) A transition in which bonding σ electrons get excited to anti bonding σ^* orbital is called as ----- transitions.
a) σ - σ^* b) n - σ^* c) π - π^* d) n - π^*
- 7) A transition in which one electron of a lone pair get excited to anti bonding σ^* orbital is called as ----- transitions.
a) σ - σ^* **b) n - σ^*** c) π - π^* d) n - π^*
- 8) A transition in which bonding π electron get excited to anti bonding π^* orbital is called as ----- transitions.
a) σ - σ^* b) n - σ^* **c) π - π^*** d) n - π^*
- 9) A transition in which one electron of a lone pair get excited (promoted) to anti bonding π^* orbital is called as n - π^* transition.
a) σ - σ^* b) n - σ^* c) π - π^* **d) n - π^***
- 10) The base value of α,β unsaturated ketone is -----
a) 215 nm b) 200 nm c) 180 nm d) 250 nm
- 11) The base value of heteroannular diene is -----
a) 210 nm **b) 214 nm** c) 180 nm d) 253 nm
- 12) The base value of homoannular diene is -----
a) 210 nm b) 214 nm c) 180 nm **d) 253 nm**
- 13) The shift of absorption maximum (λ_{max}) to the higher wave length is called ----- effect.
a) Hyperchromic b) Hypsochromic **c) Bathochromic** d) Hypochromic

- 14) The shift of absorption maximum (λ_{\max}) to the shorter wave length is called ----- effect.
 a) Hyperchromic **b) Hypsochromic** c) Bathochromic d) Hypochromic
- 15) An effect which leads to an increase in absorption of intensity (ϵ_{\max}) is called ----- shift.
a) Hyperchromic b) Hypsochromic c) Bathochromic d) Hypochromic
- 16) An effect which leads to a decrease in absorption of intensity (ϵ_{\max}) is called ----- shift.
 a) Hyperchromic b) Hypsochromic c) Bathochromic **d) Hypochromic**
- 17) Any isolated co-valently bounded group that shows characteristic absorption in UV region is called
a) Chromophore b) Auxochrome c) Nanochrome d) None of these
- 18) A functional group which does not absorb radiation above 200 nm but when attached to chromophore causes λ_{\max} at higher wave length is called -----
 a) Chromophore **b) Auxochrome** c) Nanochrome d) None of these
- 19) The equation of $\log \frac{I_0}{I} = E.C.I.$ is an expression of :
 a) Beer-Lambert's law **b) Hooks law** c) Beer law d) Lambert's law
- 20) The distance between two adjacent crest or trough in a particular wave is called -----
 a) Frequency b) Wave number **c) Wave length** d) None of these
- 21) A number of waves passes through a point in one second is called -----
a) Frequency b) Wave number c) Wave length d) None of these
- 22) Reciprocal of wave length is called -----
 a) Frequency **b) Wave number** c) Wave length d) None of these
- 23) A compound containing chromophore is called -----
 a) Achromogen b) A peptide c) A dye **d) Auxochrome**
- 24) UV spectroscopy is used for detection of ----- in organic compounds
 a) functional group b) conjugation c) protons d) None of these
- 25) In methane molecule, ----- transitions occur.
a) $\sigma-\sigma^*$ b) $n-\sigma^*$ c) $\pi-\pi^*$ d) $n-\pi^*$
- 26) In methyl alcohol molecule, $n-\sigma^*$ transitions occur at -----
 a) 100 nm b) 150 nm **c) 174 nm** d) 300 nm
- 27) In 1,3-butadiene molecule, $\pi-\pi^*$ transitions occur at -----
 a) 100 nm **b) 217 nm** c) 150 nm d) 300 nm
- 28) In acetone molecule, $n-\pi^*$ transitions occur at -----

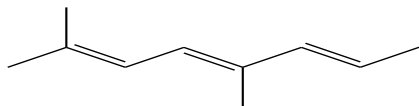
a) 100 nm b) 217 nm c) 174 nm **d) 280 nm**

29) λ_{max} of following compound is ----



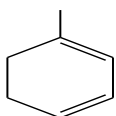
a) 224 nm b) 234 nm c) 244 nm d) 254 nm

30) λ_{max} of following compound is ----



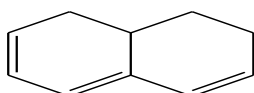
a) 224 nm b) 234 nm **c) 264 nm** d) 284 nm

31) λ_{max} of following compound is ----



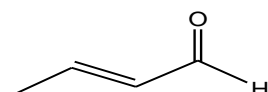
a) 224 nm **b) 268 nm** c) 274 nm d) 284 nm

32) λ_{max} of following compound is ----



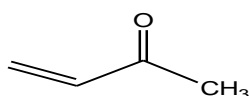
a) 303 nm b) 234 nm c) 244 nm d) 254 nm

33) λ_{max} of following compound is ----



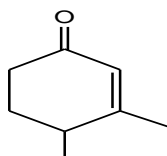
a) 225 nm **b) 219 nm** c) 144 nm d) 254 nm

34) λ_{max} of following compound is ----



a) 224 nm b) 234 nm **c) 215 nm** d) 254 nm

35) λ_{max} of following compound is ----



a) 239 nm b) 254 nm c) 264 nm d) 284 nm

IR Spectroscopy

- 1) IR spectroscopy is used for detection of ----- in known and unknown compounds.
a) functional group b) conjugation c) protons d) none of these
- 2) Movement of both atoms with respect to central atom in the same direction is known as ----- stretching vibrations.
a) asymmetric **b) symmetric** c) twisting d) wagging
- 3) Movement of one of the atom approaches to central atom while other away from it, known as ----- stretching vibration.
a) asymmetric b) symmetric c) twisting d) wagging
- 4) Two atoms approach to each other with change in their bond angle, known as ---
--- bending vibration.
a) Rocking **b) Scissoring** c) twisting d) wagging
- 5) Movement of two atoms in the same direction, known as ----- bending vibrations.
a) Rocking b) Scissoring c) twisting d) wagging
- 6) Two atoms move up and down with respect to plane of the central atom, known as ----- bending vibration.
a) Rocking b) Scissoring c) twisting **d) wagging**
- 7) One of the atom move up and other moves down to the plane with respect to central atom, known as ----- bending vibration.
a) Rocking b) Scissoring **c) twisting** d) wagging
- 8) The ordinary (important) IR-region extend from -----
a) 4000- 667 cm⁻¹ b) 1-10 cm⁻¹ c) 200-400 nm d) 5000-50 cm⁻¹
- 9) The >C=O group of ketone shows IR-absorption in the range -----
a) 3650-3440 cm⁻¹ **b) 1760-1690 cm⁻¹** c) 2280-2130 cm⁻¹ d) 1320-1180 cm⁻¹
- 10) The -OH group of alcohol shows IR-absorption in the range -----
a) 3600-3200 cm⁻¹ b) 1760-1690 cm⁻¹ c) 2280-2130 cm⁻¹ d) 1320-1180 cm⁻¹
- 11) The Ar-H group of aromatic compound shows IR-absorption in the range ----
a) 3650-3440 cm⁻¹ b) 1760-1690 cm⁻¹ **c) 3100-3000 cm⁻¹** d) 1320-1180 cm⁻¹
- 12) The N-H group of amines shows IR-absorption in the range -----
a) 3500-3300 cm⁻¹ b) 1760-1690 cm⁻¹ c) 2280-2130 cm⁻¹ d) 1320-1180 cm⁻¹
- 13) The -C=C- group of aromatic compound shows IR-absorption in the range ----
a) 3500-3300 cm⁻¹ **b) 1600-1450 cm⁻¹** c) 2280-2130 cm⁻¹ d) 1320-1180 cm⁻¹

- 14) The $\text{-C}\equiv\text{C-}$ group of alkene shows IR-absorption in the range -----
a) $3500\text{-}3300\text{ cm}^{-1}$ b) $1760\text{-}1690\text{ cm}^{-1}$ **c) $2200\text{-}2100\text{ cm}^{-1}$** d) $1320\text{-}1180\text{ cm}^{-1}$
- 15) The $\text{-C}\equiv\text{N-}$ group of cyanide shows IR-absorption in the range -----
a) $3500\text{-}3300\text{ cm}^{-1}$ b) $1760\text{-}1690\text{ cm}^{-1}$ **c) $2280\text{-}2200\text{ cm}^{-1}$** d) $1320\text{-}1180\text{ cm}^{-1}$
- 16) In IR-spectroscopy **Finger print region** extend from -----
a) $1400\text{-}667\text{ cm}^{-1}$ b) $1760\text{-}1690\text{ cm}^{-1}$ c) $3100\text{-}3000\text{ cm}^{-1}$ d) $1320\text{-}1180\text{ cm}^{-1}$
- 17) In IR-spectroscopy **Functional group region** extend from -----
a) $1400\text{-}667\text{ cm}^{-1}$ **b) $4000\text{-}1400\text{ cm}^{-1}$** c) $3100\text{-}3000\text{ cm}^{-1}$ d) $1320\text{-}1180\text{ cm}^{-1}$
- 18) In alcohols, C-O stretching of primary alcohol appears at ----
a) 1200 cm^{-1} b) 1150 cm^{-1} c) 1100 cm^{-1} **d) 1050 cm^{-1}**
- 19) In alcohols, C-O stretching of secondary alcohol appears at ----
a) 1200 cm^{-1} b) 1150 cm^{-1} **c) 1100 cm^{-1}** d) 1050 cm^{-1}
- 20) In alcohols, C-O stretching of tertiary alcohol appears at ----
a) 1200 cm^{-1} **b) 1150 cm^{-1}** c) 1100 cm^{-1} d) 1050 cm^{-1}
- 21) In phenols, C-O stretching appears at ----
a) 1200 cm^{-1} b) 1150 cm^{-1} c) 1100 cm^{-1} d) 1050 cm^{-1}
- 22) In ethers, C-O stretching appears at ----
a) 1200 cm^{-1} b) 1150 cm^{-1} c) 1100 cm^{-1} **d) 1070 cm^{-1}**

PMR Spectroscopy

- 1) What is the range of chemical shift in PMR spectrum ?
a) 0 to 20 ppm b) 0 to 40 ppm **c) 0 to 10 ppm** d) 0 to 30 ppm
- 2) The number of PMR signals in Diethyl ether is :
a) 2 b) 3 c) 4 d) 1
- 3) The number of PMR signals in ethylamine is -----
a) 2 **b) 3** c) 4 d) 1
- 4) The number of PMR signals in Mesitylene is -----
a) 4 b) 3 **c) 2** d) 1
- 5) The number of PMR signals in Acetone is -----
a) 4 b) 3 c) 2 **d) 1**
- 6) The number of PMR signals in Cyclobutane is -----
a) 4 b) 3 c) 2 **d) 1**
- 7) The number of PMR signals in Methanol is -----
a) 4 b) 3 **c) 2** d) 1
- 8) The number of PMR signals in Ethyl benzene is -----
a) 4 **b) 3** c) 2 d) 1
- 9) In PMR spectroscopy, when acetylene molecule placed in magnetic field then the proton shows ----- effect.
a) Shielded b) Deshielded c) Both a & b d) None of these
- 10) In PMR spectroscopy, when benzene molecule placed in magnetic field then the proton shows ----- effect.
a) Shielded **b) Deshielded** c) Both a & b d) None of these
- 11) The splitting of PMR signal is called as ----- coupling.
a) spin-spin b) twisted c) twinted d) None of these
- 12) A set of protons with identical environment is called -----
a) Equivalent protons b) Non equivalent protons
c) Shielded protons d) Deshielded protons
- 13) A set of protons with different environment is called -----
a) Equivalent protons **b) Non equivalent protons**
c) Shielded protons d) Deshielded protons

- 14) Which is an example of equivalent protons ?
 a) $\text{CH}_3\text{-OH}$ **b) $\text{CH}_3\text{-CO-CH}_3$** c) $\text{CH}_3\text{CH}_2\text{Br}$ d) $\text{CH}_3\text{CH}_2\text{NH}_2$
- 15) Which is an example of non equivalent protons ?
 a) **$\text{CH}_3\text{-OH}$** b) $\text{CH}_3\text{-CO-CH}_3$ c) CH_3CH_3 d) CH_4
- 16) Which is an example of equivalent protons ?
 a) $\text{CH}_3\text{-OH}$ b) $\text{CH}_3\text{-CO-CH}_3$ c) $\text{CH}_3\text{CH}_2\text{Br}$ d) $\text{CH}_3\text{CH}_2\text{NH}_2$
- 17) In PMR spectroscopy, shielded protons present in -----
 a) Benzene **b) Acetylene** c) Acetone d) None of these
- 18) In PMR spectroscopy, deshielded protons present in -----
a) Benzene b) Acetylene c) Acetone d) None of these
- 19) Splitting of PMR signal is called -----
 a) chemical shift b) TMS **c) spin-spin splitting** d) None of these
- 20) In PMR spectroscopy, $\text{CH}_3\text{-CH}_2\text{-Br}$ molecule, signal of $-\text{CH}_2$ protons shows -----
 a) singlet **b) quartet** c) doublet d) None of these
- 21) In PMR spectroscopy, $\text{CH}_3\text{-CH}_2\text{-Br}$ molecule, signal of $-\text{CH}_3$ protons shows -----
a) triplet b) quartet c) doublet d) None of these
- 22) The distance between the centers of two adjacent bands in a multiplet is called as -----
 a) chemical shift **b) coupling constant** c) TMS d) None of these
- 23) TMS is called as -----
 a) chemical shift b) coupling constant **c) Tetramethyl silane** d) None of these

Amino acids, Peptides and Molecular rearrangements

- 1) Amino acids are the biologically important compounds containing an ----- and ----
-- functional group in the same compound.
a) -NH₂ & -COOH b) -NH₂ & -NO₂ c) -OH & -COOH d) -OH & -NH₂
- 2) Amino acid containing one amino group and one carboxylic acid group is called
as ----- amino acids.
a) Acidic b) Basic **c) Neutral** d) None of these
- 3) Amino acid containing two amino groups and one carboxylic acid group is called
as ----- amino acids.
a) Acidic **b) Basic** c) Neutral d) None of these
- 4) Amino acid containing one amino group and two carboxylic acid groups is called
as ----- amino acids.
a) Acidic b) Basic c) Neutral d) None of these
- 5) When a-chloro acetic acid react with NH₃ gives -----
a) Glycine b) Glycol c) Glycerol d) None of these
- 6) When potassium phthalimide react with ethyl chloroacetate gives N-substituted
phthalimide which on acidic hydrolysis with water gives -----
a) Glycine b) Glycol c) Glycerol d) None of these
- 7) When potassium phthalimide react with ethyl chloroacetate gives N-substituted
phthalimide which on acidic hydrolysis with water gives glycine. This reaction is
known as -----
a) Streckers synthesis **b) Gabriel phthalimide synthesis**
c) Kolbes synthesis d) None of these
- 8) The isoelectric point of PH at which an amino acid exists completely as a -----
a) Zwitter ion b) Halo acids c) Fatty acid d) None of these
- 9) A molecule containing $\text{---}\overset{\text{O}}{\parallel}{\text{C}}\text{---NH---}$ bond is called as----- peptides
a) amino acid **b) peptides** c) Fatty acid d) None of these
- 10) Two amino acids molecules on condensation with elimination of water gives ----
a) dipeptide b) tripeptides c) polypeptide d) None of these
- 11) Three amino acids molecules on condensation with elimination of water gives ----
a) dipeptide **b) tripeptides** c) polypeptide d) None of these
- 12) Many no. of amino acids molecules on condensation with elimination of water
gives ----
a) dipeptide b) tripeptides **c) polypeptide** d) None of these

- 13) Which of the following is an example of polypeptide ?
a) amino acid b) Glycylalanine **c) protein** d) None of these
- 14) Acid catalyzed rearrangement of pinacol to pinacolone with elimination of water is known as ----- rearrangement.
a) pinacol to pinacolone b) Favroskii c) PhotoFries d) Stevens
- 15) Base catalyzed rearrangement of α -haloketones or cyclopropanones to carboxylic acids or their derivatives known as ----- rearrangement.
a) pinacol to pinacolone **b) Favroskii** c) PhotoFries d) Stevens
- 16) Phenyl acetate on irradiated with UV light, the acyl group migrates from the phenolic oxygen to ortho or para position on the ring to form o/p-hydroxy acetophenone this is called as ----- rearrangement.
a) pinacol to pinacolone b) Favroskii **c) Photo Fries** d) Stevens
- 17) Quaternary ammonium salts and sulfonium salts in presence of a strong base converted into the corresponding amines or sulfides ----- rearrangement.
a) pinacol to pinacolone b) Favroskii c) PhotoFries **d) Stevens**