



**BUDDHA SERIES**  
**(Unit Wise Solved Question & Answers)**

**Course – B.Sc. Bio 3<sup>rd</sup> year (5<sup>th</sup> semester)**

**College – Buddha Degree College**

**(DDU Code-859)**

**Department:** Science

**Subject:** Chemistry

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# UNIT-1

## Alkanes and Cycloalkanes

1. In alkanes, a **tertiary carbon** is one that is:

- A) Attached to one carbon
- B) Attached to two carbon atoms
- C) Attached to three carbon atoms
- D) Attached to four carbon atoms

**Answer: C**

2. The general formula of alkanes is:

- A)  $C_n H_{2n}$
- B)  $C_n H_{2n-2}$
- C)  $C_n H_{2n+2}$
- D)  $C_n H_n$

**Answer: C**

3. Wurtz reaction involves reaction of:

- A) Alkyl halides with zinc
- B) Alkyl halides with sodium
- C) Alkanes with chlorine
- D) Alcohols with NaOH

**Answer: B**

4. Wurtz-Fittig reaction is used to prepare:

- A) Alkenes
- B) Alkanes
- C) Aromatic hydrocarbons
- D) Alcohols

**Answer: C**

5. Free radical halogenation occurs in:

- A) Cold temperature
- B) Presence of light or heat
- C) Acidic medium
- D) Neutral medium only

**Answer: B**

6. The order of reactivity in halogenation of alkanes is:

- A)  $1^\circ > 2^\circ > 3^\circ$
- B)  $3^\circ > 2^\circ > 1^\circ$
- C)  $2^\circ > 3^\circ > 1^\circ$
- D)  $1^\circ > 3^\circ > 2^\circ$

**Answer: B**

7. In free radical halogenation, **selectivity** follows the order:

- A)  $\text{Cl}_2 > \text{Br}_2$
- B)  $\text{Br}_2 > \text{Cl}_2$
- C)  $\text{F}_2 > \text{Br}_2$
- D)  $\text{I}_2 > \text{Cl}_2$

**Answer: B**

8. Cycloalkanes have the general formula:

- A)  $\text{C}_n \text{H}_{2n+2}$
- B)  $\text{C}_n \text{H}_{2n}$
- C)  $\text{C}_n \text{H}_n$
- D)  $\text{C}_n \text{H}_{2n-2}$

**Answer: B**

9. Baeyer's strain theory fails for:

- A) Cyclopropane
- B) Cyclopentane
- C) Cyclohexane
- D) Cyclobutane

**Answer: C**

10. Which is the most stable conformation of cyclohexane?

- A) Boat
- B) Chair
- C) Twist-boat
- D) Planar

**Answer: B**

11. Which cycloalkane exhibits **banana bonds**?

- A) Cyclobutane
- B) Cyclopropane
- C) Cyclopentane
- D) Cyclohexane

**Answer: B**

12. The angle strain in cyclopropane is due to:

- A) Bond angle of  $120^\circ$
- B) Tetrahedral angle distortion
- C) Pyramidal geometry
- D) Aromaticity

**Answer: B**

13. In the **twist-boat** form of cyclohexane:

- A) All atoms are planar
- B) Strain is higher than chair
- C) It is more stable than chair

D) It is the least stable

**Answer: B**

**14.** Cyclopentane avoids angle strain by:

A) Becoming planar

B) Adopting an envelope conformation

C) Remaining rigid

D) Expanding bond angles

**Answer: B**

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## Alkenes

**15.** Alkenes have the general formula:

A)  $C_n H_{2n}$

B)  $C_n H_{2n+2}$

C)  $C_n H_n$

D)  $C_n H_{2n-2}$

**Answer: A**

**16.** Addition of HBr to propene follows:

A) Anti-Markovnikov's rule

B) Markovnikov's rule

C) Rearrangement

D) SN1 mechanism

**Answer: B**

**17.** Which reaction gives **anti-Markovnikov** product?

A) HCl addition

B) HBr in presence of peroxides

C)  $H_2O$  addition

D) Oxymercuration

**Answer: B**

**18. Hydroboration-oxidation** of alkenes gives:

A) Markovnikov alcohol

B) Anti-Markovnikov alcohol

C) Alkene

D) Aldehyde

**Answer: B**

**19.** In halogenation of alkenes, the intermediate is:

A) Free radical

B) Carbocation

- C) Halonium ion
- D) Carbanion

**Answer: C**

**20.** Which reagent is used in **epoxidation** of alkenes?

- A)  $\text{KMnO}_4$
- B) Peracids (e.g., mCPBA)
- C)  $\text{HCl}$
- D)  $\text{LiAlH}_4$

**Answer: B**

**21.** Syn hydroxylation of alkenes is done using:

- A)  $\text{O}_3$
- B)  $\text{KMnO}_4$  (cold, dilute)
- C)  $\text{HCl}$
- D)  $\text{H}_2$

**Answer: B**

**22.** Ozonolysis of alkenes produces:

- A) Alcohols
- B) Aldehydes/ketones
- C) Acids
- D) Alkanes

**Answer: B**

**23.** The hydrogenation of alkenes results in:

- A) Formation of alcohol
- B) Alkynes
- C) Alkanes
- D) Epoxides

**Answer: C**

**24.** Bromination of alkenes gives:

- A) Syn addition
- B) Anti addition
- C) Rearranged product
- D) Radical chain reaction

**Answer: B**

**25.** Which of the following represents **E-isomer** of 2-butene?

- A) Both  $\text{CH}_3$  groups on same side
- B) Both  $\text{CH}_3$  groups on opposite sides
- C) Hydrogen and  $\text{CH}_3$  on same side
- D) None of these

**Answer: B**

## UNIT-2

### Chemistry of Alkynes

1. The general formula of alkynes is:

- A)  $C_n H_{2n}$
- B)  $C_n H_{2n-2}$
- C)  $C_n H_{2n+2}$
- D)  $C_n H_{2n+4}$

**Answer: B**

2. Which of the following is a method of forming alkynes?

- A) Dehydrohalogenation of dihalides
- B) Oxidation of alkanes
- C) Hydrolysis of alkyl halides
- D) Hydrogenation of alkenes

**Answer: A**

3. Terminal alkynes react with sodium metal to form:

- A) Alcohol
- B) Carbanion
- C) Acetylide ion
- D) Ketone

**Answer: C**

4. Addition of HBr to alkynes gives:

- A) Syn product
- B) Anti-Markovnikov product
- C) Markovnikov product
- D) Alcohol

**Answer: C**

5. Hydrogenation of alkynes in presence of Lindlar's catalyst gives:

- A) Alkanes
- B) Trans-alkenes
- C) Cis-alkenes
- D) Alkyl halides

**Answer: C**

6. In the hydration of alkynes, the intermediate product is:

- A) Alcohol
- B) Carbanion
- C) Enol

D) Ether

**Answer: C**

7. What is formed when acetylene is treated with water in presence of  $\text{Hg}^{2+}$  and  $\text{H}_2\text{SO}_4$ ?

A) Ethanol

B) Ethanal

C) Acetic acid

D) Acetaldehyde

**Answer: B**

8. Which type of reaction is halogenation of alkynes?

A) Nucleophilic substitution

B) Electrophilic addition

C) Elimination

D) Rearrangement

**Answer: B**

9. Which alkynes show acidic nature?

A) Internal

B) Terminal

C) All alkynes

D) None

**Answer: B**

10. Which of the following reagents is used for complete hydrogenation of alkynes?

A) Lindlar's catalyst

B)  $\text{Pd/C}$  and  $\text{H}_2$

C)  $\text{Na/NH}_3$

D) PCC

**Answer: B**

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## Aromaticity and Arenes

11. Which of the following compounds is **aromatic**?

A) Cyclooctatetraene

B) Benzene

C) Cyclobutadiene

D) Cyclopropenyl cation

**Answer: B**

12. Aromatic compounds follow which rule?

A)  $4n$

B)  $4n+2$

C)  $n^2$

D)  $2n+1$

**Answer: B**

**13.** The number of  $\pi$ -electrons in benzene is:

A) 4

B) 2

C) 6

D) 8

**Answer: C**

**14.** Which orbital picture explains benzene's stability?

A) Hybrid orbitals

B) Sigma bonding

C) MO (Molecular Orbital) model

D) Valence bond model

**Answer: C**

**15.** The reaction of benzene with  $\text{Br}_2/\text{FeBr}_3$  is:

A) Nucleophilic substitution

B) Electrophilic aromatic substitution

C) Radical substitution

D) Elimination

**Answer: B**

**16.** What is the product of nitration of benzene?

A) Benzonitrile

B) Nitrobenzene

C) Benzamide

D) Phenylamine

**Answer: B**

**17.** Which group is **meta-directing** in electrophilic substitution?

A)  $-\text{CH}_3$

B)  $-\text{OH}$

C)  $-\text{NO}_2$

D)  $-\text{NH}_2$

**Answer: C**

**18.** Which of the following is a Friedel-Crafts reaction?

A) Alkylation of benzene using alkyl halide

B) Bromination with  $\text{Br}_2$

C) Nitration with  $\text{HNO}_3$

D) Hydrogenation

**Answer: A**



**19.** Birch reduction of benzene gives:

- A) Cyclohexane
- B) 1,4-cyclohexadiene
- C) Cyclohexene
- D) Phenol

**Answer:** B

**20.** Which reagent is used in Birch reduction?

- A) Zn/HCl
- B) Na/NH<sub>3</sub>
- C) Pd/C
- D) KMnO<sub>4</sub>

**Answer:** B

**21.** Biphenyl consists of:

- A) One phenyl ring
- B) Two phenyl rings connected by a bond
- C) Benzene and naphthalene
- D) Benzene and toluene

**Answer:** B

**22.** Which of the following is a fused ring system?

- A) Toluene
- B) Phenol
- C) Anthracene
- D) Chlorobenzene

**Answer:** C

**23.** In electrophilic substitution, alkylbenzene reacts faster than benzene because:

- A) Alkyl group deactivates the ring
- B) Alkyl group is electron-withdrawing
- C) Alkyl group is electron-donating
- D) Resonance is absent

**Answer:** C

**24.** Which of the following is non-aromatic?

- A) Benzene
- B) Cyclohexane
- C) Tropylium ion
- D) Furan

**Answer:** B

**25.** The major product of sulfonation of benzene is:

- A) Benzene sulfonic acid
- B) Benzoic acid
- C) Phenol

D) Nitrobenzene

**Answer:** A