

Quiz: amines 1

Q1: Which of the following is a primary amine?

- A) CH₃NH₂
- B) (CH₃)₂NH
- C) (CH₃)₃N
- D) C₆H₅NHCH₃

Q2: The nitrogen atom in amines is typically:

- A) sp hybridised
- B) sp² hybridised
- C) sp³ hybridised
- D) sp³d hybridised

Q3: Which method is used to prepare primary amines from amides?

- A) Gabriel phthalimide synthesis
- B) Hofmann bromamide reaction
- C) Carbylamine reaction
- D) Stephen reduction

Q4: What is the IUPAC name of CH₃CH₂NH₂?

- A) Methanamine
- B) Ethanamine
- C) Propylamine
- D) Aminoethane

Q5: Which of the following amines is most basic in aqueous solution?

- A) Aniline
- B) Methylamine
- C) Dimethylamine
- D) Trimethylamine

Q6: Basicity of amines in aqueous solution depends on:

- A) Inductive effect
- B) Solvation effect
- C) Resonance
- D) All of the above

Q7: Which amine reacts with nitrous acid to form alcohol?

- A) Primary alkyl amine
- B) Secondary amine
- C) Tertiary amine
- D) Aromatic amine

Q8: Which of the following does not react with nitrous acid?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine

D) Amide

Q9: Which reagent is used in the carbylamine test?

- A) Phenyl isocyanide
- B) Chloroform + base
- C) Acetic anhydride
- D) HNO₃

Q10: Gabriel phthalimide synthesis is used for the preparation of:

- A) Secondary amines
- B) Tertiary amines
- C) Primary amines
- D) Quaternary ammonium salts

Q11: Which of the following is an aromatic amine?

- A) Methylamine
- B) Ethanamine
- C) Aniline
- D) Diethylamine

Q12: Which of the following describes a secondary amine?

- A) RNH₂
- B) R₂NH
- C) R₃N
- D) NH₃

Q13: The lone pair on nitrogen in amines is responsible for its:

- A) Nucleophilicity
- B) Basicity
- C) Coordination ability
- D) All of the above

Q14: Which reaction converts acetamide to methanamine?

- A) Hofmann bromamide reaction
- B) Gabriel synthesis
- C) Esterification
- D) Cannizzaro reaction

Q15: Which of the following is least basic?

- A) Methylamine
- B) Aniline
- C) Dimethylamine
- D) Ethanamine

Q16: Upon reaction with nitrous acid, arylamines produce:

- A) Alcohols
- B) Phenols
- C) Azo compounds
- D) No reaction

Q17: How many structural isomers are possible for C₃H₉N?

- A) 3
- B) 4
- C) 5
- D) 2

Q18: Which test distinguishes primary from secondary and tertiary amines?

- A) Lucas test
- B) Hinsberg test
- C) Tollens test
- D) Bromine water test

Q19: Which amine will not react with Hinsberg reagent?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) None of the above

Q20: Which of the following has the highest boiling point?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) Ammonia

Q21: Carbylamine reaction identifies:

- A) Primary amines
- B) Secondary amines
- C) Tertiary amines
- D) All amines

Q22: Aromatic amines are generally:

- A) More basic than aliphatic amines
- B) Less basic than aliphatic amines
- C) Equally basic
- D) Non-basic

Q23: Which synthesis is used to prepare primary amines without rearrangement?

- A) Gabriel synthesis
- B) Hofmann degradation
- C) Carbylamine reaction
- D) Eschweiler-Clarke reaction

Q24: The basic strength order in aqueous solution is often influenced by:

- A) Inductive effect
- B) Solvation
- C) Resonance
- D) All of the above

Q25: Which amine does not form diazonium salt with nitrous acid?

- A) Primary aromatic amine
- B) Primary aliphatic amine
- C) Secondary amine
- D) None

Q26: Reduction of nitrobenzene gives:

- A) Aniline
- B) Nitrosobenzene
- C) Phenol
- D) Benzene

Q27: Which of the following reagents can be used to reduce nitro compounds to amines?

- A) H₂/Pd
- B) Sn/HCl
- C) Fe/HCl
- D) All of the above

Q28: Which amine is least soluble in water?

- A) Methylamine
- B) Ethanamine
- C) Aniline
- D) Dimethylamine

Q29: The Hoffmann elimination of amines produces:

- A) Alkene
- B) Alkane
- C) Alcohol
- D) amide

Q30: Which of the following will react with Hinsberg reagent to give a soluble sulphonamide that doesn't precipitate on acidification?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) All amines

Q31: Which compound is a tertiary amine?

- A) CH₃NH₂
- B) CH₃NHCH₃
- C) N(CH₃)₃
- D) C₆H₅NH₂

Q32: The solubility of amines in water increases due to:

- A) Hydrogen bonding
- B) Dipole interactions
- C) Ionic interactions after protonation
- D) All of the above

Q33: Which of these cannot be used to prepare amines?

- A) Reduction of nitriles
- B) Reductive amination
- C) Oxidation of alcohols
- D) Hofmann bromamide reaction

Q34: IUPAC name of $(CH_3)_2NH$ is:

- A) Methanamine
- B) Ethanamine
- C) Dimethylamine
- D) Trimethylamine

Q35: Which amine gives positive carbylamine test?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) All amines

Q36: Which reaction converts nitriles to amines?

- A) LiAlH₄ reduction
- B) Hofmann elimination
- C) Esterification
- D) Friedel-Crafts

Q37: Which of the following amines is most hindered?

- A) Methylamine
- B) Ethylamine
- C) Diethylamine
- D) Trimethylamine

Q38: Reaction of amines with acyl chlorides gives:

- A) Amides
- B) Esters
- C) Alcohols
- D) Aldehydes

Q39: Which test can separate primary and secondary amines?

- A) Lucas test
- B) Hinsberg test
- C) Bromine water test
- D) Tollens test

Q40: Which factor decreases basicity of an aromatic amine compared to aliphatic amines?

- A) Inductive effect
- B) Electron delocalisation
- C) Hyperconjugation
- D) Steric hindrance

Q41: Which of the following amines is expected to be the strongest base in aqueous solution?

- A) Aniline
- B) Benzylamine
- C) Ethylamine
- D) 4-Nitroaniline

Q42: The Hinsberg test is used to distinguish between primary, secondary and tertiary amines because:

- A) Only primary amines react to form sulphonamides
- B) Tertiary amines react fastest
- C) Secondary amines form soluble products
- D) Tertiary amines form ammonium salts only

Q43: Nitrous acid reacts with primary aliphatic amines to give:

- A) Alcohols
- B) Diazonium salts
- C) Azo compounds
- D) No reaction

Q44: Which method is used for the preparation of primary amines without rearrangement?

- A) Gabriel phthalimide synthesis
- B) Hofmann bromamide degradation
- C) Carbylamine reaction
- D) Ammonolysis of alkyl halides

Q45: Which of the following is a secondary amine?

- A) CH_3NH_2
- B) $(\text{CH}_3)_2\text{NH}$
- C) $(\text{CH}_3)_3\text{N}$
- D) $\text{C}_6\text{H}_5\text{NH}_2$

Q46: In the carbylamine test, which compound is formed when primary amines react with chloroform and base?

- A) Isocyanide
- B) Amide
- C) Amine salt
- D) Azo compound

Q47: Which of the following will not form a diazonium salt with nitrous acid?

- A) Aniline
- B) p-Nitroaniline
- C) Benzylamine
- D) Aromatic primary amine

Q48: The order of *basic strength* in aqueous solution for amines is influenced by:

- A) Inductive effect
- B) Solvation effects
- C) Resonance
- D) All of the above

Q49: Which of the following will undergo Hofmann elimination to give the major alkene with the least substituted double bond?

- A) Ammonium salt of $(CH_3)_3N$
- B) Ammonium salt of CH_3NH_2
- C) Ammonium salt of $C_6H_5NH_2$
- D) Ammonium salt of $(CH_3)_2NH$

Q50: Which amine is most likely to be soluble in dilute HCl?

- A) Aniline
- B) Tertiary amine
- C) Primary aliphatic amine
- D) Aromatic tertiary amine

Q51: Which of the following amines will give a positive carbylamine test?

- A) Secondary amine
- B) Tertiary amine
- C) Primary amine
- D) Aromatic tertiary amine

Q52: The molecule $CH_2=CH-NHCH_3$ is named as:

- A) N-Methyl-ethenamine
- B) Ethenylamine
- C) 1-Amino-ethene
- D) Vinyl methylamine

Q53: Which reagent is used to distinguish primary and secondary amines by forming sulphonamides?

- A) Benzene sulphonyl chloride
- B) Acetic acid
- C) Nitrous acid
- D) $FeCl_3$

Q54: Which of these amines has the least basic character in aqueous solution?

- A) Methylamine
- B) Dimethylamine
- C) Aniline
- D) Triethylamine

Q55: In Gabriel phthalimide synthesis, the active intermediate formed is:

- A) Imide anion
- B) Carbocation
- C) Free radical
- D) Azide ion

Q56: Which reagent converts a primary amine to an alcohol?

- A) HNO_2
- B) $Br_2/NaOH$
- C) H_2/Pd
- D) $NaBH_4$

Q57: Which of the following is a secondary amine?

- A) CH₃NHCH₂CH₃
- B) NH₃
- C) CH₃CH₂NH₂
- D) (CH₃)₃N

Q58: The reaction of an amine with an acyl chloride produces:

- A) Amide
- B) Ester
- C) Alcohol
- D) Ketone

Q59: Which property increases when an amine forms an ammonium salt?

- A) Boiling point
- B) Water solubility
- C) Basicity
- D) Aromaticity

Q60: Which of the following is NOT a method for preparing amines?

- A) Reduction of nitriles
- B) Hofmann degradation of amides
- C) Oxidation of alcohols
- D) Gabriel synthesis

Q61: Which reagent reduces a nitrile to a primary amine?

- A) LiAlH₄
- B) Pd/C
- C) NaOH
- D) Fe/HCl

Q62: Which of the following is an aromatic amine?

- A) Aniline
- B) Methylamine
- C) Ethylamine
- D) Diethylamine

Q63: The basic strength of amines generally increases with:

- A) Electron donating groups
- B) Electron withdrawing groups
- C) Aromatic rings attached
- D) Steric hindrance

Q64: Which of the following amines is most sterically hindered?

- A) Trimethylamine
- B) Methylamine
- C) Dimethylamine
- D) Ethylamine

Q65: Which reagent distinguishes primary from secondary amines by producing different types of sulphonamides?

- A) Hinsberg reagent
- B) Benzoyl chloride
- C) Nitrous acid
- D) Sulphuric acid

Q66: Which of the following salts results from amine reacting with acid?

- A) Ammonium salt
- B) Carboxylate
- C) Sulphonate
- D) Ether

Q67: Which amine reacts vigorously with nitrous acid to form nitrogen gas?

- A) Primary aliphatic amine
- B) Secondary amine
- C) Tertiary amine
- D) None

Q68: Which of the following is a tertiary amine?

- A) $\text{NH}(\text{CH}_3)_2$
- B) $\text{N}(\text{CH}_3)_3$
- C) CH_3NH_2
- D) $\text{C}_6\text{H}_5\text{NH}_2$

Q69: The boiling point of amines increases with:

- A) Increased hydrogen bonding
- B) Increased aromaticity
- C) Decreased molecular mass
- D) Branching

Q70: Which of the following is not a characteristic reaction of amines?

- A) Acylation
- B) Esterification
- C) Alkylation
- D) Formation of ammonium salt

Q71: Which of the following amines is the most basic in aqueous solution?

- A) Aniline
- B) Methylamine
- C) N-Ethylethanamine
- D) N-Methylaniline

Q72: Which reagent is used to distinguish primary and secondary amines by forming sulphonamides?

- A) Benzene sulphonyl chloride
- B) Nitrous acid
- C) Acetic anhydride
- D) Lucas reagent

Q73: Which amine will form a diazonium salt with nitrous acid?

- A) Secondary aliphatic amine
- B) Tertiary amine
- C) Primary aromatic amine
- D) All amines

Q74: Which of the following is a primary amine?

- A) Diethylamine
- B) Trimethylamine
- C) Aniline
- D) Cyclohexylamine

Q75: Which of the following tests identifies the presence of primary amines by producing foul smell?

- A) Hinsberg test
- B) Lucas test
- C) Carbylamine reaction
- D) Tollens test

Q76: Which of the following compounds is a tertiary amine?

- A) $\text{NH}(\text{CH}_3)_2$
- B) $\text{N}(\text{CH}_3)_3$
- C) CH_3NH_2
- D) $\text{C}_6\text{H}_5\text{NH}_2$

Q77: Which of the following amines does not react with nitrous acid to evolve nitrogen gas?

- A) Primary aliphatic amine
- B) Secondary amine
- C) Primary aromatic amine
- D) None

Q78: In Gabriel phthalimide synthesis, the intermediate formed is:

- A) Carbocation
- B) Imide anion
- C) Free radical
- D) Nitrene

Q79: The boiling point of an amine increases due to:

- A) Increased branching
- B) Hydrogen bonding
- C) Aromaticity
- D) Decreased polarity

Q80: Which of the following amines is least soluble in water?

- A) Methylamine
- B) Ethanamine
- C) Propanamine
- D) Benzenamine

Q81: Which reagent converts an amine into its ammonium salt?

- A) Dilute HCl
- B) NaOH
- C) HNO₂
- D) Sulphuric acid

Q82: Which of the following amines will give a positive Hinsberg test with a soluble sulphonamide that dissolves in alkali?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) Quaternary amine

Q83: Which statement about aromatic amines is correct?

- A) More basic than aliphatic amines
- B) Less basic than aliphatic amines
- C) Equal basicity
- D) Not basic at all

Q84: The reaction of an amine with acyl chloride yields:

- A) Amide
- B) Ester
- C) Alcohol
- D) Aldehyde

Q85: Which of the following is an example of a secondary amine?

- A) CH₃NHCH₂CH₃
- B) NH₃
- C) CH₃NH₂
- D) (CH₃)₃N

Q86: Which preparation method gives primary amines without rearrangement?

- A) Hofmann bromamide reaction
- B) Gabriel phthalimide synthesis
- C) Reductive amination
- D) Carbylamine reaction

Q87: Which of the following amines can be distinguished using nitrous acid test?

- A) Primary aliphatic amine
- B) Secondary amine
- C) Tertiary amine
- D) All of them

Q88: Which amine reacts to produce an isocyanide in carbylamine test?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) Quaternary ammonium

Q89: Which amine is expected to have the lowest boiling point?

- A) Primary amine
- B) Secondary amine
- C) Tertiary amine
- D) Ammonia

Q90: Which method converts amides to primary amines?

- A) Hofmann bromamide reaction
- B) Gabriel synthesis
- C) Nitration
- D) Esterification

Q91: Which of the following is the functional group present in amines?

- A) -OH
- B) -NH₂ / -NR₂
- C) -COOH
- D) -CHO

Q92: Which amine will be most easily protonated in acidic medium?

- A) Aniline
- B) Methylamine
- C) Benzylamine
- D) N-Methylaniline

Q93: Which reagent will reduce a nitro compound to an amine?

- A) LiAlH₄
- B) NaOH
- C) H₂/Pt or Sn/HCl
- D) KMnO₄

Q94: Which of the following factors decreases basicity of an amine?

- A) Electron donating groups
- B) Electron withdrawing groups
- C) Alkyl substituents
- D) Solvation

Q95: Aromatic amines like aniline are less basic because:

- A) Nitrogen is sp hybridised
- B) Lone pair delocalises into ring
- C) They react rapidly with acids
- D) They form hydrogen bonds