

# Quiz: amines 1

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**Q1: Which of the following is a primary amine?**

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

**Q2: The nitrogen atom in amines is typically:**

- A) sp hybridised
- B) sp<sup>2</sup> hybridised
- C) sp<sup>3</sup> hybridised
- D) sp<sup>3</sup>d 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  $\text{CH}_3\text{CH}_2\text{NH}_2$ ?**

- 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)  $\text{HNO}_3$

**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)  $\text{RNH}_2$
- B)  $\text{R}_2\text{NH}$
- C)  $\text{R}_3\text{N}$
- D)  $\text{NH}_3$

**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 C<sub>3</sub>H<sub>9</sub>N?**

- 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)  $\text{H}_2/\text{Pd}$
- B)  $\text{Sn}/\text{HCl}$
- C)  $\text{Fe}/\text{HCl}$
- 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)  $\text{CH}_3\text{NH}_2$
- B)  $\text{CH}_3\text{NHCH}_3$
- C)  $\text{N}(\text{CH}_3)_3$
- D)  $\text{C}_6\text{H}_5\text{NH}_2$

**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  $(\text{CH}_3)_2\text{NH}$  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)  $\text{LiAlH}_4$  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)  $\text{CH}_3\text{NH}_2$
- 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  $(\text{CH}_3)_3\text{N}$
- B) Ammonium salt of  $\text{CH}_3\text{NH}_2$
- C) Ammonium salt of  $\text{C}_6\text{H}_5\text{NH}_2$
- D) Ammonium salt of  $(\text{CH}_3)_2\text{NH}$

**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  $\text{CH}_2=\text{CH}-\text{NHCH}_3$  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)  $\text{FeCl}_3$

**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)  $\text{HNO}_2$
- B)  $\text{Br}_2/\text{NaOH}$
- C)  $\text{H}_2/\text{Pd}$
- D)  $\text{NaBH}_4$

**Q57: Which of the following is a secondary amine?**

- A)  $\text{CH}_3\text{NHCH}_2\text{CH}_3$
- B)  $\text{NH}_3$
- C)  $\text{CH}_3\text{CH}_2\text{NH}_2$
- D)  $(\text{CH}_3)_3\text{N}$

**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)  $\text{LiAlH}_4$
- B)  $\text{Pd/C}$
- C)  $\text{NaOH}$
- D)  $\text{Fe/HCl}$

**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)  $\text{CH}_3\text{NH}_2$
- 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)  $\text{CH}_3\text{NH}_2$
- 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) HNO<sub>2</sub>
- 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) CH<sub>3</sub>NHCH<sub>2</sub>CH<sub>3</sub>
- B) NH<sub>3</sub>
- C) CH<sub>3</sub>NH<sub>2</sub>
- D) (CH<sub>3</sub>)<sub>3</sub>N

**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) -NH<sub>2</sub> / -NR<sub>2</sub>
- 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) LiAlH<sub>4</sub>
- B) NaOH
- C) H<sub>2</sub>/Pt or Sn/HCl
- D) KMnO<sub>4</sub>

**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