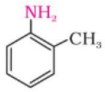
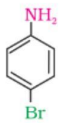
Amines

Set- 1

Table 13.1: Nomenclature of Some Alkylamines and Arylamines

Amine	Common name	IUPAC name
$CH_3-CH_2-NH_2$	Ethylamine	Ethanamine
$CH_3-CH_2-CH_2-NH_2$	*n*-Propylamine	Propan-1-amine
$CH_3-\underset{\displaystyle NH_2}{\underset{\vert}{CH}}-CH_3$	Isopropylamine	Propan-2-amine
$CH_3-\underset{\displaystyle H}{\underset{\vert}{N}}-CH_2-CH_3$	Ethylmethylamine	N-Methylethanamine
$CH_3-\underset{\displaystyle CH_3}{\underset{\vert}{N}}-CH_3$	Trimethylamine	N,N-Dimethylmethanamine
$C_2H_5-\underset{\displaystyle C_2H_5}{\underset{\vert}{N}}-\overset{1}{C}H_2-\overset{2}{C}H_2-\overset{3}{C}H_2-\overset{4}{C}H_3$	*N,N*-Diethylbutylamine	N,N-Diethylbutan-1-amine
$NH_2-\overset{1}{C}H_2-\overset{2}{C}H=\overset{3}{C}H_2$	Allylamine	Prop-2-en-1-amine
$NH_2-(CH_2)_6-NH_2$	Hexamethylenediamine	Hexane-1,6-diamine
	Aniline	Aniline or Benzenamine
	*o*-Toluidine	2-Methylaniline
	*p*-Bromoaniline	4-Bromobenzenamine or 4-Bromoaniline
	*N,N*-Dimethylaniline	N,N-Dimethylbenzenamine

Q1. Which of the following is the correct IUPAC name for the given compound?

A. Trimethylamine
B. Propanamine
C. N,N-Dimethylmethanamine
D. None of these

Ans. (C)

Q2. Which of the following is allylamine?

A. Prop-2-en-1-amine
B. Prop-1-en-1-amine
C. But-3-en-1-amine
D. Ethenamine

Ans. (A)

Q3. Which of the following is toluidine?

A. Methylaniline
B. Methylphenol
C. Methylbenzoic acid
D. Aminophenol

Ans. (A)

Q4. Which of the following is the correct IUPAC name for the given compound?

A. Phenylethanamine
B. N,N-phenyl methyl methanamine
C. 1,2-Dimethylaniline
D. N,N-Dimethylaniline

Ans. (D)

Q5. Which of the following is the correct IUPAC name for hexamethylenediamine?

A. Hexane-1,6-diamine
B. 6-aminohexanamine
C. N,N-dimehtylbutanamine
D. None of these

Ans. (A)

Set – 2

Table 13.2: Comparison of Boiling Points of Amines, Alcohols and Alkanes of Similar Molecular Masses

Sl. No.	Compound	Molar mass	b.p./K
1.	$n\text{-}C_4H_9NH_2$	73	350.8
2.	$(C_2H_5)_2NH$	73	329.3
3.	$C_2H_5N(CH_3)_2$	73	310.5
4.	$C_2H_5CH(CH_3)_2$	72	300.8
5.	$n\text{-}C_4H_9OH$	74	390.3

Q1. Which of the following is the correct order of boiling point among these compounds: n-C4H9NH2, (C2H5)2NH, C2H5N(CH3)2, C2H5CH(CH3)2, n-C4H9OH?

A. $n\text{-}C_4H_9OH > n\text{-}C_4H_9NH_2 > (C_2H_5)_2NH > C_2H_5N(CH_3)_2 > C_2H_5CH(CH_3)_2$
B. $n\text{-}C_4H_9NH_2 > n\text{-}C_4H_9OH > (C_2H_5)_2NH > C_2H_5N(CH_3)_2 > C_2H_5CH(CH_3)_2$
C. $n\text{-}C_4H_9OH > C_2H_5N(CH_3)_2 > (C_2H_5)_2NH > n\text{-}C_4H_9NH_2 > C_2H_5CH(CH_3)_2$
D. $n\text{-}C_4H_9OH > C_2H_5CH(CH_3)_2 > n\text{-}C_4H_9NH_2 > (C_2H_5)_2NH > C_2H_5N(CH_3)_2$

Ans. (A)

Q2. In the set of molecules with different functional groups(having approximately equal molecular weight), the order of boiling point is compared on the basis of strength of intermolecular forces. Which of the following is the correct order?

A. Hydrogen bonding>Ion-dipole>Dipole-dipole>London forces
B. Hydrogen bonding>Ion-dipole>London forces>Dipole-dipole
C. Ion-dipole>Hydrogen bonding>Dipole-dipole>London forces
D. Hydrogen bonding>Dipole-dipole>Ion-dipole>London forces

Ans. (C)

Q3. Which is the correct order of boiling points of isomeric alkyl amines?

A. 3°>2°>1°
B. 2°>1°>3°
C. 1°>2°>3°
D. 3°>1°>2°

Q4. Which is the correct order of boiling points of isomeric alkyl amines?

A. 3°>2°>1°
B. 2°>1°>3°
C. 1°>2°>3°
D. 3°>1°>2°

Ans. (C)

Q5. What is the reason behind such an order of boiling point shown by isomeric alkyl amines?

A. Strength of Hydrogen bonding
B. Molecular weight
C. Branching
D. None of these

Ans. (A)

Set – 3

Table 13.3: pK_b Values of Amines in Aqueous Phase

Name of amine	pK_b
Methanamine	3.38
N-Methylmethanamine	3.27
N,*N*-Dimethylmethanamine	4.22
Ethanamine	3.29
N-Ethylethanamine	3.00
N,*N*-Diethylethanamine	3.25
Benzenamine	9.38
Phenylmethanamine	4.70
N-Methylaniline	9.30
N,*N*-Dimethylaniline	8.92

Q1. Which of the following is the correct order of basicity in aqueous phase?

A. Methanamine> N-methylmethanamine> N,N-dimethylmethanamine
B. N,N-dimethylmethanamine> N-methylmethanamine> Methanamine
C. N-methylmethanamine> Methanamine> N,N-dimethylmethanamine
D. N-methylmethanamine> N,N-dimethylmethanamine> Methanamine

Ans. (C)

Q2. Which of the following is the correct order of pKbvalues in aqueous phase?

A. Ethanamine> N-ethylethanamine> N,N-diethylethanamine
B. N,N-diethylethanamine> N-ethylethanamine> Ethanamine
C. Ethanamine> N,N-diethylethanamine> N-ethylethanamine
D. N-ethylethanamine> N,N-diethylethanamine> Ethanamine

Ans. (C)

Q3. Which of the following is the correct order of basicity in aqueous phase?

A. N,N-dimethylaniline> N-methylaniline> Aniline
B. Aniline> N-methylaniline> N,N-dimethylaniline
C. N-methylaniline> Aniline> N,N-dimethylaniline
D. Aniline> N,N-dimethylaniline> N-methylaniline

Ans. (A)

Q4. Which of the following has the maximum basicity?

A. Aniline
B. N-methylaniline
C. N,N-dimethylaniline
D. Phenylmethanamine

Ans. (D)

Q5. Why do we observe an unexpected trend in the order of basicity in aqueous phase in methylamine and ethylamine derivatives?

A. Steric Inhibition of Protonation effect
B. Solvation effect

C. Steric hindrance
D. Both B and C

Ans. (D)

Q6. Which among the following has the maximum pKbvalue?

A Methanamine
B. N-ethylethanamine
C. N,N-dimethylmethanamine
D. N,N-diethylethanamine

Ans. (C)