INDIAN SCHOOL AL WADI AL KABIR		
CLASS: XII	**DEPARTMENT: SCIENCE (2024-2025)** **SUBJECT: CHEMISTRY**	**DATE: 31/05/2024**
WORKSHEET NO: 4 WITH ANSWERS	**TOPIC: AMINES**	**Note: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

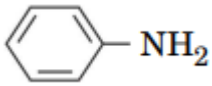
MULTIPLE CHOICE QUESTIONS

1. CH_3CONH_2 on reaction with NaOH and Br_2 in alcoholic medium gives:

a) CH_3COONa
b) CH_3NH_2
c) CH_3CH_2Br
d) $CH_3CH_2NH_2$

2. Which of the following is least basic?

a) $(CH_3)_2NH$ b) NH_3

c)  d) $(CH_3)_3N$

3. The reaction of ammonia with a large excess of CH_3Cl will give mainly:

a) $(CH_3)_3N$
b) $(CH_3)_4N^+Cl^-$
c) CH_3NH_2
d) $(CH_3)_2NH$

4. Which of the following compounds can not be prepared by Gabriel phthalimide synthesis?

a) Methanamine b) Ethanamine
c) Propan-1-amine d) Aniline

5. CH_3CH_2CN and CH_3CONH_2 on reduction with $LiAlH_4$ give

a) Ethanamine and Methanamine respectively

b) Methanamine and Ethanamine respectively

c) Ethanamine and Ethanamine respectively

d) Propanamine and Ethanamine respectively

6. The most soluble amine in water in the following compounds is ……

a) Butan-1-amine b) Butan-2-amine

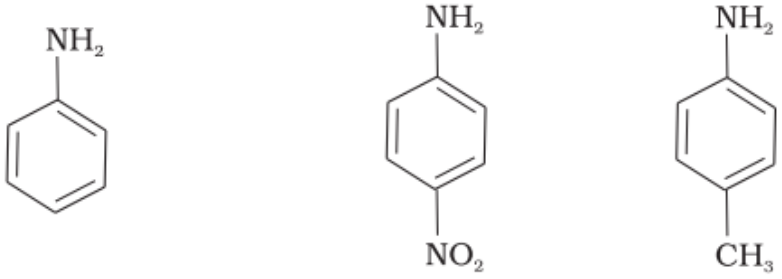
c) 2-Methylpropan-2-amine d) Pentan-2-amine

7. Hoffmann Bromamide Degradation reaction is answered by …….

a) $ArNH_2$ b) $ArCONH_2$

c) $ArNO_2$ d) $ArCH_2NH_2$

8. The correct increasing order of basic strength for the following compounds is ……



(I) (II) (III)

a) II < III < I

b) III < I < II

c) III < II < I

d) II < I < III

9. The compound that does not react with Hinsberg's reagent is …….

a) Methylamine

b) Dimethylamine

c) Trimethylamine

d) Ethylamine

10. Identify the products obtained when direct nitration of aniline is carried out.

a) Only p-Nitroaniline

b) Only o-Nitroaniline

c) A mixture of ortho and para nitroaniline

d) A mixture of ortho, meta and para nitroaniline

Read the given passage and answer the questions that follow:

Amines constitute an important class of organic compounds derived by replacing one or more hydrogen atoms of ammonia molecule by alkyl/aryl groups. Amines are usually formed from nitro compounds, halides, amides, etc. They exhibit hydrogen bonding which influences their physical properties. Alkyl amines are found to be stronger bases than ammonia. In aromatic amines, electron releasing and withdrawing groups, respectively increase and decrease their basic character. Reactions of amines are governed by availability of the unshared pair of electrons on nitrogen. Influence of the number of hydrogen atoms at nitrogen atom on the type of reactions and nature of products is responsible for identification and distinction between primary, secondary and tertiary amines. Reactivity of aromatic amines can be controlled by acylation process.

11. Why does aniline not give Friedel-Crafts reaction?

12. Arrange the following in the increasing order of their pK_b values in aqueous phase:

$C_6H_5NH_2$, NH_3, $C_2H_5NH_2$, $(CH_3)_3N$

13. How can you distinguish between $CH_3CH_2NH_2$ and $(CH_3CH_2)_2NH$ by Hinsberg's test?

Assertion and Reason Type

14. Assertion: $-NH_2$ group is o- and p-directing in electrophilic substitution reactions.

Reason: Aniline cannot undergo Friedel-Crafts reaction.

a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c) Assertion is correct, but reason is wrong statement.
d) Assertion is wrong, but reason is correct statement.

15. Assertion: Butan-1-amine is more soluble in water than Butan-1-ol.

Reason: Alcohols are more polar than amines and form stronger intermolecular hydrogen bonds than amines.

a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
c) Assertion is correct, but reason is wrong statement.
d) Assertion is wrong, but reason is correct statement.

16. Assertion: In aqueous phase, secondary amines are more basic than primary amines.

Reason: Alkyl group is electron donating.

a) Both assertion and reason are correct statements, and reason is the correct explanation of the assertion.
b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.

c) Assertion is correct, but reason is wrong statement.
d) Assertion is wrong, but reason is correct statement.

Question – Answer Type:

17. Arrange the following compounds in decreasing order of their boiling points: **1**
Butan-1-ol, Butan-1-amine, Butane

18. Arrange the following in decreasing order of basic character : **1**
$C_6H_5NH_2$, $(CH_3)_3N$, $C_2H_5NH_2$

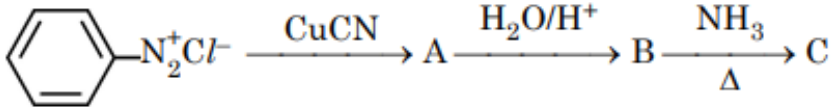
19. Give a simple chemical test to distinguish between Aniline and N,N-dimethylaniline. **1**

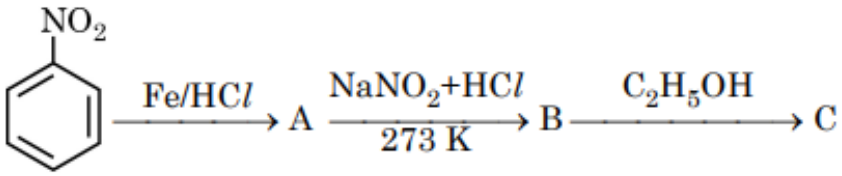
20. Account for the following: **2**

(a) Gabriel phthalimide synthesis is not preferred for preparing aromatic primary amines.

(b) On reaction with benzene sulphonyl chloride, primary amine yields product soluble in alkali whereas secondary amine yields product insoluble in alkali.

21. Write the structures of A, B and C in the following reactions: **3**

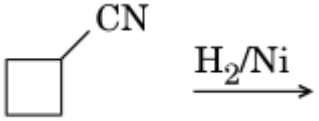
(i) 

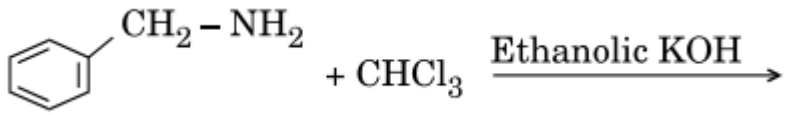
(ii) 

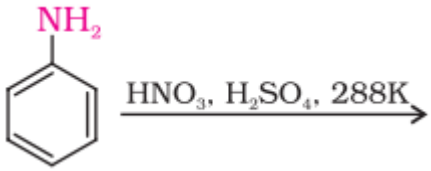
22. Write the reactions involved in the preparation following compounds from Benzenediazonium chloride: **3**

(i) Fluorobenzene (ii) Nitrobenzene (iii) p-Aminoazobenzene

23. Complete the following reactions: **3**

a) 

b) 

c) 

24. An Organic compound (A) with molecular formula C_3H_7NO on heating with Br_2 and KOH forms a compound (B). Compound (B) on heating with $CHCl_3$ and alcoholic KOH produces a foul smelling compound (C) and on reacting with $C_6H_5SO_2Cl$ forms a compound (D) which is soluble in alkali. Write the structures of (A), (B), (C) and (D). **3**

25. a) How will you convert the following? **5**

(i) Benzoic acid to aniline

(ii) Aniline to p-bromoaniline

b) Give reasons:

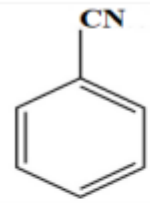
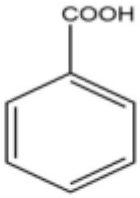
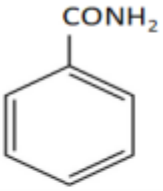
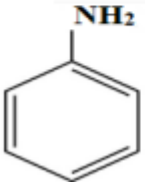
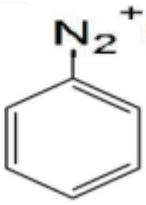
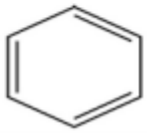
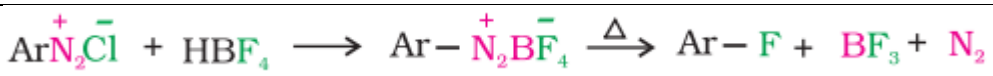
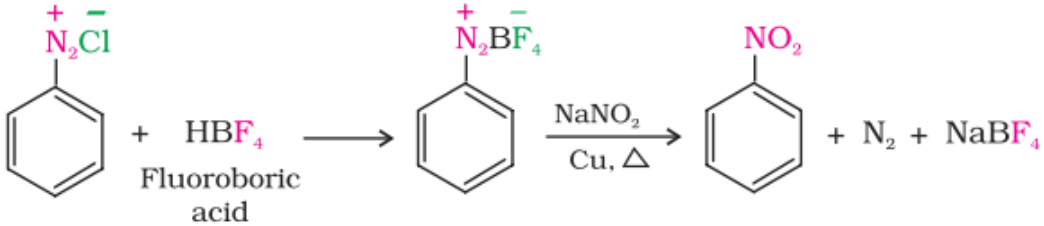
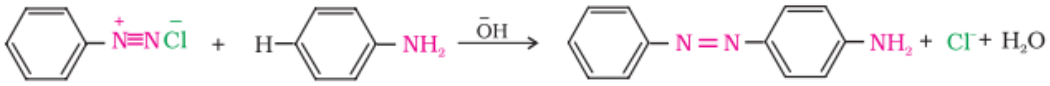
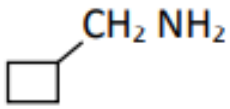
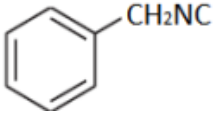
(i) Aniline on nitration gives good amount of m-nitroaniline, though – NH_2 group is o/p directing in electrophilic substitution reactions.

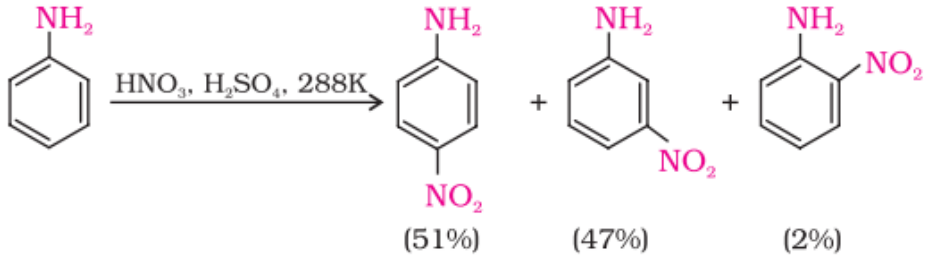
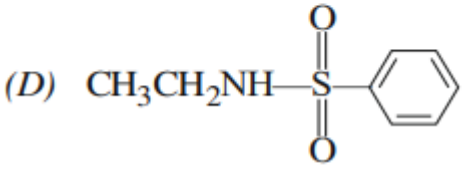
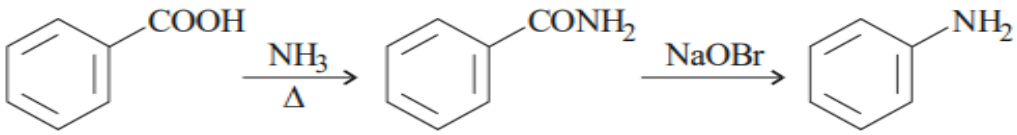
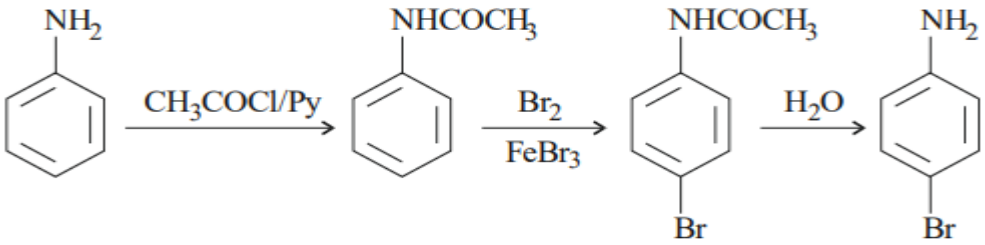
(ii) $(CH_3)_2$ NH is more basic than $(CH_3)_3N$ in an aqueous solution.

(iii) Ammonolysis of alkyl halides is not a good method to prepare pure primary amines.

ANSWERS

1.	b
2.	c
3.	b
4.	d
5.	d
6.	a
7.	b
8.	d
9.	c
10.	d
11.	Aniline is a Lewis base and it reacts with $AlCl_3$ to form a salt / N of aniline acquires positive charge with $AlCl_3$ and hence is a deactivating group.
12.	$C_2H_5 NH_2 < (CH_3)_3N < NH_3 < C_6H_5NH_2$
13.	Add Hinsberg's reagent (benzene sulphonyl chloride) to both the compounds. $CH_3CH_2NH_2$ gives ppt. that is soluble in alkali while the ppt. formed by $(CH_3CH_2)_2NH$ is insoluble in alkali.

14.	b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
15.	d) Assertion is wrong, but reason is correct statement.
16.	b) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion.
17.	Butan-1-ol > Butan-1-amine > Butane
18.	$(CH_3)_3N > C_2H_5NH_2 > C_6H_5NH_2$
19.	Add chloroform in the presence of KOH and heat, Aniline gives an offensive smell while N, N-Dimethylaniline does not.
20.	(a) Aryl halides do not undergo nucleophilic substitution with the anion formed by phthalimide. (b) This is due the absence of acidic hydrogen attached to nitrogen (N-H) in the product of secondary amine.
21.	(i) **A =**  **B =**  **C =**  (ii) **A =**  **B =**  **C =** 
22.	(i)  (ii)  (iii) 
23.	a)  b) 

	c) 
24.	(*A*) $CH_3CH_2CONH_2$ (*B*) $CH_3CH_2NH_2$ (*C*) CH_3CH_2NC (*D*) 
25.	a) (i)  (ii)  b) (i) Aniline gets protonated and is deactivated / Aniline on protonation forms anilinium ion which is meta-directing. (ii) Combination of inductive effect and solvation effect. (iii) Because it forms a mixture of amines that is difficult to separate.

Prepared by: *Mr. Anoop Stephen*	*Checked by:* *HoD Science*