Saitechinfo NEET JEE Academy

43, Haridoss Main Rd, CH-99. Ph:9444929163

CHEMISTRY REVISION TEST - AMINES AND CARBONYL COMPOUNDS

Class 12 - Chemistry

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 60**

1. i. An organic compound (X) having molecular formula $C_5H_{10}O$ can show various properties depending on its structures. **[5]**

   Draw each of the structures if it:

   I. shows Cannizzaro reaction.

   II. reduces Tollens' reagent and has a chiral carbon.

   III. gives positive iodoform test.

   ii. Write the reaction involved in the following:

   I. Clemmensen reduction

   II. Etard reaction

2. Which of the following compounds will undergo aldol condensation, which the Cannizzaro reaction and which neither? **[5]**

   Write the structures of the expected products of aldol condensation and Cannizzaro reaction.

   i. Methanal

   ii. 2-Methylpentanal

   iii. Benzaldehyde

   iv. Benzophenone

   v. Cyclohexanone

   vi. 1-Phenylpropanone

   vii. Phenylacetaldehyde

   viii. Butan-1-ol

3. a. Write the main product formed when propanal reacts with the following reagents: **[5]**

   i. 2 moles of CH_3OH in presence of dry HCl

   ii. Dilute NaOH

   iii. $H_2N - NH_2$ followed by heating with KOH in ethylene glycol

   b. Arrange the following compounds in increasing order of their property as indicated:

   i. F - CH_2COOH, $O_2N - CH_2COOH$, CH_3COOH, HCOOH - acid character

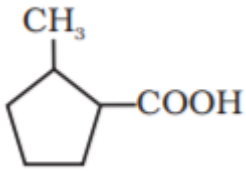
   ii. Acetone, Acetaldehyde, Benzaldehyde, Acetophenone - reactivity towards addition of HCN

4. Give the IUPAC names of the following compounds: **[5]**

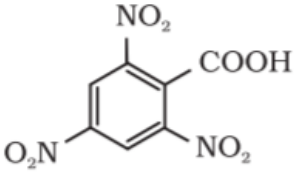
   i. Ph CH_2CH_2COOH

   ii. $(CH_3)_2$ C = CHCOOH

iii.

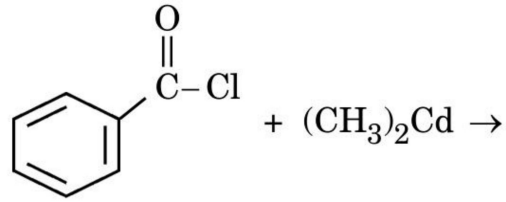


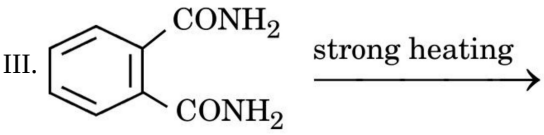
iv.



5. i. Write the product(s) in the following reactions: **[5]**

I. $2CH_3COOH \xrightarrow[\text{heat}]{P_4O_{10}}$

II. 

III. 

ii. Write the reaction involved in the following reactions:

I. Wolff-Kishner Reduction

II. Decarboxylation Reaction

6. An organic compound 'A' with molecular formula C_8H_8O gives positive DNP test and iodoform test. It does not reduce Tollen's or Fehling's reagent and does not decolourise bromine water. On oxidation with chromic acid (H_2CrO_4) it gives a carboxylic acid (B) with molecular formula $C_7H_6O_2$. Deduce the structures of A and B. **[5]**

7. i. Illustrate the following reactions giving suitable example in each case: **[5]**

a. Ammonolysis

b. Coupling reaction

c. Acetylation of amines

ii. Describe Hinsberg method for the identification of primary, secondary and tertiary amines. Also, write the chemical equations of the reactions involved.

8. a. Give plausible explanation for each of the following: **[5]**

i. Why are amines less acidic than alcohols of comparable molecular masses?

ii. Why are primary amines highest boiling than tertiary amines?

iii. Why are aliphatic amines stronger bases than aromatic amines?

b. Complete the following reactions:

i. $C_6H_5N_2Cl + C_2H_5OH \rightarrow$

ii. $C_6H_5NH_2 + (CH_3CO)_2O \rightarrow$

9. a. Write the reactions involved in the following: **[5]**

i. Hoffmann bromamide degradation reaction

ii. Diazotisation

iii. Gabriel phthalimide synthesis

b. Give reasons:

i. $(CH_3)_2NH$ is more basic than $(CH_3)_3N$ in an aqueous solution.

ii. Aromatic diazonium salts are more stable than aliphatic diazonium salt.

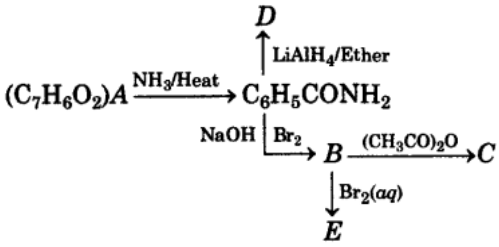
10. A. For the following conversion reactions write the chemical equations: **[5]**

i. Ethyl isocyanide to ethylamine

ii. Aniline to N-phenylethanamide

B. Two isomeric compounds A and B having molecular formula $C_4H_{11}N$, both lose N_2 on treatment with HNO_2 and gives compound C and D, respectively. C is resistant to oxidation but immediately responds to Lucas reagent, whereas 'D' responds to Lucas reagent after 5 minutes and gives a positive iodoform test. Identify A and B.

11. An aromatic compound 'A' of molecular formula $C_7H_6O_2$ undergoes a series of reactions as shown below. Write the structures of A, B, C, D and E in the following reactions. **[5]**



12. i. Write the structure of main products when aniline reacts with the following reagents : **[5]**

a. Br_2 water

b. HCl

c. $(CH_3CO)_2O$/pyridine

ii. Arrange the following in the increasing order of their boiling point: $C_2H_5NH_2$, C_2H_5OH, $(CH_3)_3N$

iii. Give a simple chemical test to distinguish between the following pair of compounds : $(CH_3)_2NH$ and $(CH_3)_3N$.