

QB365 Question Bank Software

12th Chemistry CBSE Case Study Questions Amines For - 2024

12th Standard

Chemistry

SECTION - A

2 x 4 = 8

1) Read the passage given below and answer the following questions:

A mixture of two aromatic compounds (A) and (B) was separated by dissolving in chloroform followed by extraction with aqueous KOH solution. The organic layer containing compound (A), when heated with alcoholic solution of KOH produce C_7H_5N (C) associated with unpleasant odour.

The following questions are multiple choice questions. Choose the most appropriate answer:

The reaction of (A) with alcoholic solution of KOH to produce (C) of unpleasant odour is called

(a) Sandmeyer reaction (b) Carbylamine reaction

(c) Ullmann reaction (d) Reimer-Tiemann reaction

(ii) The alkaline aqueous layer (B) when heated with chloroform and then acidified give a mixture of isomeric compounds of molecular formula $C_7H_6O_2$. (B) is

(a) C_6H_5CHO (b) C_6H_5COOH (c) $C_6H_5CH_3$ (d) C_6H_5OH

(iii) In the chemical reaction,

$CH_3CH_2NH_2 + CHCl_3 + 3KOH \longrightarrow (A) + (B) + 3H_2O$, the compounds (A) and (B) are respectively

(a) C_2H_5NC and KCl (b) C_2H_5CN and KCl

(c) $CH_3CH_2CONH_2$ and KCl (d) C_2H_5NC and K_2CO_3

(iv) Direct nitration of an aromatic compound (A) is not feasible because

(a) the reaction cannot be stopped at the mononitration stage

(b) a mixture of o, m and p-nitroaniline is always obtained

(c) nitric acid oxidises most of the aromatic compound to give oxidation products along with only a small amount of nitrated products

(d) all of the above

Answer : (i) (b) : Carbylamine reaction



Aniline

Phenyl isocyanide (C)

(A)

(ii) (d): Alkaline layer on treating with $CHCl_3$ followed by acidification gives two isomers having formula ($C_7H_6O_2$). This is Reimer-Tiemann reaction and thus (B) is C_6H_5OH .



Phenol (B)

(iii) (a): $CH_3CH_2NH_2 + CHCl_3 + 3KOH \rightarrow C_2H_5NC + 3KCl + 3H_2O$

This is called carbylamine reaction.

(iv) (c): Direct nitration of aniline is not a feasible process because nitric acid oxidises most of aniline to give oxidation products along with only a small amount of nitrated products.

2) Organic compounds containing amine as functional group are present in wide variety of compounds namely amino acids, hormones, neurotransmitters, DNA, alkaloids, dyes etc. Drugs including nicotine, morphine, codein, heroin etc. which have physiological effects on human also contain $-NH_2$ group in one form or another. Amines are basic in nature due to presence of lone pair of electron on nitrogen. Adrenaline hormone and ephedrine drug, both contain second amino group are used for increasing blood pressure. Novacain, a synthetic compound contains both primary and tertiary amino group, is used as anaesthetic in

dentistry. Benadryl, a widely used antihistamine drug contains tertiary amino group, Quarternary ammonium salts of long chain, tertiary amines are used as cationic detergents. Diazonium salts are used for synthesis of azodyes and useful aromatic compounds.

(a) Write the formula of tertiary amine with molecular formula C_3H_9N , which does not react with Hinsberg reagent?

(b) Convert Aniline to p-hydroxy azo benzene.

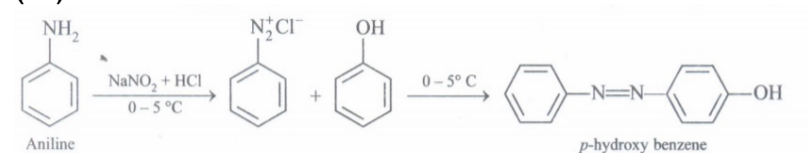
(c) Give one example of cationic detergent.

(d) What is formula of paracetamol, (crosin), a well known antipyretic?

(e) How will you distinguish between Aniline and Benzyl amine?

Answer : (a) $(CH_3)_3N$ does not react with Hinsberg reagent.

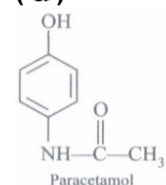
(b)



(c)



(d)



(e) Add $NaNO_2$ and cone, HCl. Cool it to $0 - 5^\circ C$. Then add alkaline solution of phenol. Aniline will give orange, azo dye, whereas Benzyl amine does not.