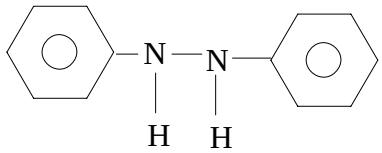
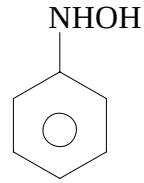
ORGANIC CHEMISTRY –I

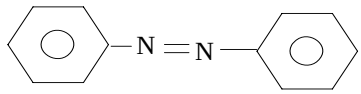
5. NITROGEN CONTAINING COMPOUNDS

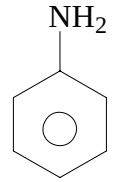
PREVIOUS EAMCET BITS

1. The structure of the compound formed, when nitrobenzene is reduced by lithium aluminium hydride (LiA/H_4) is **(2008 E)**

1) 

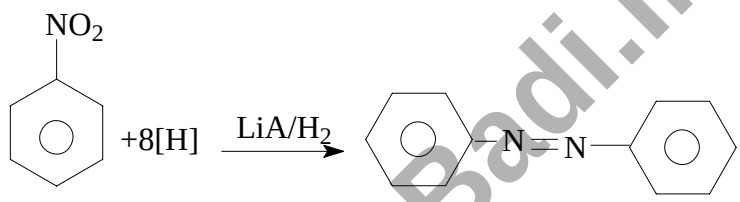
2) 

3) 

4) 

Ans : 3

Sol:



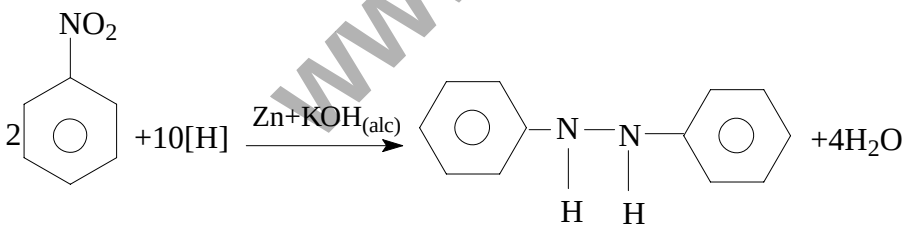
Azo benzene

2. Nitrobenzene undergoes reduction with Zn/alcoholic KOH to form a compound A. The number of Sigma and Pi bonds in A, respectively, are **(2008 M)**

1) 17,6 2) 27,6 3) 27,8 4) 17,8

Ans : 2

Sol:



3. Nitrobenzene is reduced by Zn and alcoholic potash mixture to get **(2007 M)**

1) $C_6H_5 - NH_2$ 2) $C_6H_5 - NH - NH - C_6H_5$

3) $C_6H_5 - N - N - C_6H_5$ 4) $C_6H_5 - NH - CO - C_6H_5$

Ans : 2

Sol: Reaction

$$2C_6H_5NO_2 + 10(H) \xrightarrow{Zn+KOH(alc)} C_6H_5 - NH - NH - C_6H_5$$

4. Which of the following reactions can produce aniline as the main product? **(2006 E)**

1) $C_6H_5NO_2 + Zn / KOH$ 2) $C_6H_5NO_2 + Zn / NH_4Cl$

3) $C_6H_5NO_2 + LiAlH_4$ 4) $C_6H_5NO_2 + Zn / HCl$

Ans : 4

Sol: Reaction

$C_6H_5NO_2 + 6(H) \xrightarrow{Zn/HCl} C_6H_5NO_2 + 2H_2O$

5. Which of the following compounds is soluble in benzene but almost insoluble in water?

(2005 E)

1) C_6H_5OH 2) CH_3CO_2H 3) CH_3CHO 4) $C_6H_5NO_2$

Ans : 4

Sol: Nitrobenzene is soluble in organic solvents like Benzene but insoluble in water.

6. Aniline is not the major product in one of the following reactions. Identify that reaction

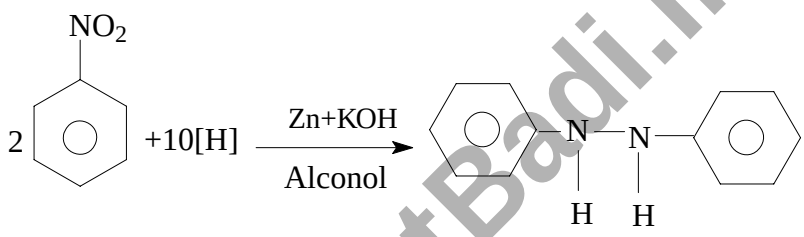
(2003 E)

1) $C_6H_5OH + NH_3 \dfrac{ZnCl_2}{300^0C}$ 2) $C_6H_5NO_2 + Zn\ powder \xrightarrow{alcoholic\ KOH}$

3) $C_6H_5Cl + NH_3 \xrightarrow[CH_2O]{200^0C}$ High pressure 4) $C_6H_5NO_2 + Fe + H_2O \xrightarrow{HCl} CHO$

Ans : 2

Sol:



Hydrazobenzene

7. In the series of reactions $C_6H_5NH_2 \xrightarrow[0-5^0C]{NaNO_2/HCl} X \xrightarrow[Cu_2O]{HNO_2} Y + N_2 + HCl$

X and Y are respectivley **(2003 M)**

1) $C_6H_5 - H = N - C_6H_5,\ C_6H_5N_2 + Cl^-$

2) $C_6H_5N_2 + Cl^-, C_6H_5 - N = N - C_6H_5$

3) $C_6H_5N_2^+ + Cl^-, C_6H_5NO_2$

4) $C_6H_5NO_2, C_6H_6$

Ans : 3

Sol: $C_6H_5NH_2 \xrightarrow[O-5^0C]{NaNO_2/HCl}$

$C_6H_5N_2Cl \xrightarrow[Cu_2O]{HNO_2} C_6H_5NO_2 + N_2 + HCl$

(X) (Y)

8. Which one of the following is the molecular formula of a tertiary amine ?

(2002 E)

1) C_2H_7N 2) C_3H_9N 3) CH_5N 4) CH_3N

Ans : 2

Sol: In tertiary amine, nitrogen atom is attached to three alkyl groups. The only formula that fits into this is C_3H_9N or $(CH_3)_3N$

9. What is the product obtained when nitrobenzene is reacted with HCl in the presence of Sn

(2001 M)

1) $C_6H_5N = NC_6H_5$ 2) $C_6H_5NH_2$

3) $C_6H_5NH - NHC_6H_5$ 4) C_6H_5NHOH

Ans : 2

Sol: When reduced in strongly acid medium (Sn + HCl) nitrobenzene gives aniline.

$C_6H_5NO_2 + 6[H] \rightarrow C_6H_5NH_2 + 2H_2O$

10. Which of the following is a secondary amine? **(2000 E)**

1) $C_6H_5 - NH_3$ 2) $CH_3 - NH_2$

3) $C_6H_5 - N(CH_3) - CH_3$ 4) $C_6H_5 - N(H) - CH_3$

Ans : 4

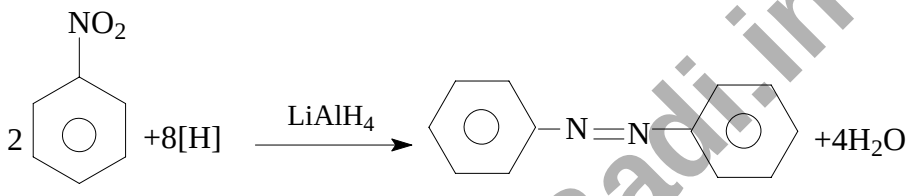
Sol. Conceptual

11. Which of the following is used to convert nitrobenzene to azobenzene ? **(2000 M)**

1) $LiAlH_4$ 2) $Zn / NaOH$ 3) Zn / NH_4Cl 4) Sn / HCl

Ans : 1

Sol:



Azobenzene