Amines

Q.1. An aromatic compound A on treatment with aques ammonia and heating forms compound B which on heating with Br_2 and KOH forms a compound C of molecular formula C_6H_7N. Write the structures and IUPAC names of the compound A,B,C.

Ans Step-1. Since compound C with M F C_6H_7N is formed from compound B on treatment with Br_2 + KOH(Hoffman bromide rex.), therefore, compound B must be an amide and C must be an amine.(i.e. $C_6H_5NH_2$.)

ii). Since C is aniline, therefore the amide from which it is formed must be benzamide($C_6H_5CONH_2$).

iii. Since compound B is formed from compound A with aq ammonia and heating therefore, compound A must be benzoic acid.(C_6H_5COOH).

Q.2. An organic compound A having the M F C_2H_2N on treatment with HNO_2 gave an only yellow substance. Identify A.

Ans. $(CH_3)_2NH + HNO_2 \text{------}\rightarrow (CH_3)_2N_2{=}O$

Compound A Yellow comp.(N-methyl-N-nitroso ethanamine)

Q.3. A compound X having m f C_3H_7NO reacts with Br_2 in the presence of KOH to give another compound Y. The compound Y reacts with HNO_2 to form ethanol and N_2 gas. Identify the compounds X and Y .

Ans. X is Propanamide and Y is Ethylamine.

Q.4. Iodomethane reacts with KCN to form a major product A compound A on reduction in presence of LiAlH4 forms a higher amine B. Compound B on treatment with $CuCl_2$ forms a blue colour complex C. Identify A, B and C.

Ans. $CH_3I + KCN\text{------}\rightarrow CH_3CN \text{----}\rightarrow CH_3CH_2NH_2 + CuCl_2\text{-----}\rightarrow \{Cu(CH_3CH_2NH_2)_4\}Cl_2$

A B C (blue complex)

Q.5. A compound A of m f $C_3H_7O_2N$ on treatment with Fe and conc. HCl gives a compound B of m f C_3H_9N compound B on treatment with $NaNO_2$ and HCl gives another compound C of m f C_3H_8O. The compound C gives efferevence with Na. On oxidation with CrO_3 the compound C gives a saturated aldehyde containing three carbon atoms. Deduce the structures of A, B, and C.

Ans. $CH_3CH_2CH_2NO_2\text{--Fe/HCl-}\rightarrow CH_3CH_2CH_2NH_2\text{--}NaNO_2/HCl\text{--}\rightarrow CH_3CH_2CH_2OH\text{---}Na\rightarrow CH_3CH_2CH_2ONa + H_2$

Compound A Compound B Compound C