ORGANIC CHEMISTRY –I

4. CARBOXYLIC ACIDS

PREVIOUS EAMCET BITS

1. What are the A, B, C in the following reactions ? **(2009 E)**

I) $(CH_3CO_2)_2Ca \xrightarrow{\Delta} \underline{A}$ II) $CH_3CO_2H \xrightarrow[\text{Red } P]{HI} \underline{B}$

III) $2CH_3CO_2H \xrightarrow{P_4O_{10}} \underline{C}$

	A	B	C
(1)	C_2H_6	CH_3COCH_3	$(CH_3CO)_2O$
(2)	$(CH_3CO)_2O$	C_2H_6	CH_3COCH_3
(3)	CH_3COCH_3	C_2H_6	$(CH_3CO)_2O$
(4)	CH_3COCH_3	$(CH_3CO)_2O$	C_2H_6

Ans: 3

Sol: Reaction

$$(CH_3COO)_2Ca \xrightarrow{\Delta} \underset{\underline{A}}{CH_3.CO.CH_3}$$

$$CH_3COOH \xrightarrow{HI+\text{Red } P} \underset{\underline{B}}{CH_3-CH_3}$$

$$2CH_3COOH \xrightarrow{P_4O_{10}} \underset{\underline{C}}{(CH_3CO)_2O}$$

2. Identify A and B in the following reaction **(2008 E)**

$$CH_3-CH_3 \xleftarrow{\underline{B}} CH_3COOH \xrightarrow{\underline{A}} CH_3CH_2OH$$

	A	B
(1)	HI + Red P	$LIAlH_4$
(2)	Ni/ Δ	$LIAlH_4$
(3)	$LiAlH_4$	HI + Red P
(4)	Pd – $BaSO_4$	Zn + HCl

Ans : 3

Sol: $CH_3COOH \xrightarrow{LiA/H_4} CH_3CH_2OH$

$CH_3COOH \xrightarrow{HI+\text{Red } P} CH_3-CH_3$

A : $LiAlH_4$ B : HI + Red P

3. $CH_3COOH \xrightarrow{LiA/CH_4} A$

$A + CH_3COOH \xrightarrow{H_2O^+} \underline{B} + H_2O$

In the above reactions 'A' and 'B' respectively are **(2007 E)**

1) $CH_3COOC_2H_5, C_2H_5OH$ 2) CH_3CHO, C_2H_5OH

3) C_2H_5OH, CH_3CHO 4) $C_2H_5OH, CH_3COOC_2H_5$

Ans : 4

Sol: Reaction

$$CH_3COOH \xrightarrow{LiAlH_4} \underset{\underline{A}}{CH_3CH_2OH}$$

$$CH_3CH_2OH + CH_3COOH \xrightarrow{H_3^+O} CH_3COOC_2H_5 + H_2O$$

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B

4. When compound X is oxidized by acidified potassium dichromate, compound Y is formed. Compound Y on reduction with $LiAlH_4$ gives X. X and Y respectively **(2006 E)**

1) C_2H_5OH, CH_3COOH
2) CH_3COCH_3, CH_3COOH
3) C_2H_5OH, CH_3COCH_3
4) CH_3CHO, CH_3COCH_3

Ans : 1

Sol: Reaction

$$CH_3.CH_2OH \xrightarrow{K_2Cr_2O_7} CH_3COOH$$

$$CH_3.COOH \xrightarrow{LiAlH_4} CH_3CH_2OH$$

5. In which of the following reactions hydrogen gas is liberated? **(2006 M)**

1) $CH_3COOH + Na$
2) $CH_3COOH + NaHCO_3$
3) $CH_3COOH + NaOH$
4) $CH_3COOH + H_2O$

Ans : 3

Sol: Reaction

$$2CH_3COOH + 2Na \rightarrow 2CH_3COONa + H_{2(g)}$$

6. Aqueous 10% $NaHCO_3$ solution is used as a reagent for identifying X. Which one of the following compounds yield X on hydrolysis ? **(2004M)**

1) $CH_3CO_2C_2H_5$
2) C_2H_5-O-C_2H_5
3) CH_3CHO
4) CH_3CH_2OH

Ans : 1

Sol: Acetic acid liberates CO_2 gas on reaction with 10% $NaHCO_3$ solution. $CH_3COOC_2H_5$ hydrolyses to give acetic acid.

7. Acid hydrolysis of X yields two different organic compounds. Which one of the following is X ? **(2003 E)**

1) CH_3COOH
2) CH_3CONH_2
3) $CH_3COOC_2H_5$
4) $(CH_3CO)_2O$

Ans : 3

$$CH_3COOC_2H_5 + H_2O \xrightarrow{H^+} CH_3COOH + C_2H_5OH$$

8. In the following reaction, X and Y are respectively :

$CH_3COOH + NH_3 \rightarrow X \xrightarrow{\Delta} Y + H_2O$ **(2002 E)**

1) CH_3CONH_2, CH_4
2) CH_3COONH_4, CH_3CONH_2
3) CH_3CONH_2, CH_3COOH
4) CH_3NH_2, CH_3CONH_2

Ans : 2

Sol: $CH_3COOH + NH_3 \rightarrow CH_3COONH_4 \xrightarrow{\Delta} CH_3CONH_2 + H_2O$

(X) (Y)

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9. In the following reaction, X and Y respectively are …….. **(2002 M)**

$$X \xrightarrow[Solution]{aq.NaOH} CH_3COOH \xrightarrow{Y} (CH_3CO)_2O \text{ solution}$$

1) $CH_3CHO.PCl_5$ 2) CH_3CN, P_2O_5

3) $CH_3CH_2OH, NaOAc$ 4) $CH_3COCH_3; H_2SO_4$

Ans : 2

Sol: $CH_3 - C \equiv N + 2H_2O \xrightarrow{Aq\,NaOH} CH_3COOH$

(X)

$\xrightarrow[(Y)]{P_2O_5} (CH_3CO)_2O$

10. Acetic acid is reacted with metallic sodium to form hydrogen and X. When X is heated with soda lime, Y and sodium carbonate are formed. Y is

1) C_2H_6 2) CH_4 3) CH_3COONa 4) CH_3CONH_2

Ans : 2

Sol: Acetic acid is reacted with metallic sodium to form sodium acetate and hydrogen. Sodium acetate when heated with Soda lime gives methane and Sodium Carbonate.

Reaction :

$$2CH_3COOH + 2Na \rightarrow 2CH_3COONa + H_2 \uparrow$$

(X)

$$CH_3COONa + NaOH \xrightarrow{Soda\,lime, Heat} CH_4 + Na_2CO_3$$

(X) (Y)

11. Which of the following converts acetic acid to acetyl chloride? **(2000 E)**

1) NaCl 2) HCl 3) Cl_2/P 4) PCl_3

Ans : 4

Sol: $3CH_3COOH + PCl_3 \rightarrow 3CH_3COCl + H_3PO_3$

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