Class 12 Chemistry · Chapter 8: Aldehydes, Ketones and Carboxylic Acids

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. Propanoyl chloride, CH_3CH_2COCl, is converted to propanal by [1]

(a) $LiAlH_4$, then H_2O (b) $NaBH_4$ in ethanol

(c) Zn–Hg and conc. HCl (d) H_2 over $Pd–BaSO_4$

2. Cyclohexanecarbonyl chloride, $C_6H_{11}COCl$, reacts with dimethylcadmium. The product is [1]

(a) 1-cyclohexylethan-1-one, $C_6H_{11}COCH_3$ (b) cyclohexanecarbaldehyde, $C_6H_{11}CHO$

(c) 1-cyclohexylethan-1-ol, $C_6H_{11}CH(OH)CH_3$ (d) methylcyclohexane, $C_6H_{11}CH_3$

3. Oxidation of 3-methylbutan-2-ol, $CH_3CH(OH)CH(CH_3)_2$, with acidified $K_2Cr_2O_7$ gives [1]

(a) 3-methylbutanal (b) 3-methylbutan-2-one

(c) 3-methylbutanoic acid (d) 2-methylbut-2-ene

4. Methyl pent-3-enoate, $CH_3–CH=CH–CH_2–COOCH_3$, is treated with DIBAL-H and then with water. The organic product is [1]

(a) $CH_3–CH=CH–CH_2–CH_2OH$ (b) $CH_3CH_2CH_2CH_2CHO$

(c) $CH_3–CH=CH–CH_2–CHO$ (d) $CH_3–CH=CH–CH_2–COOH$

5. Toluene can be converted to benzaldehyde, the oxidation stopping at the aldehyde stage, by treating it with [1]

(a) alkaline $KMnO_4$, heat, then H_3O^+ (b) CrO_2Cl_2 in CS_2, then H_3O^+

(c) acidified $K_2Cr_2O_7$, heat (d) Cl_2 and $FeCl_3$ in the dark

6. The addition of HCN to propanone is very slow with pure HCN but fast when a little base is present. Explain, writing the product formed. [2]

7. What hydrocarbon is obtained when (a) sodium 2-methylpropanoate is heated with sodalime, (b) an aqueous solution of sodium propanoate is electrolysed? Write the equation for (a). [2]

8. A sample of pentane is contaminated with a little pentanal. How can the aldehyde be separated and then recovered? Give the reason the method works. [2]

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9. Butanal is warmed with dilute NaOH. Write the structure and IUPAC name of the aldol formed and of the product it gives on heating. Which hydrogen of butanal makes the reaction possible? [3]

10. Write, as numbered steps, the mechanism of nucleophilic addition of cyanide ion to ethanal, and state how the hybridisation and shape at the carbonyl carbon change. [3]

11. Show two ways of converting 1-bromopropane into butanoic acid, writing the equations. What do the two routes have in common? [3]