INDIAN SCHOOL MUSCAT
SENIOR SECTION
DEPARTMENT OF CHEMISTRY
CLASS XII
CHAPTER-ALDEHYDES ,KETONES AND CARBOXYLIC ACIDS
WORKSHEET – 08

1. Write short notes on the following:

   a. Clemmensen reduction b. Aldol Condensation c. Rosenmund reduction
   d. Hell-Volhard-Zelinsky reaction e. Cannizzaro reaction f. Cross Aldol Condensation reaction

2. Give the structure of the following:

   a. Hex-2-en-4-ynoic acid b. 3-hydroxy butanal
   c. *p*-Nitropropiophenone d. 3-Bromo-4-phenylpentanoic acid
   e. 3-Methylcyclohexane carbaldehyde

3. Explain the following mechanisms:

   a) Nucleophilic attack on a carbonyl group of an aldehyde or a ketone.

   b) Nucleophilic addition of Grignard reagent on a carbonyl group of an aldehyde or a ketone.

4. Distinguish the following:

   a) Formic acid and Acetic acid b) Phenol and benzoic acid
   c) Benzaldehyde and Acetaldehyde d) Benzaldehyde and acetophenone

5. Give the structure of the following:

   a) Hex-2-en-4-ynoic acid b) 2,3- dimethylcyclopentane carbaldehyde
   c) *p*-Nitropropiophenone

6. Arrange the following in the increasing order of the property given as indicated:

   a) Acetaldehyde, acetone, Di-ter-butylketone, methyl-ter-butylketone (Reactivity towards HCl)

   b) 2-Bromobutanoic acid, 3-bromobutanoic acid, 2-methypropanoic acid, butanoic acid (Acid strength)

   c) CH_3CHO, CH_3CH_2OH, CH_3OCH_3, $CH_3CH_2CH_3$ (Boiling point)

   d) Ethanal, Propanal, Propanone, Butanone (Nucleophilic addition)

   e) Benzoic acid , 4- nitrobenzoic acid , 3,4- dinitrobenzoic acid , 4- methoxybenzoic acid (acid strength)

7. Effect the following conversions:

   a. Propanone to propene b. Propanal to Butan-2-one
   c. Ethanol to 3-hydroxy butanal d. Benzaldehyde to 2-hydroxyphenyl acetic acid.
   e.Styrene to benzoic acid

8. Account for the following:

a) Carboxylic acids do not give reactions of carbonyl group.

b) Aldehydes are more reactive to nucleophilic addition than ketones.

c) Carboxylic acids have higher boiling points than aldehyde, ketones and even alcohols of comparable molecular mass.

d) Chloroacetic acid is stronger than acetic acid.

e) There is two $-NH_2$ groups in semicarbazide , however only one is involved in the formation of semicarbazone.

9. a) An organic compound A contains 69.77% carbon, 11.63% hydrogen and rest oxygen. The molecular mass of the compound is 86. It does not reduce Tollens' reagent but forms an addition compound with sodium hydrogen sulphite and give positive iodoform test. On vigorous oxidation it gives ethanoic and propanoic acid. Write the possible structure of the compound A.

b) Write the chemical tests to distinguish between the following pairs of compounds:

i. Acetophenone and Benzophenone

ii. Ethanal and Propanal

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