CHEMISTRY STUDY MATERIALS FOR CLASS 12

(NCERT Based Key Points of Chapter - 11) GANESH KUMAR DATE: 11/10/2020

Alcohols, Phenols and Ethers

- Reactions of alcohols and phenols involving cleavage of O–H bond:
 - a. Reaction with metals:

$$2R-O-H + 2Na \longrightarrow 2R-O-Na + H_2$$
Sodium alkoxide

OH
ONa
$$2 \longrightarrow + 2Na \longrightarrow 2 \longrightarrow + H_2$$
Phenol Sodium phenoxide

b. Esterification:

$$Ar/RO - H + R' - COOH \xrightarrow{H^+} Ar/ROCOR' + H_2O$$
Phenol / Alcohol

 $Ar/R-OH + (R'CO)_2O \xrightarrow{H^+} Ar/ROCOR' + R'COOH$
Phenol / Alcohol

 $R/ArOH + R'COC1 \xrightarrow{Pyridine} R/ArOCOR + HC1$
Phenol / Alcohol

- 2. Reactions of alcohols involving cleavage of carbon oxygen (C–O) bond:
 - a. Reaction with hydrogen halides: (Lucas reagent-Conc. HCI + ZnCI₂)

ROH + HX
$$\xrightarrow{\text{conc. HCI}}$$
 RX + H O

b. Reaction with phosphorus trihalides:

$$3 \text{ ROH} + PX_3 \rightarrow 3 \text{ R-X} + H_3PO_3 (X = CI, Br)$$

c. Dehydration:

Protic acids (conc.
$$H_2SO_4$$
 or H_3PO_4)

or

Catalysts (anhyd. $ZnCl_2$ or alumina)

Heat

Chemical properties of phenols:
