QUALITATIVE TEST FOR ALCOHOL

1. LUCAS TEST:

To distinguish primary, secondary & tertiary alcohol

Lucas reagent= $HCl + ZnCl_2$

Cloudiness appears immediately → Tertiary alcohols

Cloudiness appears within five to ten minutes → Secondary alcohols

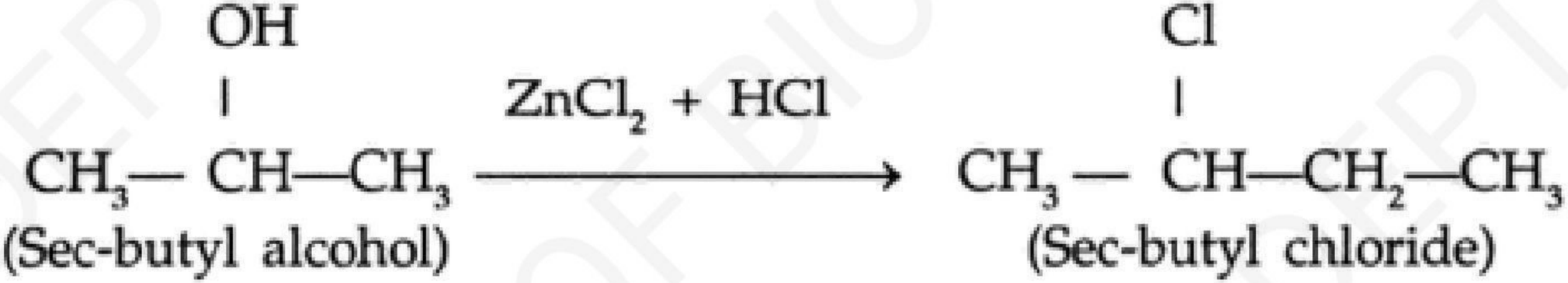
*Cloudiness appears only on heating → Primary alcoh*ols

(i)

$$CH_3CH_2OH \xrightarrow[\text{[DEPTH OF BIOLOGY]}]{ZnCl_2 + HCl} \text{No reaction}$$

(Ethyl alcohol)

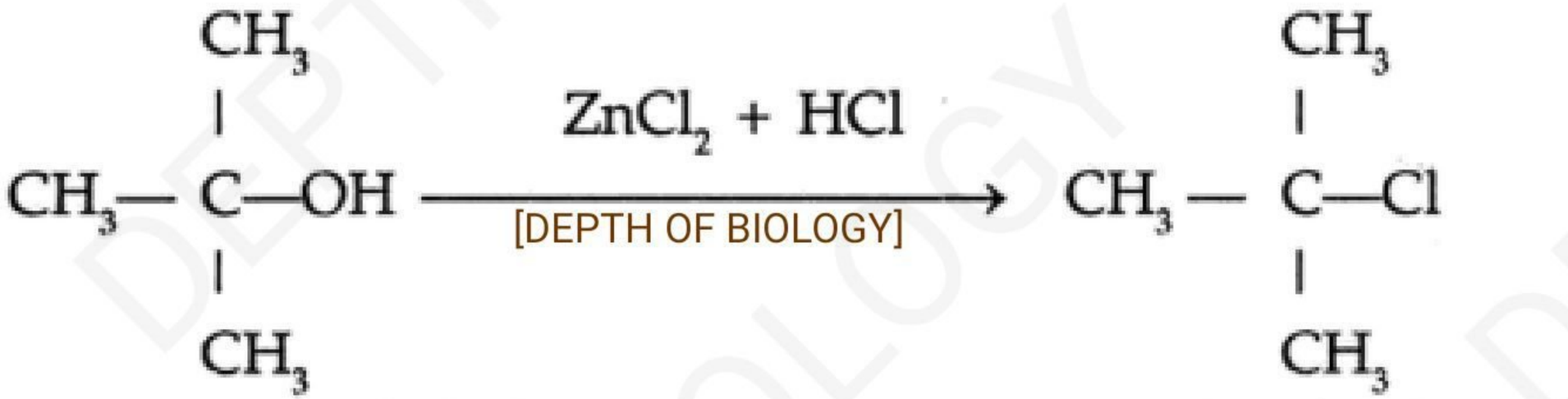
(ii)



(Sec-butyl alcohol) (Sec-butyl chloride)

[DEPTH OF BIOLOGY]

(iii)



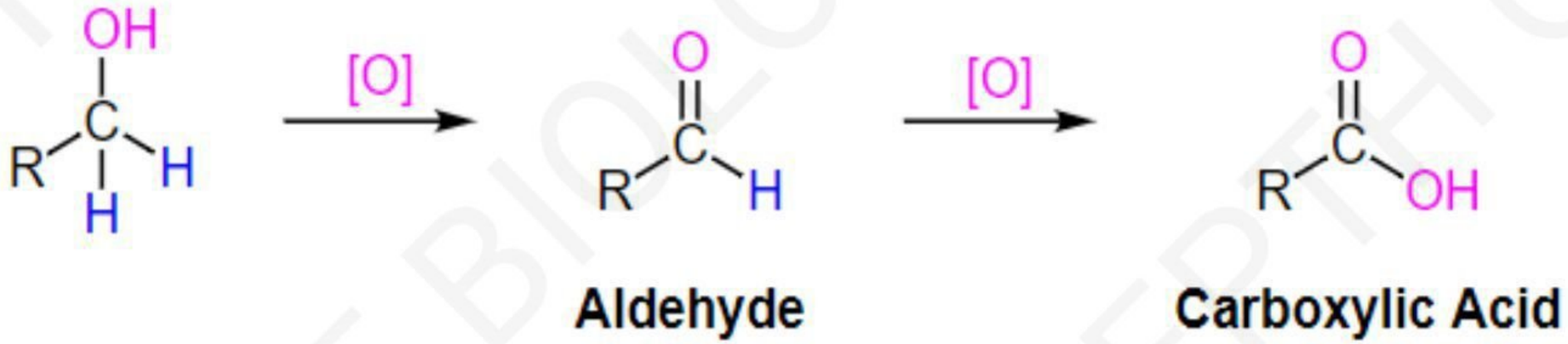
[DEPTH OF BIOLOGY]

(Tert-butyl alcohol) (Tert-butyl chloride)

2. OXIDATIVE TEST: [DEPTH OF BIOLOGY]

Here we detect the OH (whether it is primary, secondary or tertiary)

Primary Alcohol



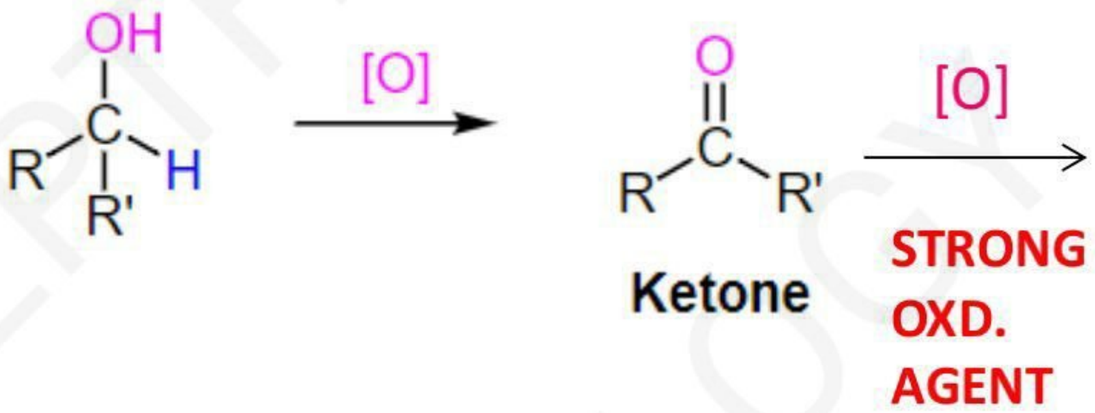
Aldehyde

Carboxylic Acid

- Acid contain same number of carbon atom as original OH

Secondary Alcohol

[DEPTH OF BIOLOGY]



Ketone

STRONG OXD. AGENT

$RCOOH + CO_2 + H_2O$

➢**Acid contain lesser number of carbon atom as original OH**

[DEPTH OF BIOLOGY]

Teritary Alcohol OXIDATION OF TERTIARY ALCOHOL IS NOT POSSIBLE

- Acid & ketone both contain lesser number of C atom as original

3. ACTION OF HOT REDUCED COPPER {CATALYTIC DEHYDROGENATION}: [DEPTH OF BIOLOGY]

when vapour of an OH passed over reduced Cu at 573K, primary & secondary alchol dehydrogenate to form aldehyde & ketone, tertiary OH however loses forming an alkene [DEPTH OF BIOLOGY]

- **1° ALCOHOL-**

$RCH_2OH \xrightarrow{Cu\ 573\ K} RCHO$ [aldehyde]

- **2° ALCOHOL-**

$R_2CHOH \xrightarrow{Cu\ 573\ K} R_2CO$ [ketone]

- **3° ALCOHOL-**

[DEPTH OF BIOLOGY]

$R_3COH \xrightarrow{Cu\ 573\ K} R_2C{=}CH_2$ [alkene]

4. VICTOR MAYER TEST: [DEPTH OF BIOLOGY]

This carries following sequence of reaction;

1. OH is treated with P & Iodine to convert it into the corresponding Iodide
2. The Iodide is then treated with silver to get corresponding nitro paraffin [DEPTH OF BIOLOGY]
3. The nitro paraffin is finally treated with nitrous acid ($NaNO_2 + HCl$) & then made alkali;

1° gives **red colour**

2° gives **blue colour**

3 ° gives **no colour**

[DEPTH OF BIOLOGY]