University Of Anbar
College Of Pharmacy

Pharmaceutical Organic Chemistry

Fourth grade

Chlorobutanol synthesis

Chapter 9

Prepared by
A.L. Abdulkareem H. Ayfan

Chlorobutanol synthesis

Chlorobutanol is 1,1,1-trichloro-2-methyl-2-propanol (it is a tertiary alcohol)

It has been used in therapeutic for a variety of purposes:

1-Bacterostatic (used as preservative) in many injectable, ophthalmic & intranasal preparations.

2-Sedative-hypnotic in the past.

3-Local anesthetic , in painful I.M injectable , topical preparations & as a dental analgesic

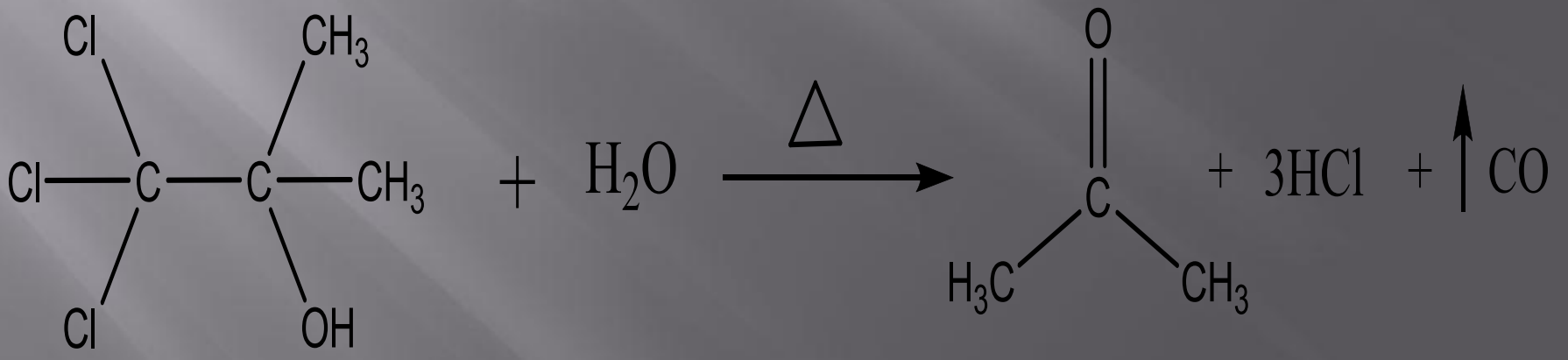
Chlorobutanol synthesis

Physical properties:

1-White crystalline substance exists in two forms(anhydrous & hydrated)

2-Characteristic camphor-like odour & taste

3-Slightly soluble in H2O (1/125) & freely soluble in alcohol (1/1). It is more soluble in boiling H2O but hydrolysis at such temp. will take place readily.

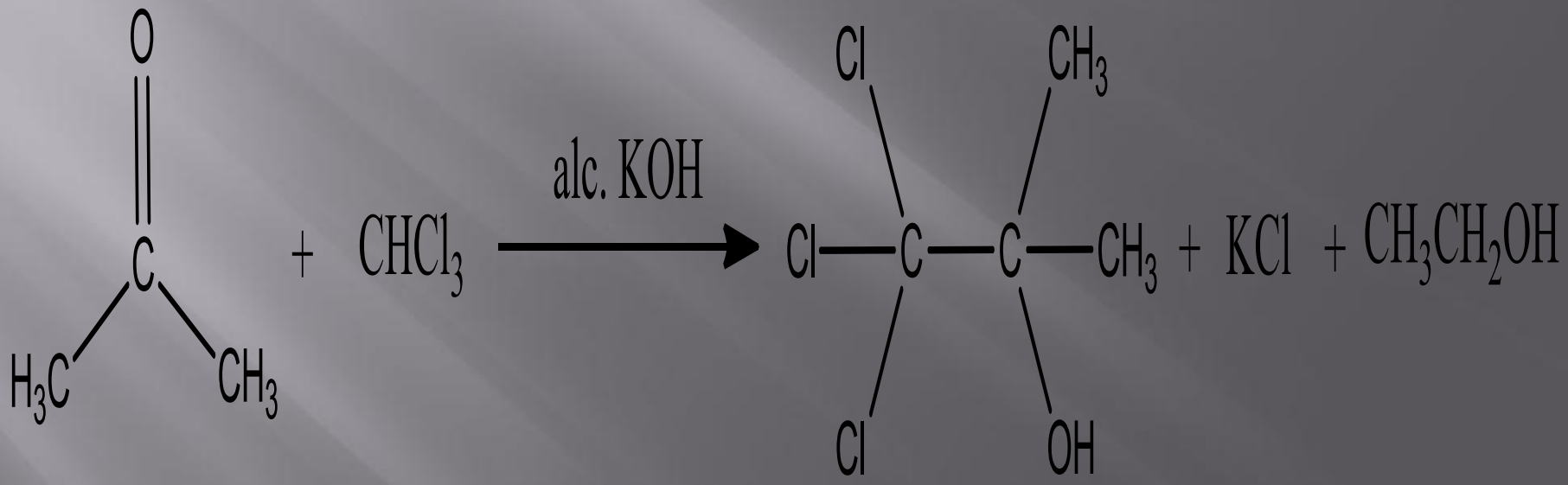


Therefore recrystallized from H2O-alcohol mixture.

CHLOROBUTANOL SYNTHESIS

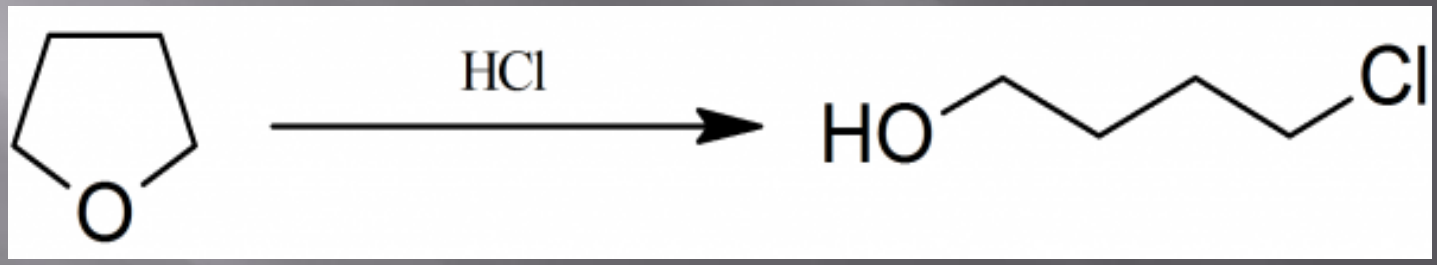
Preparation :

It is prepared from acetone & chloroform in alcoholic KOH (to speed the reaction)

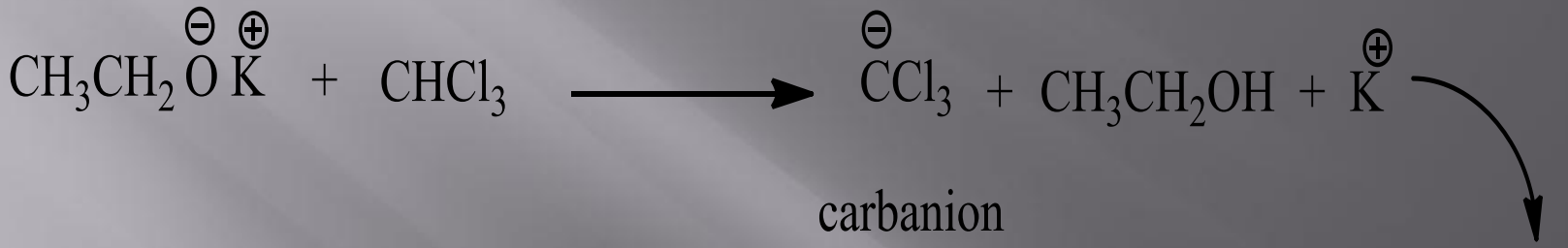


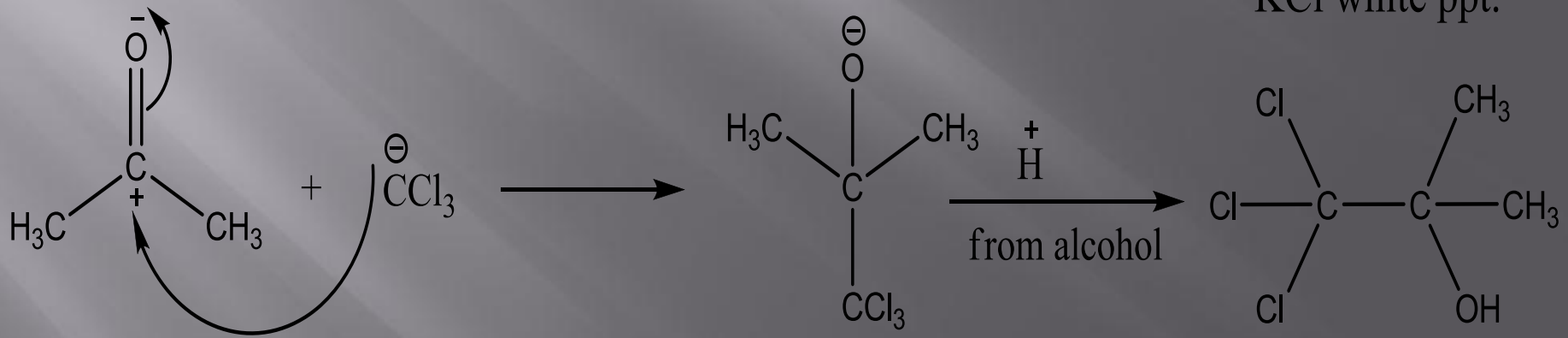
SYNTHESIS CHLOROBUTANUL FROM FURAN

4-Chloro-1-butanol is obtained simply by leading hydrogen chloride into boiling tetrahydrofuran until the temperature of the boiling mixture reaches 103.5-105.5°C (ca. 5 hours). 4-Chloro-1-butanol is isolated in 54-57% yield by distillation in a vacuum, at 15 mm, much hydrochloric acid being at first evolve. 4-Chloro-1-butanol 84-85 °C/16 mmHg.



Chlorobutanol synthesis





White ppt. is produced, may be due to dissociation of a second molecules of CHCl3 to give Cl-together with K+ to give potassium chloride (KCl)

Chlorobutanol synthesis

Procedure:

1-Mix 33 ml acetone (25 gm) in dry conical flask with 7 ml chloroform (10 gm)

2-Cool the mixture

3-Prepare alcoholic KOH (1.75 gm KOH / 12.5 ml alcohol) & put in separatory funnel

4-Add this solution (alc. KOH) drop wise from the separatory funnel on the previous solution within a period of 15 min.

5-Filter the ppt. KCl

6-Evaporate the filtrate on H2O bath