Experiment No. 03

AIM: To prepare and submit Chlorobutanol from acetone

REFERENCES:

1. Vogel's Textbook of Practical Organic Chemistry by Brian S. Furniss, Antony J. Hannaford, Peter W. G. Smith & Austin R. Tatchell; Fifth Edition; Page No. 1197.

REQUIREMENTS

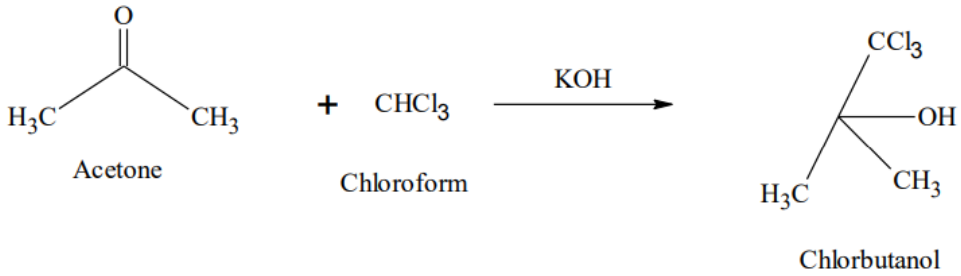
Chemicals: Chloroform, Potassium hydroxide, Acetone.d

Apparatus:

PRINCIPLE:

Chlorobutanol, also known as Chloroketone, is a trichloro derivative of tertiary butyl alcohol. It is prepared with acetone and chloroform in the presence of solid potassium hydroxide. Chlorobutanol is used as a local anesthetic and antiseptic in dental preparation.

REACTION:



PROCEDURE:

1. The mixture of 50 g of acetone and 100 g of chloroform is continuously stirred until it cools below 0°C.
2. Add 32.5 g of potassium hydroxide over a period of 6 hours after it stands at room temperature for a further 3.6 hours with continuous stirring.
3. The mass is filtered, and the residue is washed with acetone. The combined filtrates are distilled to recover chloroform and acetone, and the fraction passing over between 165°C and 172°C is collected separately.
4. The distillate is poured into water, and when this is complete, the solid is filtered off and recrystallized from a mixture of alcohol and water.
5. Chlorobutanol is extremely volatile, even at ordinary temperatures.

6. Chlorobutanol forms white glistening crystals. When anhydrous, it melts at 96- 97°C. It is soluble in water and 90% ethyl alcohol.

CALCULATION:

Here, the limiting reagent is acetone; hence, the yield should be calculated from the amount taken.

The molecular formula of acetone = C_2H_6O

And molecular formula of Chlorobutanol = $C_4H_7Cl_3O$

Molecular weight of resorcinol = 46 g/mole

The molecular weight of Chlorobutanol= 177 g/mole

Theoretical yield:

46 g of acetone forms 177 g of Chlorobutanol

Therefore, 50 g acetone forms …….? (X) g of Chlorobutanol

= …. g

Theoretical yield = ….g

Practical yield = ————- g

% Yield = (Practical Yield)/(Theoretical Yield) × 100

RESULT:

Chlorobutanol was synthesized from acetone and submitted.

Name of Compound	**Chlorobutanol**
Theoretical yield	……gm
Practical yield	……gm
% Practical yield	…….%
Melting point	…….^{o}C

pharma