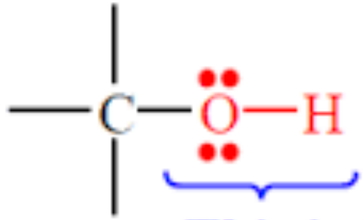
Estimation of Alcohol

Advance Chemistry Lab 4

Assist. Lect. Zahra A. Ismail

Alcohols

are organic compounds characterized by the presence of a carboxyl group in their compounds. They are derived from hydrocarbons by replacing the hydrogen atom with a hydroxyl group. Alcohols have the general formula ROH.



This is the functional group of an alcohol

Principle of Alcohol Estimation

- Alcohol reacts with oxidizing agent i.e. potassium dichromate and gets oxidized to acetic acid.
- Remaining of the potassium dichromate will react with iodine. This is a light sensitive process, so incubation is carried out in dark.
- Liberated iodine is titrated with 0.1N sodium thiosulphate.
- In this process starch is used as an indicator.

Reaction

$$K_2Cr_2O_7 + H_2SO_4 + 2C_2H_5OH \rightarrow 3CH_3COOH + 2K_2SO_4 + 4H_2O + 2Cr_2(SO_4)_3$$

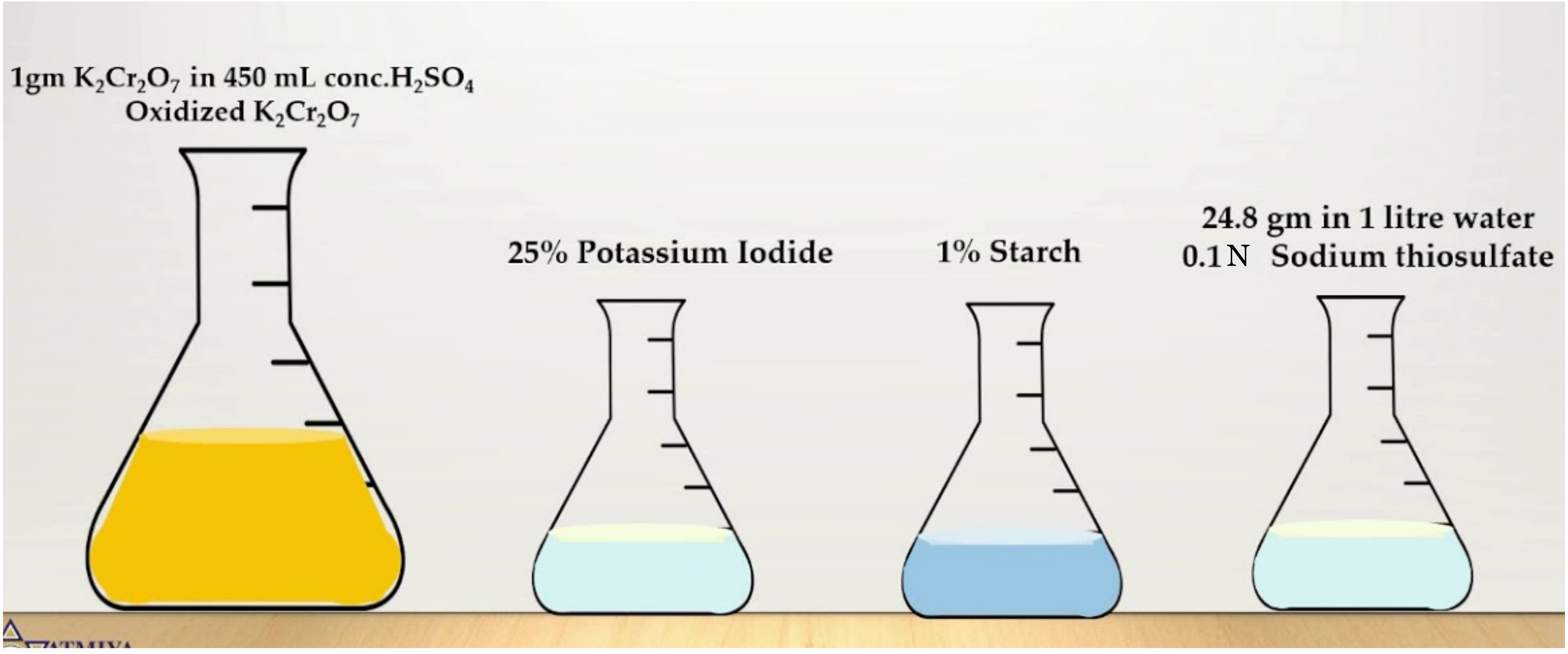
Experimental Work

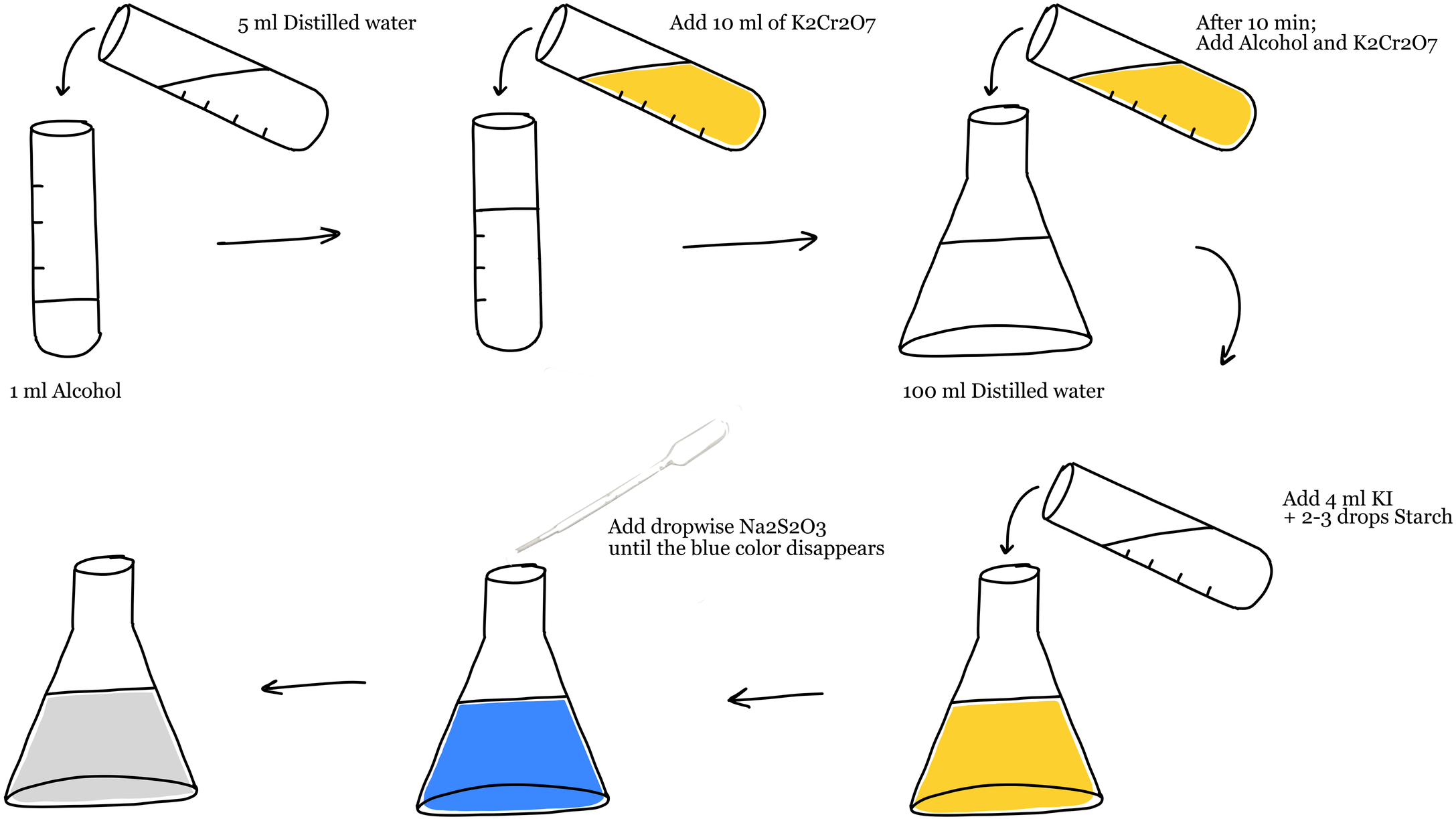
Chemicals and equipments

- Potassium Dichromate ($K_2Cr_2O_7$)
- Potassium Iodide (KI) [25%]
- Sulphuric Acid (H_2SO_4)
- Starch [1%]
- Distilled Water
- Sodium Thiosulphate ($Na_2S_2O_3$) [0.1N]
- Flask
- Graduated cylinder
- Pipet

Experiment Steps

- Add 5 ml Distilled water to 1 ml of Alcohol.
- Add 10ml of $K_2Cr_2O_7$ (1 g $K_2Cr_2O_7$ dissolved in 450 ml H_2SO_4) and incubate at room temperature for 10 minute (color is yellow).
- Empty the tube containing Alcohol + $K_2Cr_2O_7$ to fresh flask containing 100ml Distilled water.
- Add 4ml KI (25%) + 2-3 drops of Starch (color becomes blue).
- Add dropwise Sodium thiosulphate (24.8 g Sodium thiosulphate dissolved in 1L water) [0.1N] until the blue color disappears and note the reading.


1gm $K_2Cr_2O_7$ in 450 mL conc.H_2SO_4
Oxidized $K_2Cr_2O_7$
25% Potassium Iodide
1% Starch
24.8 gm in 1 litre water
0.1 N Sodium thiosulfate


5 ml Distilled water
Add 10 ml of K2Cr2O7
After 10 min;
Add Alcohol and K2Cr2O7
1 ml Alcohol
100 ml Distilled water
Add 4 ml KI
+ 2-3 drops Starch
Add dropwise Na2S2O3
until the blue color disappears