AL-Mustaqbal University College

Radiology Techniques Department

First Class

Practical General Chemistry

Fourth Lecture (Alcohols)

Alcohols

Alcohol is an organic compound carrying at least one functional hydroxyl (OH) group attached to a saturated carbon atom. The term alcohol originally denotes basic alcohol ethanol (ethyl alcohol), which is used as a medicine. , Of which methanol and ethanol are the simplest components, include all compounds for which the general formula is C_nH_{2n+1OH}. Alcohols include primary (RCH_2OH), secondary (R_2CHOH) alcohol, and tertiary alcohol (R_3COH).

Reactions of alcohol

We divide the reactions of alcohols into:

1- Reactions in which the bond is broken down by oxygen Hydrogen O-H

2- Reactions in which the bond breaks down carbon - oxygen C-O

First / reactions in which the RO-H bond is broken:

(A) Reaction of alcohols with alkali metals

(B) Ester formation reaction

(C) Oxidation of alcohol

Second / The reactions in which the C-O bond is broken

A) Dehydration reaction of alcohols

(B) Interaction of alcohols with HX mineral acids

(C) Interaction of alcohols with PBr_3 - Phosphorous Tribromide

(D) Interaction of alcohols with $SOCl_2$ - Thionyl Chloride

The physical properties of alcohols

1- The (OH) group makes the alcohol more polar, meaning it is more soluble in water.

2- Alcohol has a higher boiling point than other hydrocarbons and ether.

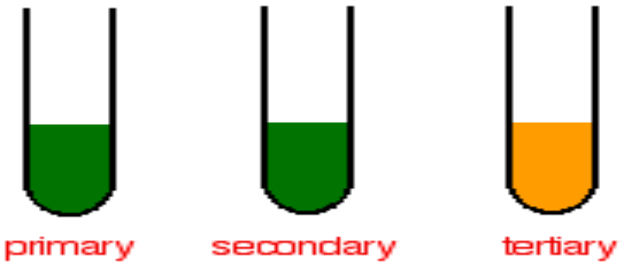
3- Most alcohol has no color.

4- Alcohols that have a number of carbon atoms more than 12 and have many branches that are solid at room temperature.

Unknown test

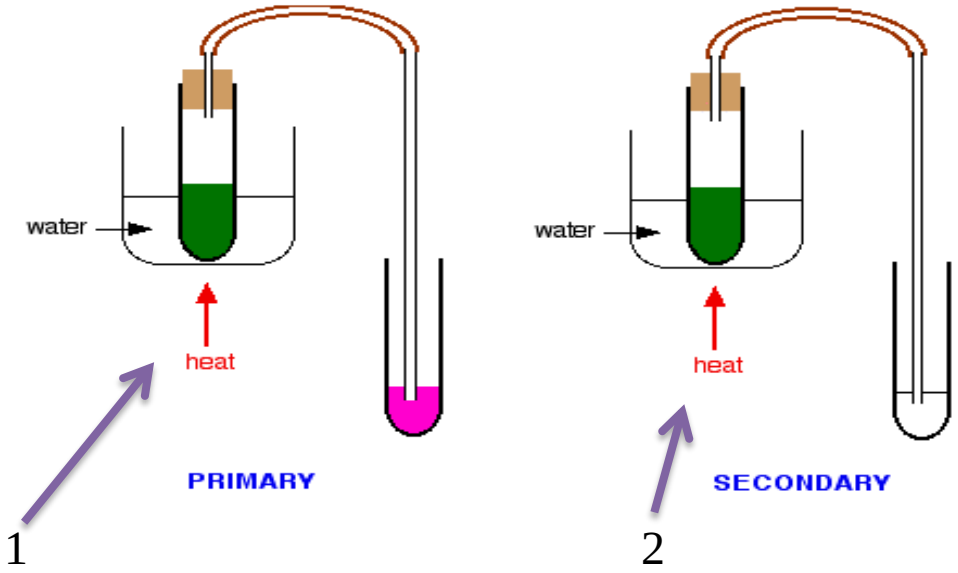
A few drops of the alcohol are added to a test tube containing potassium dichromate(VI) solution acidified with dilute sulfuric acid. The tube is warmed in a hot water bath

After heating, the following colors are observed



In the case of a primary or secondary alcohols, the orange solution turns green. The Schiff's test will need to be performed to distinguish between the primary and secondary alcohols. With a tertiary alcohol, there is no color change.

A secondary alcohol is identified by the color change with the acidified potassium dichromate(VI) solution and the absence of a color change with the Schiff's reagent .



1 2

The alcoholic group can be detected by the following tests:

1. Sodium metal test
   Alcohols react with active metals like sodium and liberate hydrogen gas that can be observed in the form of effervescence

2. Ester test

Alcohols react with carboxylic acids to form fruity smelling compounds called esters

3. Ceric ammonium nitrate test

4. Acetyl chloride test

5. Iodoform test