General Chemistry

University Of Fallujah
College Of Medicine

Lecture : ***reaction of soap and cholestrol***

Stage : First stage 2st

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- **Saponification**
- Fats are generally composed of esters of fatty acids and can be hydrolyzed to glycerol and fatty acids by different agents like lipase, superheated steam, long continued action of air and light or boiling with alkali. In this test alkali is used to hydrolyze fat. This process of hydrolyzing triacylglycerol into glycerol and fatty acids by the any one of the above said means is known as saponification. Metallic salts of higher fatty acids are called soaps. Ordinary hard soaps are sodium soaps. Potassium soaps are soft soaps. Calcium and magnesium form insoluble soaps.

- **Procedure**: – Take a clean dry test tube and add 0.5 ml of oil and add 2-3 ml of ethyl alcohol to it and mix well. – Then add 10 ml of 10% alcoholic NaOH solution. Shake well and keep in a boiling water bath for 15 minutes. – Take the test tube out of boiling water bath. keep it in rack for another 15 minutes and add 15 ml of water. Shake thoroughly. – Divide the contents into 4 equal parts and add into 4 tubes marked A, B, C and D. – To 'A' add 3 ml of concentrated HCl and shake well. – To 'B' add 4 ml of saturated NaCl solution. – To 'C' add 3 drops of $CaCl_2$ solution – "D" will serve as contro

- Tube A White precipitate Addition of HCl liberates fatty acids which will be seen as white precipitate since it is insoluble in water
- Tube B Pale white layer Added NaCl reacts with fatty acids to form sodium salts of fatty rises up acids
- Tube C White precipitate Calcium salt of fatty acid (insoluble in water) are formed on adding $CaCl_2$

- CHOLESTEROL. Identification by microscopy: Cholesterol has a characteristic shape which can be appreciated by microscopy. Cholesterol crystals have a rhombic shape with a notch at one corner

- COLOR REACTION OF CHOLESTEROL
- 1. Salkowski's Reaction (H_2SO_4 Test)
  Procedure: Dissolve a few crystals of cholesterol in 2 ml of chloroform in a dry test tube and add an equal volume of concentrated H_2SO_4 gently along the sides of the tube. The acid being heavier goes down.
  Observation: The acid layer develops a yellow color with a green florescence. A play of colors from bluish red to cherry red to purple develops in chloroform layer.

- 2. Liebermann-Burchard Reaction (Acetic Anhydride Sulfuric Acid Test)
- Procedure: Dissolve a few crystals of cholesterol in 2 ml of chloroform in a dry test tube. Add 10 drops of acetic anhydride and 1-3 drops of concentrated sulfuric acid.
  Observation: The solution becomes red, then blue and finally bluish green in colour.
  Principle: Acetic anhydride dehydrate cholesterol which then reacts with cholesterol to give the color.