**Aim: Determination of the saponification value of fat sample**

**Video:** [**https://www.youtube.com/watch?v=ersHDsiAVko**](https://www.youtube.com/watch?v=ersHDsiAVko)

**Principle:** Fats (triglycerides) upon alkaline hydrolysis (either with KOH or NaOH ) yield glycerol and potassium or sodium salts of fatty acids (soap) .



The saponification number is the number of milligrams of potassium hydroxide  required to neutralize the fatty acids  resulting from the complete hydrolysis of 1g of fat .

It gives information concerning the character of the fatty acids of the fat- the longer the carbon chain, the less acid is liberated per gram of fat hydrolysed. It is also considered  as a  measure of the average molecular weight (or chain length) of all the fatty acids present.

The long chain fatty acids found in fats have low saponification value because they have a relatively fewer number of carboxylic functional groups per unit mass of the fat and therefore high molecular weight .

**Materials Required:**

1)    Fats and Oils [coconut  oil, sunflower oil]

2)    Conical Flask

3)    100ml beaker

4)    Weigh Balance

5)    Dropper

6)    Reflux condenser

7)    Boiling Water bath

8)    Glass pipette (25ml)

9)    Burette

**Reagents Required:**

1)    Ethanolic KOH(95% ethanol, v/v)

2)    Potassium hydroxide [0.5N]

3)    Fat solvent

4)    Hydrochloric acid[0.5N]

5)    Phenolphthalein indicator

**Procedure:**

1)    Weigh 1g of fat in a tared beaker  and dissolve in about 3ml of the fat solvent   [ ethanol /ether mixture].
2)    Quantitatively transfer the contents of the beaker three times with a further 7ml of the solvent.
3)    Add 25ml of 0.5N alcoholic KOH and mix well, attach this to a reflux condenser.
4)    Set up another reflux condenser as  the blank with all other reagents present except the fat.
5)    Place both the flasks in a boiling water bath for 30 minutes .
6)    Cool the flasks to room temperature .
7)    Now add phenolphthalein indicator to both the flasks and titrate with 0.5N HCl .
8)    Note down the endpoint of blank and test .
9)    The difference between the blank and test reading gives the number of millilitres of 0.5N KOH required to saponify 1g of fat.
10)  Calculate the saponification value using the formula :

                              Saponification value or number of fat = mg of KOH consumed  by 1g of fat.

                              Weight of KOH = Normality of KOH \* Equivalent weight\* volume  of KOH in litres

                               Volume of  KOH consumed by 1g  fat = [Blank – test]ml