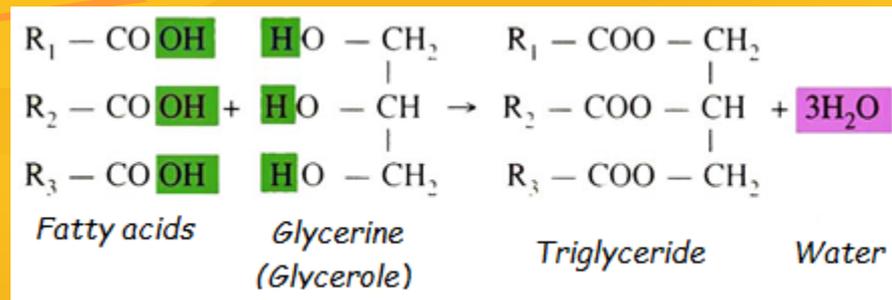


# QUANTITATION OF FIXED OILS

- Fats and closely related oils are mixtures of compounds consisting of fatty acids combined with glycerol (commonly known as glycerin) via ester linkages.
- Fats and oils are commonly called "triglycerides" resulting from the combination of one molecule of glycerol with three molecules of fatty acids.





- Animal sources

- Food fats and oils are especially derived from oilseed.

# How to determine fat content?

- The sample's size is reduced to increase the surface area and due to it, there is larger exposed surface.
- The sample is first mixed with anhydrous  $\text{Na}_2\text{SO}_4$  to dry it.
- The samples are then soxhlet-extracted.
  - The mixed sample placed in an extraction thimble (Thimbles are produced from cellulose and the thimble ensures that the rapid motion of the solvent does not transport any solid material to the still pot.)
  - Fill a round bottom flask with nonpolar solvent (petroleum eter, hexane, chloroform,  $\text{CCl}_4$  or ether)
- After extraction, the solvent is removed by means of distillation.
- The flask is dried in an  $105\text{ }^\circ\text{C}$  oven.
- The sample is allowed to cool down. The weight of the flask is taken and % yield is calculated.

# SOXHLET EXTRACTOR

- Soxhlet extractor allows efficiently recycling a small amount of solvent to dissolve a larger amount of material.
- Soxhlet apparatus mainly consists of three parts:
  1. Condenser
  2. Extractor
  3. Thimble

# Procedure

Semen Sesami

+

Anhydrous  $\text{Na}_2\text{SO}_4$

↓ mixed

The thimble is loaded into the main chamber of the Soxhlet extractor.

↓  
Extracted with hexane for 1.5 hours.

↓  
The extract is transferred to accurately weighed flask and distilled.

↓  
The flask is dried in an  $105^\circ\text{C}$  oven.

↓  
Then is cooled in a desiccator and % yield is calculated.

The reason we added the  $\text{Na}_2\text{SO}_4$  at the beginning: If water is found in the drug, it prevents the oil from passing into the nonpolar solvent

**Quantitative transfer:** The transfer of a sample from one container to another such that none is lost; a complete transfer.

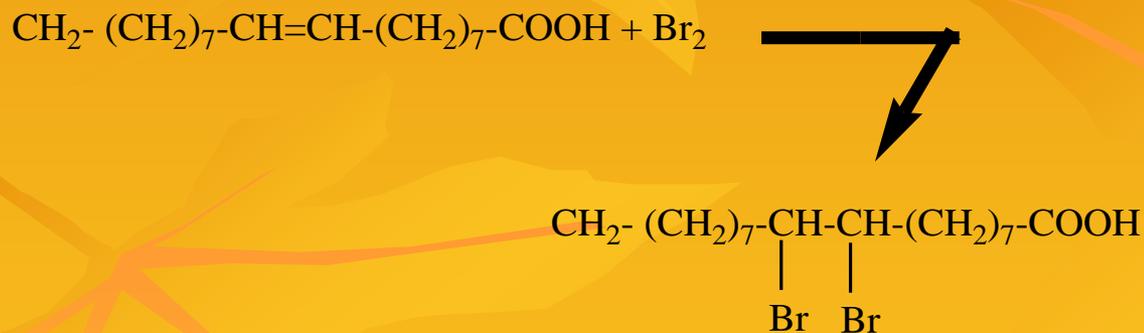
# Some experiments on fixed oils

- Place one drop of Oleum Olivae (fixed oil) on the filter paper and Oleum Origani (essential oil) on the other side and dry in oven. The essential oil's stain disappears spontaneously.
- Test the solubility of Oleum Olivae in water, 90% Ethanol, Ether,  $\text{CHCl}_3$  and  $\text{CCl}_4$ .
- Test the solubility of Oleum Ricini in absolute alcohol, 90% ethanol and glacial acetic acid (99%). (Unlike Oleum Olivae, it is soluble in alcohol. This is because most of the oil is ricinoleic acid (12-OH oleic acid), so the oil is more polar.)

**Acetic acid: 69-71%.**

**Acetic acid anhydride is two molecules of acetic acid with a molecule of water removed.**

- Oleum Olivae is solved in  $\text{CCl}_4$  before adding bromine water to it. Decolourisation of the bromine indicates unsaturation. This method utilizes the addition of elemental bromine to the unsaturated bonds in oleic acid



# BAUDOIN REACTION

Add 1% sucrose-containing HCl to Oleum Sesami and wait for 5 min. Repeat the experiment with non-sucrose HCl and compare them. Sesame oil produces specific **red color** in sucrose-containing test. The reason for this is that sesamol in sesame oil produces specific color when combined with **furfural** and HCl.

