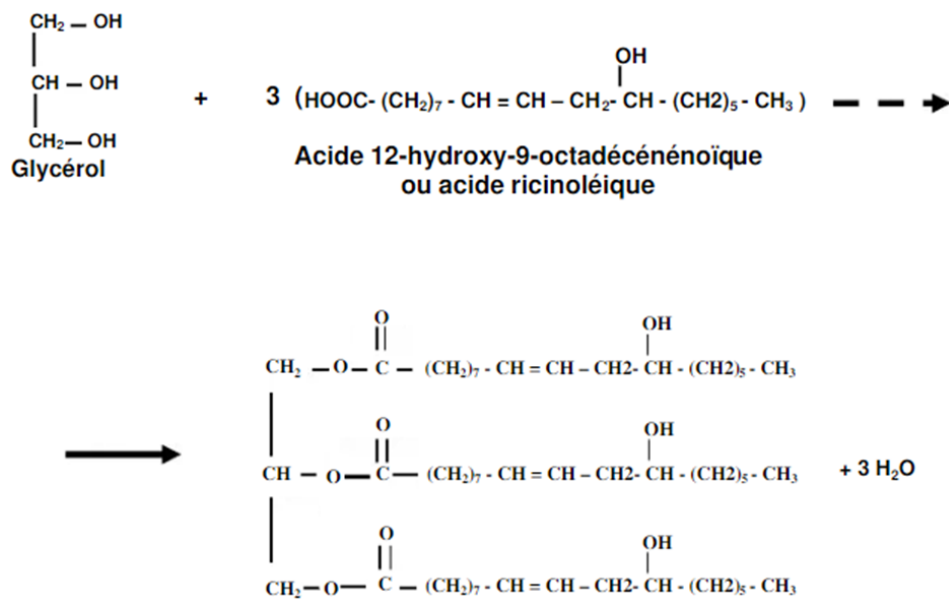


Partial work N°5: Saponification index of a fatty substance

1. Aim

Determination of the saponification index of triricinolein, the major triglyceride of castor oil.



2. Principle of the saponification reaction

In a hot and strongly basic environment, triglycerides release glycerol and alkaline salts of fatty acids called soaps.



The saponification index is the quantity in mg of KOH necessary to neutralize the fatty acids resulting from the hydrolysis of 1g of fatty substances.

It allows oils to be classified according to the length of the fatty acid chains that compose them.

3. Material

- Balance
- Burette
- Pipettes
- Test tubes
- Boiling water bath
- Funnels
- Beakers

4. Reagents

- KOH 0.5N in ethanol
- H₂SO₄ 0.25N
- distilled water
- Phenol phthalein
- Castor oil

5. Manipulation

- Weigh the test tube.
- Introduce 0.6ml of castor oil and reweigh, determine the mass of the oil.
- Add 6ml of alcoholic KOH 0.5N, shake.
- Cap the test tube. Stir using the vortex.
- Place the tubes in a boiling water bath, stirring occasionally, until the oil completely disappears (30 min)
- Leave to cool, transfer into a beaker and collect what remains in the tube by rinsing it with 5ml of distilled water
- Add 2 drops of phenolphthalein (purplish pink coloring)
- Titrate the excess KOH with H₂SO₄ (burette). Note the V_e volume
- Make a control containing 6ml of KOH. Note the V_t
- Determination of the saponification index

$$IS = [(N_{KOH} \cdot (V_t - V_e) \cdot M_{KOH}) / m_{huile}]$$