

Practical work N°2:
Redox dosage –Manganimetry-**1-Reminder:**

- **Manganimetry:** Method of volumetric dosage of reducing bodies using a standard solution of potassium permanganate, generally in an acidic medium.
- A redox reaction is a reaction which involves a transfer of electrons from a reducer (Red1) of an Ox1/Red1 couple to the oxidant (Ox2) of another Ox2/Red2 couple.
- Oxidation is a loss of electrons.
- A reduction is a gain of electrons.

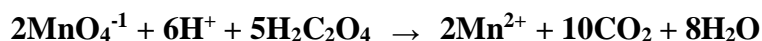
We summarize this as follows: **Reducer → Oxidant + ne⁻**

2- Objective:

Determination of the concentration and mass of oxalic acid.

Principle of manipulation:

The dosage consists of determining the concentration of a reducing solution knowing that of the oxidizing solution. We propose to study the oxidation of oxalic acid by the permanganate ion MnO_4^{-1} in an acidic medium.



This dosage is called manganimetry. The oxidizing properties of the permanganate ion are at the origin of manganimetry. The oxidizing form MnO_4^{-1} is purple, the reducing form Mn^{2+} is colorless, which allows the equivalent point to be determined without using colored indicators.

The H^+ ions are provided by excess sulfuric acid (if the acid is not in sufficient quantity, the permanganate does not completely discolor and a brown color is observed).

This reaction is slow at the start, to activate, you can heat it slightly (not to exceed 60 °C) at the start of the dosage.

3- Materials:

Volumetric flask (100ml), Erlenmeyer, Pipette (20ml) or Test tube, Burette, Beaker, Funnel, Hot plate and stirring, Magnetic bar, Thermometer.

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4- Products used:

Oxalic acid solution $\text{H}_2\text{C}_2\text{O}_4$ of unknown concentration, Potassium permanganate solution KMnO_4 of normality 0.1N, Sulfuric acid solution H_2SO_4 , Distilled water.

5- Operating Mode:

- Fill the burette with the KMnO_4 oxidizing solution of 0.1N normality.
- You find a quantity of oxalic acid $\text{H}_2\text{C}_2\text{O}_4$ in a 100ml vial. Complete with distilled water up to the mark, mix well.
- Take 20ml of $\text{H}_2\text{C}_2\text{O}_4$ in an Erlenmeyer flask, add 10ml of H_2SO_4 sulfuric acid.
- Heat the solution between 50 °C and 60 °C.
- Allow the oxidizing solution of KMnO_4 to flow drop by drop with stirring until a pink color appears. Note the volume of KMnO_4 .
- Repeat the operation 3 times to ensure results.