COLLOIDAL SOLUTIONS CRITICAL MICELLE CONCENTRATION OF AN IONIC SURFACTANT

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INDEX

INDEX

- **Introduction**
- Theoretical background
- Procedure
- Data to be collected

Introduction

- Study the behaviour of colloidal solutions.

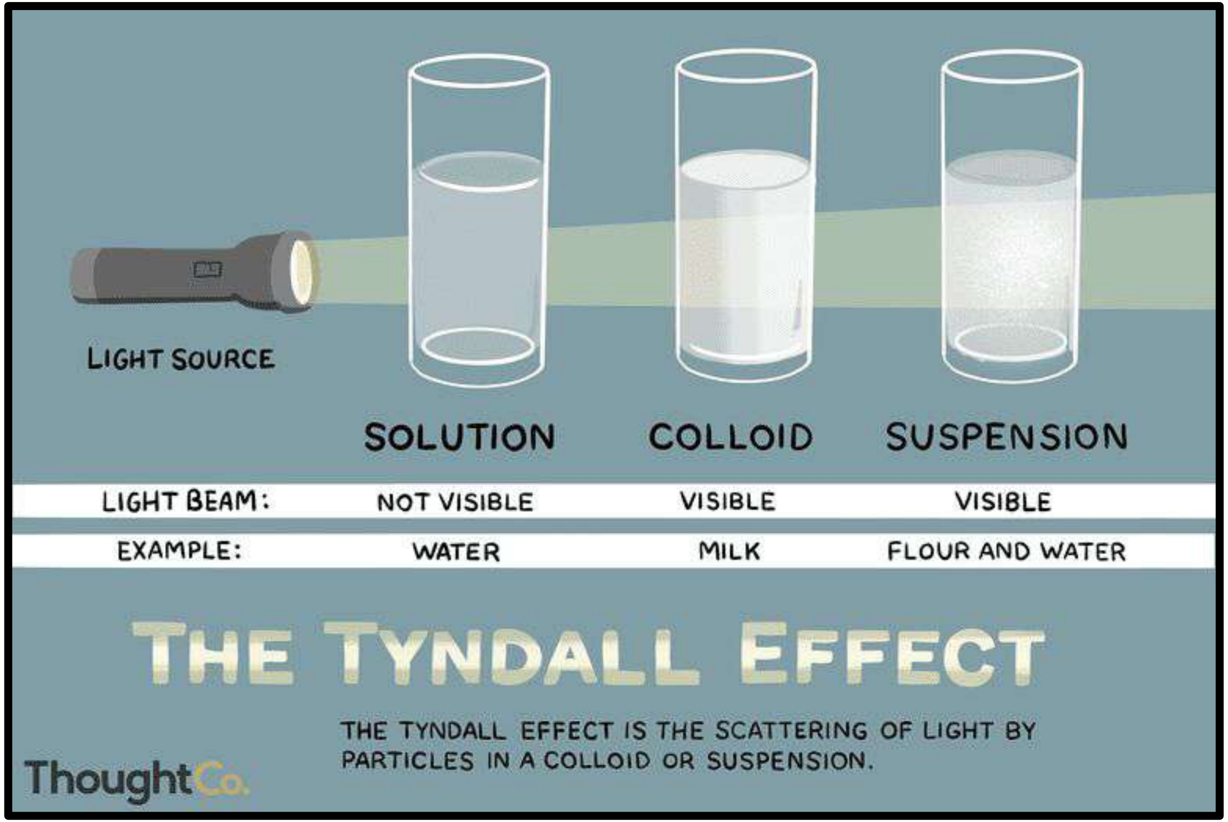
- Obtain the CMC value and see how it varies depending on the medium.

INDEX

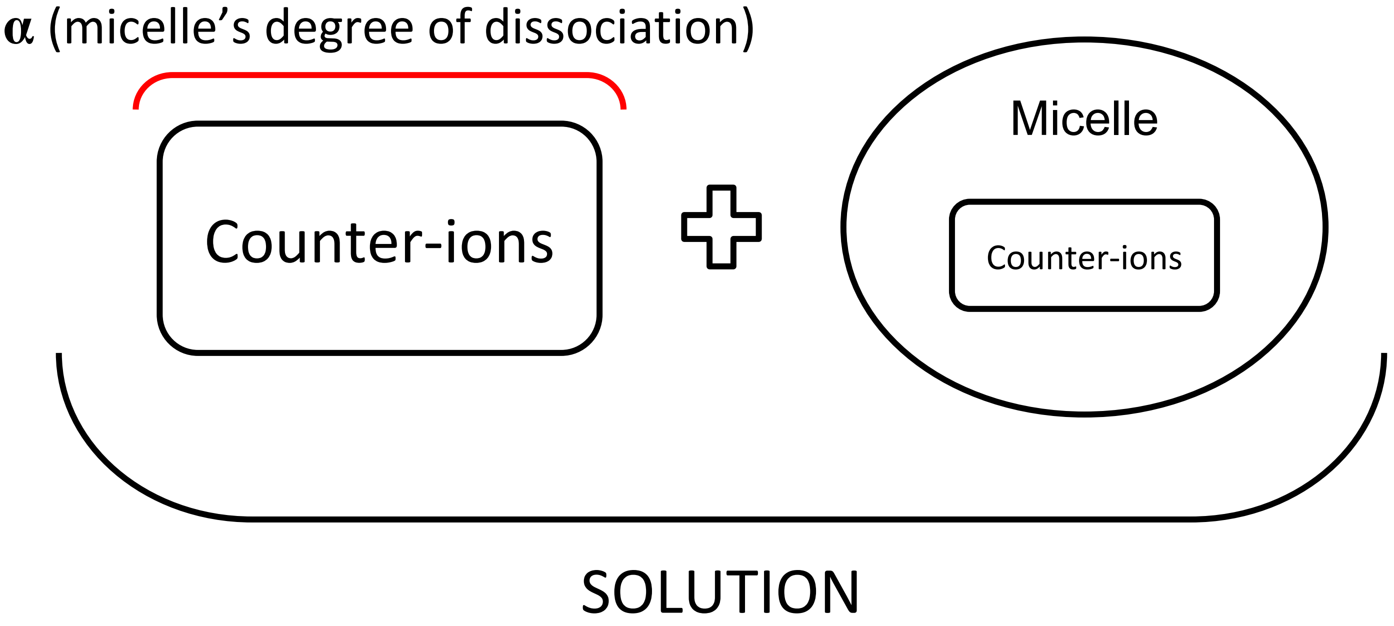
- Introduction
- **Theoretical background**
- Procedure
- Data to be collected

Theoretical background

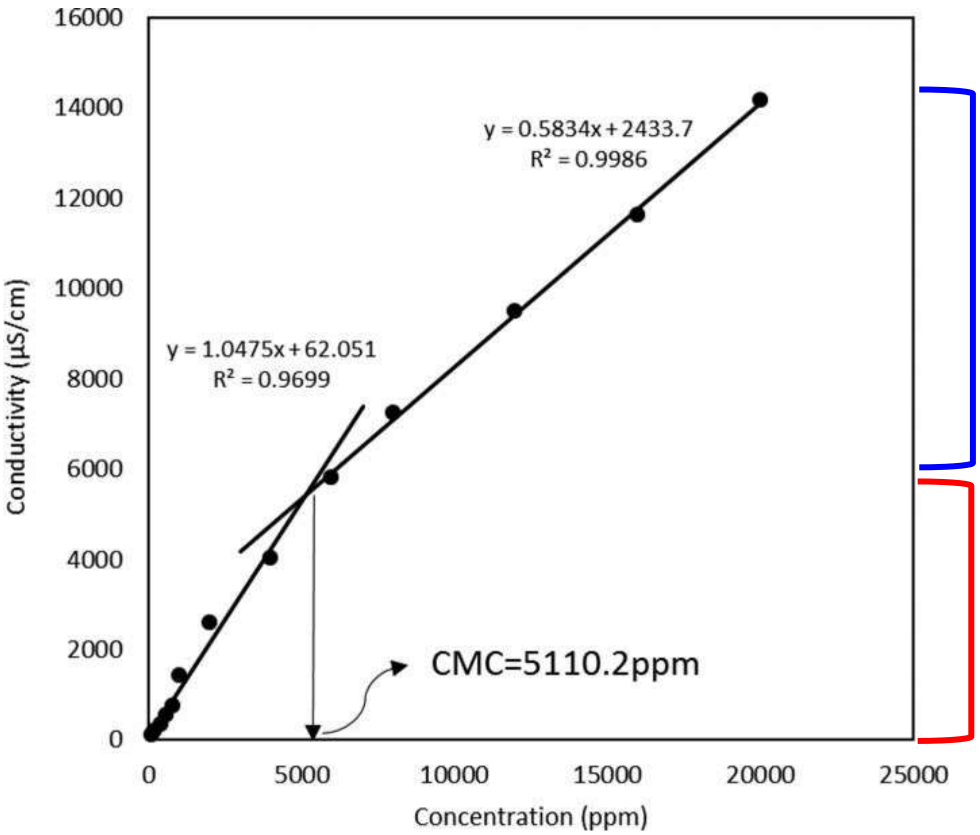
A colloidal solution is a dispersion of one substance in another, normally a liquid.



Theoretical background



Theoretical background



Partially ionised micelles

Strong electrolyte

Theoretical background

$$\Delta G^0 = RT \ln CMC$$

CMC= minimum concentration of the surfactant necessary to form micelles

INDEX

- Introduction
- Theoretical background
- **Experimental Procedure**
- Data to be collected

Experimental Procedure

In water

1. Prepare 100 mL of 0,08M DSNa in water.
2. On another baker (100 mL baker), put 50 mL of water and insert a conductivity cell. Stir it and measure the specific conductivity of pure water.
3. Put on a burette 25 mL of the previously prepared DSNa solution, and add 1 mL to the baker containing the pure water with de conductivity cell. Homogenise the solution and measure the conductivity. Repeat the process adding up to 15 mL of the DSNa solution.

Experimental Procedure

In an electrolyte solution

1. Prepare 250 mL of 0,1/0,02/0,01/0,005/0,001 M NaCl diluting in water.
2. Prepare 100 mL of 0,08 M DSNa with each of the NaCl solutions.
3. Measure the specific conductivity of 50 mL of 0,02 M NaCl.
4. Add drop by drop the 0,08 M DSNa solution in every NaCl solution (first the 0,02 M, then 0,01 M...). Add aliquots of DSNa up to 15 mL

INDEX

Data to be collected

Note down the specific conductivity, first of all, of water and then,of the solution, each time 1 mL DSNa solution is added.

Do the same in the part of the *electrolyte solution* with each solution, where different NaCl concentrations have been used.

This data will allow us to determine some properties of the solutions, like CMC, α and ΔG.

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