Department of Science.
2º ESO Lab practice.

DETERMINATION OF DENSITY FROM SOLIDS AND LIQUIDS

TARGET

You will determine the density of a liquid and a regular or irregular solid, measuring its mass and its volume.

INTRODUCTION

The **density** of a substance is defined as the relationship between the mass and the volume it occupies. Density is a characteristic property of matter and it doesn't depend on the amount of substance, otherwise it does depend on the temperature.

$$d = \frac{m}{V}$$

The unit of density in SI units is kg/m^3, but it is usually expressed in g/cm^3.

MATERIAL

- Scales.
- Graduated cylinder in ml.
- Eyedropper.
- Water.

- 250 o 500 ml beaker.
- Samples of regular solid bodies.
- Samples of irregular solid bodies.

PROCEDURE

➢ **A. Determination of density of water from its mass and its volume.**

1. Measure the graduated cylinder mass with the scales (it must be clean and dry).
2. Drop the water inside it until 60 ml. Use the eyedropper to make up the volume if necessary.
3. Measure again the mass of the graduated cylinder with the water.
4. Now, add water until 70 ml. Measure its mass again.
5. Repeat the previous stage with volumes of 80, 90 y 100 ml. Fill the **table I** with these results. Remember that 1 ml = 1 cm^3.
6. Draw a mass-volume graph. This will be **graph I**.
7. Calculate the density of water as an average value from densities obtained from each measurement.

➢ **B. Determination of density of a regular solid.**

1. Choose two samples of regular solids and measure their dimensions with a ruler.
2. Note down the results in **table II**. Fill the table calculating the volumes from each solid.
3. Next, measure their masses with the scales and write down these results in the table.
4. Calculate the density of each regular solid.

➢ **C. Determination of density of an irregular solid.**

1. Choose two samples of irregular solids.
2. Measure the volume of each one with the graduated cylinder according to the experimental method.
3. Note down the results in **table III**.
4. Next, measure their masses with the scales. Write down these results in the table.
5. Fill the table with the density of every irregular solid.
6. Repeat this process three times and obtain a final result as an average value from densities obtained from each measurement.

RESULTS

Complete the tables for each stage:

TABLE I (density of water):

Volume (cm³)	Mass (g)	Density (g/cm³)

TABLE II (density of a regular solid):

Object	Base	Height	Volume (cm³)	Mass (g)	Density (g/cm³)

TABLE III (density of an irregular solid):

Substance	Volume (cm³)	Mass (g)	Density (g/cm³)

QUESTIONS

1. What conclusion do you obtain from this lab practice?
2. Why density depends on the temperature? Why haven't we taken into account this point in this experiment?
3. Express your personal opinion about any aspect from this experiment.