

# CHEMISTRY

## Lab 1: Preparing solutions

General instructions:

- keep clear notes of all measurements with their uncertainties
- note down the raw data with the correct number of significant figures
- keep notes of all calculations done
- take into account any remaining material during weighing
- dissolve first the solute in a beaker and then pour it in a volumetric flask through a funnel. Shake well to mix the contents.
- label all your samples
- calculate the exact molarity of the solutions you make and estimate the final molarity's uncertainty.

- A. Prepare 100 cm<sup>3</sup> of 1 M solution of NaCl. (Sample 1)  
 - How many moles of NaCl should be in 100 cm<sup>3</sup> of solution?  
 - How many grams is it?
- B. Take **half** of the solution you have prepared and dilute it to get a solution of 0.8 M. (Sample 2).  
 - How many moles are in half of Sample 1?  
 - How many moles should you have in Sample 2?  
 - In what volume of solution should these moles be?
- C. Mix 20 cm<sup>3</sup> of Sample 1 with 30 cm<sup>3</sup> of Sample 2.  
 - How many moles are there in 20 cm<sup>3</sup> of Sample 1?  
 - How many moles are there in 30 cm<sup>3</sup> of Sample 2?  
 - What is the total number of moles and the total volume?  
 - What is the molarity of the mixture? (Sample 3)
- D. Fill in the following table using the correct units and uncertainties:

|                      | Sample 1 | Sample 2 | Sample 3 |
|----------------------|----------|----------|----------|
| Mass of solute       |          |          |          |
| Volume of solution   |          |          |          |
| Molarity of solution |          |          |          |

- E. - What is the uncertainty of each instrument used?  
 - What is the percentage uncertainty?  
 - What is the percentage and absolute uncertainty of the molarity of Sample 3?

$$\boxed{\text{moles (mol)} = \frac{\text{mass (gr)}}{\text{molar mass (gr/mol)}}} \quad \text{or} \quad \boxed{n = \frac{m}{M}}$$

$$\boxed{\text{concentration / molarity (mol dm}^3\text{)} = \frac{\text{moles}}{\text{volume}}} \quad \text{or} \quad \boxed{C = \frac{n}{V}}$$