The law of conservation of mass

✦ WHAT IS THE AIM OF THIS PRACTICAL?

You will test whether the mass of the reactants in a chemical reaction equals the

mass of the products.

✦ WHAT DO YOU NEED?

Materials:

Digital scale (accuracy=0.01 g)	A well-plate	Plastic pipettes	Safety goggles

Chemicals: Sodium carbonate 0.5 M, calcium nitrate 0.5 M, hydrochloric acid 1 M, marble chips (small).

✦ A BIT OF THEORY

The law of conservation of mass was discovered by the French scientist Antoine Lavoisier. It states that mass cannot be created nor destroyed.

This means that the total mass of reactants in a chemical reaction will equal the total

mass of the products.

If a gas is produced during a reaction, which mass is often forgotten when calculating

the final mass because the students are unable to see the gas. For this reason, balloons

or zip lock bags may be used to collect the gas and preserve the mass.

⬦ WHAT DO YOU HAVE TO DO?

Part A -chemical reaction 1: The reaction between sodium carbonate, Na_2CO_3, and calcium nitrate, $Ca(NO_3)_2$

1) Place the well-plate on the digital scale.

2) Press the "tare" button.

3) Fill a plastic pipette with the sodium carbonate solution.

4) Put 20 drops of this solution into one of the wells (labelled A) of the mini wellplate.

5) Fill a plastic pipette with the calcium nitrate solution.

6) Put 20 drops of this solution into another well (labelled B) of the mini well-plate.

7) Write down what is displayed in the scale. This is the mass of the reactants.

8) Press the "tare" button again.

9) Put 20 drops of sodium carbonate solution into one of the wells (labelled C) followed by 20 drops of calcium nitrate solution.

10) Write down what is displayed in the scale. This is the mass of the products.

⬦ QUESTIONS

1) Write the chemical equation for the chemical reaction that took place.

2) Is there a difference in the masses before and after the reaction? Explain your answer.

Part B- Chemical reaction 2: The reaction between marble and hydrochloric acid

1) Place one piece of marble chip in one of the well.

2) Put 10 drops of hydrochloric acid into one of the well,

3) Write down what is displayed in the scale. This is the mass of the reactants.

4) Press the "tare" button.

5) Add 10 drops of hydrochloric acid to the well containing the marble chip.

6) When the reaction has finished, write down what is displayed in the scale.

✚ QUESTIONS

1) Write the chemical equation for the chemical reaction that took place.

2) Is there a difference in the masses before and after the reaction? Explain your answer.

✚ FEED-BACK

Evaluate the difficulty of this practical. Circle the number that suits the level of difficulty you found while going through this practical:

Very Easy   *1   2   3   4   5*   *Very Difficult*

Did you enjoy going through this practical? Circle the number that suits your choice

Not at all   *1   2   3   4   5*   *Very much*