Quantitative Chemistry

Reading : pages 41-45

Knowledge

1. How is formula mass calculated?

2. What is the formula mass of CH_4 NH_4Cl

3. What is a 'mole'?

4. How many atoms or molecules are there in a mole?

5. What does the term 'limiting reactant' mean?

6. What happens to mass during a chemical reaction?

7. What do the symbols (s), (l), (g) and (aq) mean?

8. What is the equation linking mass, molar mass and moles?

9. How many cm^3 are there in $1dm^3$?

10. What is the equation linking mass, volume and concentration?

Application

1. What is the % mass of calcium in calcium chloride ($CaCl_2$)

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2. Work out the mass of 5 moles of NaF.

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3. If you have 20g of hydrogen gas (H_2), how many moles do you have?

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4. For the reaction below, calculate the mass of potassium needed to make 50g of potassium Iodide

$$2K + I_2 \rightarrow 2KI$$

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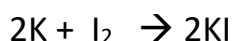
5. 1.62 g of hydrogen bromide (HBr) reacts with 0.98 g of sulfuric acid (H_2SO_4)to produce 0.36 g of water, 0.64 g of sulfur dioxide(SO_2) and 1.60 g of bromine (Br_2). Use the masses to write the balanced equation
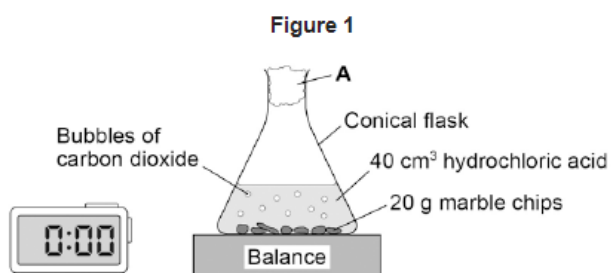
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6. Some students carried out the following experiment :

Figure 1

The reaction can be represented by the equation:

$$CaCO_3\ (\ ) + ...\ HCl\ (\ ) \rightarrow CaCl_2\ (\ ) + H_2O(\ ) + CO_2\ (\ )$$

a) Balance the equation

b) Add state symbols to the brackets

c) Why was cotton wool put into the conical flask?

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6d) The students measured the change in mass. Their results are shown below:

Repeat	1	2	3	mean
Mass lost (g)	8.6	8.2	8.3	8.4

Calculate the uncertainty in the students' results.

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7. A solution of sodium chloride has 35g dissolved in $200cm^3$. Calculate the concentration in g/dm^3.

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