**15.2 Calculations Based on Amount of Two Reactants.**

In mass-mass stoichiometry, the quantity of one substance was given and used to calculate the quantity of another. The calculations assumed that any other reactants were present in sufficient quantities to react completely.

It is more likely that one of the reactants will be used up before the other. The reaction stops when one reactant is used up (the limiting reagent), even though some of the other substance is unreacted. The other reactant is said to be in excess (the excess reagent) – some of it remains when the reaction is finished.

 **Mass-mass Stoichiometry**

The following steps outline the process:

* Step 1: Write a balanced equation.
* Step 2: Calculate the amount of each reactant in mol (n)

$$n= \frac{m}{M}$$

* Step 3: Identify the reactant in excess
* Step 4: Use the amount of the limiting reagent and the equation to determine the amount (in mol) of the required product
* Step 5: Calculate the mass of the required product

$$m=n ×M$$

Remember: To calculate the amount, in mol, it’s mass must be given in grams.

**Worked Examples**

1. **A gaseous mixture of 25.0 g of hydrogen gas and 100.0 g of oxygen gas are mixed and ignited. The product is collected and weighted. What is the expected mass of water produced?**

**Step 1: Write balanced equation.**

**Step 2: Calculate the amount of each reactant.**

**Step 3: Identify reactant in excess**

**Step 4: Determine the amount of the required product (in mol).**

**Step 5: Calculate the mass of the required substance.**

1. **2.50 g of aluminium is mixed with 5.00 g of iodine and allowed to react.**
	1. **What mass of aluminium iodide would be produced?**
	2. **What is the mass of the reactant in excess?**

**Text Questions: 9 – 11 Worksheet 30**