Conservation of Mass

No atoms are lost or made during a chemical reaction. This means that the mass is always conserved. In other words, the total mass of products after the reaction is the same as the total mass of reactants at the start.

This fact allows you to work out the mass of one substance in a reaction if the masses of the other substances are known, For example:

C + O2 --> CO2

12g of carbon will react to form 44g of carbon dioxide. It must react with 44g-22g=32g of oxygen to do this.

Balanced chemical equations

Balanced equations give the symbols and formulas of the substances involved in a reaction.

For Example: Cu + O2 --> CuO

To make things equal, we need to adjust the number of units of some of the substances until we get an equal numbers of each type of atom on both sides of the arrow.

Here is the **balanced symbol equation**

2Cu + O2 --> 2CuO

You can see that now we have two copper atoms and two oxygen atoms on each side. This matches what happens in the reaction

Relative formula mass

To find the relative formula mass (Mr) of a compound, you just add together the atomic (Ar) values for all the atoms in its formula.

Example 1 Find the Mr of carbon monoxide (**CO**)

The Ar of carbon is **12** and the Ar of oxygen is **16**.

So the Mr of carbon monoxide is **12 + 16 = 28**

The relative formula mass of a substance, shown in grams, is called **one mole** of that substance. So one mole of carbon monoxide has a mass of 28g.

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