



The Law of Conservation of Mass

Topic Summary

- The Law of Conservation of Mass was proposed by Antoine Lavoisier in 1789.
- In a chemical reaction, atoms are not created or destroyed, so **the total mass of reactants equals the total mass of products**.
- Chemical reactions involve atoms being **rearranged** into new substances.
- Apparent changes in mass are usually caused by gases either escaping from, or entering, the reaction. This happens because most chemical reactions do not take place in 'closed systems'.
- A balanced symbol equation is used to show that the same number and type of atom exists before and after a reaction.
- The Law of Conservation of Mass can be used to solve simple quantitative chemistry calculations.
- Key exam tip: If the question only gives a word equation, the calculation usually only requires application of The Law of Conservation of Mass and simple arithmetic, rather than conversion into molar quantities.



General Recall

State the Law of Conservation of Mass

....In a chemical reaction no atoms are created or destroyed (1).....

....and so the total mass of the reactants is equal to the total mass of the products (or vice-versa)...(1).....

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If a reaction generates a product that is in the gas state, why might the mass of the products seem to be less than mass of the reactants?

.....It is not carried out in a closed system / some of (or all of) the gas escapes and so its mass is not recorded...(1).....

When magnesium burns in oxygen, why is the magnesium oxide produced heavier than the original magnesium ribbon?

.....The oxygen atoms bind with / form bonds with the magnesium atoms (1) and so the mass of the magnesium oxide is heavier / the magnesium oxide has the combined mass of both the oxygen and the magnesium atoms (1).....



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Questions involving calculations

Find the missing mass in the following calculations, you will need to work on an additional sheet of paper to have space to show your working out.

- 1) Magnesium + Oxygen → Magnesium Oxide
 4.8g 3.2g ...8g.... (1)
- 2) Nitrogen + Hydrogen → Ammonia
 28g 6g ..34g... (1)
- 3) Sodium hydroxide + hydrochloric acid → Sodium Chloride + Water
 4g 3.65g 5.85g ...1.8g... (2)
- 4) Sodium + Chlorine → Sodium Chloride
 9.2g ...14.2g... (2) 23.4g
- 5) Methane + Oxygen → Carbon Dioxide + Water
 ...8g.... (3) 32g 22g 18g



Do this later...

Give your brain a break and come back to these questions later. Cover the rest of the sheet while you have a go. By doing this 24-48 hours after watching the video you will boost your chances of remembering the key points in an exam. If you struggle with these questions, re-watch the video and then try again.

State the Law of Conservation of Mass

.....see page 1.....

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If a student fully reacts 1.2 g of magnesium with 0.8g of oxygen, what mass of magnesium oxide will form?

