

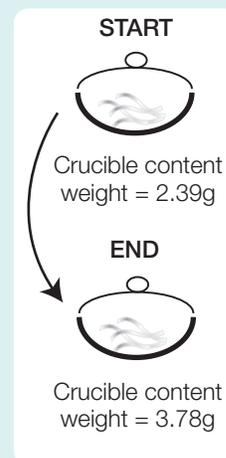
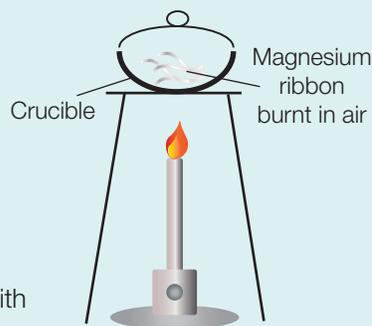
### 1) BURNING MAGNESIUM RIBBON IN AIR

The mass of the magnesium is weighed at the start and at the end of the reaction. Look at the results - it appears new mass has been created!

When we write down the balanced chemical equation it becomes obvious where this extra mass has come from.



Oxygen gas from the atmosphere has joined in the reaction. This is what causes the increase in mass. We can calculate the mass of oxygen gas that combined with the magnesium.... $3.78 - 2.39 = 1.39\text{g}$

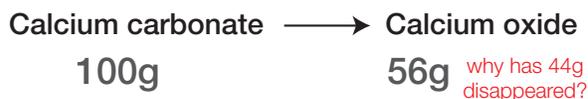


### 2) THERMAL DECOMPOSITION USING HEAT TO BREAK DOWN CALCIUM CARBONATE INTO CALCIUM OXIDE

When the solid calcium oxide is weighed at the end of the reaction it has less mass than the calcium carbonate at the start. It looks as if mass has been destroyed/disappeared. This is not possible. It all becomes clear when we look at the balanced equation.



In the lab we see these measurements, but it doesn't make sense as mass can't be destroyed.



The balanced equation shows that  $\text{CO}_2$  has escaped from the reaction



Some mass has escaped into the air as carbon dioxide gas. How much mass has escaped cannot be easily measured during the experiment. If you forget to put  $\text{CO}_2$  into the equation, you won't be able to balance it.

**Total mass -** When these experiments take place in a classroom the mass of the whole room does not change. Some mass simply moves into or out of the reaction from the surrounding air.

1. Which law describes what happens to the mass of substances as they take part in a chemical reaction?
2. When magnesium burns in air the mass of the product made seems to be greater than the mass of the starting reactants. Can you explain these results?
3. Why does the mass of a carbonate decrease if it is heated strongly?
4. Write a balanced equation for the thermal decomposition of copper carbonate.
5. Use the balanced equation and calculate the mass of reactants and products of the decomposition to prove that mass is conserved.
6. When magnesium is heated in air the lid of the crucible is kept in place and only lifted slightly at intervals. Give 2 reasons for this.