

Conservation of Mass

KS3 Chemistry · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

12 g of carbon reacts completely with 32 g of oxygen. What mass of carbon dioxide forms?

Step 1 · Conservation of mass

Total mass of reactants = total mass of products.

Step 2 · Add the reactants

$$12\text{ g} + 32\text{ g} = 44\text{ g}.$$

Answer: 44 g of carbon dioxide

Check: No atoms are lost or made, so the mass is the same.

2. Now try one with the steps

100 g of calcium carbonate is heated and makes 56 g of calcium oxide. What mass of carbon dioxide escaped?

Step 1 · Word equation

Step 2 · Mass of products = 100 g

Step 3 · Subtract

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Complete: in a chemical reaction, the total mass of the products is _____ the total mass of the reactants. [1]

2. 200 g of ice melts in a sealed container. What is the mass of the water, in g? [1]

3. 5 g of salt is dissolved in 95 g of water. What is the mass of the solution, in g? [1]

4. In a chemical reaction, are atoms created, destroyed or rearranged? [1]
- _____
- _____
5. What is a closed system? [1]
- _____
- _____
6. 56 g of iron reacts with 32 g of sulfur. What mass of iron sulfide forms, in g? [1]
- _____
- _____
7. 24 g of magnesium makes 40 g of magnesium oxide. What mass of oxygen reacted, in g? [1]
- _____
- _____
8. Marble chips react with acid in an open beaker on a balance. The reading goes down. Why? [2]
- _____
- _____
9. How could you show that mass is conserved in the reaction in question 8? [2]
- _____
- _____
10. Copper carbonate (12.4 g) is heated. 8.0 g of copper oxide is left. What mass of carbon dioxide escaped, in g? [1]
- _____
- _____
11. Why does a piece of steel wool get heavier when it burns? [2]
- _____
- _____
12. A burning candle gets lighter. Does this break the law of conservation of mass? Explain. [3]
- _____
- _____
- _____
13. A student repeats the magnesium experiment three times and gets oxygen masses of 0.80 g, 0.78 g and 0.82 g. What is the mean, in g? [1]
- _____
- _____

14. Suggest ONE reason the student's crucible results could be lower than expected.

[1]

4. Before you hand it in

"The mass went down, so mass was destroyed."

Look for a gas leaving (open system). In a closed system the mass stays the same.

"Burning makes things lighter, so burning metal must lose mass."

Burning metals get heavier because oxygen atoms join them.

"Gases have no mass."

Gases do have mass; it is just spread out. A balloon full of carbon dioxide sinks.

Forgetting to add the mass of the solvent when dissolving.

Mass of solution = mass of solute + mass of solvent.