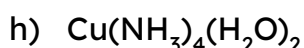
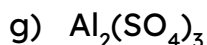
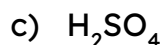
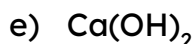


Chemical formulae and conservation of mass



Task 1: Reading formulae

Write out the **name** and **number** of atoms of each element in each formula.



Task 2: Conservation of mass

a) **Answer** the questions using the equation and masses provided.

reactant		products
calcium carbonate	→	calcium oxide + carbon dioxide
200 g		112 g 88 g

i) **What** is the mass of the reactant?

ii) **What** is the mass of each product?

iii) **What** is the total mass of the products?

iv) Does this experiment data support the law of conservation of mass? **Explain** why.

b) **Calculate** the missing masses for each reaction.

i) magnesium	+	oxygen	→	magnesium oxide
?	+	32 g	→	80.6 g

ii) lithium	+	oxygen	→	lithium oxide
21.9 g	+	8 g	→	?

iii) sodium	+	oxygen	→	sodium oxide +	oxygen	
46 g	+	32 g	→	62 g	+	?

Name _____



c) **Calculate** the missing masses for each reaction.

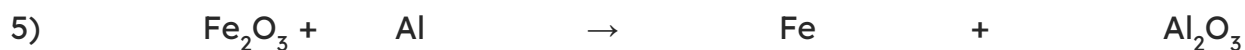
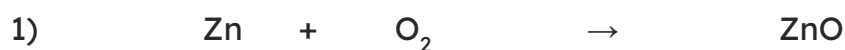
i) 4 grams of hydrogen reacts with oxygen to make 36 grams of water. **Calculate** the amount of oxygen used by applying the law of conservation of mass.

ii) In a chemical reaction, 150 g sodium bicarbonate and vinegar on heating gives off 87 g of carbon dioxide gas. **What mass** of solid residue is left?

iii) When 0.0976 g of magnesium is heated in air, 0.1618 g of magnesium oxide is produced. **What mass** of oxygen is need to produce 0.1618 g of magnesium oxide?

Task 4: Balancing equations

Balance the equations.





Task 1: Reading formulae

Write out the **name** and **number** of atoms of each element in each formula.

- a) CO_2 1 carbon, 2 oxygen e) Ca(OH)_2 1 calcium, 2 oxygen, 2 hydrogen
- b) NaCl 1 sodium, 1 chlorine f) Fe_2O_4 2 iron, 4 oxygen
- c) H_2SO_4 2 hydrogen, 1 sulfur, 4 oxygen g) $\text{Al}_2(\text{SO}_4)_3$ 2 aluminium, 3 sulfur, 12 oxygen
- d) CaCO_3 1 calcium, 1 carbon, 3 oxygen h) $\text{Cu(NH}_3)_4(\text{H}_2\text{O})_2$ 1 copper, 4 nitrogen, 16 hydrogen, 2 oxygen

Task 2: Conservation of mass

a) **Answer** the questions using the equation and masses provided.

reactant		products
calcium carbonate	→	calcium oxide + carbon dioxide
200 g		112 g 88 g

- i) **What** is the mass of the reactant? 200 g
- ii) **What** is the mass of each product? 112 g and 88 g
- iii) **What** is the total mass of the products? 200 g
- iv) Does this experiment data support the law of conservation of mass? **Explain** why.
Yes, the total mass of the reactant is equal to the total mass of the products no mass has been lost or gained.

b) **Calculate** the missing masses for each reaction.

- i) magnesium + oxygen → magnesium oxide
 48.6 g + 32 g → 80.6 g
- ii) lithium + oxygen → lithium oxide
 21.9 g + 8 g → 29.9 g
- iii) sodium + oxygen → sodium oxide + oxygen
 46 g + 32 g → 62 g + 16 g



c) **Calculate** the missing masses for each reaction.

i) 4 grams of hydrogen reacts with oxygen to make 36 grams of water. **Calculate** the amount of oxygen used by applying the law of conservation of mass.

$$36 \text{ g} - 4 \text{ g} = 32 \text{ g}$$

ii) In a chemical reaction, 150 g sodium bicarbonate and vinegar on heating gives off 87 g of carbon dioxide gas. **What mass** of solid residue is left?

$$150 \text{ g} - 87 \text{ g} = 63 \text{ g}$$

iii) When 0.0976 g of magnesium is heated in air, 0.1618 g of magnesium oxide is produced. **What mass** of oxygen is need to produce 0.1618 g of magnesium oxide?

$$0.1618 \text{ g} - 0.0976 \text{ g} = 0.0642 \text{ g}$$

Task 4: Balancing equations

Balance the equations.

