Balancing equations practice

Remember

A chemical equation is **balanced** when it has the same number of each type of atom on the left and right of the arrow. Never change a chemical formula to balance an equation.

Task 1

This is the balanced equation for methane burning in oxygen:

$$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$$

1. Look at the reactants (on the left of the arrow). State the number of atoms of each element.

   carbon, C ..... hydrogen, H ..... oxygen, O .....

2. Look at the products (on the right of the arrow). State the number of atoms of each element.

   carbon, C ..... hydrogen, H ..... oxygen, O .....

3. Explain why this equation is **balanced**.

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Task 2

Add a 2, 3 or 4 in each space to correctly balance these equations.

4. $H_2 + Cl_2 \rightarrow$ ..... HCl

5. $Zn +$ ..... $HCl \rightarrow ZnCl_2 + H_2$

6. $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 +$ ..... $NaCl$

7. $CuCO_3 +$ ..... $HCl \rightarrow CuCl_2 + CO_2 + H_2O$

8. ..... $H_2 + O_2 \rightarrow$ ..... H_2O

9. ..... $Cu + O_2 \rightarrow$ ..... CuO

10. ..... $Na + O_2 \rightarrow$ ..... Na_2O

11. ..... $NaOH + H_2SO_4 \rightarrow Na_2SO_4 +$ ..... H_2O

12. ..... $KOH + H_3PO_4 \rightarrow K_3PO_4 +$ ..... H_2O

13. ..... $Fe +$ ..... $Cl_2 \rightarrow$ ..... $FeCl_3$

14. ..... $NaOH + CuSO_4 \rightarrow Na_2SO_4 + Cu(OH)_2$

14. $FeCl_3 +$ ..... $NH_4OH \rightarrow Fe(OH)_3 +$ ..... NH_4Cl

Balancing equations practice – ANSWERS

1. C = 1, H = 4, O = 4
2. C = 1, H = 4, O = 4
3. The number of each type of atom on the left and right of the arrow is the same.
4. $H_2 + Cl_2 \rightarrow \mathbf{2}HCl$
5. $Zn + \mathbf{2}HCl \rightarrow ZnCl_2 + H_2$
6. $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + \mathbf{2}NaCl$
7. $CuCO_3 + \mathbf{2}HCl \rightarrow CuCl_2 + CO_2 + H_2O$
8. $\mathbf{2}H_2 + O_2 \rightarrow \mathbf{2}H_2O$
9. $\mathbf{2}Cu + O_2 \rightarrow \mathbf{2}CuO$
10. $\mathbf{4}Na + O_2 \rightarrow \mathbf{2}Na_2O$
11. $\mathbf{2}NaOH + H_2SO_4 \rightarrow Na_2SO_4 + \mathbf{2}H_2O$
12. $\mathbf{3}KOH + H_3PO_4 \rightarrow K_3PO_4 + \mathbf{3}H_2O$
13. $\mathbf{2}Fe + \mathbf{3}Cl_2 \rightarrow \mathbf{2}FeCl_3$
14. $\mathbf{2}NaOH + CuSO_4 \rightarrow Na_2SO_4 + Cu(OH)_2$
14. $FeCl_3 + \mathbf{3}NH_4OH \rightarrow Fe(OH)_3 + \mathbf{3}NH_4Cl$

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2. C = 1, H = 4, O = 4
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7. $CuCO_3 + \mathbf{2}HCl \rightarrow CuCl_2 + CO_2 + H_2O$
8. $\mathbf{2}H_2 + O_2 \rightarrow \mathbf{2}H_2O$
9. $\mathbf{2}Cu + O_2 \rightarrow \mathbf{2}CuO$
10. $\mathbf{4}Na + O_2 \rightarrow \mathbf{2}Na_2O$
11. $\mathbf{2}NaOH + H_2SO_4 \rightarrow Na_2SO_4 + \mathbf{2}H_2O$
12. $\mathbf{3}KOH + H_3PO_4 \rightarrow K_3PO_4 + \mathbf{3}H_2O$
13. $\mathbf{2}Fe + \mathbf{3}Cl_2 \rightarrow \mathbf{2}FeCl_3$
14. $\mathbf{2}NaOH + CuSO_4 \rightarrow Na_2SO_4 + Cu(OH)_2$
14. $FeCl_3 + \mathbf{3}NH_4OH \rightarrow Fe(OH)_3 + \mathbf{3}NH_4Cl$