

Chemical Reactions



Chemical Equations

- A **chemical equation** is a representation of a chemical reaction; the formulas of the reactants (on the left) are connected by an arrow with the formulas of the products (on the right).
- Skeleton Equation does not indicate the amounts of reactants or products.
 - No coefficients
- Example



All chemical reactions

- have two parts
- **Reactants** - the substances you start with (**the ones reacting**)
- **Products**- the substances you end up with (**the ones produced**)
- The reactants turn into the products.
- Reactants → Products

Word Equations

- Example

Methane + Oxygen \rightarrow Carbon dioxide +
Water

- The arrow means yields, gives, or reacts to produce.



Rules for balancing

- 1 Write the correct formulas for all the reactants and products
- 2 Count the number of atoms of each type appearing on both sides
- 3 Balance the elements one at a time by adding coefficients (the numbers in front)
- 4 Check to make sure it is balanced.

Never

- Change a subscript to balance an equation.
- If you change the formula you are describing a different reaction.
- H_2O is a different compound than H_2O_2
- Never put a coefficient in the middle of a formula
- 2NaCl is okay, Na_2Cl is not.

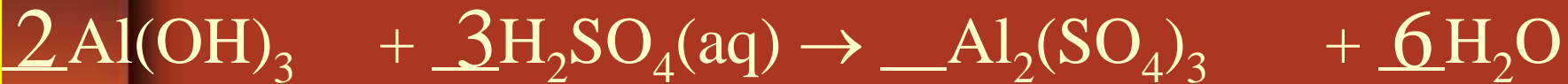
Practice



Answers



Try to balance this reaction:



Al ~~1~~ 2

S ~~1~~ 3

H ~~5~~ ~~8~~ 12

O ~~7~~ ~~10~~ 18

Al 2

S 3

H ~~2~~ 12

O ~~13~~ 18

Balance these equations

- $\underline{\quad} \text{Mg} + \underline{\quad} \text{O}_2 \rightarrow \underline{\quad} \text{MgO}$
- $\underline{\quad} \text{KClO}_3 \rightarrow \underline{\quad} \text{KCl} + \underline{\quad} \text{O}_2$
- $\underline{\quad} \text{Cu} + \underline{\quad} \text{AgNO}_3 \rightarrow \underline{\quad} \text{Cu}(\text{NO}_3)_2 + \underline{\quad} \text{Ag}$
- $\underline{\quad} \text{KOH} + \underline{\quad} \text{H}_3\text{PO}_4 \rightarrow \underline{\quad} \text{K}_3\text{PO}_4 + \underline{\quad} \text{H}_2\text{O}$

ANSWERS

- $2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$
- $2 \text{KClO}_3 \rightarrow 2 \text{KCl} + 3 \text{O}_2$
- $\text{Cu} + 2 \text{AgNO}_3 \rightarrow \text{Cu}(\text{NO}_3)_2 + 2 \text{Ag}$
- $3 \text{KOH} + \text{H}_3\text{PO}_4 \rightarrow \text{K}_3\text{PO}_4 + 3 \text{H}_2\text{O}$