

# Essay about chemical reactions



**ASSIGN  
BUSTER**

## Chemical Change

- reorganization
- original substances form new substances with different formulas
- may or may not involve a change of state
- symbols used to describe chemical reaction are known as a chemical equation • Chemical equations do not have equal signs (=) they have an arrow

## Chemical Equations

- Must follow the Law of Conservation of Matter
- atoms can neither be created or destroyed during a chemical reaction
- What goes in must come out!

## Chemical Equations

- Reactants = Products same number of atoms of each element on each side of the reaction arrow

Equations must be balanced!

- other symbols
- (s)solid
- (l)liquid
- (g)gas
- (aq)aqueous, dissolved in water

## Balancing Chemical Equations

First check all ionic formulas to see if they are correct! Five steps to balancing equations

1. Count the number of atoms of each element (or polyatomic ion) on the reactant side and then on the product side. You may want to use a chart or table.
2. Determine which are out of balance - these need to be balanced
3. Pick an element or polyatomic ion to start with...
4. Balance using coefficients. Do not use coefficients of 1. No changes may be made to the subscripts use least common multiples.
5. Check and recheck!

- Practice balancing these equations
- $\text{H}_2(\text{g}) + \text{O}_2(\text{g}) > \text{H}_2\text{O}$  •  $\text{KCl} + \text{BaSO}_4 > \text{K}_2\text{SO}_4 + \text{BaCl}_2$  Types of Chemical Reactions
- Combination /Direct Combinationsynthesis
- $2\text{Na}(\text{s}) + \text{Cl}_2(\text{g}) > 2 \text{NaCl}(\text{s})$

### Single Displacement

- single substitution
- anion always replaces anion
- cation always replaces cation  $\text{Mg} + 2 \text{HCl} > \text{MgCl}_2 + \text{H}_2$
- Complete the following Single Displacement (formula is correct)  $\text{Al} + \text{CuSO}_4$

### Double Displacement

- 2 substitutions
- ion-exchange
- $\text{MgSO}_4 + \text{BaCl}_2 > \text{BaSO}_4 + \text{MgCl}_2$
- What are the expected products of  $\text{MgSO}_4 + \text{BaCl}_2$
- $\text{KOH} + \text{MgCl}$  ( • check formulas and complete)

**Decomposition**

$\text{HgO} \rightarrow \text{Hg} + \text{O}_2$  (balance) •  $2 \text{HgO} \rightarrow 2 \text{Hg} + \text{O}_2$  • carbonic acid in lab activity

**Oxidation / Reduction**

- oxidize iron into rust  $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$  Oxidation reactions • add O (or remove H)

**Reduction reactions**

- add H ( or remove O) Redox reaction
- Combination of oxidation and reduction

**Practice**

- How many grams of diatomic oxygen ( $\text{O}_2$ ) are needed to make 4 moles of magnesium oxide ( $\text{MgO}$ ) from magnesium ribbon ( $\text{Mg}$ )?
- Hint balance equation and use coefficient as mole.

**Energy in a Chemical Reaction Endothermic**

- heat in
- requires activation energy
- $\text{A} + \text{B} + 100\text{kcal} \Rightarrow \text{C} + \text{D}$

**Exothermic**

- heat out
- $\text{A} + \text{B} \Rightarrow \text{C} + \text{D} + 100 \text{ kcal}$