What is a Chemical Reaction?

Worksheet

A chemical reaction is a process that converts one or more substances (reactants) into different substances (products) through the breaking and forming of chemical bonds, with atoms conserved but rearranged.

@text{aA} + @text{bB} @rightarrow @text{cC} + @text{dD}

Questions

1. Which best defines a chemical reaction?

A) A physical change in shape only
B) A process that converts reactants into new products via bond changes
C) Mixing two liquids without change
D) Heating a substance without reaction

2. 2Na + Cl2 2NaCl is an example of which reaction type?

A) Decomposition
B) Combustion
C) Synthesis (combination)
D) Single replacement

3. In CH4 + 2O2 CO2 + 2H2O, what type of reaction is shown?

A) Combustion
B) Decomposition
C) Double replacement
D) Synthesis

4. Which law explains why atoms balance on both sides of an equation?

A) Law of Definite Proportions
B) Law of Conservation of Mass
C) Ideal Gas Law
D) Avogadro's Law

5. Methane burns completely in oxygen. Write and classify the reaction.

6. Hydrogen peroxide decomposes into water and oxygen gas. Write the equation.

7. Sodium metal reacts with chlorine gas to form table salt. Write the equation.

8. Define: What is a chemical reaction?

9. Define: What is a synthesis reaction?

10. Define: What is a decomposition reaction?

Answer Key

1. B) A process that converts reactants into new products via bond changes - A chemical reaction rearranges atoms into new substances by breaking and forming bonds.

2. C) Synthesis (combination) - Two reactants combine into a single product, so it's a synthesis reaction.

3. A) Combustion - A fuel (CH4) reacts with O2, releasing energy - a combustion reaction.

4. B) Law of Conservation of Mass - Mass (and atoms) is conserved - matter is neither created nor destroyed in a reaction.

5. CH4 + 2O2 CO2 + 2H2O All atoms are conserved: 1 C, 4 H, 4 O on each side This is a combustion reaction (fuel + O2 CO2 + H2O)

6. 2H2O2 2H2O + O2 Check atoms: 4 H and 4 O on each side This is a decomposition reaction (one compound two or more products)

7. 2Na + Cl2 2NaCl Check atoms: 2 Na and 2 Cl on each side This is a synthesis (combination) reaction (two or more reactants one product)

8. A process where reactants turn into new products through breaking and forming chemical bonds.

9. Two or more simple substances combine to form one more complex product: A + B AB.

10. One compound breaks down into two or more simpler products: AB A + B.