

Predicting Products Of Chemical Reactions Worksheet Answer Key PDF

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Part 1: Building a Foundation

Which of the following is a synthesis reaction?

undefined. A) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ ✓

undefined. B) $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$

undefined. C) $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{AgCl}$

undefined. D) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$

A synthesis reaction involves combining two or more substances to form a new compound.

Which of the following is a synthesis reaction?

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A synthesis reaction occurs when two or more reactants combine to form a single product.

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A synthesis reaction occurs when two or more reactants combine to form a single product.

Which of the following are indicators of a chemical reaction? (Select all that apply)

undefined. A) Change in color ✓

undefined. B) Formation of a precipitate ✓

undefined. C) Dissolving sugar in water

undefined. D) Production of gas ✓

Indicators of a chemical reaction include observable changes such as color change, gas production, and precipitate formation.

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Indicators of a chemical reaction include changes in color, formation of a precipitate, and production of gas.

Explain the law of conservation of mass and its importance in balancing chemical equations.

The law of conservation of mass states that mass is neither created nor destroyed in a chemical reaction, which is crucial for balancing equations.

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List the five main types of chemical reactions and provide a brief description of each.

1. Synthesis Reaction

Two or more reactants combine to form a single product.

2. Decomposition Reaction

A single compound breaks down into two or more simpler substances.

3. Single Replacement Reaction

An element replaces another element in a compound.

4. Double Replacement Reaction

Two compounds exchange ions to form two new compounds.

5. Combustions Reaction

A substance combines with oxygen, releasing energy in the form of light or heat.

The five main types of chemical reactions are synthesis, decomposition, single replacement, double replacement, and combustion.

Which of the following best describes a decomposition reaction?

undefined. A) Two elements combine to form a compound.

undefined. B) A compound breaks down into simpler substances. ✓

undefined. C) An element replaces another in a compound.

undefined. D) Two compounds exchange ions.

A decomposition reaction involves a single compound breaking down into simpler substances.

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Part 2: Application and Analysis

Given the reaction: $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$, which metal is more reactive?

undefined. A) Zinc ✓

undefined. B) Copper

undefined. C) Both are equally reactive

undefined. D) Cannot be determined

Zinc is more reactive than copper, as it displaces copper from the compound.

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In a combustion reaction involving methane (CH₄), which products are typically formed? (Select all that apply)

undefined. **A) Carbon dioxide** ✓

undefined. **A) Water** ✓

undefined. A) Oxygen

undefined. **A) Carbon monoxide** ✓

The products of a combustion reaction involving methane are carbon dioxide and water.

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The typical products of a combustion reaction involving methane are carbon dioxide and water.

Apply the law of conservation of mass to balance the following equation: C₃H₈ + O₂ → CO₂ + H₂O.

Balancing the equation involves ensuring the number of each type of atom is equal on both sides.

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Apply the law of conservation of mass to balance the following equation: $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$.

Balancing the equation involves ensuring that the number of each type of atom is equal on both sides.

In the reaction $2KClO_3 \rightarrow 2KCl + 3O_2$, what type of reaction is occurring and why?

undefined. A) Synthesis, because two products are formed.

undefined. **A) Decomposition, because a compound breaks down into simpler substances. ✓**

undefined. A) Single replacement, because one element replaces another.

undefined. A) Double replacement, because two compounds exchange ions.

This is a decomposition reaction because a compound breaks down into simpler substances.

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Analyze the following reaction: $Na_2CO_3 + CaCl_2 \rightarrow 2NaCl + CaCO_3$. Which of the following statements are correct? (Select all that apply)

undefined. **A) This is a double replacement reaction. ✓**

undefined. A) Calcium carbonate is a precipitate. ✓

undefined. A) Sodium chloride is insoluble in water.

undefined. A) The reaction follows the solubility rules. ✓

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Part 3: Evaluation and Creation

Which of the following scenarios would most likely result in an endothermic reaction?

undefined. A) Mixing vinegar and baking soda

undefined. B) Dissolving ammonium nitrate in water ✓

undefined. C) Burning wood in a fireplace

undefined. D) Combining hydrogen and oxygen to form water

Dissolving ammonium nitrate in water is an endothermic reaction as it absorbs heat from the surroundings.

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Dissolving ammonium nitrate in water is an endothermic reaction as it absorbs heat.

Evaluate the following statements about balancing chemical equations. Which are true? (Select all that apply)

undefined. A) Coefficients can be fractions. ✓

undefined. B) Subscripts can be changed to balance equations.

undefined. C) The number of atoms for each element must be equal on both sides. ✓

undefined. D) Balancing equations is based on the law of conservation of mass. ✓

The true statements include that coefficients can be fractions, the number of atoms for each element must be equal on both sides, and balancing is based on the law of conservation of mass.

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True statements include that coefficients can be fractions and the number of atoms for each element must be equal on both sides.

Create a balanced chemical equation for a reaction between aluminum and hydrochloric acid, and describe the type of reaction.

The balanced equation is $2\text{Al} + 6\text{HCl} \rightarrow 2\text{AlCl}_3 + 3\text{H}_2$, which is a single replacement reaction.

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