

Reactions Practice Test

1. You are asked to balance the chemical equation $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$. How many of the following ways are correct ways to balance this equation?
- I. $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
II. $\text{H}_2 + \frac{1}{2}\text{O}_2 \rightarrow \text{H}_2\text{O}$
III. $4\text{H}_2 + 2\text{O}_2 \rightarrow 4\text{H}_2\text{O}$
IV. $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2$
- A) 0
B) 1
C) 2
D) 3
2. Which of the following statements is **not** true of balancing a chemical equation?
- A) Subscripts in the reactants must be conserved in the products.
B) Coefficients are used to balance the atoms on both sides.
C) The law of conservation of matter must be followed.
D) Phases are often shown for each compound but are not critical to balancing an equation.
3. When the following equation is balanced using the smallest possible integers, what is the number in front of the substance in bold type?
- $$\text{Sn} + \text{NaOH} \rightarrow \text{Na}_2\text{SnO}_2 + \mathbf{\text{H}_2}$$
- A) 1
B) 2
C) 3
D) 4
4. When the following equation is balanced using the smallest possible integers, what is the number in front of the substance in bold type?
- $$\mathbf{\text{Na}_2\text{S}_2\text{O}_3} + \text{I}_2 \rightarrow \text{NaI} + \text{Na}_2\text{S}_4\text{O}_6$$
- A) 1
B) 2
C) 3
D) 4
5. When the following equation is balanced using the smallest possible integers, what is the number in front of the substance in bold type?
- $$\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{CO}_3 \rightarrow \text{PbCO}_3 + \mathbf{\text{KNO}_3}$$
- A) 5
B) 4
C) 3
D) 2
6. All of the following are clues that a chemical reaction has taken place **except**
- A) A color change occurs.
B) A solid forms.
C) The reactant is smaller.
D) Bubbles form.
E) A flame occurs.
7. In what type of reaction is water always a product?
- A) single replacement
B) double replacement
C) synthesis
D) decomposition
E) combustion
8. Balance the following equation in standard form and determine the sum of the coefficients.
- $$\text{FeO}(s) + \text{O}_2(g) \rightarrow \text{Fe}_2\text{O}_3(s)$$
- A) 3
B) 4
C) 6
D) 7
E) 14
- Use the following to answer questions 9-13:
- A. single replacement
B. double replacement
C. synthesis
D. decomposition
E. combustion
9. $\text{ZnBr}_2(aq) + 2\text{AgNO}_3(aq) \rightarrow \text{Zn}(\text{NO}_3)_2(aq) + 2\text{AgBr}(s)$
10. $\text{KBr}(aq) + \text{AgNO}_3(aq) \rightarrow \text{AgBr}(s) + \text{KNO}_3(aq)$
11. $\text{Zr}(s) + \text{O}_2(g) \rightarrow \text{ZrO}_2(s)$
12. $6\text{Na}(s) + \text{N}_2(g) \rightarrow 2\text{Na}_3\text{N}(s)$
13. $2\text{HCl}(aq) + \text{Pb}(\text{OH})_2(aq) \rightarrow \text{PbCl}_2(s) + 2\text{H}_2\text{O}(l)$
14. $\text{C}_3\text{H}_8(g) + 5\text{O}_2(g) \rightarrow 3\text{CO}_2(g) + 4\text{H}_2\text{O}(g)$
15. Aluminum oxide solid reacts with gaseous carbon monoxide to produce aluminum metal and carbon dioxide gas. Write the balanced equation for this reaction. Include phases in your reaction.
16. Sodium metal reacts with liquid water to produce aqueous sodium hydroxide and hydrogen gas. Write the balanced equation for this reaction. Include phases in your reaction.
17. What kind of reaction is taking place in Question #16?
- A) single replacement
B) double replacement
C) synthesis
D) decomposition
E) combustion

Answer Key

1. D
2. A
3. A
4. B
5. D
6. C
7. E
8. D
9. B
10. B
11. C
12. C
13. B
14. E
15. $\text{Al}_2\text{O}_3(s) + 3\text{CO}(g) \rightarrow 2\text{Al}(s) + 3\text{CO}_2(g)$
16. $2\text{Na}(g) + 2\text{H}_2\text{O}(l) \rightarrow 2\text{NaOH}(aq) + \text{H}_2(g)$
17. A