

## Chemical Equations Practice Test

### Chemistry

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

1) Which compound is a *variable* charge binary ionic compound?

- A)  $\text{Cr}_2\text{O}_3$     B)  $\text{MgBr}_2$     C)  $\text{K}_2\text{O}$     D)  $\text{LiCl}$

2) Which of the following ionic compounds is named *without* using a Roman numeral?

- A)  $\text{CaO}$     B)  $\text{PbO}$     C)  $\text{AuCl}_3$     D)  $\text{CuS}$

3) The correct name for the ionic compound  $\text{SnS}_2$  is \_\_\_\_\_.

- A) selenium sulfide    B) sodium sulfide    C) tin(IV) sulfide    D) tin(II) sulfide

4) For the compound  $\text{CrO}_3$ , what is the correct Roman numeral in the name, chromium(\_\_\_\_) oxide?

- A) III    B) II    C) IV    D) VI

5) Which one of the following polyatomic ions does *not* contain oxygen?

- A) sulfate    B) hydroxide    C) nitrate    D) ammonium

6) A student wrote the formula for the compound aluminum phosphate as  $\text{AlPO}_4$ . What is wrong with this formula?

- A) There cannot be three different atom types in a chemical formula.  
B) Aluminum is a nonmetal so it cannot form an ionic compound.  
C) The formula should be  $\text{Al}(\text{PO}_4)$ .  
D) The compound is not charge-neutral.  
E) Nothing is wrong with the formula.

7) The selenate ion,  $\text{SeO}_3^{2-}$ , is classified as which of the following?

- A) polyatomic cation  
B) monoatomic anion  
C) polyatomic anion  
D) monoatomic cation  
E) none of the above

8) What is the chemical formula for the copper(I) ion?

- A)  $\text{Cu}^{2+}$   
B)  $\text{Co}^+$   
C)  $\text{Co}^{2+}$   
D)  $\text{Cu}^+$   
E) none of the above

9) What is the systematic name for  $\text{PO}_4^{3-}$ ?

- A) phosphide ion  
B) tetraphosphate ion  
C) phosphite ion

- D) phosphate ion
- E) none of the above

10) Identify the missing words in the following statement: "For an ordinary chemical reaction the mass of the products is \_\_\_\_\_ the mass of the reactants."

- A) usually less than
- B) always less than
- C) always equal to
- D) usually more than

11) What is the term for a type of reaction in which a more active metal displaces a less active metal from a solution?

- A) combination
- B) double replacement
- C) decomposition
- D) single replacement
- E) neutralization

12) What is the term for a digit in front of a chemical formula that helps to balance a chemical equation?

- A) coefficient
- B) subscript
- C) superscript
- D) exponent

13) What is the term for a particle composed of two nonmetal atoms?

- A) monoatomic ion
- B) diatomic molecule
- C) polyatomic ion
- D) formula unit
- E) none of the above

14) What is the term for a substance undergoing a chemical change?

- A) compound
- B) reactant
- C) product
- D) catalyst
- E) none of the above

15) What term refers to an insoluble solid substance that is produced from a chemical reaction in aqueous solution?

- A) suspension
- B) precipitate
- C) condensate
- D) salt
- E) none of the above

16) Which of the following formulas represents an element in its natural state?

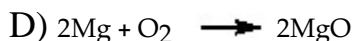
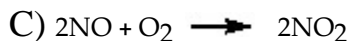
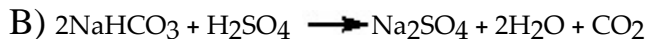
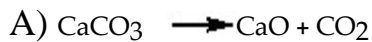
- A) O<sub>2</sub>
- B) N<sub>2</sub>
- C) H<sub>2</sub>
- D) all of the above

E) none of the above

17) How many oxygen atoms are there in 5 molecules of  $\text{Al}_2(\text{SO}_4)_3$ ?

A) 5 B) 12 C) 18 D) 60

18) Which of the following equations is *not* balanced?



19) Balance the following equation. What is the sum of the coefficients?

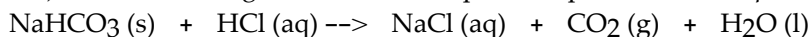


A) 12 B) 19 C) 13 D) 14

20) When the equation  $\text{C}_8\text{H}_{18} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$  is correctly balanced, the coefficient in front of  $\text{O}_2$  is \_\_\_\_\_.

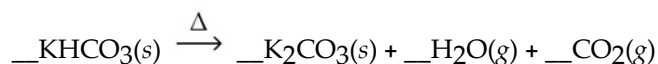
A) 12 B) 18 C) 25 D) 16

21) In the following reaction, which species is present in the *liquid* state?



A)  $\text{NaHCO}_3$  B)  $\text{NaCl}$  C)  $\text{H}_2\text{O}$  D)  $\text{CO}_2$

22) What is the coefficient of carbon dioxide after balancing the following equation?



A) 2

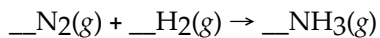
B) 4

C) 1

D) 3

E) none of the above

23) What is the coefficient of ammonia gas after balancing the following equation?



A) 2

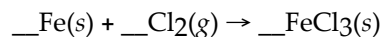
B) 4

C) 3

D) 1

E) none of the above

24) What is the coefficient of chlorine gas after balancing the following equation?

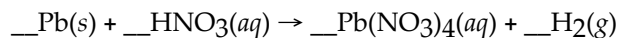


A) 1

B) 2

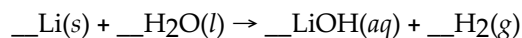
- C) 4
- D) 3
- E) none of the above

25) What is the coefficient of hydrogen gas after balancing the following equation?



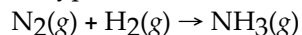
- A) 4
- B) 2
- C) 1
- D) 3
- E) none of the above

26) What is the coefficient of water after balancing the following equation?



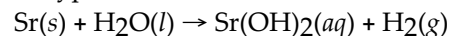
- A) 2
- B) 3
- C) 4
- D) 1
- E) none of the above

27) What type of chemical reaction is illustrated in the following example?



- A) decomposition reaction
- B) single-replacement reaction
- C) combination reaction
- D) neutralization reaction
- E) double-replacement reaction

28) What type of chemical reaction is illustrated in the following example?

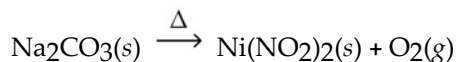


- A) decomposition reaction
- B) neutralization reaction
- C) single-replacement reaction
- D) combination reaction
- E) double-replacement reaction

29) Which of the following reactions is *incorrectly* classified?

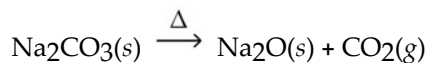
- A)  $\text{Mg}(s) + 2\text{HCl}(aq) \longrightarrow \text{MgCl}_2(aq) + \text{H}_2(g)$  (single-replacement)
- B)  $\text{PbO}(s) + \text{C}(s) \longrightarrow \text{Pb}(s) + \text{CO}(g)$  (double-replacement)
- C)  $\text{CaO}(s) + \text{H}_2\text{O}(l) \longrightarrow \text{Ca}(\text{OH})_2(aq)$  (synthesis)
- D)  $\text{Pb}(\text{NO}_3)_2(aq) + 2\text{LiCl}(aq) \longrightarrow 2\text{LiNO}_3(aq) + \text{PbCl}_2(s)$  (double-replacement)

30) Which of the statements below best describes the following reaction?



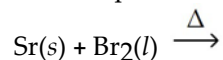
- A) Nickel(II) nitrate decomposes to nickel(II) nitrite and oxygen gas.
- B) Nickel(II) nitrate decomposes to nickel(II) nitrite and oxygen.
- C) Solid nickel(II) nitrate is heated to give solid nickel(II) nitrite and oxygen gas.
- D) Nickel(II) nitrate is heated to give nickel(II) nitrite and oxygen.
- E) Nickel(II) nitrate decomposes with heat.

31) Which of the statements below best describes the following reaction?



- A) Sodium carbonate is heated to give sodium oxide and carbon dioxide.
- B) Sodium carbonate decomposes with heat.
- C) Sodium carbonate decomposes to sodium oxide and carbon dioxide gas.
- D) Solid sodium carbonate is heated to give solid sodium oxide and carbon dioxide gas.
- E) Sodium carbonate decomposes to sodium oxide and carbon dioxide.

32) What is the predicted product from the following combination reaction?

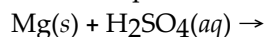


- A) SrBr<sub>2</sub>
- B) Sr<sub>2</sub>Br<sub>3</sub>
- C) Sr<sub>2</sub>Br
- D) Sr<sub>3</sub>Br<sub>2</sub>
- E) SrBr

33) What is the formula of the predicted product from heating magnesium metal and nitrogen gas?

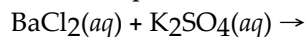
- A) MgN
- B) MgN<sub>2</sub>
- C) Mg<sub>3</sub>N<sub>2</sub>
- D) Mg<sub>2</sub>N<sub>3</sub>
- E) Mg<sub>2</sub>N

34) What are the products from the following single-replacement reaction?



- A) no reaction
- B) MgO and H<sub>2</sub>S
- C) MgO and H<sub>2</sub>SO<sub>3</sub>
- D) MgSO<sub>4</sub> and H<sub>2</sub>
- E) MgSO<sub>4</sub> and H<sub>2</sub>O

35) What are the products from the following double-replacement reaction?



- A) BaSO<sub>3</sub> and KCl
- B) BaS and KClO<sub>4</sub>
- C) BaSO<sub>3</sub> and KClO<sub>4</sub>
- D) BaSO<sub>4</sub> and KClO<sub>4</sub>
- E) BaSO<sub>4</sub> and KCl

- |       |       |       |       |
|-------|-------|-------|-------|
| 1) A  | 2) A  | 3) C  | 4) D  |
| 5) D  | 6) E  | 7) C  | 8) D  |
| 9) D  | 10) C | 11) D | 12) A |
| 13) B | 14) B | 15) B | 16) D |
| 17) D | 18) B | 19) C | 20) C |
| 21) C | 22) C | 23) A | 24) D |
| 25) B | 26) A | 27) C | 28) C |
| 29) B | 30) C | 31) D | 32) A |
| 33) C | 34) D | 35) E |       |