

### Practice Test - Unit 3

- \_\_\_\_\_ 1. 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.
- \_\_\_\_\_ 2. Which of the following statements about chemical reactions is **false**?
- A) In balancing a chemical equation, all subscripts must be conserved.
  - B) When one coefficient is doubled, the rest of the coefficients in the balanced equation must also be doubled.
  - C) The subscripts in a balanced equation tell us the number of atoms in a molecule.
  - D) An individual coefficient in a balanced equation is meaningless.
  - E) The phases in a chemical reaction tell us the nature of the reactants and products.
- \_\_\_\_\_ 3. 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
- \_\_\_\_\_ 4. Increasing the concentration of a reactant will increase the speed of a reaction.
- A) True
  - B) False
- \_\_\_\_\_ 5. Lowering the temperature will increase the speed of a reaction.
- A) True
  - B) False
- \_\_\_\_\_ 6. A catalyst is used to speed up a reaction.
- A) True
  - B) False
- \_\_\_\_\_ 7. Grinding a reactant into a powder is one way to slow down a reaction.
- A) True
  - B) False
- \_\_\_\_\_ 8. In a precipitation reaction, the ions that do **not** form the precipitate
- A) evaporate
  - B) are cations only
  - C) form a second insoluble compound in the solution
  - D) are left dissolved in the solution
  - E) none of these
- \_\_\_\_\_ 9. A substance that, when dissolved in water, produces a solution that conducts electric current very efficiently is called
- A) a strong electrolyte
  - B) a weak electrolyte
  - C) a strong ion
  - D) an electrical solute
  - E) none of these

- \_\_\_\_\_ 10. An aqueous solution of ammonium sulfate is allowed to react with an aqueous solution of lead(II) nitrate.

Identify the solid in the balanced equation.

- A)  $(\text{NH}_4)_2\text{SO}_4$
- B)  $\text{Pb}(\text{NO}_3)_2$
- C)  $\text{PbSO}_4$
- D)  $\text{NH}_4\text{NO}_3$
- E) There is no solid formed when the two solutions are mixed.

- \_\_\_\_\_ 11. The factors that most commonly cause chemical reactions to occur are all the following **except**

- A) formation of a solid
- B) formation of a gas
- C) formation of water
- D) transfer of electrons
- E) a decrease in temperature

12. List 4 observations that may be clues that a chemical reaction is taking place.

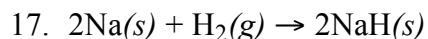
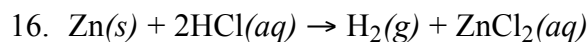
13. Complete and write the balanced equation for the following: An aqueous solution of magnesium chloride is added to an aqueous solution of silver nitrate. State the reaction type.

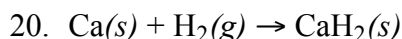
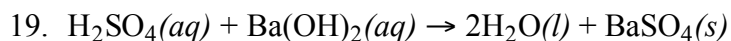
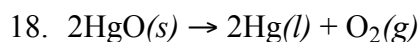
14. Write the balanced equation and state the reaction type, for the following reaction: Aqueous solutions of copper(I) nitrate and sodium hydroxide are mixed to form solid copper(II) hydroxide and aqueous sodium nitrate.

Use the following to answer questions 15-20.

Use the following choices to classify each reaction given below (more than one choice may apply).

- a. oxidation-reduction
- b. acid-base
- c. precipitation
- d. double replacement
- e. single replacement
- f. synthesis
- g. decomposition
- h. combustion

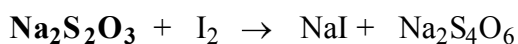




\_\_\_\_ 21. When the equation  $\text{Si}(s) + \text{HF}(aq) \rightarrow \text{SiF}_4(g) + \text{H}_2(g)$  is balanced, what is the coefficient for HF?

- A) 0                      B) 1                      C) 2                      D) 3                      E) 4

\_\_\_\_ 22. When the following equation is balanced using the smallest possible integers, what is the number in front of the substance in bold type?



- A) 1                      B) 2                      C) 3                      D) 4                      E) 6

\_\_\_\_ 23. The reaction  $\text{AgNO}_3(aq) + \text{NaCl}(aq) \rightarrow \text{AgCl}(s) + \text{NaNO}_3(aq)$  is a(n) \_\_\_\_\_ reaction.

- A) precipitation                                      D) single-replacement  
B) acid-base    E) none of these  
C) oxidation-reduction

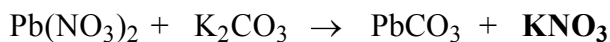
\_\_\_\_ 24. Which of the following statements is **not** true of balancing a chemical equation?

- A) Subscripts of elements must be the same on each side of the equation.  
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.  
E) All of the above statements (a-d) are true.

\_\_\_\_ 25. In a precipitation reaction, one of the products must be

- A) a gas                      B) water                      C) soluble                      D) insoluble

\_\_\_\_ 26. When the following equation is balanced using the smallest possible integers, what is the number in front of the substance in bold type?



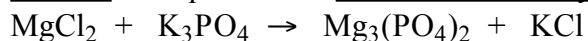
- A) 5                      B) 4                      C) 3                      D) 2                      E) 1

\_\_\_\_ 27. In what type of reaction is water always a product?

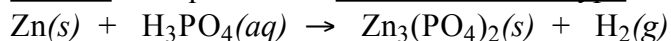
- A) precipitation                                      D) decomposition  
B) acid-base    E) synthesis  
C) oxidation

28. Complete and write the balanced equation for the following: An aqueous solution of potassium chloride is mixed with an aqueous solution of sodium sulfate. State the reaction type.

29. Balance the equation and state the reaction type.



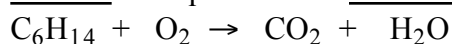
30. Balance the equation and state the reaction type.



31. Refer to the Conversion Tables in the back of the lab book. Use dimensional analysis, showing all of your calculations. How many liters are in 2.00 cubic feet?

32. Write and balance the equation and state the reaction type for the reaction of calcium metal with oxygen gas. Note: You'll need to write the product(s).

33. Balance the equation and state the reaction type.



### Answer Key - Practice Test 3 102309

1. C
2. A
3. D
4. True
5. False
6. True
7. False
8. D
9. A
10. C
11. E
- 12A. light, color change, temperature change, precipitate, bubbles or fizzing
- 12B.
13.  $\text{MgCl}_2 + 2 \text{AgNO}_3 \rightarrow 2 \text{AgCl} + \text{Mg}(\text{NO}_3)_2$   
Double Replacement (or Precipitation)
14.  $\text{Cu}(\text{NO}_3)_2(aq) + 2\text{NaOH}(aq) \rightarrow \text{Cu}(\text{OH})_2(s) + 2\text{NaNO}_3(aq)$   
*Double Replacement, Precipitation*
15. b, d
16. a, e
17. a; c
18. a; d
19. b, c, d
20. a, f
21. E
22. B
23. A
24. A
25. D
26. D
27. B
28.  $2 \text{KCl}(aq) + \text{Na}_2\text{SO}_4(aq) \rightarrow \text{K}_2\text{SO}_4(aq) + 2 \text{NaCl}(aq)$   
Double Replacement
29.  $3\text{MgCl}_2 + 2\text{K}_3\text{PO}_4 \rightarrow \text{Mg}_3(\text{PO}_4)_2 + 6\text{KCl}$   
Double Replacement
30.  $3\text{Zn}(s) + 2\text{H}_3\text{PO}_4(aq) \rightarrow \text{Zn}_3(\text{PO}_4)_2(s) + 3\text{H}_2(g)$   
single replacement, oxidation-reduction
- 31A. 56.6 L
- 31B.
32.  $2\text{Ca}(s) + \text{O}_2(g) \rightarrow 2\text{CaO}(s)$   
synthesis, oxidation-reduction
33.  $2\text{C}_6\text{H}_{14} + 19\text{O}_2 \rightarrow 12\text{CO}_2 + 14\text{H}_2\text{O}$   
combustion, oxidation-reduction