

### Midterm Review

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. The percent by mass of water in  $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$  (formula mass = 243) is equal to

- A.  $\frac{18}{243} \times 100$       B.  $\frac{36}{243} \times 100$   
C.  $\frac{243}{18} \times 100$       D.  $\frac{243}{36} \times 100$

2. The percent by mass of oxygen in CO is approximately

- A. 73%    B. 57%    C. 43%    D. 17%

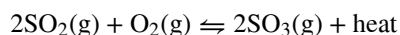
3. What is the percent by mass of oxygen in  $\text{Fe}_2\text{O}_3$  (formula mass = 160)?

- A. 16%    B. 30%    C. 56%    D. 70%

4. Element *A* and element *B* chemically combine to form substance *C*. Substance *C* must be

- A. a solution                      B. a compound  
C. an element                      D. a mixture

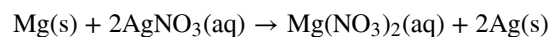
5. Given a reaction that occurs in the contact process:



Adding a catalyst to this system causes the

- A. activation energy to decrease      B. activation energy to increase  
C. heat of reaction to decrease      D. heat of reaction to increase

6. Given the reaction:



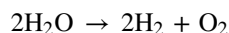
Which type of reaction is represented?

- A. single replacement      B. double replacement  
C. synthesis                      D. decomposition

7. All chemical reactions have a conservation of

- A. mass, only  
B. mass and charge, only  
C. charge and energy, only  
D. mass, charge, and energy

8. Base your answer(s) to the following question(s) on the balanced chemical equation below.

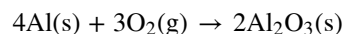


What type of reaction does this equation represent?

9. Which list includes three types of chemical reactions?

- A. condensation, double replacement, and sublimation  
B. condensation, solidification, and synthesis  
C. decomposition, double replacement, and synthesis  
D. decomposition, solidification, and sublimation

10. Given the balanced equation representing a reaction:



Which type of chemical reaction is represented by this equation?

- A. double replacement      B. single replacement  
C. substitution                      D. synthesis

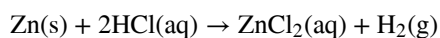
11. As the temperature increases, the number of effective collisions between reacting particles in a chemical reaction

- A. initially increases, then decreases
- B. decreases, only
- C. initially decreases, then increases
- D. increases, only

12. As the number of effective collisions between reacting particles increases, the rate of a chemical reaction

- A. decreases
- B. increases
- C. remains the same

13. Given the reaction:



The reaction occurs more slowly when a single piece of zinc is used than when the same mass of powdered zinc is used. Why does this occur?

- A. The powdered zinc is more concentrated.
- B. The powdered zinc has a greater surface area.
- C. The powdered zinc requires less activation energy.
- D. The powdered zinc generates more heat energy.

14. Under which conditions will the rate of a chemical reaction always decrease?

- A. The concentration of the reactants decreases, and the temperature decreases.
- B. The concentration of the reactants decreases, and the temperature increases.
- C. The concentration of the reactants increases, and the temperature decreases.
- D. The concentration of the reactants increases, and the temperature increases.

15. Which conditions will increase the rate of a chemical reaction?

- A. decreased temperature and decreased concentration of reactants
- B. decreased temperature and increased concentration of reactants
- C. increased temperature and decreased concentration of reactants
- D. increased temperature and increased concentration of reactants

16. Increasing the temperature increases the rate of a reaction by

- A. lowering the activation energy
- B. increasing the activation energy
- C. lowering the frequency of effective collisions between reacting molecules
- D. increasing the frequency of effective collisions between reacting molecules

17. Adding a catalyst to a chemical reaction will

- A. lower the activation energy needed
- B. lower the potential energy of the reactants
- C. increase the activation energy needed
- D. increase the potential energy of the reactants

18. Which quantity is equivalent to 39 grams of LiF?

- A. 1.0 mole
- B. 2.0 moles
- C. 0.50 mole
- D. 1.5 moles

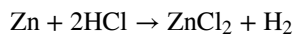
19. What is the gram formula mass of  $\text{Ca(OH)}_2$ ?

- A. 29 g
- B. 34 g
- C. 57 g
- D. 74 g

20. What is the total number of moles in 80.0 grams of  $\text{C}_2\text{H}_5\text{Cl}$  (gram-formula mass = 64.5 grams/mole)?

21. What is the mass of 4.76 moles of  $\text{Na}_3\text{PO}_4$  (gram-formula mass = 164 grams/mole)?

22. Given the equation:



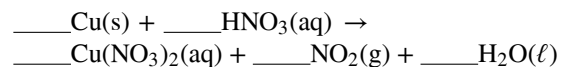
How many moles of HCl would be required to produce a total of 2 moles of  $\text{H}_2$ ?

- A. 0.5      B. 2      C. 3      D. 4

23. When the equation  $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$  is completely balanced, the sum of all the coefficients will be

- A. 5      B. 8      C. 3      D. 4

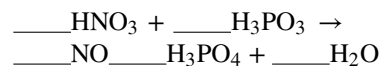
24. Given the reaction:



When the reaction is completely balanced using smallest whole numbers, the coefficient of  $\text{HNO}_3(\text{aq})$  will be

- A. 1      B. 2      C. 3      D. 4

25. Given the reaction:



When the reaction is completely balanced using the smallest whole numbers, the coefficient of  $\text{H}_3\text{PO}_4$  will be

- A. 1      B. 2      C. 3      D. 4

Midterm Review 11/20/2015

- |         |  |         |       |
|---------|--|---------|-------|
| 1.      |  | 21.     |       |
| Answer: | B  | Answer: | 781 g |
| 2.      |  | 22.     |       |
| Answer: | B  | Answer: | D     |
| 3.      |  | 23.     |       |
| Answer: | B  | Answer: | A     |
| 4.      |  | 24.     |       |
| Answer: | B  | Answer: | D     |
| 5.      |  | 25.     |       |
| Answer: | A  | Answer: | C     |
| 6.      |  |         |       |
| Answer: | A  |         |       |
| 7.      |  |         |       |
| Answer: | D  |         |       |
| 8.      |  |         |       |
| Answer: | decomposition, analysis, redox,<br>endothermic, electrolysis |         |       |
| 9.      |  |         |       |
| Answer: | C  |         |       |
| 10.     |  |         |       |
| Answer: | D  |         |       |
| 11.     |  |         |       |
| Answer: | D  |         |       |
| 12.     |  |         |       |
| Answer: | B  |         |       |
| 13.     |  |         |       |
| Answer: | B  |         |       |
| 14.     |  |         |       |
| Answer: | A  |         |       |
| 15.     |  |         |       |
| Answer: | D  |         |       |
| 16.     |  |         |       |
| Answer: | D  |         |       |
| 17.     |  |         |       |
| Answer: | A  |         |       |
| 18.     |  |         |       |
| Answer: | D  |         |       |
| 19.     |  |         |       |
| Answer: | D  |         |       |
| 20.     |  |         |       |
| Answer: | 1.24 mol   |         |       |