

Name:

## Unit 4 Study Guide Part 1

### Review of last unit:

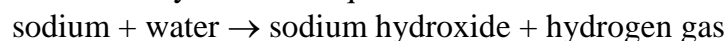
1. What follows an element's symbol in a chemical formula to indicate the number of atoms of that element in one molecule of the compound?
  2. What is the correct name for the  $\text{NO}_3^-$  ion?
  3. What is the correct formula for copper(I) cyanide?
  4. What is the correct name for the compound  $\text{P}_2\text{Cl}_4$ .
  5. What is the correct name for the compound  $\text{Ni}_2\text{CO}_3$ ?
  6. The chemical formula for an ionic compound represents one
    - a. formula unit.
    - b. ion.
    - c. molecule.
    - d. cation.
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### Chemical Reaction Unit:

7. The molar mass of water is equal to
  - a. 1 g of O plus 2 g of H.
  - b. 1 g of O plus 1 g of H.
  - c. the mass of 1 mol of O plus the mass of 1 mol of H.
  - d. the mass of 1 mol of O plus the mass of 2 mol of H.
8. What is the molar mass of pure tin?
  - a. 1.00 g/mol
  - b. 47.88 g/mol
  - c. 118.71 g/mol
  - d. 237.42 g/mol
9. How many moles of compound are there in 15.0 g of potassium dichromate,  $\text{K}_2\text{Cr}_2\text{O}_7$ ? (The molar mass of  $\text{K}_2\text{Cr}_2\text{O}_7$  is 294.2 g.)
  - a. 0.0510 mol
  - b. 11.0 mol
  - c. 15.0 mol
  - d. 294 mol
10. What is the mass percentage of cobalt in cobalt(II) fluoride,  $\text{CoF}_2$ ?
  - a. 33.33%
  - b. 39.20%
  - c. 60.80%
  - d. 96.93%

11. What is the mass of 4.80 mol of barium hydride, BaH<sub>2</sub>?
- 4.80 g
  - 29.0 g
  - 139 g
  - 669 g
12. What is the formula for a compound that contains 12.62% Li, 29.17% S, and 58.21% O?
- LiSO<sub>2</sub>
  - LiS<sub>2</sub>O<sub>6</sub>
  - Li<sub>2</sub>SO<sub>4</sub>
  - Li<sub>2</sub>SO<sub>3</sub>
13. What is the molecular formula for the compound with a formula mass of 58.12 amu and contains C and H?
- C<sub>2</sub>H<sub>5</sub>
  - C<sub>4</sub>H<sub>10</sub>
  - C<sub>6</sub>H<sub>15</sub>
  - C<sub>8</sub>H<sub>20</sub>
14. What is the molecular formula for the compound that is made up of 30.45 g N and 69.55 g O, and has a formula mass of 92.02 amu?
- NO
  - N<sub>2</sub>O<sub>2</sub>
  - NO<sub>2</sub>
  - N<sub>2</sub>O<sub>4</sub>
15. Changing a subscript in a correctly written chemical formula will
- change the electron configuration of that element.
  - change the charges on the other ions in the compound.
  - change the formula so that it no longer represents the same compound.
  - have no effect on the formula.
16. You mix solution A with solution B in a beaker. Which of the following observations does not help you prove that a chemical reaction has occurred?
- The beaker becomes warm.
  - You see gas bubble out of solution.
  - Solution A, solution B, and the mixture are all yellow.
  - None of the above; all help prove that a chemical reaction has occurred.
17. Which of the following indicates that a chemical equation is balanced?
- The numbers of atoms of each element are the same on both sides of the equation.
  - All of the coefficients are the same.
  - The numbers of molecules on each side of the equation are equal.
  - The sums of the coefficients on each side of the equation are equal.
18. From a complete and correctly written chemical equation, you can obtain the
- chemical formulas of the reactants and products.
  - relative amounts of the reactants and products.
  - physical states of the reactants and products.
  - All of the above
19. The formation of a solid product in a chemical reaction is represented by the symbol
- (aq).
  - (g)
  - (l)
  - (s).
20. In the expression 3CO<sub>2</sub>, the numbers 3 and 2 are, respectively,
- a subscript and a coefficient.
  - a coefficient and a subscript.
  - two subscripts.
  - two coefficients.

21. In the reaction described by the word equation:



- a. sodium hydroxide is a product.
- b. sodium is a product.
- c. water is a reactant.
- d. Both (a) and (c)

22. Which equation below violates the law of conservation of mass?

- a.  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- b.  $\text{KCl} + \text{Br} \rightarrow \text{KBr} + \text{Cl}_2$
- c.  $2\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow 4\text{Fe} + 3\text{CO}_2$
- d.  $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$

23. Which of the following equations represents the balanced equation for the reaction of iron and oxygen?

- a.  $2\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$
- b.  $\text{Fe} + 3\text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$
- c.  $4\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$
- d.  $3\text{Fe} + 3\text{O}_2 \rightarrow 2\text{Fe}_2\text{O}_3$

24. Which coefficients correctly balance the formula equation below?



- a. 1, 1, 1
- b. 1, 1, 3
- c. 2, 2, 3
- d. 2, 1, 1

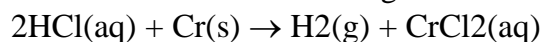
25. Which equation is not balanced?

- a.  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- b.  $4\text{H}_2 + 2\text{O}_2 \rightarrow 4\text{H}_2\text{O}$
- c.  $\text{H}_2 + \text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O} + \text{H}_2\text{O}$
- d.  $2\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$

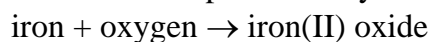
26. Formula mass of any compound is described in units of:

27. Which type of reaction do two or more compounds react to form one product?

28. What type of chemical reaction does the following chemical equation represent?

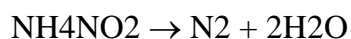


29. What type of chemical reaction is represented by the following word equation?



30. A mixture of propane and oxygen react to form carbon dioxide and water. What type of chemical reaction is this?

31. What is the total number of molecules that is represented by the following chemical equation?



32. When can the term molecular mass be used instead of formula mass?

33. What is the molar mass of tetraethyl lead,  $\text{Pb}(\text{C}_2\text{H}_5)_4$ ?

34. What is the formula mass of copper(II) chloride,  $\text{CuCl}_2$ ?

35. What is the percentage composition of copper in  $\text{CuCl}_2$  by mass?

36. What is the mass of 0.240 mol glucose,  $C_6H_{12}O_6$ ?

37. What is the formula for a sample of a compound that contains 259.2 g F and 40.8 g C?

38. A sample of a compound is 80% carbon and 20% hydrogen by mass. Its formula mass is 30 amu. What is its molecular formula?

39. Explain how to balance a chemical equation