

## Chemistry Challenge Practice Exam #2

### Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- \_\_\_ 1. How many atoms are in 0.075 mol of titanium?  
a.  $1.2 \times 10^{-25}$  c.  $6.4 \times 10^2$   
b.  $2.2 \times 10^{24}$  d.  $4.5 \times 10^{22}$
- \_\_\_ 2. How many molecules are in 2.10 mol  $\text{CO}_2$ ?  
a.  $2.53 \times 10^{24}$  molecules c.  $3.49 \times 10^{-24}$  molecules  
b.  $3.79 \times 10^{24}$  molecules d.  $1.26 \times 10^{24}$  molecules
- \_\_\_ 3. What is the percent by mass of carbon in acetone,  $\text{C}_3\text{H}_6\text{O}$ ?  
a. 20.7% c. 1.61%  
b. 62.1% d. 30.0%
- \_\_\_ 4. What is the molar mass of  $\text{AuCl}_3$ ?  
a. 96 g c. 232.5 g  
b. 130 g d. 303.6 g
- \_\_\_ 5. What is the name of the ionic compound formed from lithium and bromine?  
a. lithium bromine c. lithium bromium  
b. lithium bromide d. lithium bromate
- \_\_\_ 6. What is the electron configuration of the gallium ion?  
a.  $1s^2 2s^2 2p^6 3s^2 3p^6$  c.  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4p^6$   
b.  $1s^2 2s^2 2p^6 3s^2 3p^5 4s^1$  d.  $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10}$
- \_\_\_ 7. What is the formula unit of sodium nitride?  
a.  $\text{NaN}$  c.  $\text{Na}_3\text{N}$   
b.  $\text{Na}_2\text{N}$  d.  $\text{NaN}_3$
- \_\_\_ 8. Which elements can form diatomic molecules joined by a single covalent bond?  
a. hydrogen only  
b. halogens only  
c. halogens and members of the oxygen group only  
d. hydrogen and the halogens only

- \_\_\_\_\_ 9. How are conditions of pressure and temperature, at which one phase exists shown on a phase diagram?
- by a line separating the phases
  - by the endpoints of the line segment separating the phases
  - by the planar regions between lines in the diagram
  - by the triple points
- \_\_\_\_\_ 10. How many valence electrons does a helium atom have?
- 2
  - 3
  - 4
  - 5
- \_\_\_\_\_ 11. How many valence electrons are in a silicon atom?
- 2
  - 4
  - 6
  - 8
- \_\_\_\_\_ 12. In which of the following sets is the symbol of the element, the number of protons, and the number of electrons given correctly?
- In, 49 protons, 49 electrons
  - Zn, 30 protons, 60 electrons
  - Cs, 55 protons, 132.9 electrons
  - F, 19 protons, 19 electrons
- \_\_\_\_\_ 13. How many protons, electrons, and neutrons does an atom with atomic number 50 and mass number 125 contain?
- 50 protons, 50 electrons, 75 neutrons
  - 75 electrons, 50 protons, 50 neutrons
  - 120 neutrons, 50 protons, 75 electrons
  - 70 neutrons, 75 protons, 50 electrons
- \_\_\_\_\_ 14. Hydrogen gas can be produced by reacting aluminum with sulfuric acid. How many moles of sulfuric acid are needed to completely react with 15.0 mol of aluminum?
- $$2\text{Al}(s) + 3\text{H}_2\text{SO}_4(aq) \rightarrow \text{Al}_2(\text{SO}_4)_3(aq) + 3\text{H}_2(g)$$
- 0.100 mol
  - 10.0 mol
  - 15.0 mol
  - 22.5 mol
- \_\_\_\_\_ 15. How many liters of hydrogen gas are needed to react with  $\text{CS}_2$  to produce 2.50 L of  $\text{CH}_4$  at STP?
- $$4\text{H}_2(g) + \text{CS}_2(l) \rightarrow \text{CH}_4(g) + 2\text{H}_2\text{S}(g)$$
- 2.50 L
  - 5.00 L
  - 7.50 L
  - 10.0 L
- \_\_\_\_\_ 16. If you rewrite the following word equation as a balanced chemical equation, what will the coefficient and symbol for fluorine be?
- nitrogen trifluoride  $\rightarrow$  nitrogen + fluorine
- $6\text{F}_2$
  - $\text{F}_3$
  - $6\text{F}$
  - $3\text{F}_2$
- \_\_\_\_\_ 17. In every balanced chemical equation, each side of the equation has the same number of \_\_\_\_.
- atoms of each element
  - molecules
  - moles
  - coefficients





**Chemistry Challenge Practice Exam #2**  
**Answer Section**

**MULTIPLE CHOICE**

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