

Choice the right answer:

1. () How many atoms are in a sulfuric acid molecule?
 A. 1 **B. 7** C. 5 D. 6 E. 8
2. () If a sample of propane, C_3H_8 , contains a total of 6.0×10^3 atoms of carbon, how many molecules of propane are in the sample?
 A. 6.0×10^3 B. 3.0×10^3 C. 8.0×10^3 D. 1.1×10^4 **E. 2.0×10^3**
3. () A compound contains only calcium and fluorine. A sample of the compound is determined to contain 2.00 g of calcium and 1.90 g of fluorine. According to the Law of Definite Proportions, how much calcium should another sample of this compound contain if it contains 2.85 g of fluorine?
 A. 2.71 g B. 4.00 g **C. 3.00 g** D. 4.50 g E. 6.00 g
4. () Which of the following is not the name of a cation?
 A. Sodium B. iron (III) C. aluminum **D. sulfide** E. ammonium
5. () What is the formula for aluminum fluoride?
 A. AlF B. Al_2F_3 C. Al_3F D. Al_3F_2 **E. AlF_3**
6. () What is the name of $Fe(OH)_3$?
 A. iron hydroxide B. iron trihydroxide **C. iron (III) hydroxide**
 D. iron (II) hydroxide E. none of these
7. () How many atoms are in 1.00 mole of water?
 A. 6.02×10^{23} B. 1.20×10^{24} **C. 1.81×10^{24}** D. 2.41×10^{24} E. 3.01×10^{23}
8. () Calculate the mass of one bromine atom.
A. 1.327×10^{-22} g B. 6.022×10^{-23} g C. 1.661×10^{-24} g D. 4.812×10^{-25} g E. 2.654×10^{-22} g
9. () Determine the formula weight of $Ca_3(PO_4)_2$.
 A. 230 amu B. 279 amu C. 215 amu **D. 310 amu** E. 135 amu
10. () How many grams of $CaCl_2$ equal 4.26 moles of $CaCl_2$?
 A. 26.1 g B. 170 g C. 302 g **D. 473 g** E. 322 g
11. () How many moles of $POCl_3$ are there in 10.0 grams of $POCl_3$?
A. 6.51×10^{-2} mol B. 3.68×10^{-1} mol C. 4.09×10^{-2} mol D. 1.21×10^{-1} mol E. 1.17×10^{-3} mol
12. () How many moles CCl_4 are present in 118. g of carbon tetrachloride?
 A. 0.839 B. 1.19 C. 0.538 D. 1.30 **E. 0.767**
13. () How many molecules are contained in 5.00 grams of NH_3 ?
 A. 5.42×10^{22} B. 3.00×10^{24} C. 3.40×10^{22} **D. 1.77×10^{23}** E. 9.45×10^{22}
14. () How many atoms of carbon are present in 34.5 g of caffeine, $C_8H_{10}N_4O_2$?
A. 8.57×10^{23} B. 2.68×10^{25} C. 1.08×10^{24} D. 2.09×10^{23} E. 4.83×10^{23}
15. () Which of the following is **not** a correct description of 16.0 grams of methane, CH_4 ?
 A. It is one mole of methane.
 B. It is the amount of methane that contains 12.0 g of carbon.
C. It is $16.0 \times 6.02 \times 10^{23}$ molecules of methane.
 D. It is the amount of methane that contains 4.0 grams of hydrogen.
 E. It is the amount of methane that contains $4 \times 6.02 \times 10^{23}$ hydrogen atoms.

16. () A sample of ethane, C_2H_6 , contains a total of $16N$ atoms, where $N = 6.02 \times 10^{23}$. How much C_2H_6 is in the sample?
A. 2.0 g B. 30 g C. 60 g D. 16 mol E. 4 mol
17. () What is the percent by mass of sulfur in $Al_2(SO_4)_3$?
A. 9.38% B. 18.8% C. 24.6% D. 28.1% E. 35.4%
18. () Analysis of a sample of a covalent compound showed that it contained 14.4% hydrogen and 85.6% carbon by mass. What is the empirical formula for this compound?
A. CH B. CH_2 C. CH_3 D. C_2H_3 E. C_2H_5
19. () Determine the simplest formula for a hydrocarbon if the complete combustion of a sample produces 3.96 g of CO_2 and 2.16 g of H_2O .
A. C_2H_3 B. C_3H_8 C. CH_3 D. CH E. C_2H_5
20. () A compound is known to contain only carbon, hydrogen, and oxygen. If the complete combustion of a 0.150-g sample of this compound produces 0.225 g of CO_2 and 0.0614 g of H_2O , what is the empirical formula of this compound?
A. C_3H_4 B. CH_4O C. C_3HO_3 D. $C_3H_4O_3$ E. $C_5H_7O_5$
21. () A compound contains, by mass, 87.5% nitrogen and 12.5% hydrogen. Its molecular weight is found to be 32 g/mol. What is its molecular formula?
A. N_2H_6 B. N_2H_4 C. N_2H_5 D. NH_3 E. NH_2
22. () A compound contains, by mass, 26.7% carbon, 71.1% oxygen and the remainder hydrogen. A 0.23 mole sample of this compound weighs 20.7 g. What is the molecular formula of this compound?
A. $C_3H_6O_2$ B. C_2H_4O C. $C_2H_2O_4$ D. CHO_2 E. C_3OH
23. () The complete combustion of a 0.2864-g sample of a compound yielded 0.420 g of CO_2 and 0.172 g of H_2O . The molecular weight was determined to be approximately 60 g/mol. What is the molecular formula of this compound if it contains only carbon, hydrogen, and oxygen?
A. $C_2H_4O_2$ B. CH_2O C. CH_4O_2 D. $C_3H_6O_3$ E. $C_{19}H_{38}O_{19}$
24. () What is the ratio of the masses of oxygen that combine with 1.00 gram of lead in the compounds PbO , PbO_2 , and Pb_2O_3 ?
A. 1:2:2 B. 1:2:1 C. 2:4:4 D. 6:12:8 E. 2:4:3
25. () What mass of fluoristan, SnF_2 , would contain the same mass of tin as 306 grams of cassiterite, SnO_2 ?
A. 295 g B. 318 g C. 278 g D. 367 g E. 335 g
26. () How do **nonmetals** form **negative** ions?
A. by losing one or more electrons B. by sharing electrons
C. by gaining one or more protons D. by gaining one or more electrons
27. () Which one of the following formulas represents a **polyatomic ion**?
A. NO_2 B. $RbNO_2$ C. Rb^+ D. NO_3
28. () Calculate the **percentage** of nitrogen, **N**, in dinitrogen trioxide, N_2O_3 .
A. 40% B. 36.8% C. 18.4% D. 46.7%