The Mole Practice Quiz

1. The number of atoms in a mole of any pure substance is called
a) its atomic number
b) Avogadro's number
c) Its mass number
d) Its isotopic number

2. The atomic number of oxygen is 8. The atomic number of sulfur is 16. Compared with a mole of oxygen, a mole of sulfur contains
a) twice as many atoms
b) half as many atoms
c) an equal number of atoms
d) 8 times as many atoms

3. To determine the molar mass of an element, one must know the element's
a) Avogadro constant
b) atomic number
c) number of isotopes
d) average atomic mass

4. Avogadro's number of atoms of any element is equivalent to
a) the atomic number of that element
b) the mass number of that element
c) 6.02×10^{23} particles
d) 100 g of that element

5. The mass of 1 mol of chromium is about
a) 12 g
b) 24 g
c) 52 g
d) 6.02×10^{23} g

6. A mass of 6.005 g of carbon contains
a) 1 mol of C
b) 2 atoms of C
c) 0.5000 mol of C
d) 1 atom of C

7. The mass of 2 moles of oxygen atoms is
a) 16 g
b) 32 g
c) 48 g
d) 64 g

8. What is the number of moles of atoms in 9.03×10^{24} atoms?
a) 1.50 mol
b) 9.03 mol
c) 10.0 mol
d) 15.0 mol

9. A sample of tin contains 3.01×10^{23} atoms. The mass of the sample is
a) 3.01 g
b) 59.3 g
c) 72.6 g
d) 11g

10. The mass of a sample of nickel is 11.74 g. It contains
a) 1.174×10^{23} atoms
b) 1.205×10^{23} atoms
c) 1.869×10^{23} atoms
d) 3.256×10^{23} atoms

11. Which of the following weighs more?
a) 1 mole of hydrogen
b) 0.25 moles of He
c) 0.1 mol of Ne
d) 0.2 mol of C

12. What is the molar mass of magnesium chloride, $MgCl_2$?
a) 46g/mole
b) 59.763g/mole
c) 95.211g/mole
d) 106.354g/mole

13. What is the molar mass of $(NH_4)_2SO_4$?
a) 114.09g/mole
b) 118.34g/mole
c) 128.06g/mole
d) 132.13g/mole

14. The molar mass of NO_2 is 46.01 g/mole. How many moles of NO_2 are present in 114.95g?
a) 0.4003mol
b) 1.000mol
c) 2.498mol
d) 114.95mol

15. The molar mass of CCl_4 is 153.81g/mol. How many grams of CCl_4 are needed to have 5.000 mol?
a) 5.000g
b) 30.76g
c) 769.0g
d) 796.05g

16. How many Cl- ions are present in 2.00 mol of KCl?
a) 1.204×10^{24}
b) 6.02×10^{24}
c) 2.00
d) 0.5

17. How many OH- ions are present in 3.00 mol of $Ca(OH)_2$?
a) 3.00
b) 6.00
c) 3.61×10^{24}
d) 2.06×10^{23}

18. What is the percent composition, by mass, of CO?

a) 50% C, 50% O
b) 12% C, 88% O
c) 25% C, 75% O
d) 43% C, 57% O

19. What is the percentage composition, by mass, of oxygen in H_2O?
a) 15.99%
b) 33%
c) 88.8%
d) 99.8%

20. The empirical formula for a compound shows the symbols of the elements with subscripts indicating the
a) actual numbers of atoms in a molecule
b) number of moles of the compound in 100 g.
c) smallest whole-number ratio of atoms
d) atomic masses of each element

21. A compound contains 259.2 g of F and 40.8 g of C. What is the empirical formula for this compound?
a) CF_4
b) C_4F
c) CF
d) CF_2

22. What is the empirical formula for a compound that is 53.3% O and 46.7% Si?
a) SiO
b) SiO_2
c) Si_2O
d) Si_2O_3

23. What is the empirical formula for a compound that is 31.9% potassium, 28.9% chlorine, and 39.2% Oxygen?
a) $KClO_2$
b) $KClO_3$
c) $K_2Cl_2O_3$
d) $K_2Cl_2O_5$

24. What is the empirical formula for a compound that is 43.6% phosphorus and 56.4% oxygen?
a) P_3O_7
b) PO_3
c) P_2O_3
d) P_2O_5

25. To find the molecular formula from the empirical formula, one must determine the compound's
a) density
b) molar mass
c) structural formula
d) shape

26. A compound's empirical formula is C_2H_5. If the molar mass is 58 g/mole, what is the molecular formula?
a) C_3H_6
b) C_4H_{10}
c) C_5H_8
d) C_5H_{15}

27. A compound containing only hydrogen and oxygen is 5.9% hydrogen by mass. The molar mass of the compound is 34 g/mole. What is the molecular formula of the compound?
a) H_2O
b) H_2O_2
c) OH
d) $H_{18}O$

28. The mass percentage of water in the hydrate $CuSO_4 \cdot 5H_2O$ is
a) 18% b) 25% c) 31% d) 36% e) 52%

29. The mass percent water in a hydrate of Na_2CO_3 is 62.98%. What is the formula for the hydrate?
a) $Na_2CO_3 \cdot H_2O$ b) $Na_2CO_3 \cdot 3H_2O$ c) $Na_2CO_3 \cdot 5H_2O$ d) $Na_2CO_3 \cdot 10H_2O$

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1. (b)
2. (c)
3. (d)
4. (c)
5. (c)
6. (c)
7. (b)
8. (d)
9. (b)
10. (b)
11. (d)
12. (c)
13. (d)
14. (c)
15. (c)
16. (a)
17. (c)
18. (d)
19. (c)
20. (c)
21. (a)
22. (b)
23. (b)
24. (d)
25. (b)
26. (b)
27. (b)
28. (d)
29. (d)