

Prep for Basic Chemistry: Competency 9 PRACTICE Key

- 1) About how many moles of aluminum does 3.42×10^{23} atoms of aluminum equal?
- A 1.27×10^{22}
 B 9.23×10^{24}
 C 6.02×10^{23}
 D **0.57**
- 2) How many moles are in 453.8 grams of C_3H_8 ?
- A 1.03
 B **10.3**
 C 0.0969
 D 19967.2
- 3) The percent composition of carbon in C_2H_6 is _____.
- A 20%
 B 60%
 C 40%
 D **80%**
- 4) One mole of water, H_2O , contains _____ particles of water molecules, _____ particles of hydrogen atoms, and _____ particles of oxygen atom.
- A 6.02×10^{23} , 6.02×10^{23} , 6.02×10^{23}
 B 12.04×10^{23} , 6.02×10^{23} , 6.02×10^{23}
 C **6.02×10^{23} , 12.04×10^{23} , 6.02×10^{23}**
 D 18.06×10^{23} , 12.04×10^{23} , 6.02×10^{23}
- 5) One mole of sulfuric acid, H_2SO_4 , contains _____ mole(s) of H^+ , _____ mole(s) of SO_4^{2-} , _____ mole(s) of S atom, and _____ mole(s) of oxygen atom.
- A **2; 1; 1; 4**
 B 2; 2; 2; 4
 C 2; 2; 1; 4
 D 1; 1; 1; 4
- 6) How many *atoms* are there in 3.64 moles of water?
- A 6.02×10^{23}
 B **6.58×10^{24}**
 C 2.19×10^{24}
 D 4.38×10^{24}
- 7) How many atoms of aluminum is 0.43 moles of aluminum?
- A cannot be determined
 B 6.02×10^{23}
 C 1.40×10^{24}
 D 7.14×10^{-25}
 E **2.59×10^{23}**
- 8) What is the mass in grams of 54.2 moles of C_3H_8 ?
- A 0.812 g
 B **2380 g**
 C 3.26×10^{25} g
 D 1.23 g

- 9) What is the gram molecular mass of CH_4 ?
- A 16.0 grams
 B 1.0 grams
 C 13.0 grams
 D 12.0 grams
- 10) What is the mass of 3.53×10^{11} atoms of silicon?
- A 1.64×10^{-11} grams
 B 5.86×10^{-13} grams
 C 2.13×10^{35} grams
 D 1.64×10^{-11} milligrams
- 11) The mass of carbon in 132 grams of C_2H_6 is _____.
- A 105.6 g
 B 12 g
 C 0.182 g
 D 24 g
- 12) A mole of water contains three times Avogadro's number of atoms.
- A True
 B False
- 13) 28.1 grams of silicon is equivalent to one mole of silicon.
- A True
 B False
- 14) Avogadro's number can be used to count particles, including atoms, ions, and molecules.
- A True
 B False
- 15) 28.1 grams of silicon atoms contains more numbers of atoms than 1.0 grams of hydrogen atoms.
- A True
 B False
- 16) One mole of any substance always contains approximately 6.02×10^{23} representative particles of that substance.
- A True
 B False
- 17) C_2H_2 and C_6H_6 have the same empirical formula.
- A True
 B False
- 18) The empirical formula of water is the same as its molecular formula.
- A True
 B False
- 19) One mole of CO contains the same mass as one mole of CO_2 .
- A True
 B False

- 20) One mole of water, H_2O , contains the same number of molecules as one mole of nitrogen gas, N_2 .
- A True
 - B False
- 21) An empirical formula is...
- A the mass of one mole of a substance with units usually in terms of grams per mole.
 - B a chemical formula with the simplest whole number ratio of the atoms in a compound.
 - C the volume of one mole of a gas at STP, equivalent to 22.4 liters.
- 22) Percent composition is...
- A the mass of one mole of a substance with units usually in terms of grams per mole.
 - B a chemical formula with the simplest whole number ratio of the atoms in a compound.
 - C the relative amount of each element in a compound expressed as a percentage.
- 23) A mole (mol) is...
- A the SI unit that measures the amount of a substance containing 6.02×10^{23} representative particles of a substance.
 - B the mass of one mole of a substance with units usually in terms of grams per mole.
 - C the experimentally determined number of particles in one mole of a substance, approximately equivalent to 6.02×10^{23} .
- 24) Avogadro's number is...
- A a chemical formula with the simplest whole number ratio of the atoms in a compound.
 - B an experimentally determined number of particles in one mole of a substance, equivalent to approximately 6.02×10^{23} .
 - C standard conditions of 0°C and 1 atmosphere of a gas.
- 25) If the percent composition of a compound with a molecular mass of 26.0 is 92.3% carbon and 7.7% hydrogen, what is its:
- a. empirical formula? CH
 - b. molecular formula? C_2H_2