

CHAPTER 7 REVIEW

Chemical Formulas and Chemical Compounds

SECTION 3

SHORT ANSWER Answer the following questions in the space provided.

1. Label each of the following statements as True or False:

- _____ a. If the formula mass of one molecule is X u, the molar mass is X g/mol.
- _____ b. Samples of equal numbers of moles of two different chemicals must have equal masses as well.
- _____ c. Samples of equal numbers of moles of two different molecular compounds must have equal numbers of molecules as well.

2. How many moles of each element are present in a 10.0 mol sample of $\text{Ca}(\text{NO}_3)_2$?

PROBLEMS Write the answer on the line to the left. Show all your work in the space provided.

3. Consider a sample of 10.0 g of the gaseous hydrocarbon C_3H_4 to answer the following questions.

- _____ a. How many moles are present in this sample?
- _____ b. How many molecules are present in the C_3H_4 sample?
- _____ c. How many carbon atoms are present in this sample?

SECTION 3 *continued*

_____ d. What is the percentage composition of hydrogen in the sample?

4. One source of aluminum metal is alumina, Al_2O_3 .

_____ a. Determine the percentage composition of Al in alumina.

_____ b. How many pounds of aluminum can be extracted from 2.0 tons of alumina.?

5. Compound A has a molar mass of 20 g/mol, and compound B has a molar mass of 30 g/mol.

_____ a. What is the mass of 1.0 mol of compound A, in grams?

_____ b. How many moles are present in 5.0 g of compound B?

_____ c. How many moles of compound B are needed to have the same mass as 6.0 mol of compound A?

Assessment

Chemical Formulas and Chemical Compounds

Section Quiz: Using Chemical Formulas

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question. For calculations that require the atomic mass of an element, round the atomic mass found on the periodic table on page 49 to two decimal places.

- _____ 1. The mass of a molecule is found by
- adding the masses of all the atoms in the molecule.
 - dividing the total mass of all the atoms in the molecule by 6.022×10^{23} .
 - multiplying the total mass of all the atoms in the molecule by 6.022×10^{23} .
 - dividing the total mass of all the atoms in the molecule by the total number of atoms.
- _____ 2. For any molecule, formula unit, or ion, the sum of the average atomic masses of all the atoms represented in a formula is the
- formula mass.
 - ionic mass.
 - molecular mass.
 - atomic mass.
- _____ 3. What is the correct formula mass for zinc hydroxide, $\text{Zn}(\text{OH})_2$?
- 83.41 g
 - 99.41 g
 - 83.41 amu
 - 99.41 amu
- _____ 4. One mole of potassium atoms has a mass of
- 1 g.
 - 39.10 g.
 - 78.20 g.
 - 6.022×10^{23} g.
- _____ 5. A compound's molar mass is numerically equal to
- the total number of atoms in the molecule.
 - the total number of moles of the compound.
 - its mass number.
 - its formula mass.

Section Quiz, *continued*

- _____ 6. How many total moles of atoms are there in one mole of silver(I) phosphate, Ag_3PO_4 ?
- 3
 - 7
 - 8
 - 11
- _____ 7. What is the correct molar mass of Ag_3PO_4 ?
- 418.58 g/mol
 - 387.61 g/mol
 - 154.84 g/mol
 - 52.32 g/mol
- _____ 8. Which statement shows how to correctly convert from the mass of a compound in grams to the amount of that compound in moles?
- $\text{molar mass (g/mol)} \times \frac{1}{\text{mass (g)}} = \text{amount (moles)}$
 - $\text{molar mass (g/mol)} \times 6.022 \times 10^{23} \text{ amount (moles)}$
 - $\text{mass (grams)} \times \frac{1}{\text{molar mass (g/mol)}} = \text{amount (moles)}$
 - $\text{mass (grams)} \times \text{molar mass (g/mol)} = \text{amount (moles)}$
- _____ 9. The percentage composition of a compound is
- the percentage by volume of each element in the compound.
 - the percentage by mass of each element in the compound.
 - the molar mass of the compound \div the mass of each element in 1 mol of the compound.
 - the mass of each element in 1 mol of the compound \times the molar mass of the compound.
- _____ 10. What is the percentage of iron in iron(III) chloride, FeCl_3 ? The molar mass of FeCl_3 is 162.2 g/mol.
- 25.00%
 - 34.43%
 - 61.17%
 - 65.57%