

Chapter 6

6.4

1. What is a chemical compound?
2. What does each methane (CH_4) molecule contain?
3. What does each mole of methane (CH_4) contain?
4. How do you find the mass of 1 mole of methane?
5. Define molar mass.
6. How do you obtain the molar mass?
7. Sometimes, for ionic compounds, the term “_____” is used instead of “molar mass.”

6.5

8. What is the formula for mass fraction for an element in a compound?
9. What do you get if you multiply mass fraction by 100%?
10. The mass percentage of all elements in a compound should add up to what?
11. Adding up the percentages is a good way to what?

6.6

12. The only sure way to identify a chemical compound is to what?
13. How does a chemist determine what compound has been formed?

14. To obtain the formula of an unknown compound, what do we use?

15. What does a chemical formula represent?

16. What is the empirical formula?

17. What is the molecular formula?

18. We can represent the molecular formula as a _____ of the empirical formula.

6.7

19. To calculate the empirical formula, what must we determine first?

20. One way to do this is to:

21. What must you do if the relative numbers of moles turn out to be nonintegers?

22. If a given compound is 15% carbon (by mass), the compound contains _____ g of carbon per _____ g of compound.

6.8

23. What must we know to calculate the molecular formula?

24. It is important to realize that the molecular formula is always an _____ of the empirical formula.

25. If $n = 1, \dots$

Chapter 6**6.4**

1. What is a chemical compound?

a collection of atoms

2. What does each methane (CH₄) molecule contain?

one carbon atom and four hydrogen atoms

3. What does each mole of methane (CH₄) contain?

one mole of carbon atoms and four moles of hydrogen atoms

4. How do you find the mass of 1 mole of methane?

by summing the masses of 1 mol of C and 4 mol of H

5. Define molar mass.

the mass (in g) of 1 mol of a substance

6. How do you obtain the molar mass?

by summing the masses of the component atoms

7. Sometimes, for ionic compounds, the term “formula weight” is used instead of “molar mass.”

6.5

8. What is the formula for mass fraction for an element in a compound?

$$\text{mass fraction for a given element} = \frac{\text{mass of element in 1 mol of compound}}{\text{mass of 1 mol of compound}}$$

9. What do you get if you multiply mass fraction by 100%?

mass percent

10. The mass percentage of all elements in a compound should add up to what?

100%

11. Adding up the percentages is a good way to what?

check the calculations

6.6

12. The only sure way to identify a chemical compound is to what?

perform experiments

13. How does a chemist determine what compound has been formed?

by determining which elements are present and how much of each is there

14. To obtain the formula of an unknown compound, what do we use?

the measured masses of the elements present

15. What does a chemical formula represent?

the relative numbers of the various types of atoms present

16. What is the empirical formula?

the smallest whole-number ratio of the atoms present

17. What is the molecular formula?

the actual formula of the compound

18. We can represent the molecular formula as a multiple of the empirical formula.

6.7

19. To calculate the empirical formula, what must we determine first?

the relative masses of the elements present

20. One way to do this is to:

measure the masses of the elements that react to form the compound

21. What must you do if the relative numbers of moles turn out to be nonintegers?

convert to the appropriate whole numbers

22. If a given compound is 15% carbon (by mass), the compound contains 15 g of carbon per 100 g of compound.

6.8

23. What must we know to calculate the molecular formula?

the compound's molar mass

24. It is important to realize that the molecular formula is always an integer multiple of the empirical formula.

25. If $n = 1, \dots$

the empirical formula and the molecular formula are the same