3.3: Compounds (Exercises)

These are homework exercises to accompany Chapter 3 of the University of Kentucky's LibreText for CHE 103 - Chemistry for Allied Health. Solutions are available below the questions.

Questions

3.1: Molecular Compounds

(click here for solutions)

Q3.1.1

What types of elements typically form binary molecular compounds?

Q3.1.2

Describe the similarities and differences between ionic and molecular compounds.

Q3.1.3

Give the prefix that would be used in the name a molecular compound for each of the following quantities of atoms.

a. 6
b. 3
c. 9
d. 5
e. 8

Q3.1.4

Write the formula for each compound.

a. diphosphorus pentoxide
b. dinitrogen monoxide
c. trisilicon tetranitride
d. dinitrogen pentoxide
e. tetraphosphorus decasulfide
f. disulfur hexafluoride
g. triboron dicarbide
h. tetraselenium tetranitride

3.2: Straight-Chain Alkanes

(click here for solutions)

Q3.2.1

What elements are found in a hydrocarbon?

Q3.2.2

Describe an alkane.

Q3.2.3

How many carbon atoms are found in octane? propane? nonane?

Q3.2.4

What is the name for the alkane with six carbons? four carbons? two carbons?

Q3.2.5

What is the difference between an alkane and a cycloalkane?

Answers

3.1: Molecular Compounds

Q3.1.1

Binary molecular compounds are composed of two nonmetallic elements.

Q3.1.2

They both form as a result of bonding between atoms. Ionic compounds result from the transfer of electrons from one element to another while molecular compounds form bonds through the sharing of electrons.

Q3.1.3

a. hexa
b. tri
c. nona
d. penta
e. octa

Q3.1.4

a. P_2O_5
b. N_2O
c. Si_3N_4
d. N_2O_5
e. P_4S_{10}
f. S_2F_6
g. B_3C_2
h. Se_4N_4

3.2: Straight-Chain Alkanes

Q3.2.1

carbon and hydrogen

Q3.2.2

An alkane contains only carbon and hydrogen atoms with the carbons connected by single bonds.

Q3.2.3

octane, 8; propane, 3; nonane, 9

Q3.2.4

6, hexane; 4, butane; 2, ethane

Q3.2.5

An alkane contains a chain of carbon atoms while a cycloalkane contains carbons in a ring structure.
