

Chapter 11

REINFORCEMENT

11.1
● Why Atoms Combine

Each statement below contains a pair of terms or phrases in parentheses. Circle the term or phrase that makes each statement true.

- Most of the matter around you is in the form of (elements, compounds).
- The properties of a compound are (the same as, different from) the properties of the elements that make up the compound.
- Na and Cl are (chemical symbols, chemical formulas).
- NaCl and NaOH are (chemical symbols, chemical formulas).
- H₂O is the formula for (salt, water).
- In the formula H₂O, the number 2 is a (subscript, superscript).
- In the formula HCl, the ratio of hydrogen atoms to chlorine atoms is (1:1, 2:1).
- The number 2 in the formula H₂O tells you that each unit of this compound contains (2 hydrogen atoms, 2 oxygen atoms).
- If a symbol in a chemical formula does not have a subscript after it, a unit of that compound contains (0 atoms, 1 atom) of that element.
- In the formula Fe₂O₃, the ratio of iron atoms to oxygen atoms is (3:2, 2:3).
- An atom is chemically stable if its outer energy level (is filled with, contains no) electrons.
- For atoms of most elements, the outer energy is filled when it has (3, 8) electrons.
- The noble gases do not readily form compounds because they (are, are not) chemically stable.
- A chemical bond is a (force, chemical) that holds together the atoms in a compound.
- Chemical bonds form when atoms lose, gain, or (share, multiply) electrons.

Complete the table below by using the formula of each compound to identify the elements that each compound contains and the ratios of those elements. The first one has been done for you as an example.

Formula	Elements in compound	Ratios
H ₂ O	hydrogen, oxygen	2:1
NaOH		
NaCl		
NH ₃		
H ₂ SO ₄		
SiO ₂		

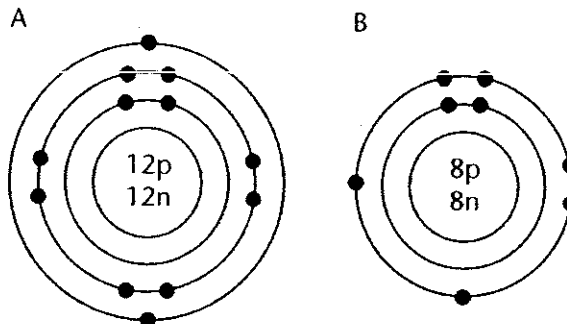
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11.2
● Kinds of Chemical Bonds

Answer the questions about the diagram shown below. Write your answers in the spaces provided.



- How many electrons will atom A lose to atom B? _____
- What kind of chemical bond will be formed between atom A and atom B if atom A loses electrons and atom B gains these electrons? _____
- If atom A gives up electrons to atom B, what will the electrical charge of atom A be?

- If atom B gains electrons from atom A, what will the electrical charge of atom B be? Why?

- What is an atom with an electrical charge called? _____
- If atom A and atom B form a compound, what will the total charge of the compound be? Why? _____

Complete the table comparing ionic compounds and covalent compounds.

Characteristic	Ionic	Covalent
How formed		
Smallest particles		
Usual state of compound at room temperature		

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11.4 Formulas and Names of Compounds

Use the Periodic Table of Elements on pages 286–287 of your textbook to identify the oxidation numbers of the elements in each group.

- _____ 1. any element in Group 1 _____ 4. any element in Group 18
 _____ 2. any element in Group 17 _____ 5. any element in Group 16
 _____ 3. any element in Group 2

Answer the following questions in the spaces provided. Use the periodic table if you need help.

1. What is the usual oxidation number of oxygen? _____
2. What is the usual oxidation number of hydrogen? _____
3. What name is given to many of the elements that have more than one oxidation number?

4. What is the sum of the oxidation numbers in a compound? _____
5. What is an oxidation number? _____

Write the formulas for the following compounds. Use the Periodic Table of the Elements in your textbook for help.

1. copper(II) sulfate _____
2. calcium chloride _____
3. iron(II) oxide _____
4. copper(I) oxide _____
5. sodium sulfide _____

Complete the following table by providing the name of the compound and the total number of atoms in each formula given.

Formula	Name	Number of atoms
NH_4OH		
NH_4Cl		
Ag_2O		
K_2SO_4		
$\text{Ca}(\text{NO}_3)_2$		
Na_2S		