

Bonding Basics

ANSWER KEY

Section A: Complete the chart using a periodic table to help you.

Element	Atomic Symbol	Total # of Electrons	# of Valence Electrons	# of Electrons Needed to Gain or Lose (to Fill Outer Shell)	Oxidation Number
Chlorine	Cl	17	7	Gain 1	1-
Potassium	K	19	1	Lose 1	1+
Magnesium	Mg	12	2	Lose 2	2+
Fluorine	F	9	7	Gain 1	1-
Aluminum	Al	13	3	Lose 3	3+
Sodium	Na	11	1	Lose 1	1+
Nitrogen	N	14	4	Gain 3	3-
Oxygen	O	8	6	Gain 2	2-
Hydrogen	H	1	1	Gain or Lose 1	1+ or 1-
Carbon	C	6	4	Gain or Lose 4	4+ or 4-
Iodine	I	53	7	Gain 1	1-

Answer these questions:

- An atom that gains one or more electrons will have a **NEGATIVE** charge.
- An atom that loses one or more electrons will have a **POSTIVE** charge.
- An atom that gains or loses one or more electrons is called an **ION**.
- A positive ion is called a **CATION** and a negative ion is called an **ANION**.

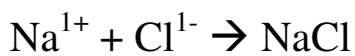
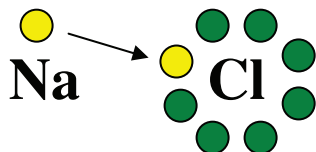
Section B: Ionic Bonds

ANSWER KEY

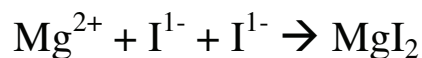
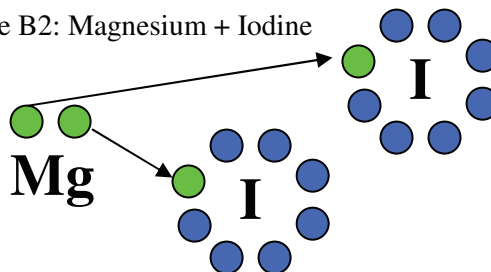
What is an ionic bond?

- Atoms will transfer one or more **electrons** to another to form the bond.
- Each atom is left with a **complete** outer shell.
- An ionic bond forms between a **metal** ion with a positive charge and a **nonmetal** ion with a negative charge.

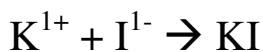
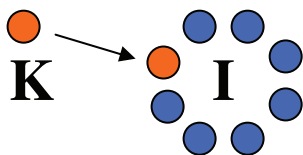
Example B1: Sodium + Chlorine



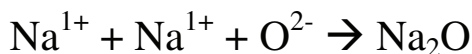
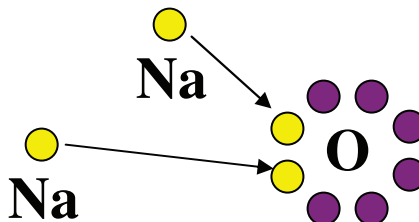
Example B2: Magnesium + Iodine



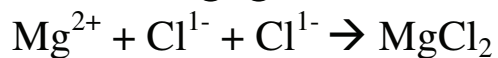
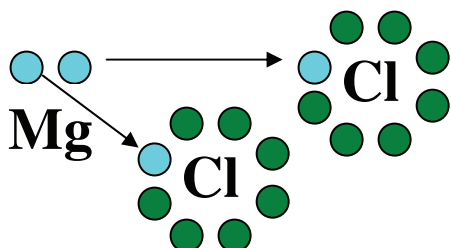
Example B3: Potassium + Iodine



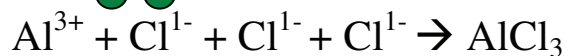
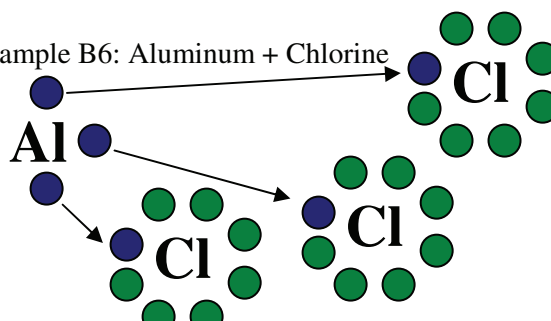
Example B4: Sodium + Oxygen



Example B5: Calcium + Chlorine



Example B6: Aluminum + Chlorine



Challenge: What are some other ionic bonds that can be formed by the elements you see? Write the chemical formula for the compound and its name.

Answers will vary.

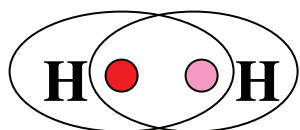
Section C: Covalent Bonds

ANSWER KEY

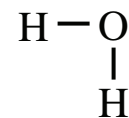
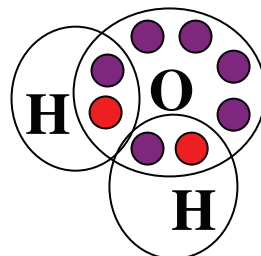
What is a covalent bond?

- Atoms share one or more **electrons** with each other to form the bond.
- Each atom is left with a **complete** outer shell.
- A covalent bond forms between two **nonmetals**.

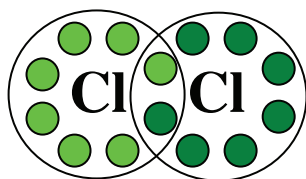
Example C1: Hydrogen + Hydrogen



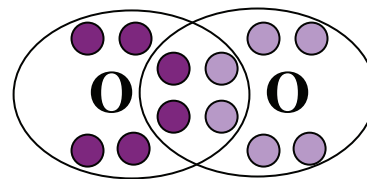
Example C2: 2 Hydrogen + Oxygen



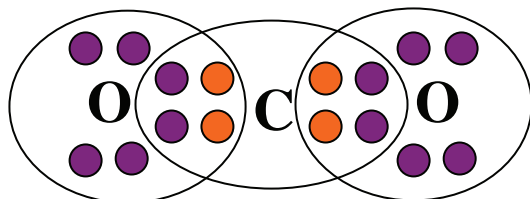
Example C3: Chlorine + Chlorine



Example C4: Oxygen + Oxygen



Example C5: Carbon + 2 Oxygen



Example C6: Carbon + 4 Hydrogen

