COVALENT BONDING

Covalent bonding occurs when two or more nonmetals share electrons, attempting to attain a stable octet of electrons at least part of the time. For example:

\[
\text{H}^+ + \text{Cl}^- \rightarrow \text{H}_2\text{Cl}_2
\]

Note that hydrogen is content with 2, not 8, electrons.

Show how covalent bonding occurs in each of the following pairs of atoms. Atoms may share one, two or three pairs of electrons.

1. \( \text{H} + \text{H} \ (\text{H}_2) \)

2. \( \text{F} + \text{F} \ (\text{F}_2) \)

3. \( \text{O} + \text{O} \ (\text{O}_2) \)

4. \( \text{N} + \text{N} \ (\text{N}_2) \)

5. \( \text{C} + \text{O} \ (\text{CO}_2) \)

6. \( \text{H} + \text{O} \ (\text{H}_2\text{O}) \)
IONIC BONDING

Ionic bonding occurs when a metal transfers one or more electrons to a nonmetal in an effort to attain a stable octet of electrons. For example, the transfer of an electron from sodium to chlorine can be depicted by a Lewis dot diagram.

\[ \text{Na}^+ + \text{Cl}^- \rightarrow \text{Na}^+\text{Cl}^- \]

Calcium would need two chlorine atoms to get rid of its two valence electrons.

\[ \text{Cl}^- + \text{Ca}^+ + \text{Cl}^- \rightarrow \text{Ca}^{2+}\text{Cl}_2^- \]

Show the transfer of electrons in the following combinations.

1. **K** + **F**

2. **Mg** + **I**

3. **Be** + **S**

4. **Na** + **O**

5. **Al** + **Br**