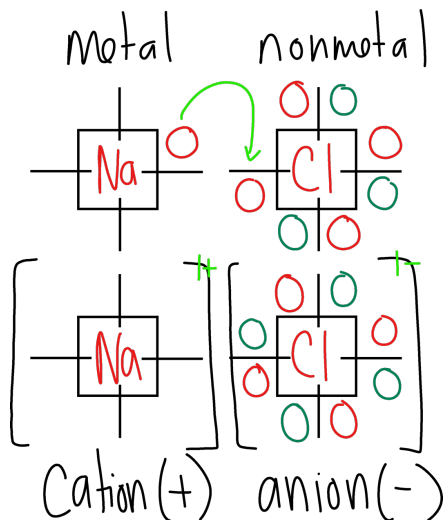


Ionic Bonding Review



Octet Rule

Atoms will *bond* with each other to obtain either 0 (*none*) or 8 (*full*) *valence electrons* around the atom.

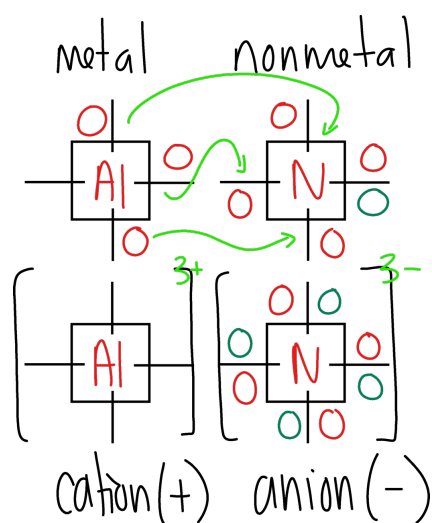
Ionic Bonding – Transfer of Electrons

An **ionic bond** forms when electrons are transferred from one atom to another to meet the *octet rule*.

1 – 3 valence e⁻ - Lose Electrons (+ ion)
5 – 7 valence e⁻ - Gain Electrons (- ion)

2

Ionic Bonding Review



Electron Transfer Procedure

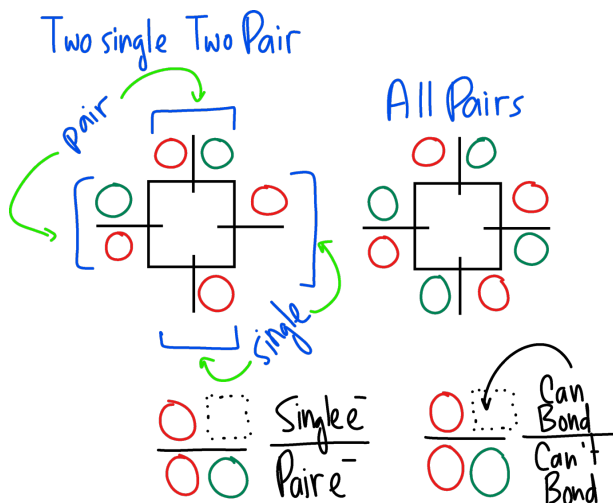
Electrons transfer to an open space within an orbital, shown in the dot structures.

Energy and Electron Transfer

Multiple valance electron transfers (*metal to non-metal*) occur at the same time when the atoms *collide* and *transfer energy* between the atoms.

3

Covalent Bonding



Covalent Bonding

A **covalent bond** forms when electrons are *shared* between two atoms to satisfy the *octet rule*.

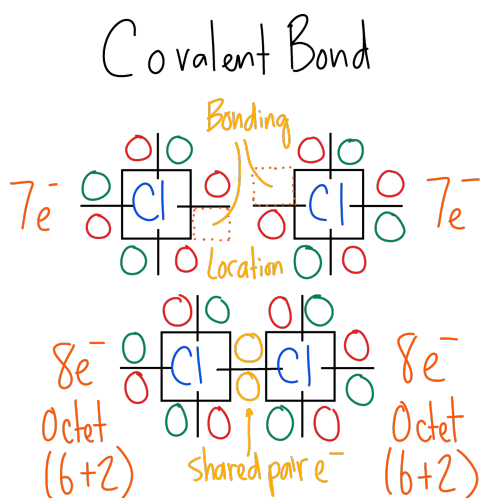
Sharing and Pairs of Electrons

If there is only a single electron on one side of a *Lewis structure* bonding can occur between atoms

If the electrons are *paired* (two electrons) no bonds can occur

4

Single Covalent Bonding



Single Covalent Bond

A **single covalent bond** is a connection (*bond*) between two non-metals due to the *sharing of electrons* between the atoms.

Each atom in the bond gets the extra electron 50% (*half*) of the time

$$\text{Atom 1: } 6 + 2 (50\%) = 8 \text{ (Octet)}$$

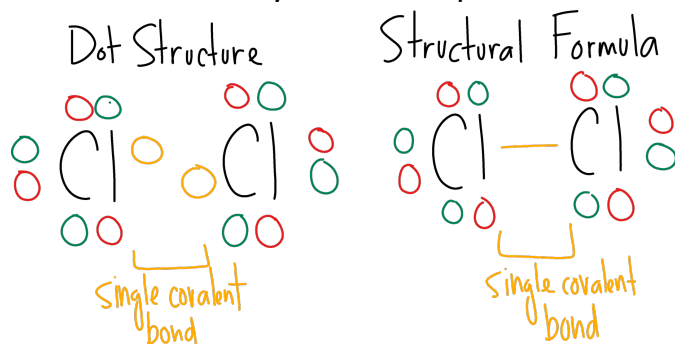
$$\text{Atom 2: } 6 + 2 (50\%) = 8 \text{ (Octet)}$$

5

Diatomic Elements

Diatomic Element

An element that only exists as a pair of atoms due to covalent bonding



Diatomic Elements are more stable bonded together to give each a share of 8 valence e⁻

| | | |
|--------|--------|----------|
| H_2 | -----> | Hydrogen |
| N_2 | -----> | Nitrogen |
| F_2 | -----> | Fluorine |
| O_2 | -----> | Oxygen |
| I_2 | -----> | Iodine |
| Cl_2 | -----> | Chlorine |
| Br_2 | -----> | Bromine |