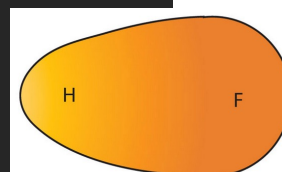
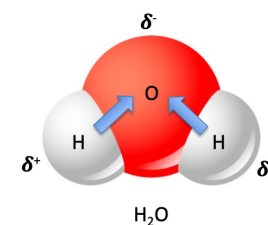
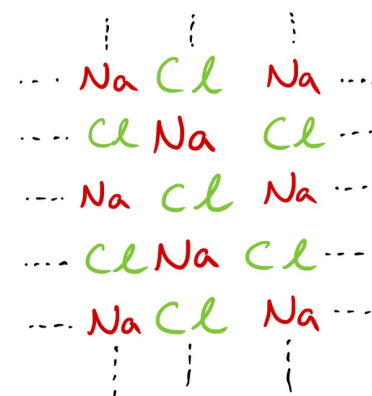
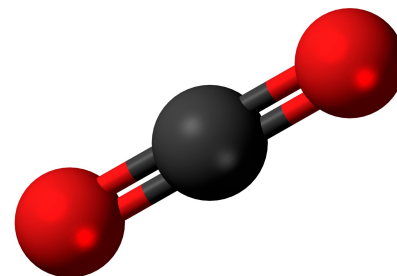


Types of Chemical Bonds

- Forces of Attraction
- Ionic vs. Covalent Bonds
- Ionic Bonds Overview
- Covalent Bonds
- Single, Double and Triple Bonds
- Polar Covalent Bonds
- Metallic Bonds



Preview File

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- Some slides appear blank because they have been removed
- Student versions have portions of the text removed which is given in the teacher version and appear as _____ which the students are to fill in
- Other slides may have on them, this represents writing that has been removed on this sample

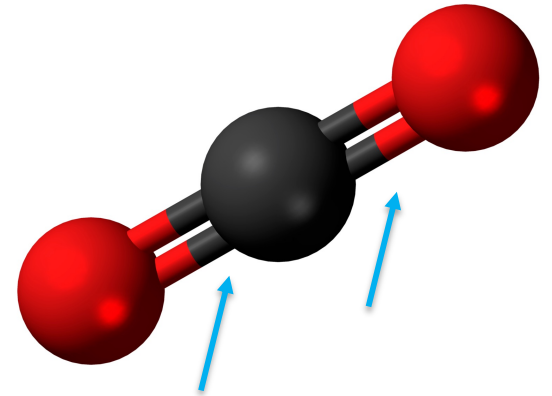
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Forces of Attraction

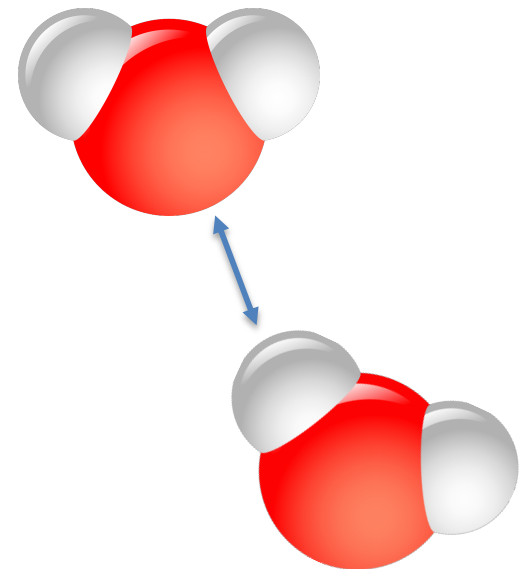
1. Intramolecular Force

- Within molecules
- The force that holds atoms of molecules together



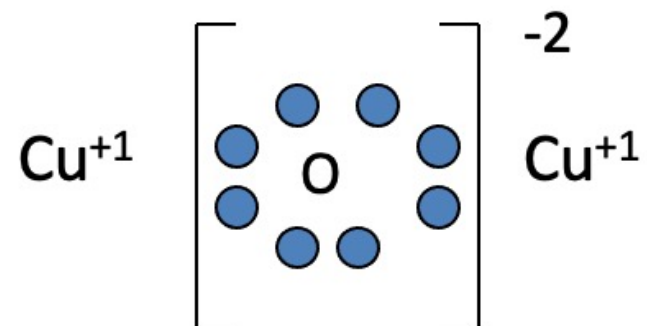
2. Intermolecular Force

- _____
- _____

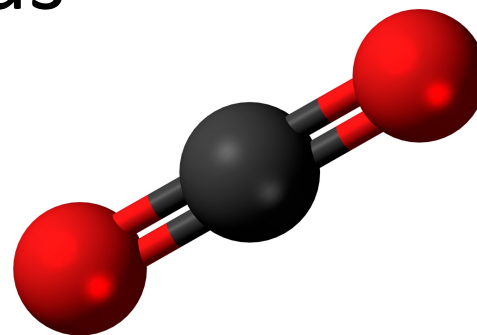


Intramolecular Forces (Bonds)

1. Ionic Bonds



2. Covalent (Molecular) Bonds



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Ionic Bonds

- In ionic compounds, the nonmetal rips away the electron(s) from the metal because the metals loosely hold their electrons



- This creates a positive and negative ion which attract each other making them bond together (opposites attract)

Ionic Bond Example

- EN of Cl = 3.0, EN of Na = 0.9
- Difference is 2.1 therefore, the chlorine atom will strip the outermost electron away from the sodium atom
- _____



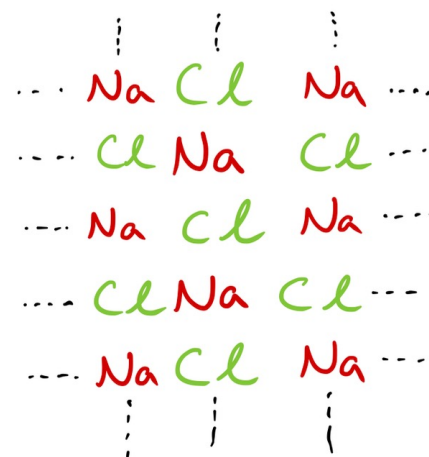
Properties of Ionic Bonds

- A HIGH intramolecular force of attraction results in ionic compounds being _____



➤ i.e., Table Salt has a melting point of 801 °C

- Solid ionic compounds form a crystal lattice, which is a repeating pattern of particles
 - Remember, NaCl represents a repeating ratio not a specific number of atoms in a molecule

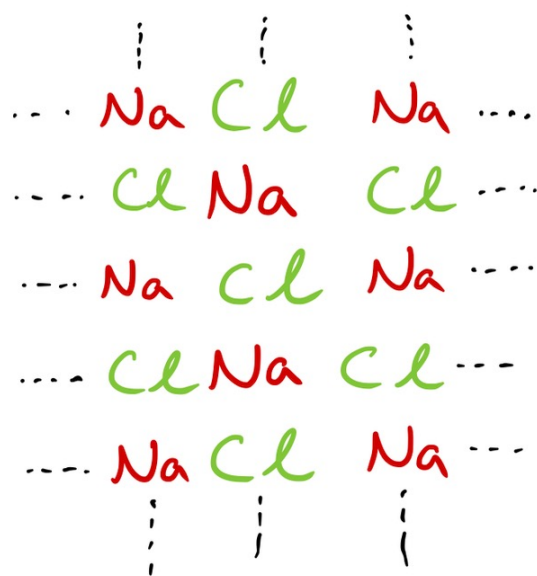


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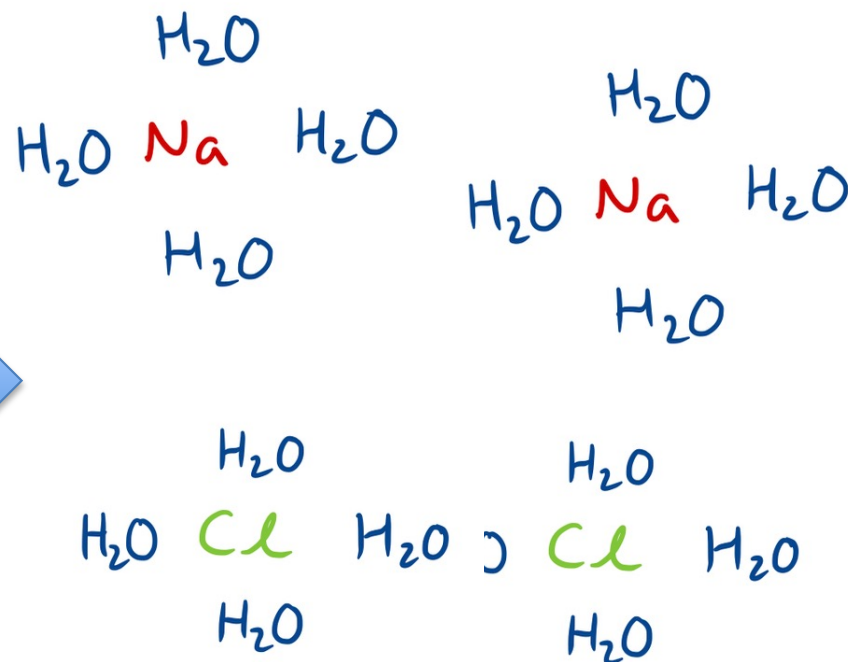
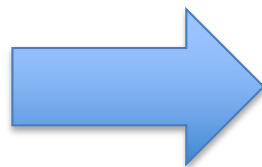
Ionic Compounds in Water

- _____

- This results in the compounds breaking apart to form electrolytes (e.g., salt easily dissolves in water)

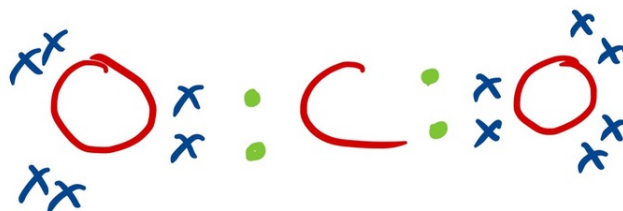
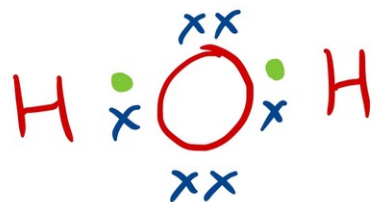


+ H₂O



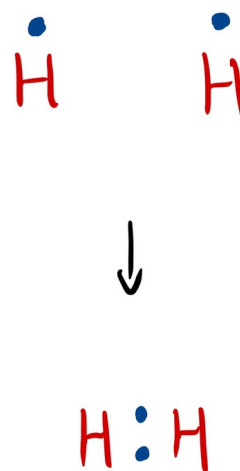
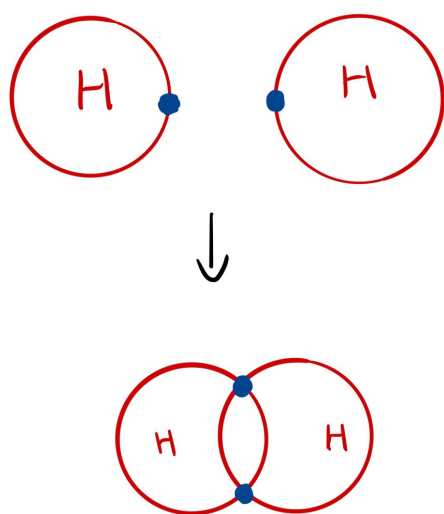
Covalent (Molecular) Bonds

- _____
- Made up of 2 nonmetals
- Involves the sharing of 1, 2, or 3 pairs of electrons



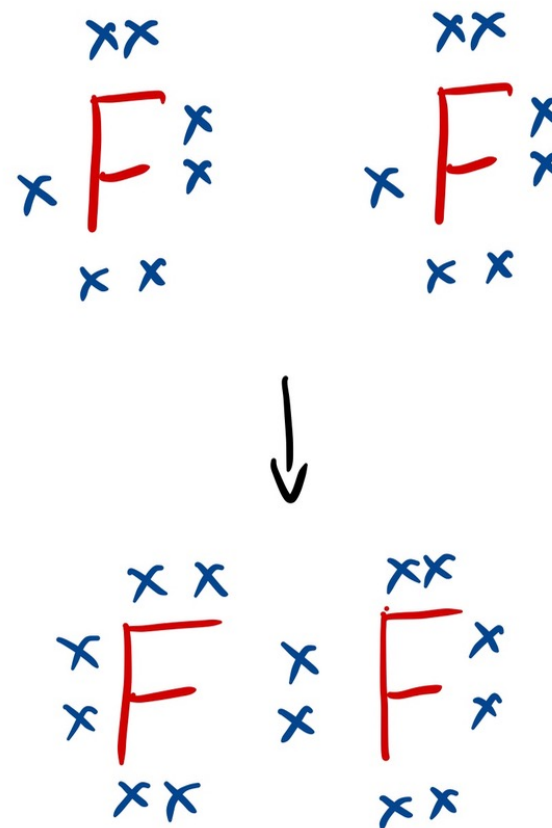
Covalent Compounds

- _____
- Negative e^- are attracted to the positive nuclei of both atoms causing them to attract



Covalent Compounds

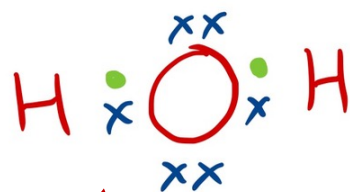
- Are formed when nonmetals share electrons to fill their outer electron orbit (shell)
- If we draw the Lewis Structure for fluorine, we can see that it needs _____
- _____
- If it bonds with another fluorine atom, we draw the shared pair of electrons between the two atoms



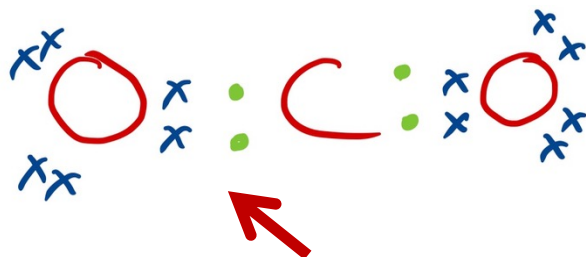
Shared electron pair → both now have 8 in outer orbit

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Multiple Covalent Bonds



Water – Single bond
because ONE pair of
electrons are shared



Carbon Dioxide – Double bond because TWO
pairs of electrons are shared

Types of Covalent Bonds

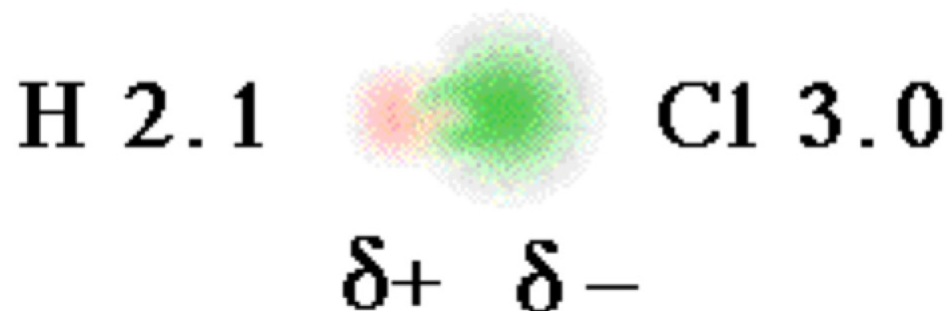
- Nonpolar Covalent Bond:

- When the EN difference is between 0 and 0.7, equal sharing of electrons occurs



- Polar Covalent Bond:

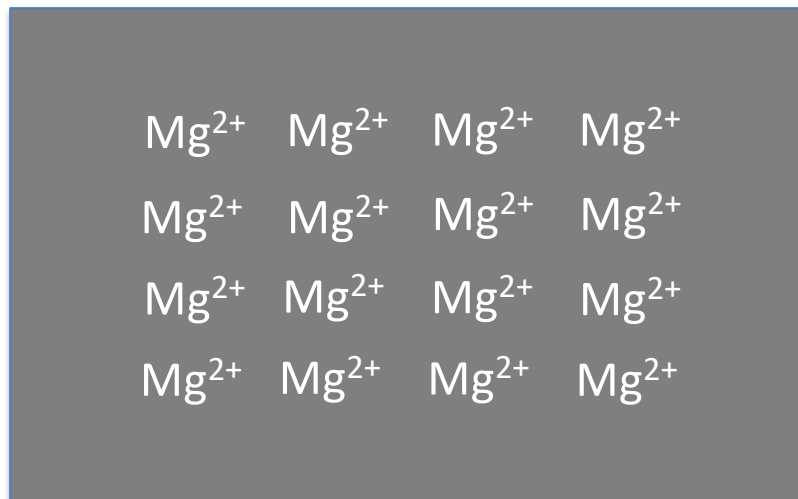
- _____
- _____



Metallic Bond

- A weak intramolecular bond that occurs between many metal atoms
- Valence electrons are released into a shared pool of electrons
- Electrons move freely through a fixed lattice of atoms

- _____



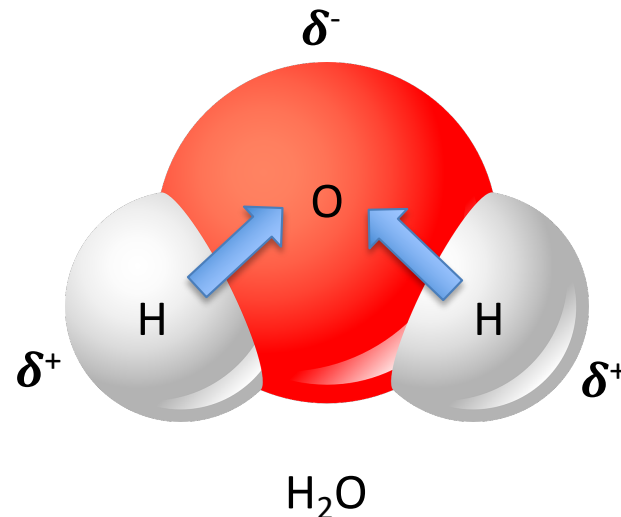
The grey area represents the sea of electrons.

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Polar Molecules

Example: H₂O

- Oxygen is more electronegative than hydrogen
- This causes the electrons to spend more time near the oxygen atom and less near the hydrogens
- _____



Nonpolar Molecule Containing Polar Bonds

- _____
- Example: If a molecule contains more than 2 atoms and is symmetrical in shape, the charges cancel out and the molecule is nonpolar. i.e., CO₂

