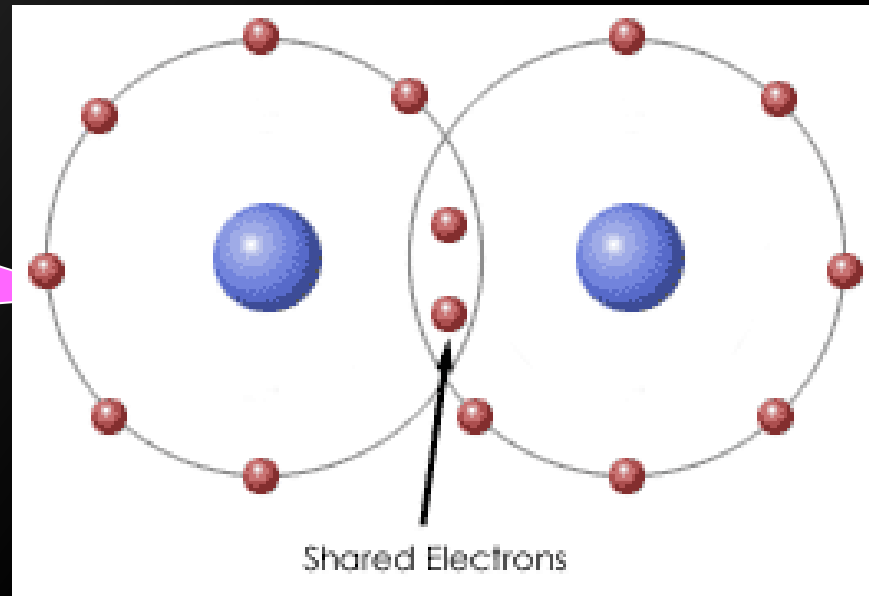


Covalent Bonds- Packet 10, Page 2

- The “nice” bonds 😊
- Covalent bonds form when atoms share their electrons to become more stable

***Occurs between non-metals and non-metals**

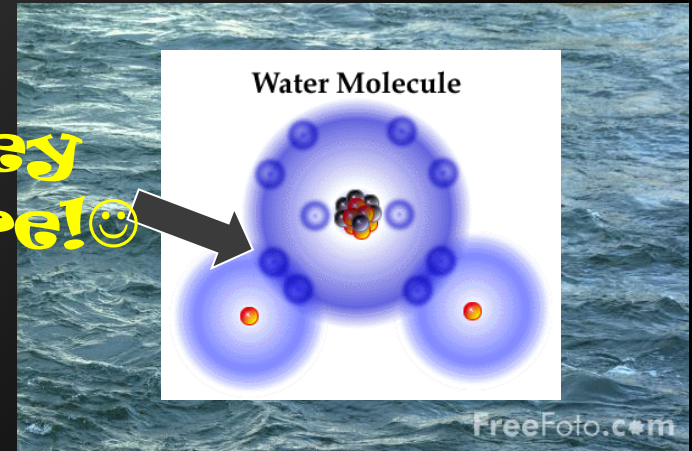


Properties of Covalent Bonds

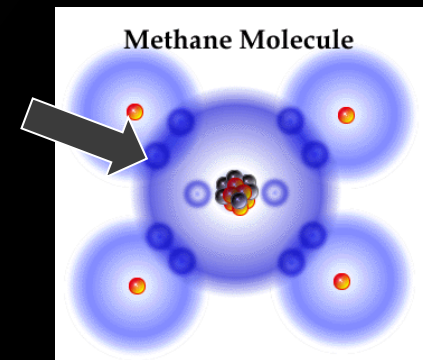
- Weak bonds – can be easily separated
- Low melting and boiling points (Often found in liquids and gases)
- Poor conductors
- Examples:

- Water: H_2O
- Oxygen gas: O_2
- Ammonia: NH_3
- Methane gas: CH_4

They share! 😊



They share too! 😊



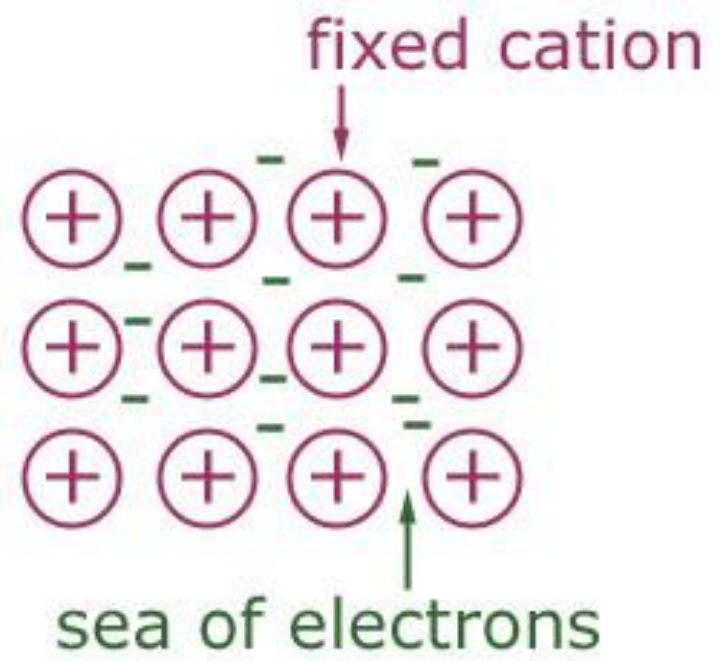
Methane: CH₄

- 21 times more powerful greenhouse gas than CO₂
 - Responsible for nearly as much global warming as all other non-CO₂ greenhouse gases put together
- Produced when organic matter decays
 - Naturally by farm animals (like cows)



Metallic Bonds

***Occur between atoms of two or more metals**

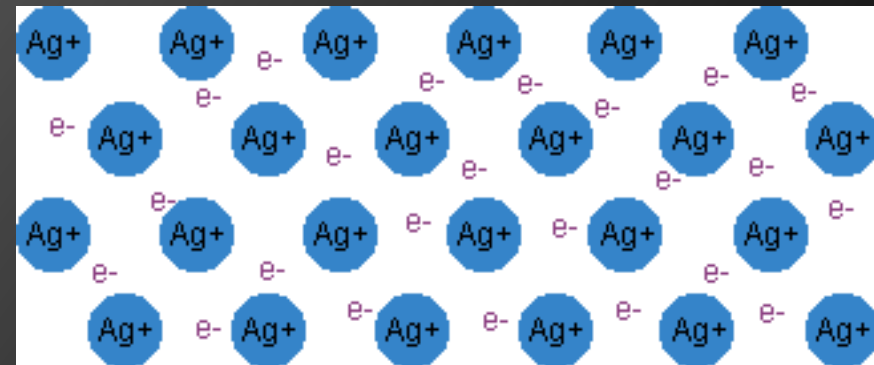


- The “hippie” bonds 😊
- Metallic bonds occur when atoms (metal) share their “free” valence electrons with other atoms (metal) so that every atom will be stable



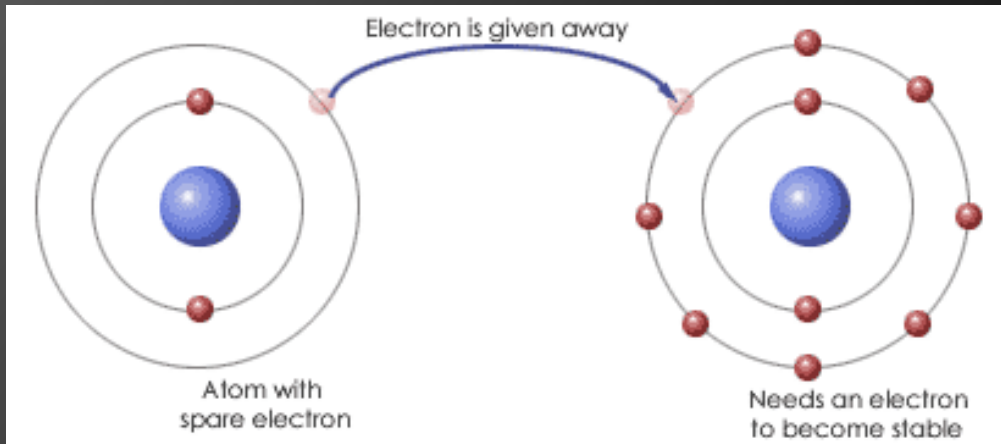
Properties of Metallic Bonds

- Loosely held electrons move freely from atom to atom
- Malleable and ductile
- Good conductors
- Ex: Copper, Gold, Silver, Aluminum



Ionic Bonds

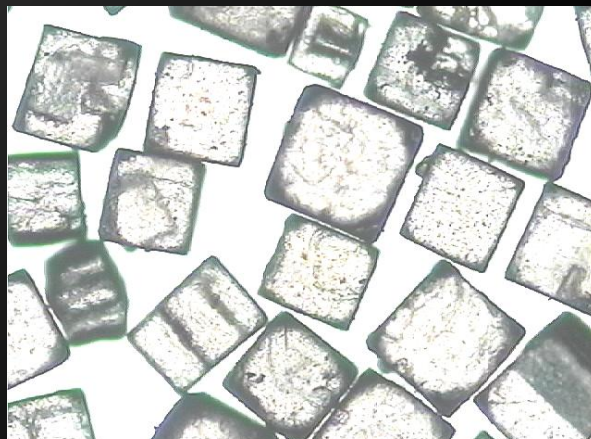
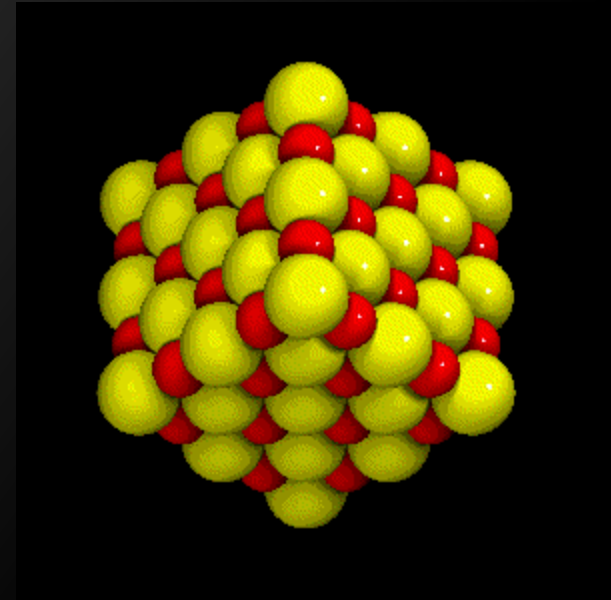
***Ionic bonds form between metals and non-metals**



- ⦿ The “greedy” ☹ or “generous” 😊 bonds
- ⦿ Form when one atom takes electrons from another atom so that both atoms can become stable
- ⦿ *Results in ions: cations (+) and anions (-) that attract to one another

Properties of Ionic Bonds

- Strong bonds between atoms
- Crystalline structures
- Solid state of matter
- High melting point and boiling points
- Good conductors of electricity
- Ex: NaCl



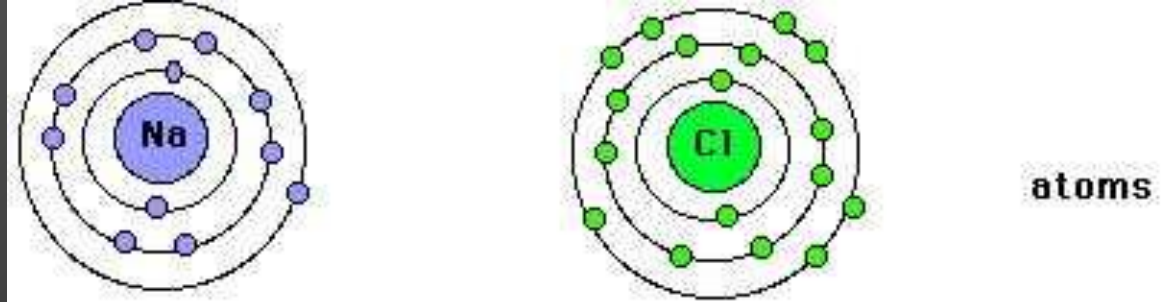
The Nature of the Ionic Bond

● Held together by strong attractions between the positive and negative charges

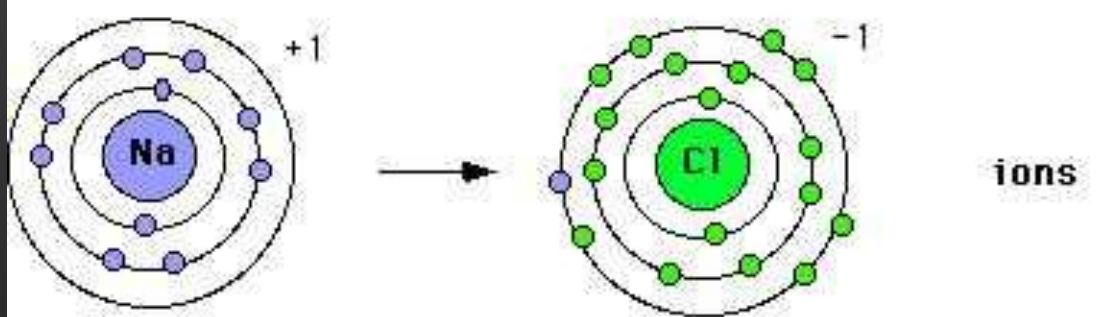
● Remember:

- The cation is the positively (+) charged ion
- The anion is the negatively (-) charged ion

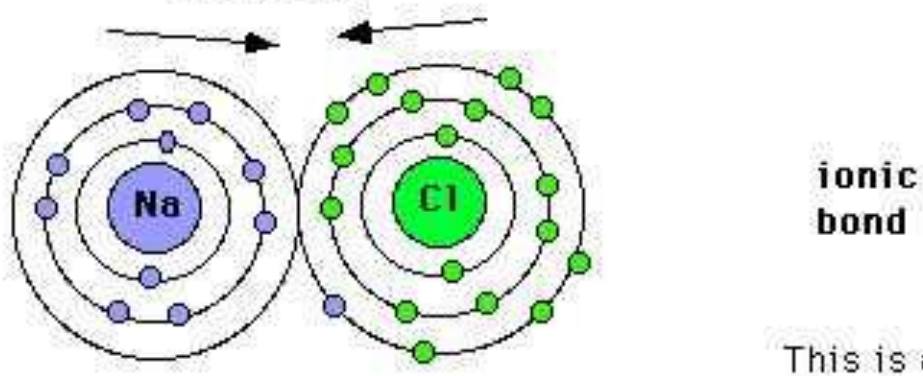
● The greater the charge, the greater the attraction



electron transfer



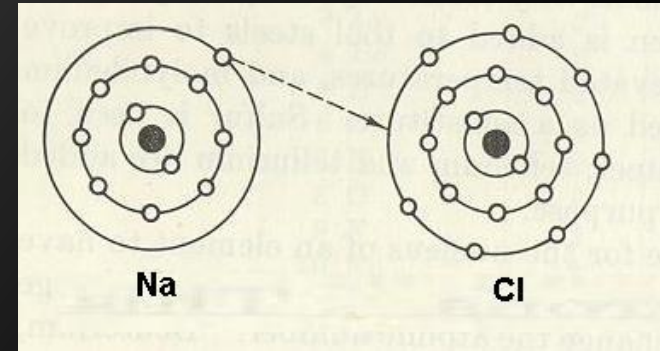
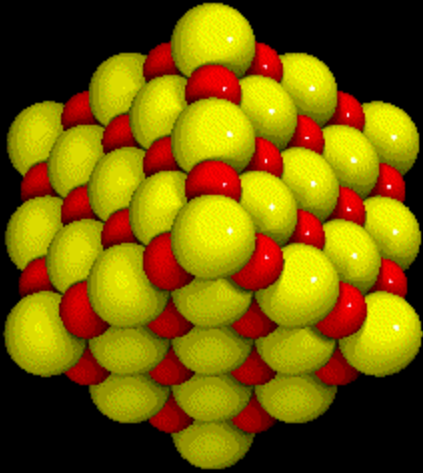
electrostatic attraction



NaCl

This is a non-directional bond; a polygamous bond

Example of an Ionic Bond: NaCl



● Table salt (NaCl) is a compound formed when sodium (Na) and chlorine (Cl) combine through ionic bonds



- Na - loses its electron, becomes a positively charged ion (cation) called Na^+
- Cl - gains an electron, becomes a negatively charged ion (anion) called Cl^-
- Becomes two attracting ions, Na^+Cl^-