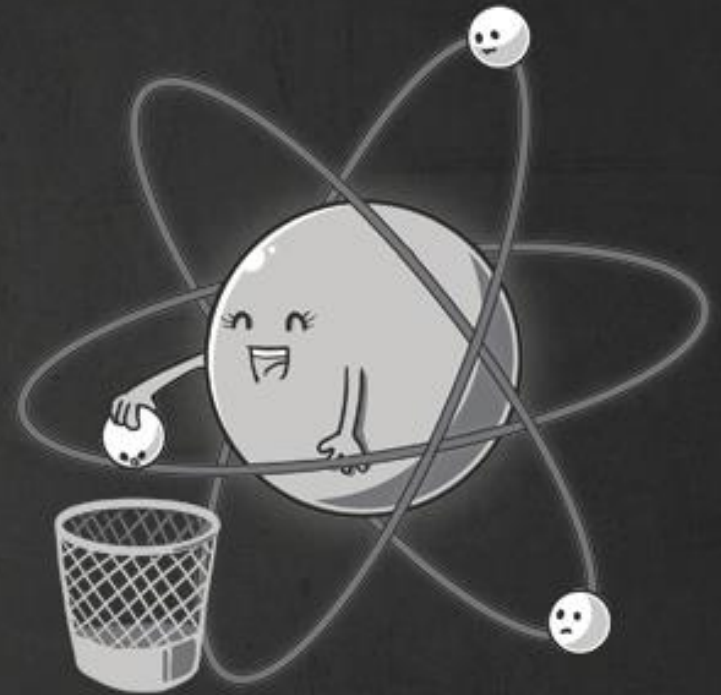
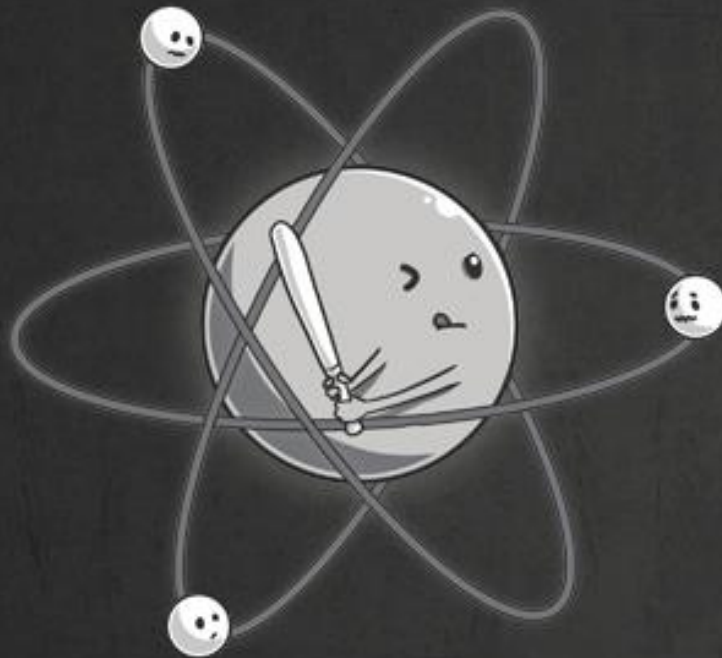


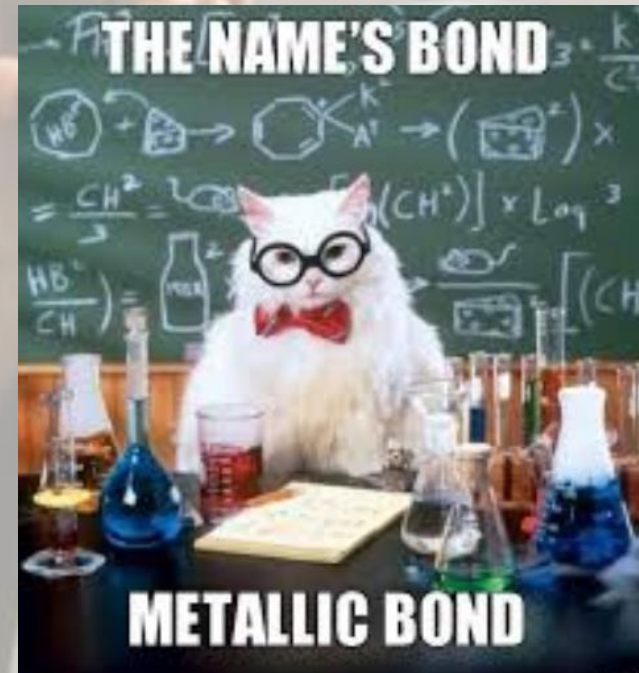
TYPES OF CHEMICAL BONDS



#3: METALLIC

METALLIC BONDING

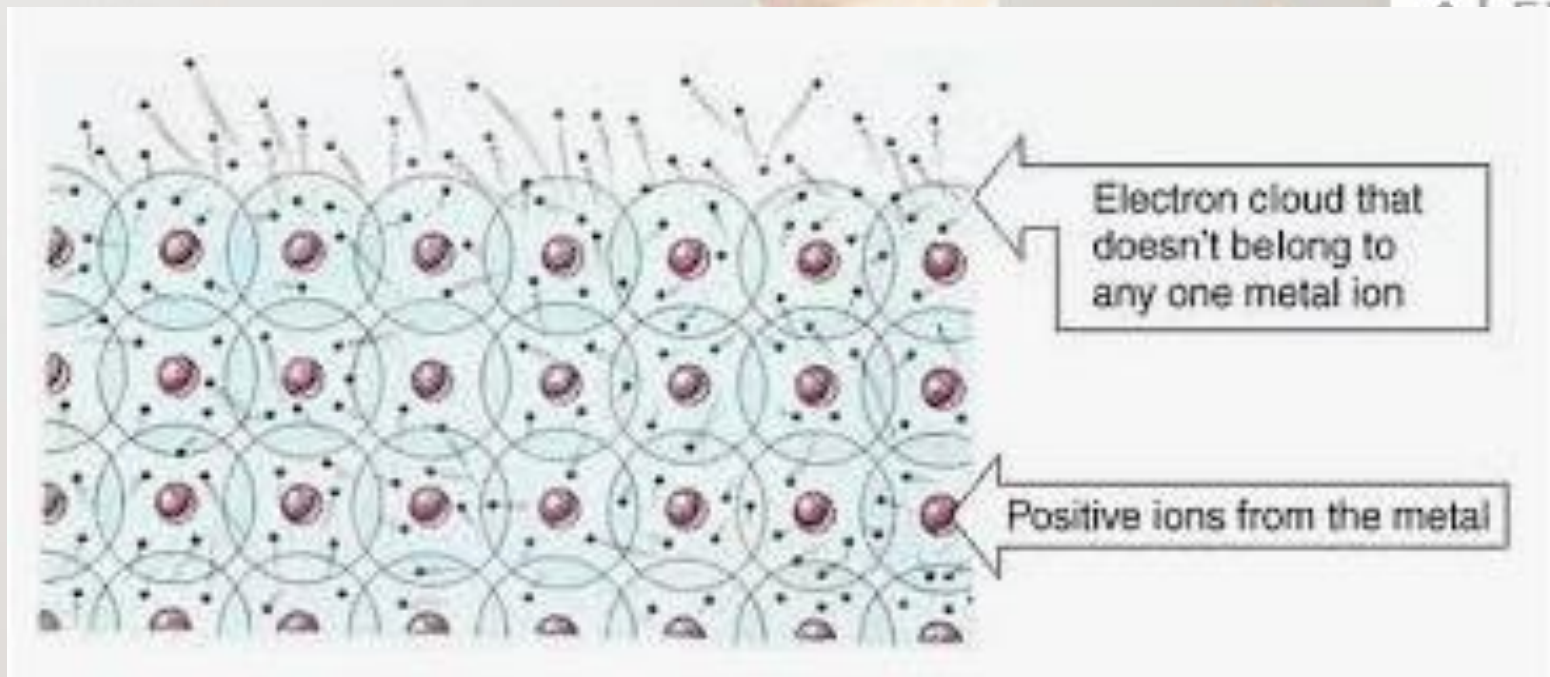
008
VILLAIN
COLLECTION
BY
LEWIS



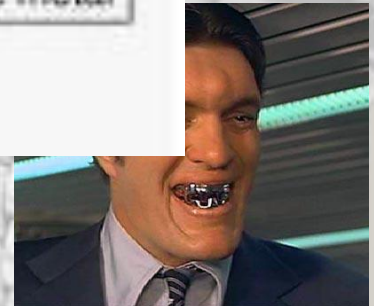
THE METAL WHO LOVED ME

METALLIC BONDING

Chemical bonding in METALS is different because of their **valence e^s**.

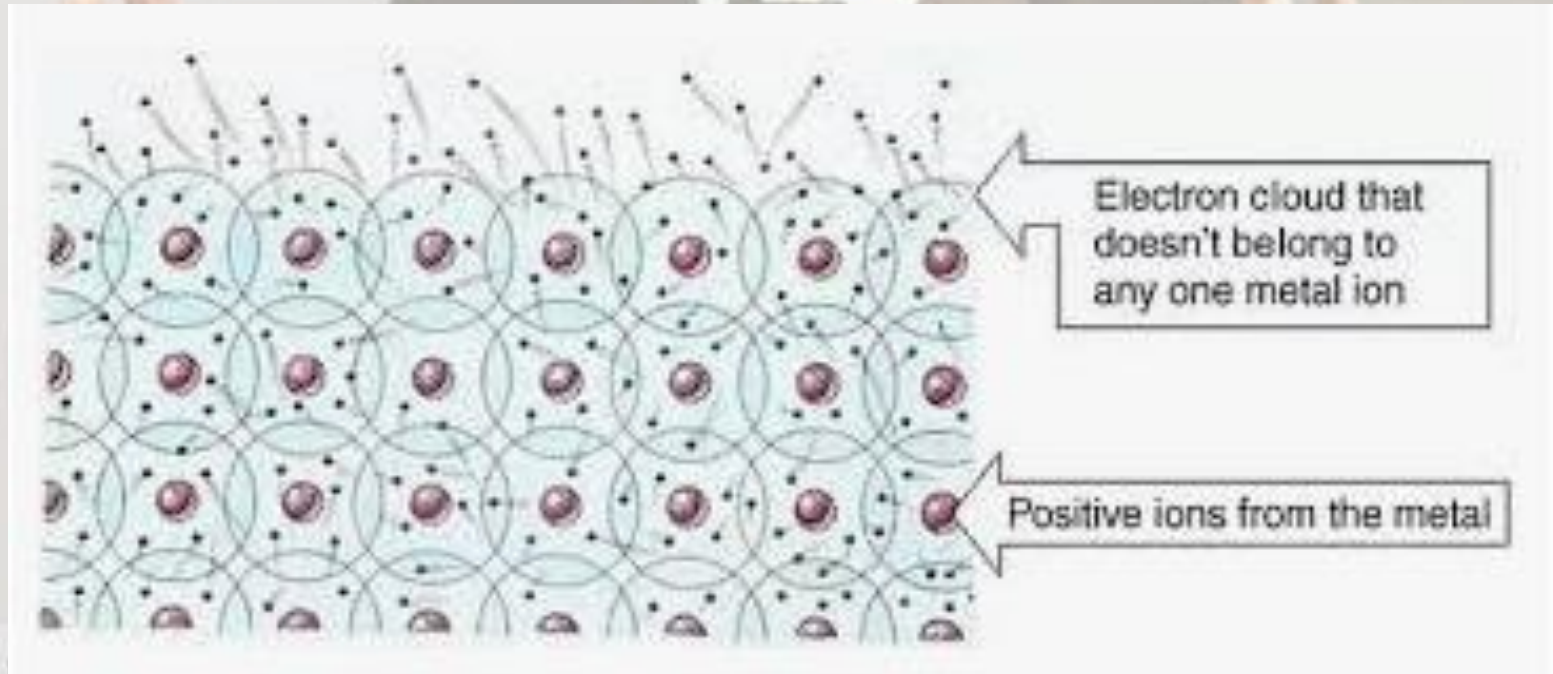


THE METAL WHO LOVED ME



METALLIC BONDING

Metals are great electrical conductors in their **solid** state because **their valence e⁻s move a lot**



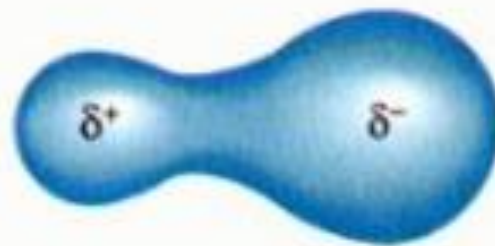
METALLIC BONDING

Why doesn't this happen in an ionic or covalent bond?

In an ionic or covalent bond, e⁻s are held **more tightly** due to stronger nuclear **force** of attraction of the atoms in these bonds.



Nonpolar covalent bond

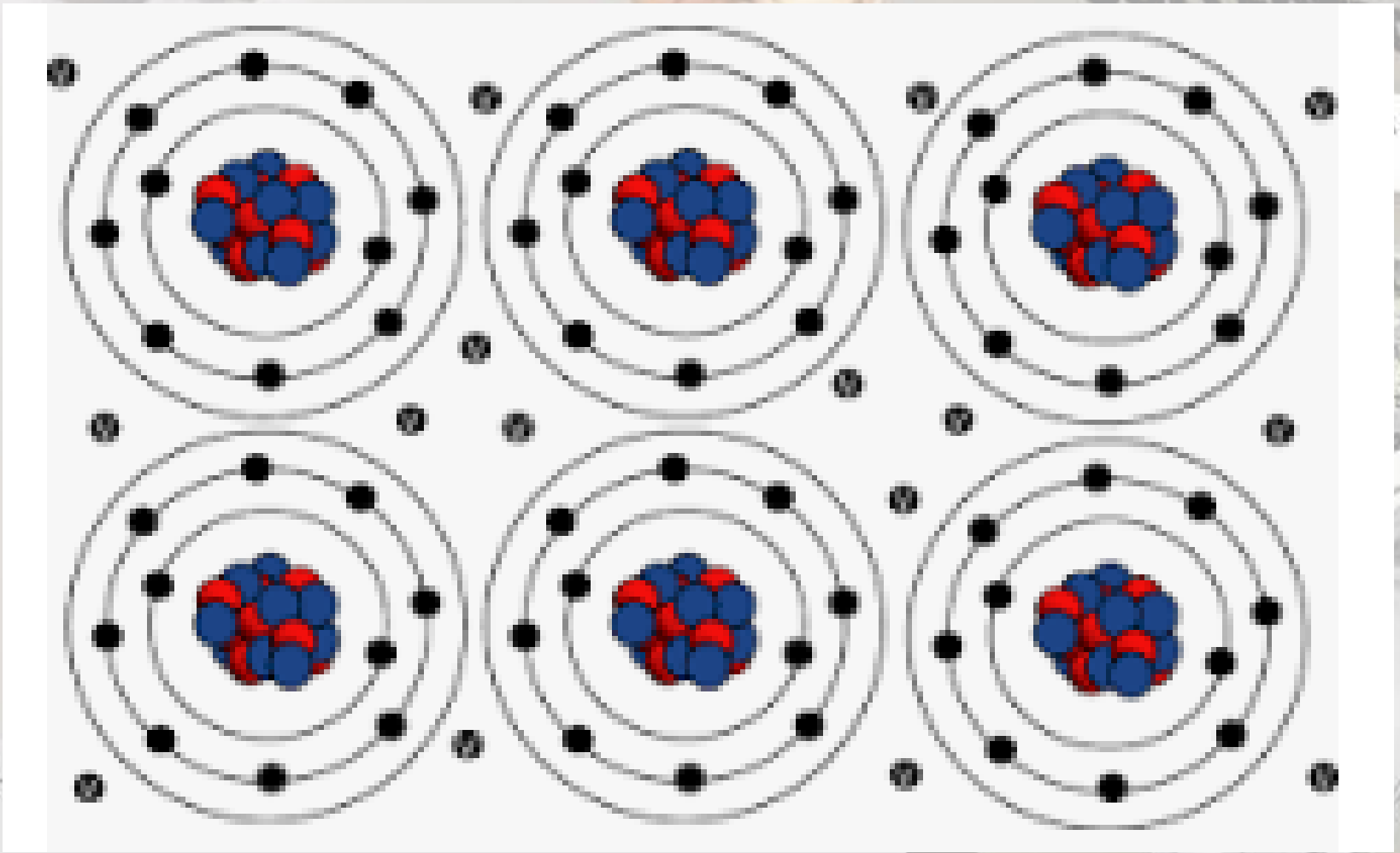


Polar covalent bond

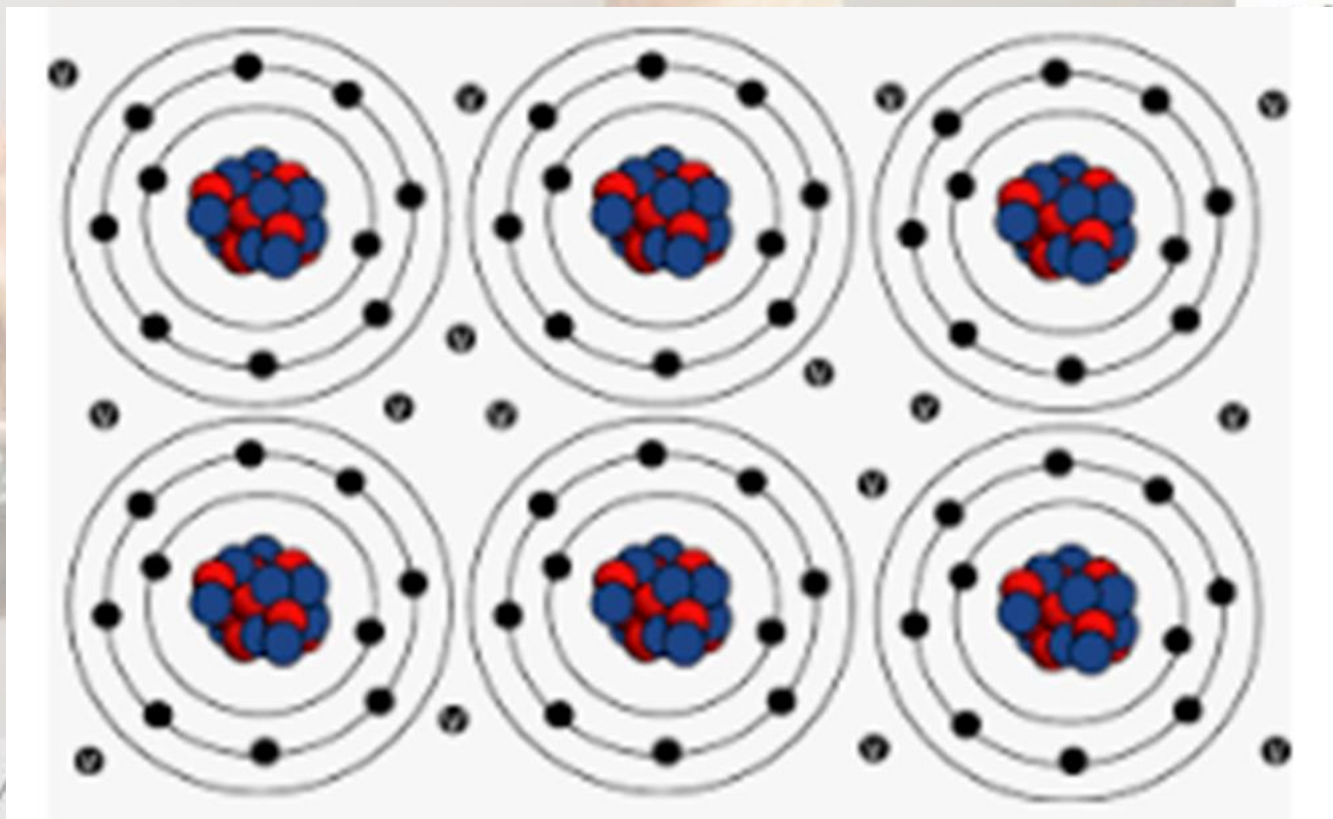


Ionic bond

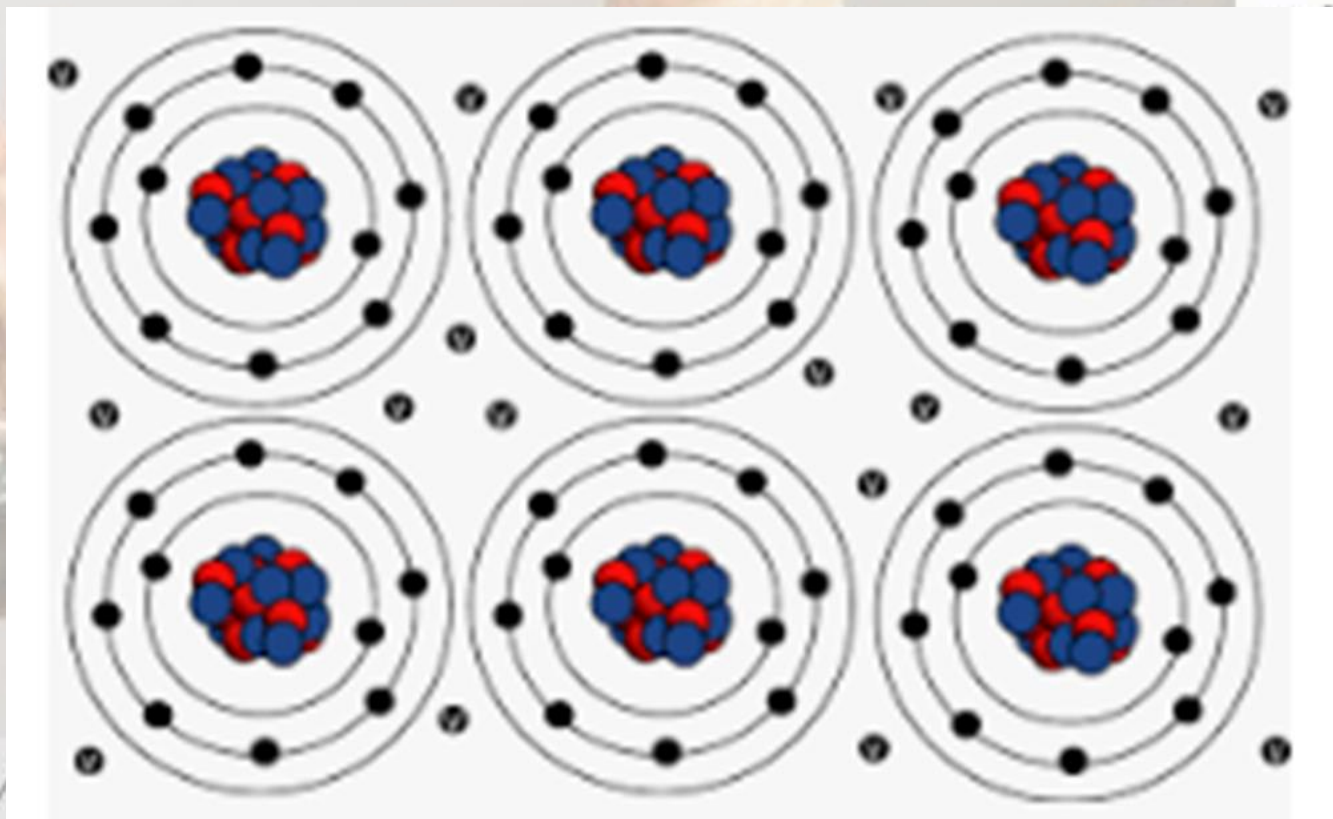
The highest E-level of metals are occupied by **few e⁻s**, leaving many vacant orbitals.



Within a metal, these vacant orbitals **overlap**. This overlapping allows e^- s to roam around **ALL of the orbitals of ALL of the atoms.**

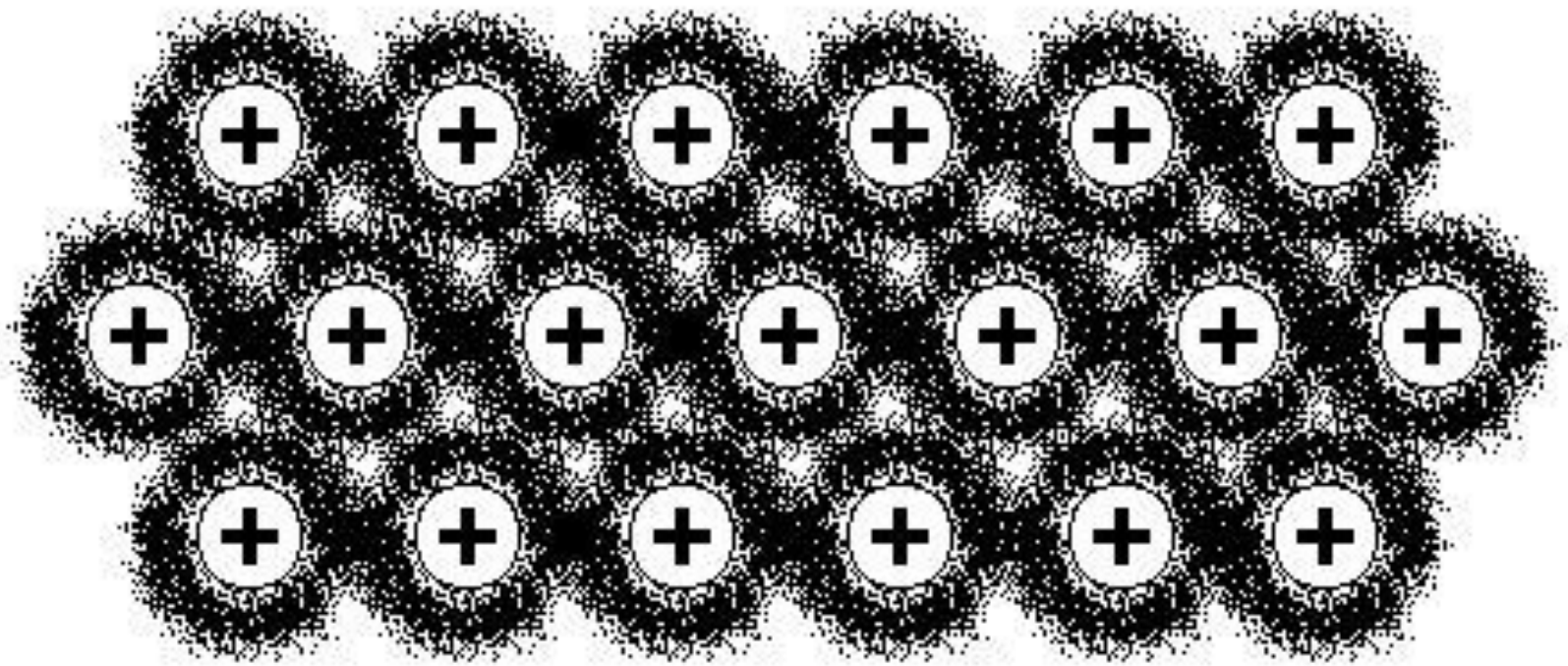


These e^- s are **delocalized**:
they do not belong to any
one atom.



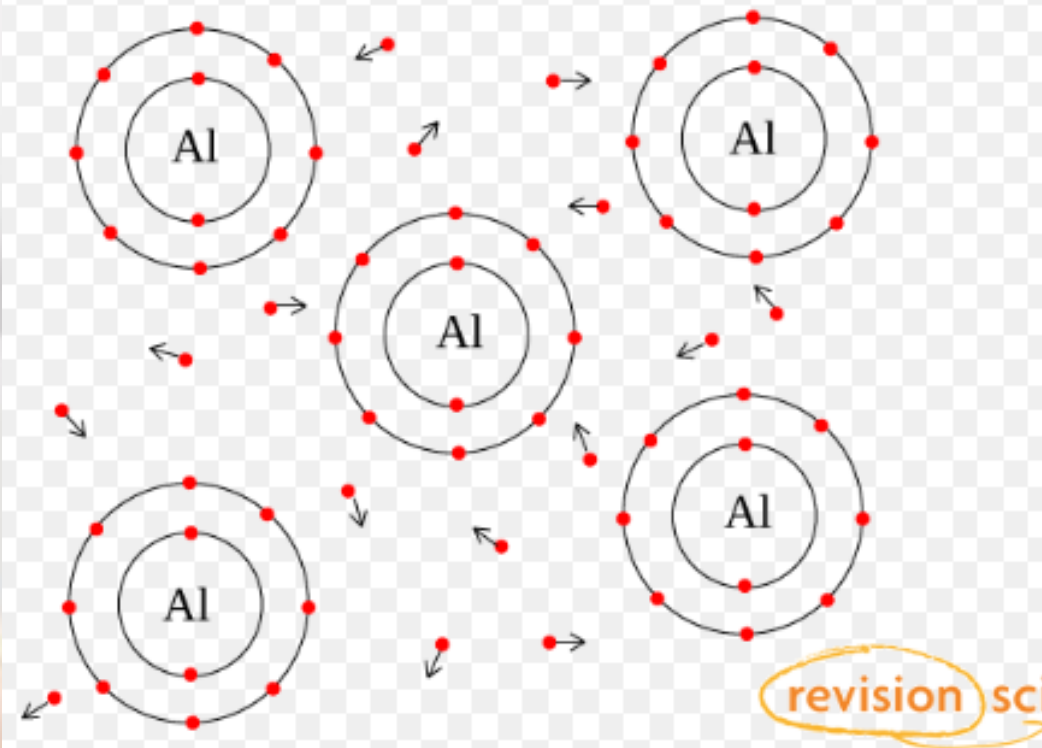
These “delocalized” electrons form a sea of electrons around the metal atoms.

Metallic Sea of Electrons



Electrons are not bonded to any particular atom

Metallic Bonding



The chemical bonding that results from the attraction between metal atoms and the surrounding sea of e^- s is called **metallic bonding**.

Ionic BONDING

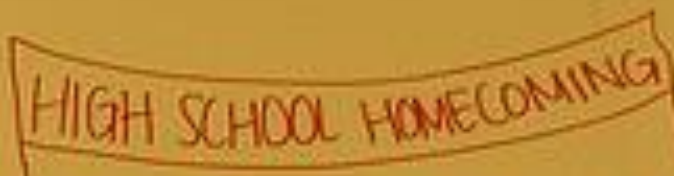


KEY	
Girls	+ve ions
Boys	-ve ions

The girls "give away" their "love" to the boys



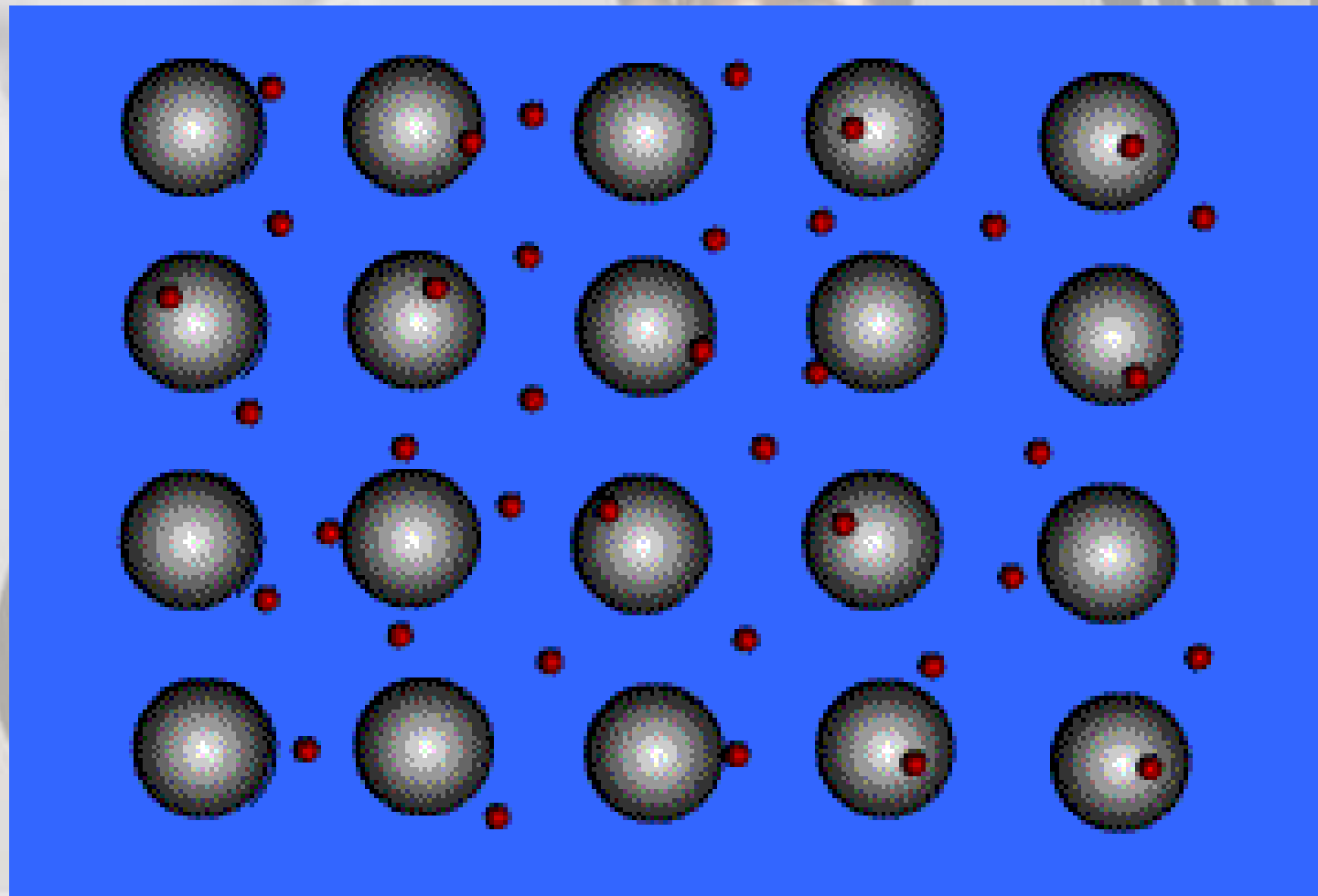
Metallic BONDING



Metallic Bonds: Mellow dogs with plenty of bones to go around.



A Sea of Electrons

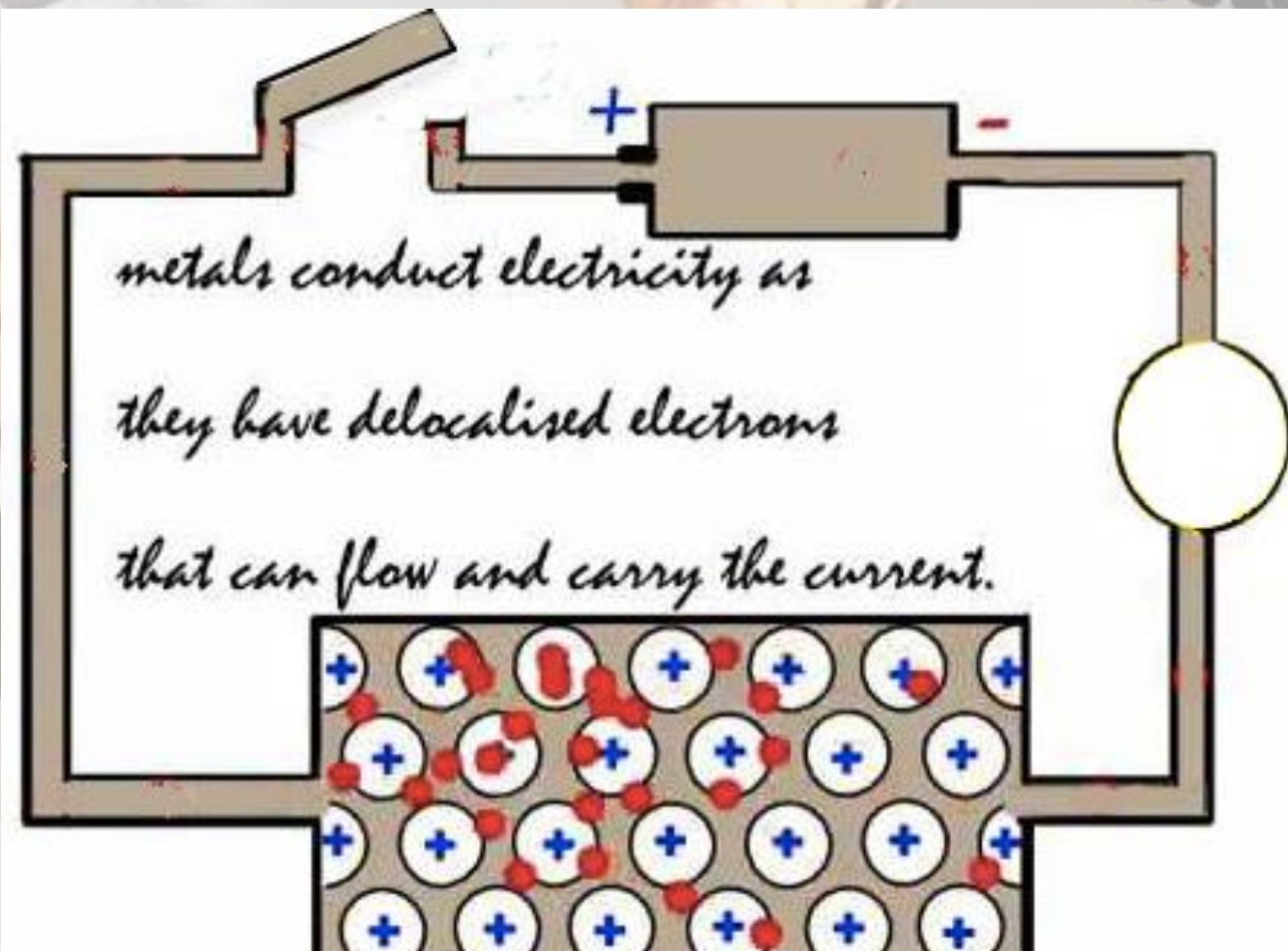


THE METAL WHO LOVED ME

The sea of e⁻s causes

High electrical conductivity

Conductor of heat and electricity.



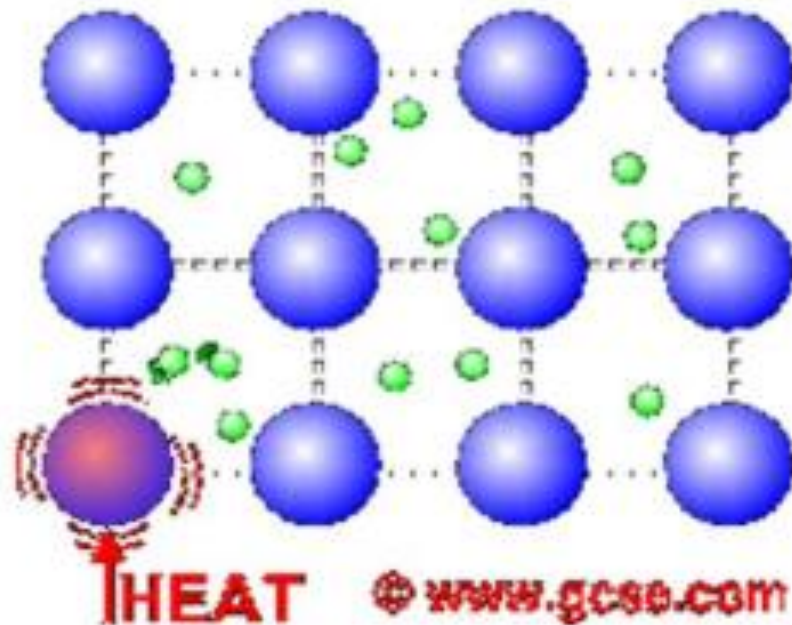
The sea of e⁻s causes High thermal conductivity

Ability of a metal to conduct heat?

- What is an element of metal made of?

Atoms that vibrate

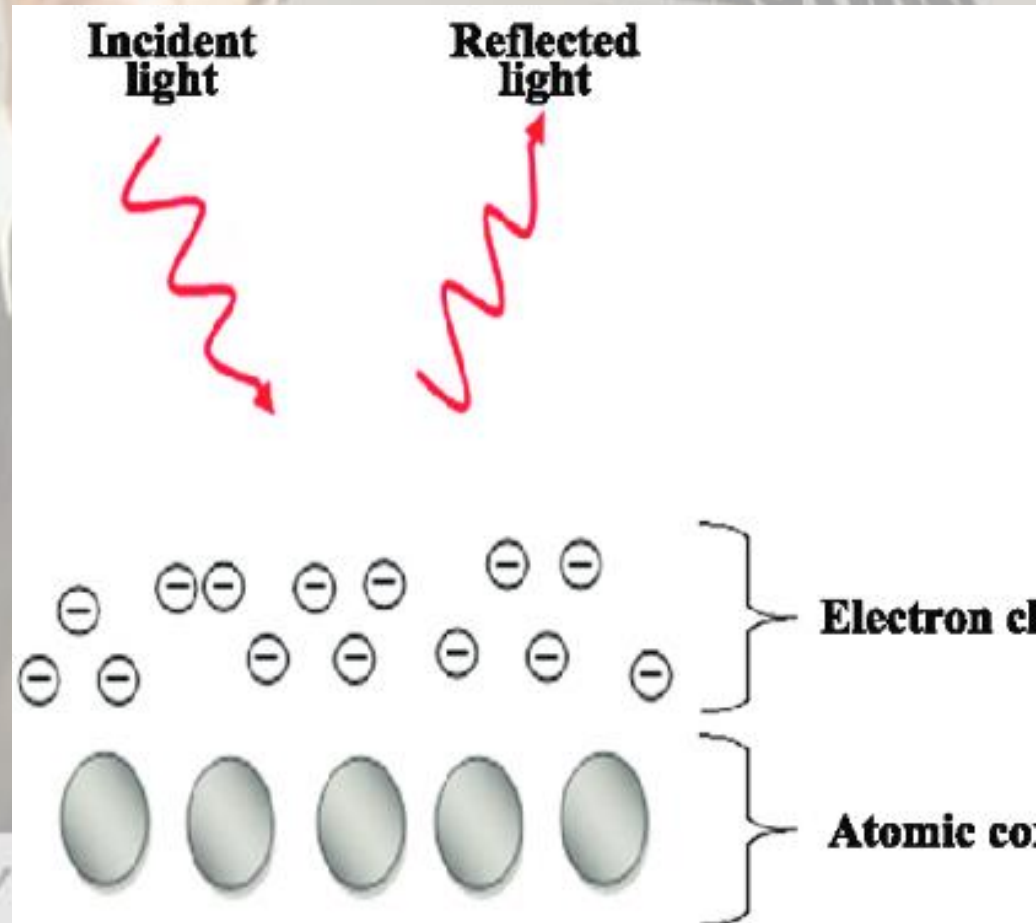
Free electrons that move around



The sea of e⁻s causes

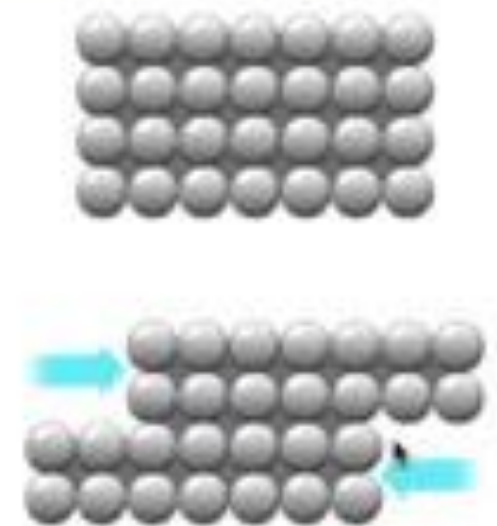
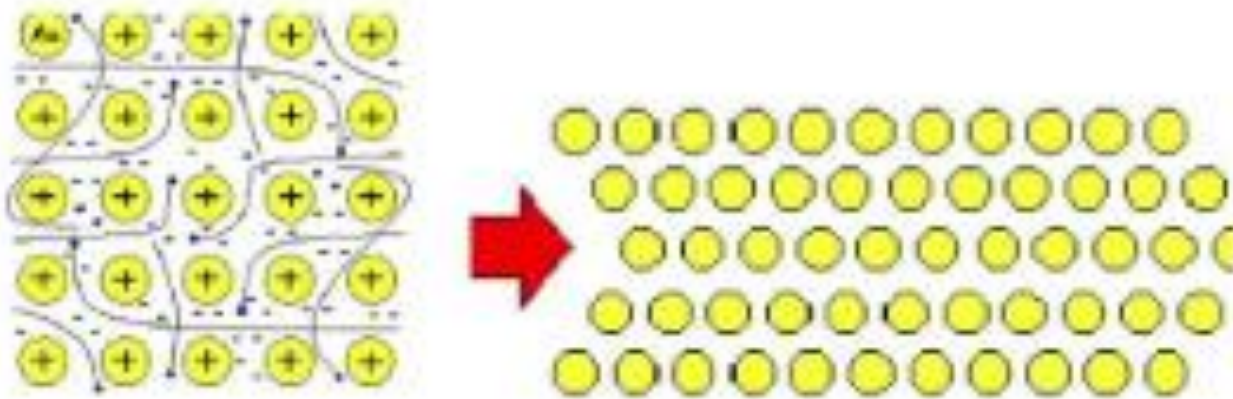
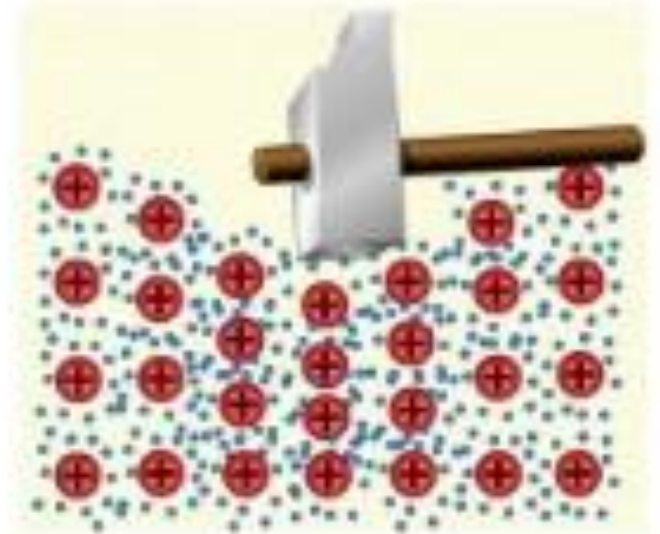
Luster

Shiny because metals reflect light



The sea of e⁻s causes

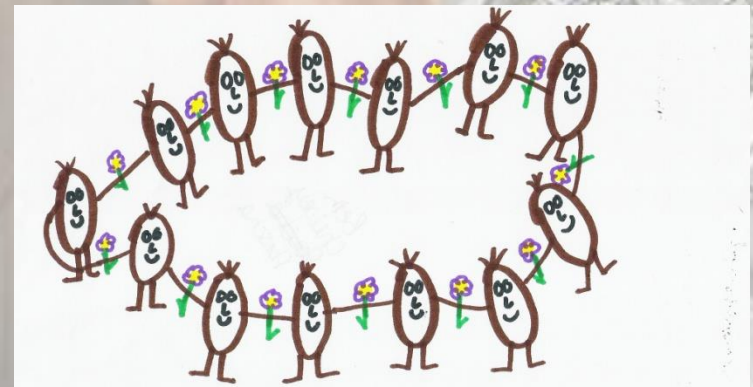
- **Malleable**
 - *Can be flattened into sheets*
- **Ductile**
 - *Can be pulled into wires*



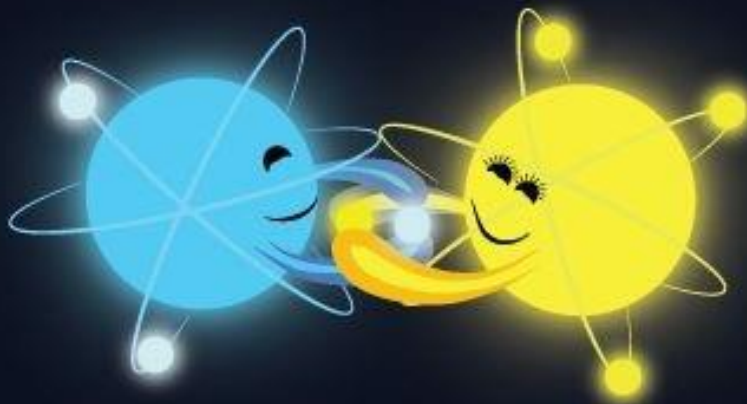
METALLIC PROPERTIES

The sea of e⁻s causes

- High electrical conductivity
- high thermal conductivity
- luster
- malleability
- ductility



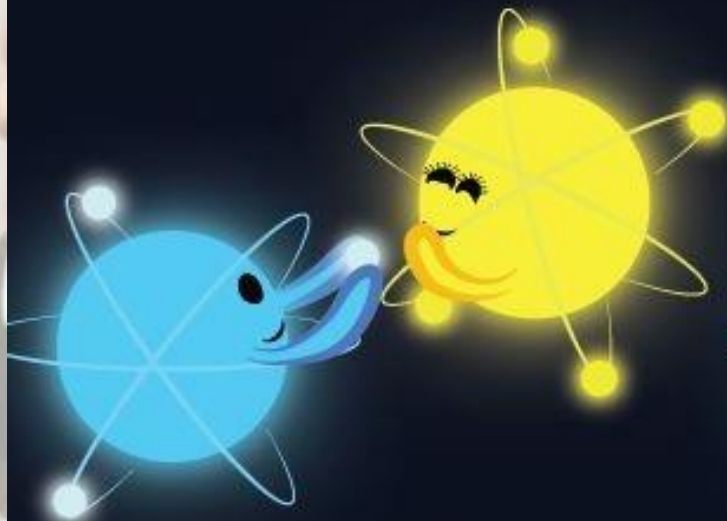
METALLIC BOND



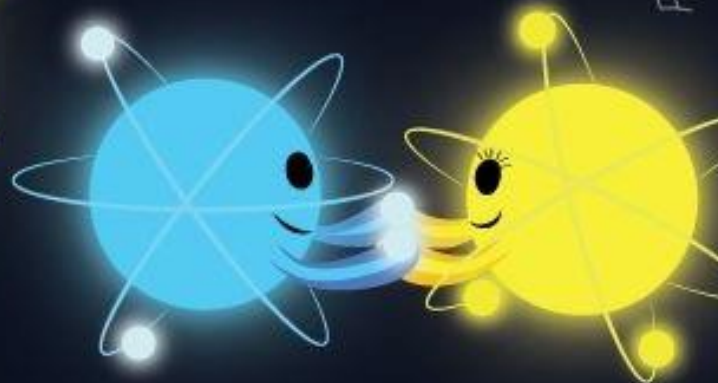
COVALENT BOND
TO LOVE IS TO SHARE



METALLIC BOND
LET THE LOVE FLOW



IONIC BOND
GIVE FOR LOVE, BUT NEVER
GIVE UP ON LOVE



COORDINATE BOND
THERE CAN NEVER BE TOO (TWO)
MUCH OF LOVE

Pearls Of Raw Nerdism

THE