

Jumpstart

- 1) What do you already know about the different types of bonding? (ionic vs. covalent)
- 2) What do you want to learn about bonding?

Jumpstart

- 1) Do metals want to gain or lose electrons?
- 2) Do non metals want to gain or lose electrons?
- 3) Using your answers to Q1 and Q2, why do metals and non metals like to make ionic bonds together? What makes them a perfect match???



Introduction to Types of Bonds

Why bother making bonds?



Atoms want to have a full outer shell like the noble gases have:

Why bother making bonds?

Atoms want to have a full outer shell like the noble gases have:

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What happens during a chemical reaction?



A CHEMICAL REACTION IS A
CHANGE TO THE ELECTRONS:

transferring or sharing electrons in order to make "bonds"

Which electrons are involved in bonding?



⌘ Valence Electrons: The e^- in the highest occupied energy level of an atom

During a Chemical Reaction



- Ionic - electrons transferred
- Covalent - electrons shared
- Metallic - free flowing electrons

Types of Chemical Bonds



Ionic

Bond between: (Metal - Nonmetal)

Covalent

Bond between: (Nonmetal - Nonmetal)

Metallic

Bond between: (Metal - Metal)

IONIC BONDS



Transferring Electrons

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Sodium Chloride (Ionic Compound)

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Properties of Ionic Compounds



- They are solids with high melting points (typically $> 400^{\circ}\text{C}$)
- Many are soluble in water

Properties of Ionic Compounds



- Molten compounds conduct electricity well because they contain mobile charged particles (ions).
- Aqueous solutions conduct electricity well for the same reason.

Properties of Compounds

Properties of compounds often have VERY different properties than the individual elements.

Sodium is an explosive metal

Chlorine is a poisonous gas.

Sodium Chloride you put on your fries



COVALENT BONDS



Sharing Electrons

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Properties of Covalent Bonds



- Don't Conduct Electricity
- Low melting points
- Usually not soluble in water

METALLIC BONDS



Free Flowing Electrons

Metal - Metal



Electrons are able to flow freely through the metal in a "SEA OF ELECTRONS"

Watch this video clip:

<https://www.youtube.com/watch?v=V5tj-xADB1c>

Properties of Metals



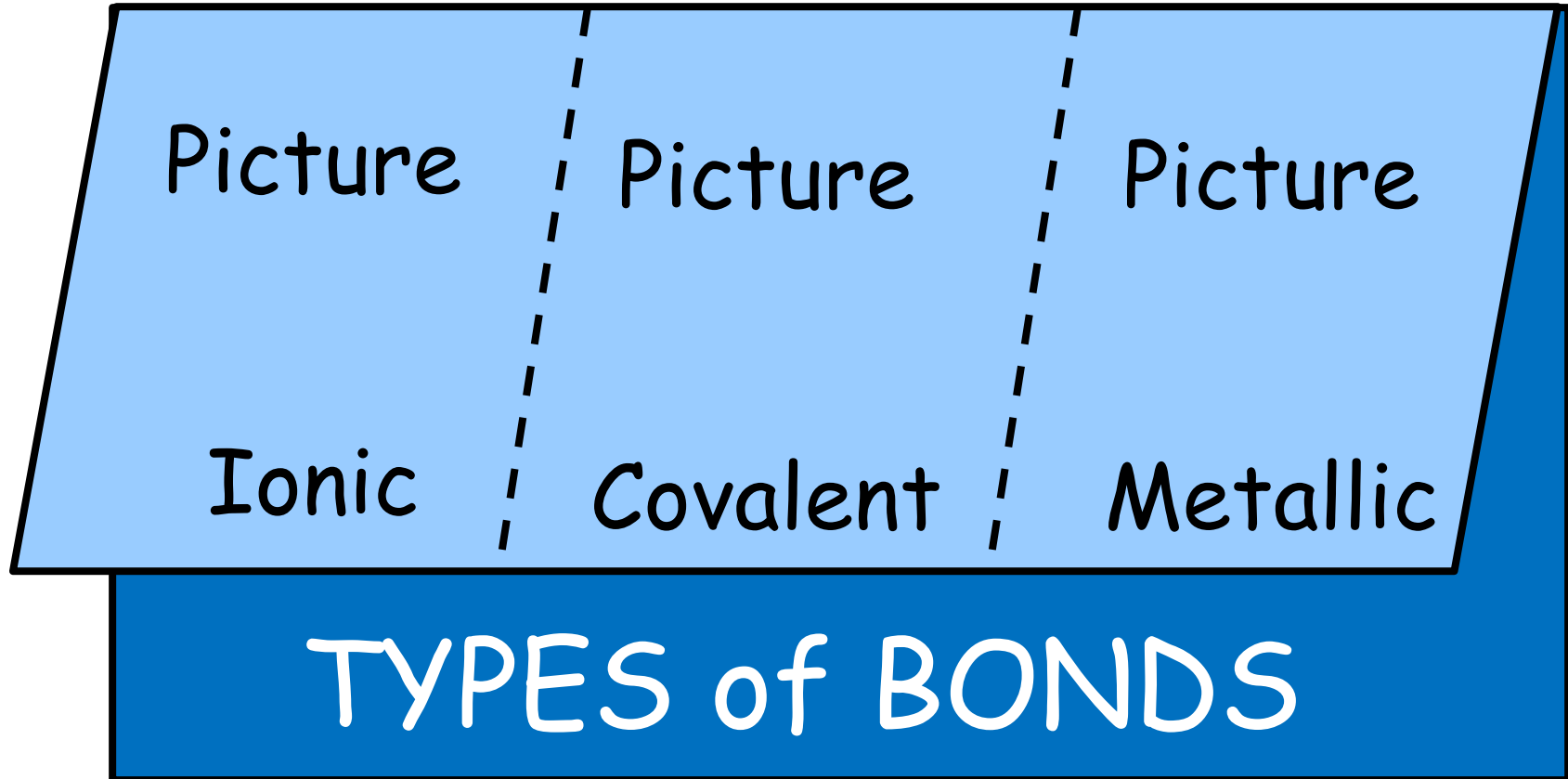
- Solid at room temperature (except for mercury...it is a liquid!)
- Conduct electricity
- Malleable
- Ductile
- Have a wide range of melting points.

WHY ARE PROPERTIES OF COMPOUNDS/MOLECULES SO DIFFERENT THAN THE PROPERTIES OF THE INDIVIDUAL ATOMS THEY MAKE UP?



Because chemical properties are due to the electron configuration of the valence electrons. During bonding, this configuration changes.

Fold-up



Properties	Properties	Properties
Example	Example	Example
Ionic	Covalent	Metallic

Three clock questions related to types of bonds. One for Each Type of Bond - see p. 6 in your notebook

What makes up each type of bond?

Properties?

Examples?

What is happening in each?

Etc, etc, etc!!