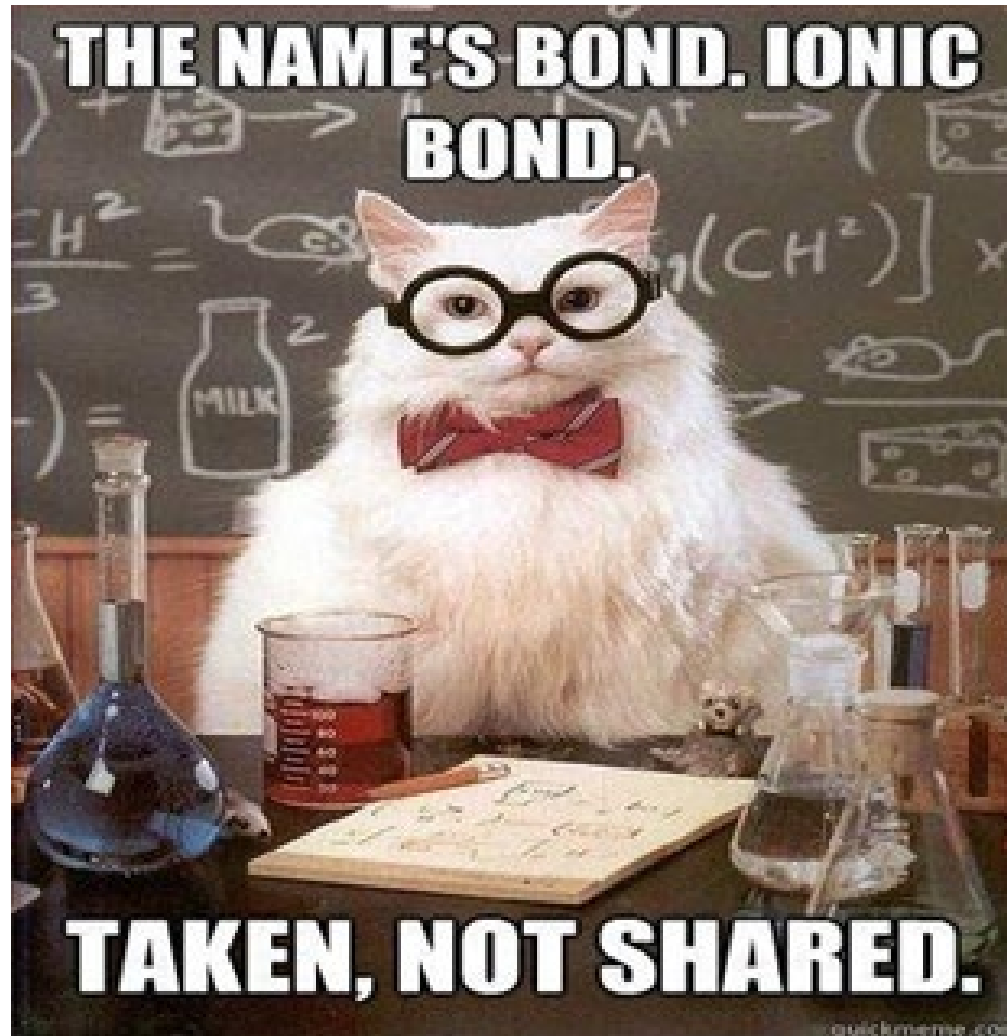


IS4T1- Bonding page 1 only



I. Type of atoms/Bond formation

A. Ionic bonds: cations and anions

1. **Transfer** electrons

- electrostatic attraction of oppositely charged ions

2. They form ionic bonds

3. Electrically neutral – cations equal anions

B. Covalent (Molecular Compounds): two nonmetals

1. **Share** electrons

2. **Covalent bonds**

C. Metallic Bonds: only metal cations

1. **Free moving valence electrons**

Do you have 9 pieces of information boxed for this first section?

II. Properties

A. Ionic compounds – composed of ions

1. At room temperature they are a crystalline solid.

2. Hard and brittle

3. High melting points

4. Crystal forms a 3D pattern

5. Can conduct an electrical current when melted or dissolved in water.

B. Covalent (Molecular Compounds)

1. At room temperature they can be a solid, liquid or gas.

2. Poor conductors of electricity

C. Metallic Solids Characteristics

1. Low to very high melting points

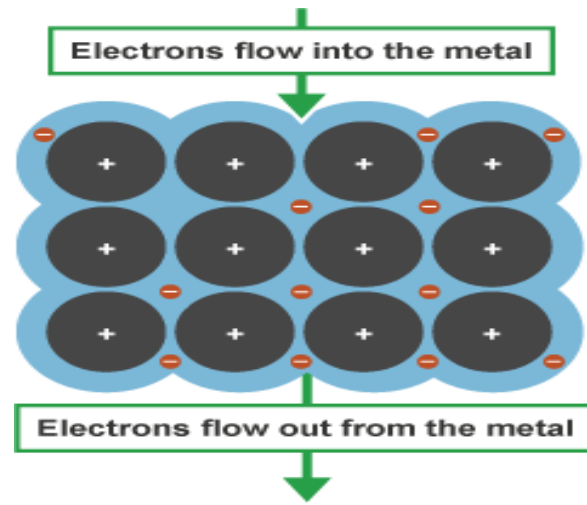
2. Ductile

3. Malleable

Do you have 7 pieces of information boxed for this first section?

II. Strength and type of bond force

- A. Ionic compounds
 - 1. **Electrostatic forces** (strong)
- B. **Covalent** (molecular compounds)
 - 1. **Intermolecular forces** (weak)
- C. Metallic solids (very strong)
 - 1. A sea of **free-floating valence electrons**



Do you have 4 pieces of information boxed for this first section?

IV. Conductors

- A. Ionic compounds are **good conductors of electricity because they contain ions.**

Conduct electricity two ways:

- 1. **In the melted or molten state**
- 2. **When the compound is dissolved in water**

How do they conduct electricity?

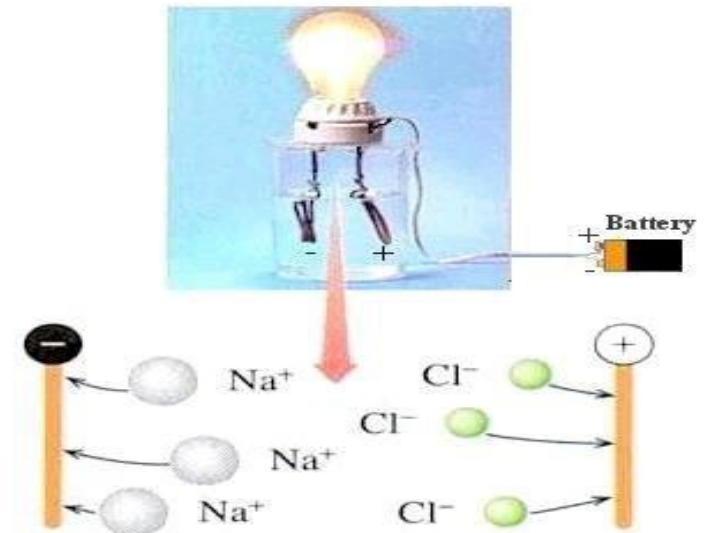
- 1. **Bonds break.**
- 2. **Ions separate (cations and anions) and move freely.**
- 3. **A voltage is applied.**
- 4. **The cations move to one electrode and the anions to the other.**
- 5. **The ion movement produces a flow of electricity.**

- B. Molecular compounds

- 1. **Poor conductors of electricity**
- 2. **Contain no ions**

- C. Metallic solids

- 1. **Good conductors of electricity and heat because of the free moving electrons**



Do you have 5 pieces of information boxed for this first section?

V. Alloys

- A. A mixture composed of two or more elements
 - 1. Example: steel (made up of Fe, Cr, C and Ni)
- B. Properties
 - 1. Hard and more durable
 - 2. More corrosion resistant

Do you have 4 pieces of information boxed for this first section?

Write down the example of an alloy, steel!



Alloy Steel

Extra information is written in the blank box towards the bottom of page 1.

- What you need to understand?
 1. Ionic compounds – composed of ions, metal & nonmetal
 2. Molecular – also known as covalent, only nonmetals
 3. Metallic – free moving valence electrons, only metals
- #1 and #3 conduct electricity
- #3 conducts heat too
- #2 poor conductor of electricity

- **Write down this summary** in BOX in the **bottom right-hand corner of page 1 and highlight it.** This is worth **6 points!!**
- **Then take a picture and submit on Google classroom by the due date & time.**
- **You will take a QUIZ NEXT CLASS using your notes.**