Ionic and Covalent Bonding

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What is a Chemical Bond?

A **chemical bond** is formed when the nucleus of one atom pulls on the electrons of another.

The bond is formed by **transferring** or **sharing electrons**. We are going to talk about 2 types of bonds:
Ionic and Covalent.

The type of bond is determined by **electronegativity difference**..

Electronegativity Difference

Electronegativity describes the degree to which the atom **attracts electrons** in a chemical bond.

If the electronegativity difference is 2 or more, then the bond is **IONIC**.
If the electronegativity difference is less than 2, then the bond is **COVALENT**.

How to find electronegativity difference

To find the electronegativity of two atoms, simply **look up their electronegativity value**.

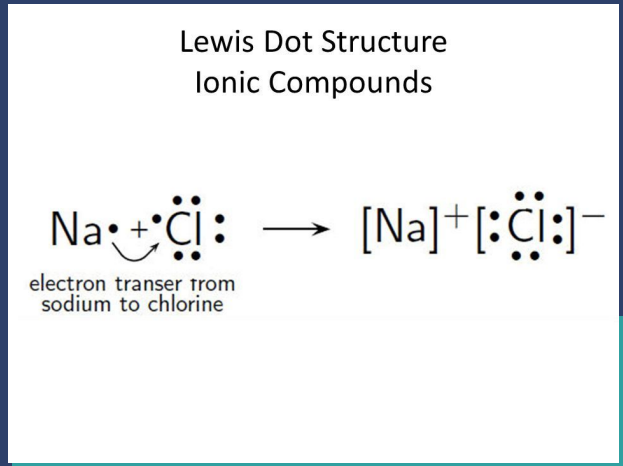
For example, “Helium Electronegativity”, “Fluorine Electronegativity”, etc.

Once you find out the electronegativity values of both atoms, **subtract them**.

Ionic Bonding

Ionic bonding is the TRANSFER of valence electrons between atoms. It is formed when a **METAL** transfers one or more valence electrons to a **NONMETAL**. In ionic bonding, you want the atoms to have an electron number of either 0 or 8. Lewis electron dot structures show what happens to the valence electrons.

Losing an electron is a **positive charge** and **gaining** an electron is a **negative charge**. In the example, Na becomes a positive charge for losing an electron and Cl becomes a negative charge for gaining an electron



Properties of Ionic Substances

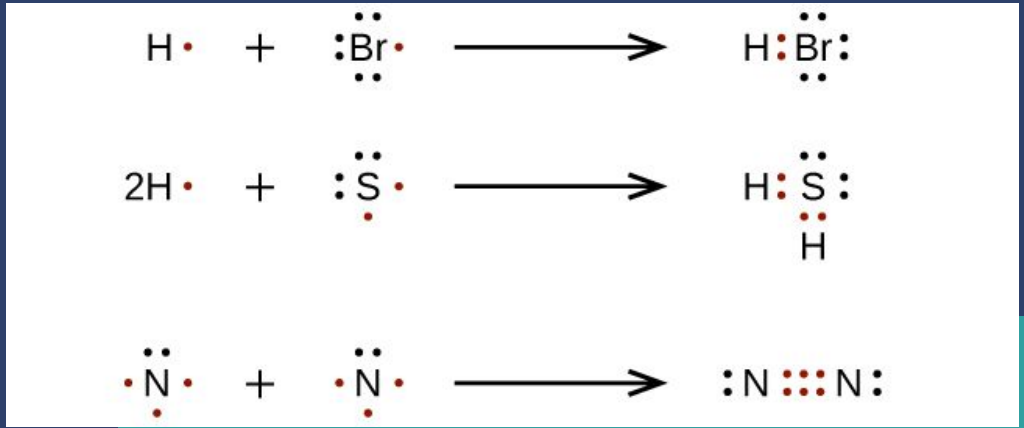
Ionic substances have a number of properties that can help distinguish them from other substances. They are:

- **hard**
- **good conductors** of heat and electricity in their liquid form
- **high melting** and **boiling points**

Covalent Bonding

Covalent bonding is the SHARING of valence electrons between atoms. It is formed two atoms, **BOTH NONMETALS** share electrons. In covalent bonding, the atoms share between them and **don't become ions**. Lewis dot structures show the forming of covalent bonds.

In the example, you can see how the atoms are **sharing** electrons instead of transferring electrons.

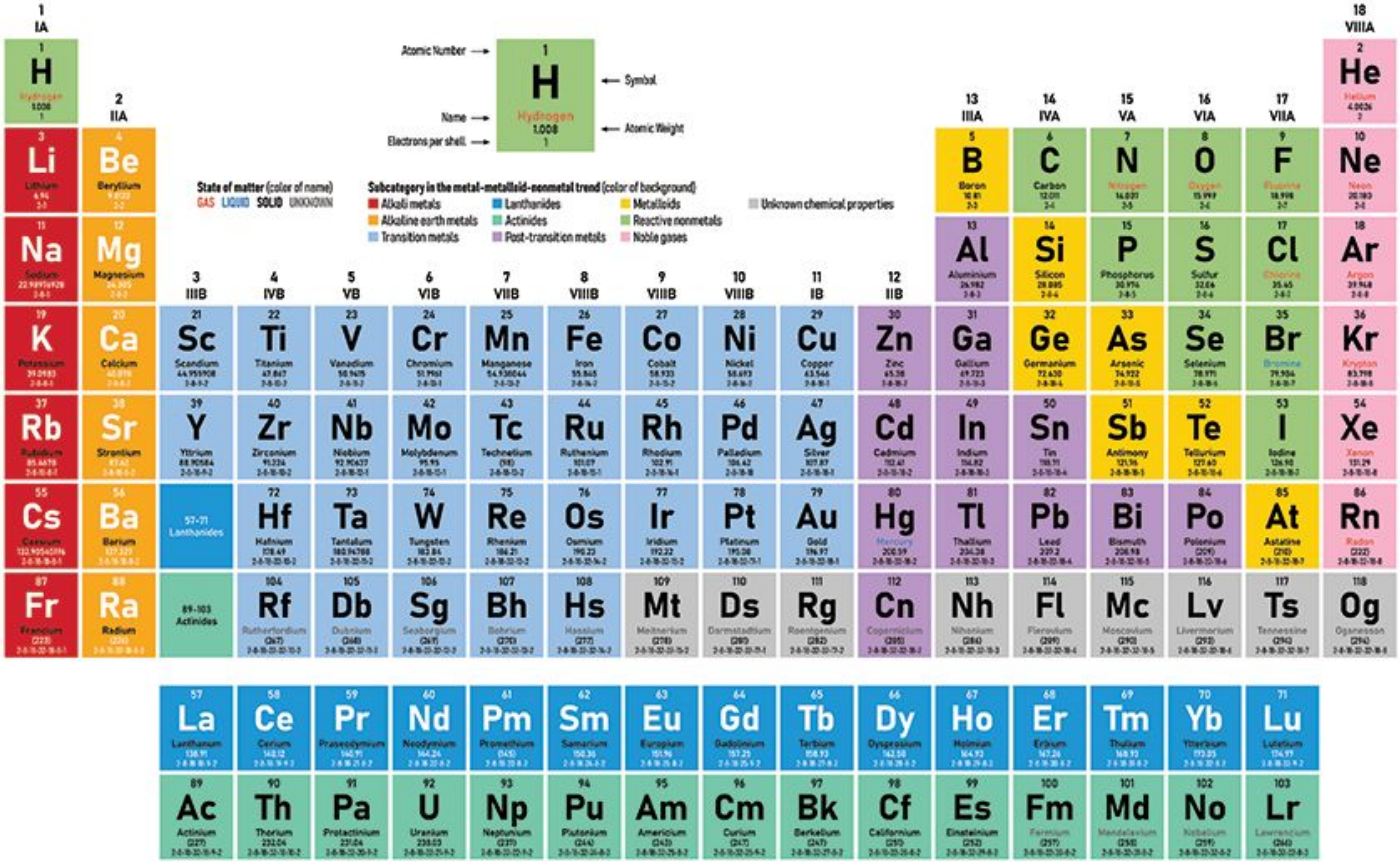


Properties of Covalent Compounds

When a covalent compound is made, it gains new properties because it is a new substance. They are:

- **soft**
- **low melting/boiling points**
- **poor conductors** of heat and electricity.

Periodic Table of the Elements

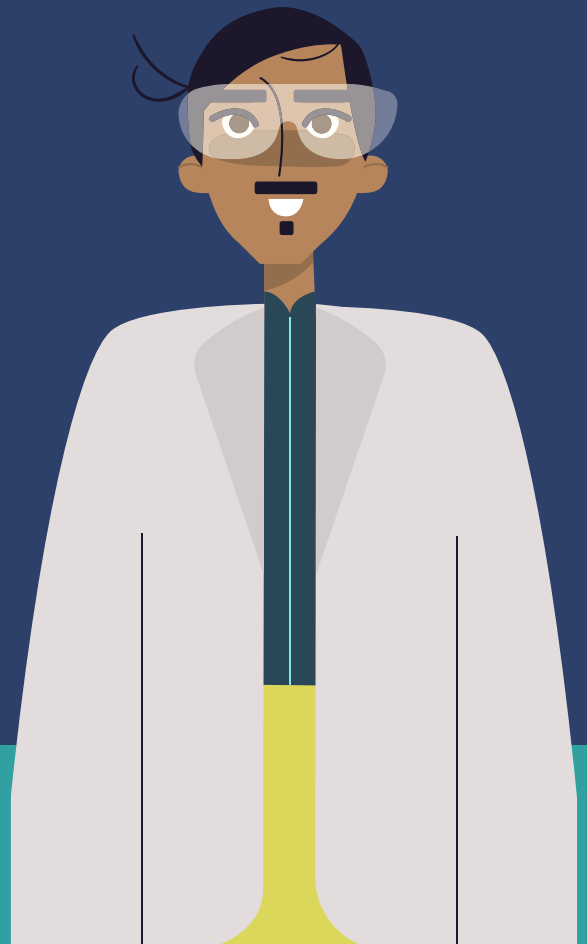


Here is a link to a more detailed periodic table:

https://www.webelements.com/

THANKS

Does anyone have any questions?



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