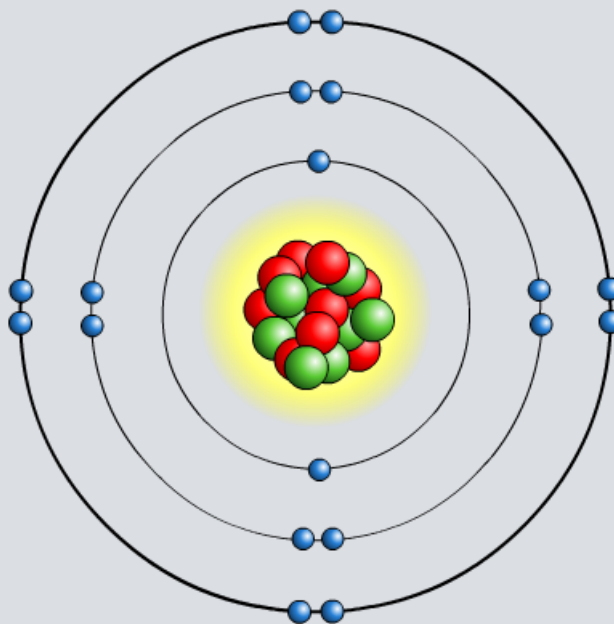


Why do Atoms form Bonds?

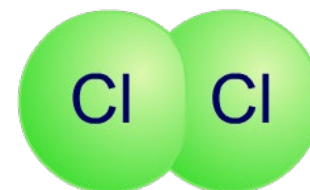


What are bonds?

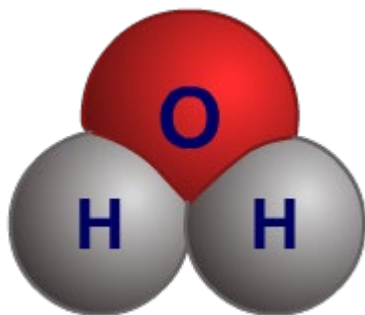
Elements are the simplest substances that exist on Earth.

Each element is made up of just one type of atom, usually joined to other atoms of the same element by **bonds**.

This forms molecules such as chlorine (Cl_2).



Compounds are formed when different elements chemically react and form bonds with each other.



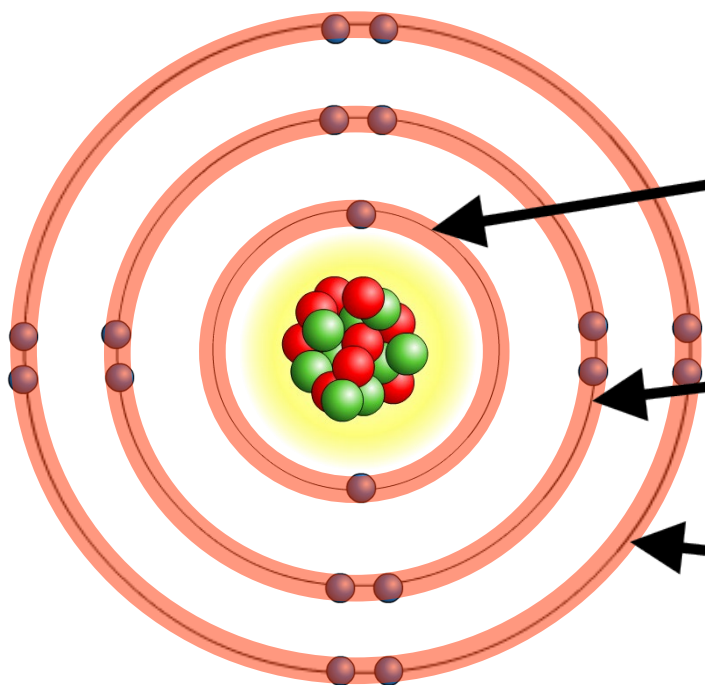
Some compounds, like water (H_2O), have small, simple structures with just a few atoms bonded together.

Others compounds, like DNA, have large, complex structures containing thousands or even millions of bonded atoms.

Why do atoms form bonds?

Bonds involve the electrons in the outer shells of atoms.

Each shell has a maximum number of electrons that it can hold. Electrons fill the shells nearest the nucleus first.



1st shell holds a maximum of **2 electrons**

2nd shell holds a maximum of **8 electrons**

3rd shell holds a maximum of **8 electrons**

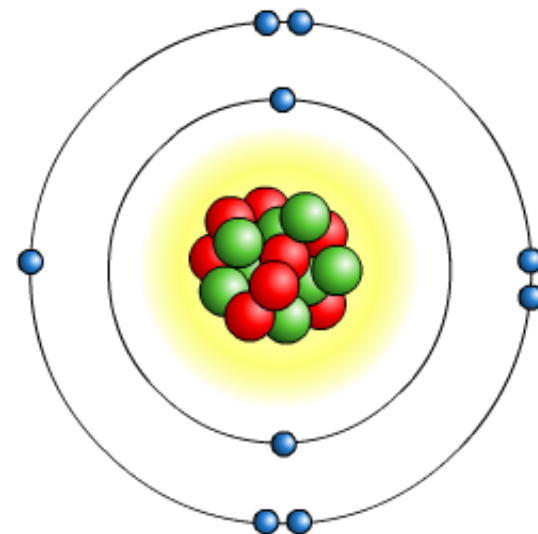
Filled electron shells are very stable.

Why do atoms form bonds?

The atoms of noble gases have **completely full** outer shells, and so are **stable**.

This makes the noble gases very **unreactive**, and so they do not usually form bonds.

The atoms of other elements have **incomplete** outer electron shells, and so are **unstable**.



By forming bonds, the atoms of these elements are able to fill outer shells and become stable.



What are the types of bonding?

Different types of bonds are formed depending on the types of atoms involved:

- **ionic bonding**: occurs between **metal** and **nonmetal** atoms.
- **covalent bonding**: occurs between **nonmetals** atoms only.
- **metallic bonding**: occurs between **metal** atoms only.

All bonds involve electrons and all bonding involves changes to the number of electrons in the outer shells of atoms.

How do you think electrons are involved in ionic bonding?



What are the missing words about bonding?

1. Atoms form bonds and become more .
2. When bonds are formed, atoms obtain full shells.
3. All bonding involves changes in the number of in the outer shells of atoms.
4. Ionic bonding occurs between and nonmetal atoms.



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