


Chapter 19

Molecules and

Compounds



Section 19.1

Bonding and

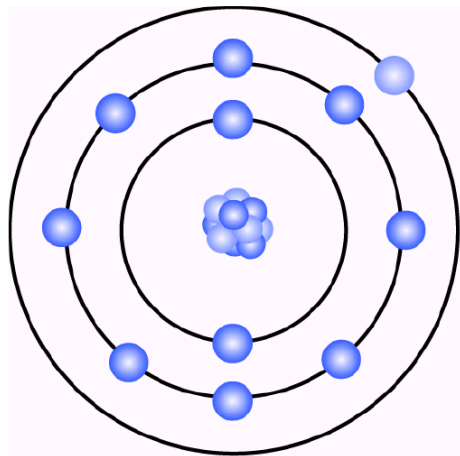
Molecules – Part 2

Types of Chemical Bonds

- # Recall that atoms gain, lose, or share e^- to gain 8 valence e^- .
- # so that they become stable.

Ionic Bonds - formed
when atoms gain or
lose electrons.

#Ex: Na has 1 valence e^-



SODIUM ATOM

=

Na•

When Na loses that electron, its 2nd E.L. becomes full and stable with 8 e⁻.



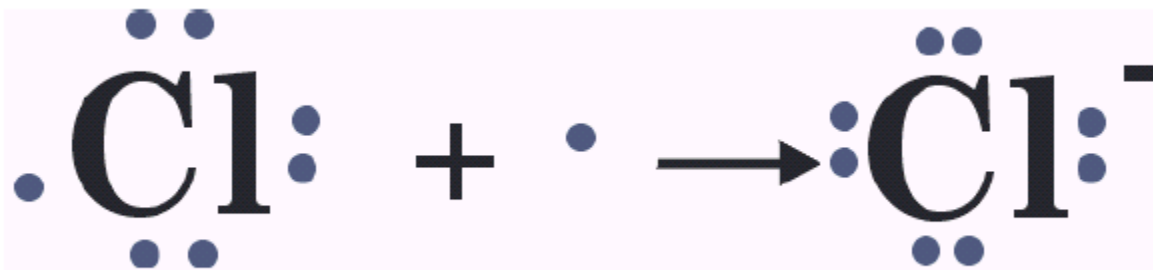
sodium atom

sodium ion

Atoms with an electrical charge are called ions.

Chlorine has 7 valence electrons.

- # If Cl gains 1 electron, its valence shell will be full and stable.



chlorine atom

chlorine ion

Opposites attract, so...

Are these two ions likely to bond?





Figure 19.9: *Sodium and chlorine form an ionic bond. The compound sodium chloride is electrically neutral as long as the two ions stay together.*

Covalent Bonds

- # **Most atoms share electrons to gain an octet.**
- # **Covalent bonds are formed when e^- are shared.**

Covalent Bonds, cont.

Covalent bonds can form between 2 different types of atoms or between 2 or more atoms of the same type.

Diatomic molecules:

– covalently bonded atoms of the same type.



Exs: H_2 Cl_2 F_2 I_2
 O_2 Br_2 N_2

How can you tell whether a bond is ionic or covalent?

In GENERAL:

Ionic – metal / nonmetal

Covalent – 2 nonmetals

Electronegativity

- # Sometimes e^- are shared unequally in covalent bonds.
- # Electronegativity – attraction atom has for shared pair of e^- .

Electronegativity

- # **Elements in Group 17 have highest electronegativity.**
- # **Elements in Groups 1 and 2 have lowest electronegativity.**