Session 1 Worksheet

Vocab

Organic Chemistry:

Organic Compounds:

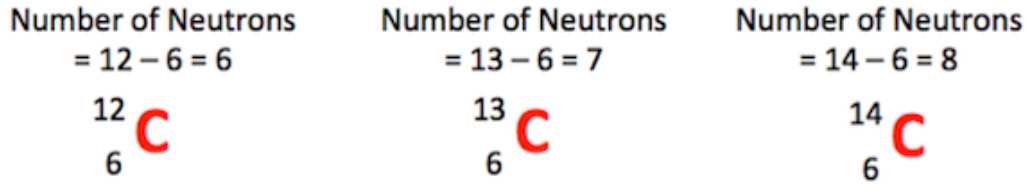
What makes carbon so special?

Inorganic Compounds:

Identify the organic compound below:

A. BF_3
B. CH_3COOH
C. Na_2CO_3
D. CO

Isotopes



Valence Electrons

The_____number tells you how many valence electrons the element has in the valence shell

Bonding

Tetravalent	*Trivalent*	*Divalent*	*Monovalent*
			
Carbon generally forms ***four*** bonds.	Nitrogen generally forms ***three*** bonds.	Oxygen generally forms ***two*** bonds.	Hydrogen and halogens generally form ***one*** bond.

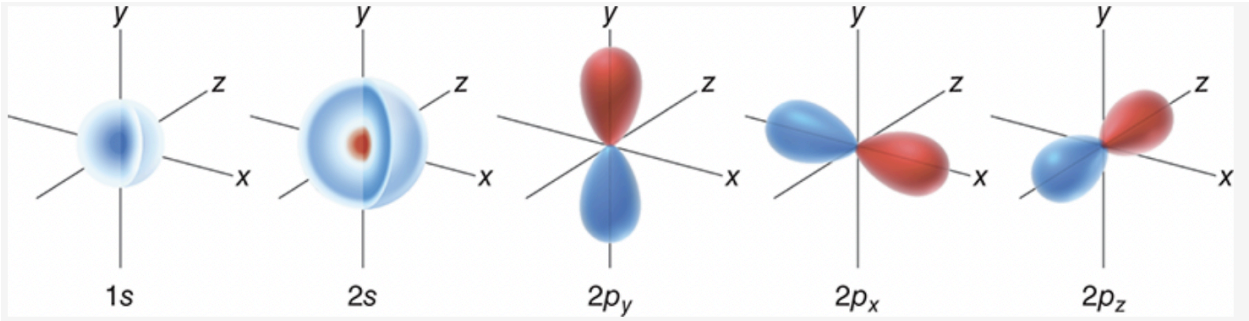
Ionic Bonding:

Covalent Bonding:

In the chart below, write down whether the bonding is ionic or covalent

Br_2	NaOH	CH_3	NaBr	$C(CH_3)_4$

Electron Orbitals



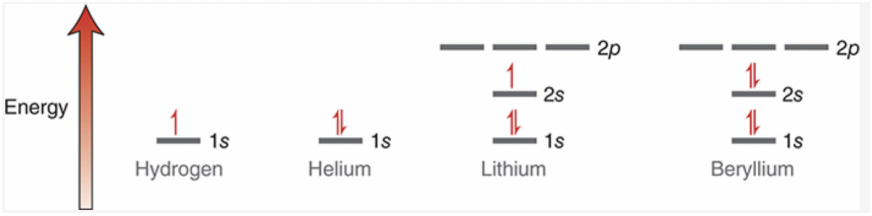
Following these three principles:

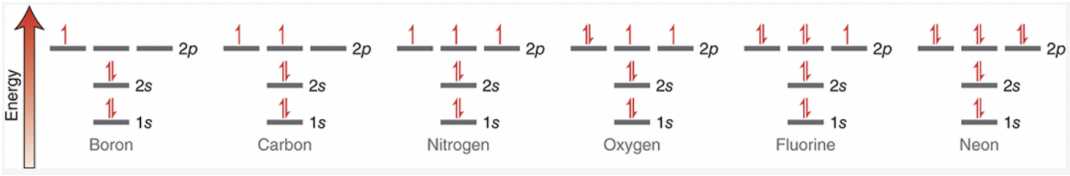
Aufbau's:

Pauli Exclusion:

Hund's Rule:

Examples of these principles at play





Practice

Atom	Electron Configuration	Noble Gas Configuration
Ni		
Cl		
B		
K		

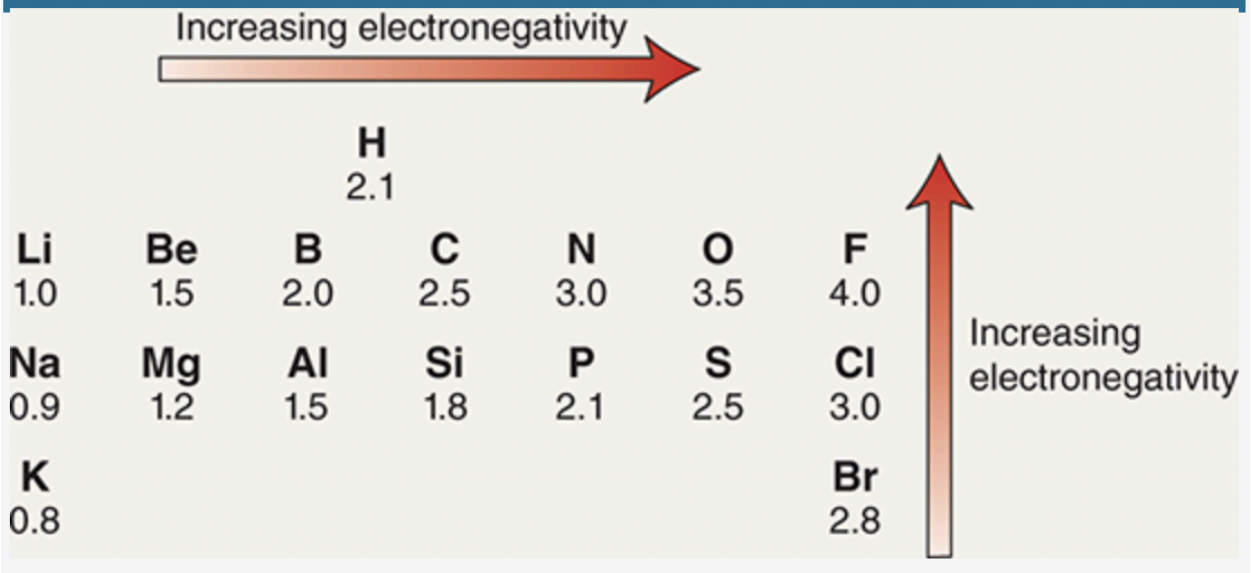
Electron Configuration	Element
$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$	
$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^5$	
$1s^2 2s^2 2p^6 3s^2 3p^6$	
$1s^2$	

Draw the orbital diagrams for Sodium and Aluminum, both in full orbital diagrams and noble gas.

Electronegativity

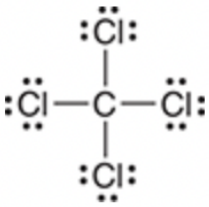
TABLE 1.1

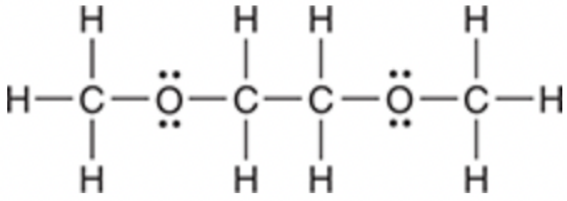
ELECTRONEGATIVITY VALUES OF SOME COMMON ELEMENTS

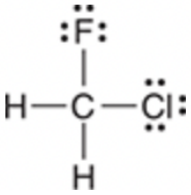


Induction causes the formation of_____and _____ charges, symbolized by_____

Label the inductive charges:







Heterolysis:

Homolysis:

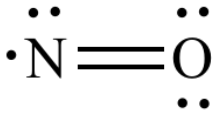
Lewis Structures

Draw the Lewis structures of:

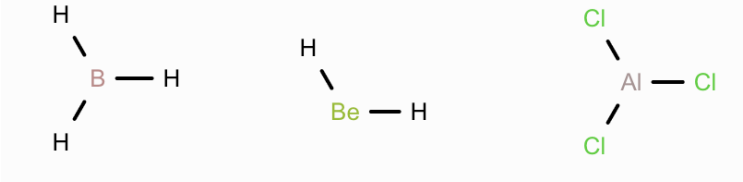
CCl_4 NH_3 Dihydrogen Monoxide

<u>Common exceptions to the octet rule</u>

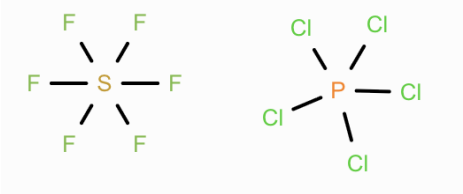
1. Free radical (odd number of electrons)



2. Incomplete octets



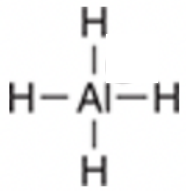
3. Overfilled octets

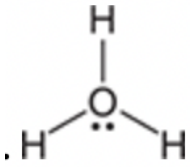


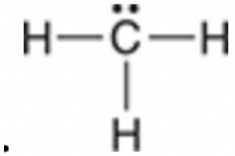
Formal Charge

Formal Charge = # - -

Find the formal charge of the central atom:







Constitutional Isomers

What is the relationship of these molecules? Different, Same, or Constitutional Isomers?

C_4H_{10}