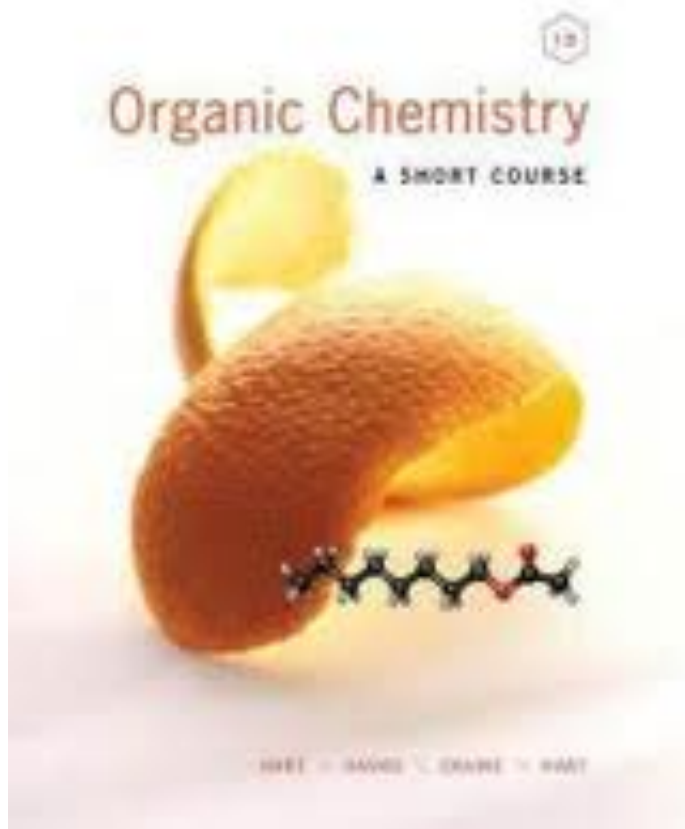


# CHEM 226

# Spring 2013

# Elementary Organic Chemistry



- Text Book
- Course Website:  
<http://employees.oneonta.edu/odagomo/>
- OWL Homework Access and Registration
- Lab Materials
- Clickers

# CLICKERS

Clicker Options: Buy directly from [TurningPoint](#) (School Code = W5bH)

Laptop or Smartphone with ResponseWare subscription (\$17/year)

iPhone, iPod Touch, iPad, Blackberry Android phones  
(download ResponseWare app)

TurningPoint NXT (cards with LCD screens, shown below):  
about \$43 Incl. shipping

These cards can be used in place of the RF cards that the bookstore stocks. So, if you have a class that uses the TurningPoint RF cards, then the NXT cards will work in those classes.



**This (NXT)**



**Not this (RF)**

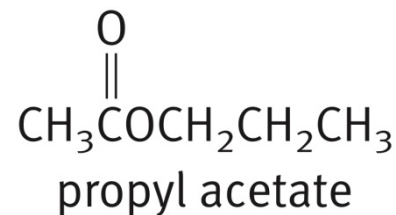
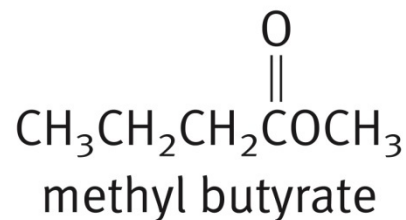
Register your clickers at: <http://tinyurl.com/s13c226clicker>

**By Friday January 18, 2013**

# Others Things to Do

1. Sign up an Evernote account
2. Sign up a dropbox account
3. Register and start working on OWL
4. Purchase and register your Clinkers

# Chapter 1: Bonding and Isomerism



Methyl butyrate and propyl acetate are both organic flavors that are found in apples and pears respectively and are structural isomers.

Structural Isomers are compounds that have the molecular formula ( $\text{C}_5\text{H}_{10}\text{O}_2$ ), but have different connectivity hence different structural formulas.

# Bonding and Isomerism

Questions ?

Why does sucrose melt at  $185^{\circ}\text{C}$  while table salt melts at  $801^{\circ}\text{C}$ ?

Why do both substances dissolve in water and olive oil does not?

Why does methyl butyrate smell like pears while propyl acetate smell like apple yet they have the same number and kind of atoms?

Bonding is the key to the structure, physical properties and chemical behavior of different kinds of matter.

# How Electrons Are Arranged in Atoms

Table 1.1  Numbers of Orbitals and Electrons in the First Three Shells

Shell number	Number of orbitals of each type			Total number of electrons when shell is filled
	<i>s</i>	<i>p</i>	<i>d</i>	
1	1	0	0	2
2	1	3	0	8
3	1	3	5	18

**Table 1.2** ■ **Electron Arrangements of the First 18 Elements**

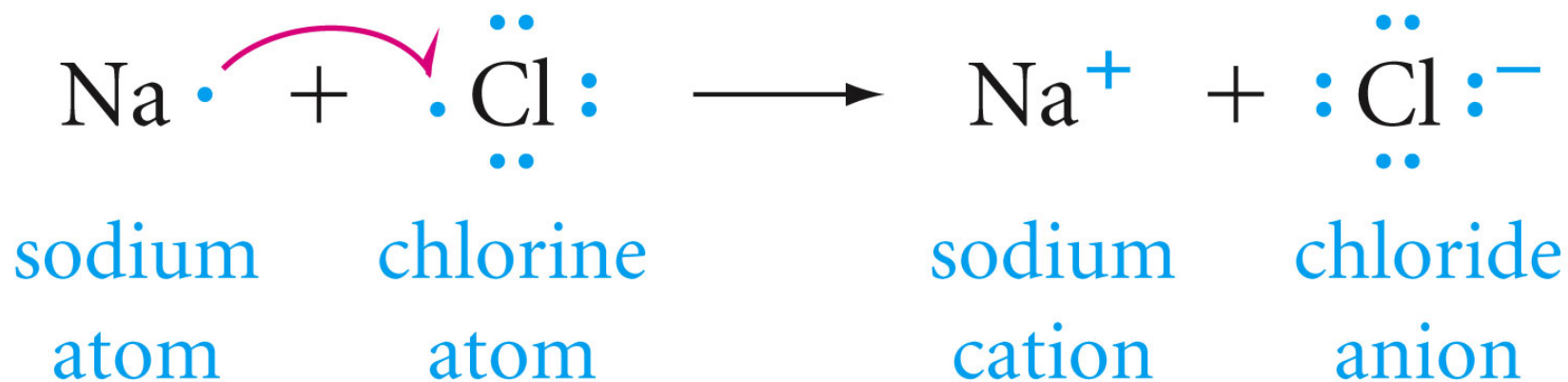
Atomic number	Element	Number of electrons in each orbital				
		1s	2s	2p	3s	3p
1	H	1				
2	He	2				
3	Li	2	1			
4	Be	2	2			
5	B	2	2	1		
6	C	2	2	2		
7	N	2	2	3		
8	O	2	2	4		
9	F	2	2	5		
10	Ne	2	2	6		
11	Na	2	2	6	1	
12	Mg	2	2	6	2	
13	Al	2	2	6	2	1
14	Si	2	2	6	2	2
15	P	2	2	6	2	3
16	S	2	2	6	2	4
17	Cl	2	2	6	2	5
18	Ar	2	2	6	2	6

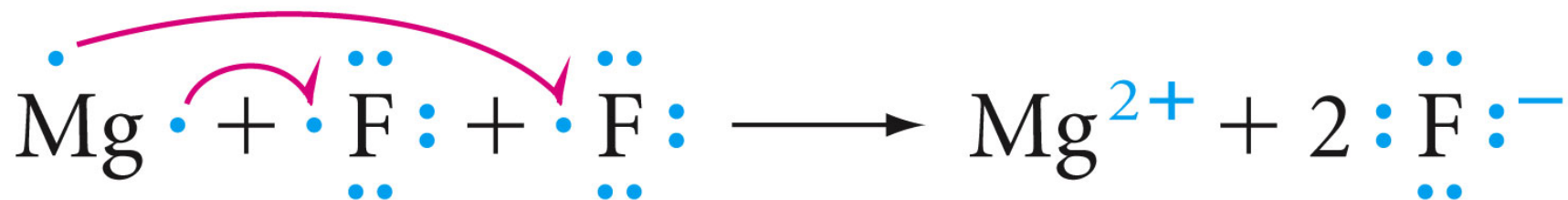


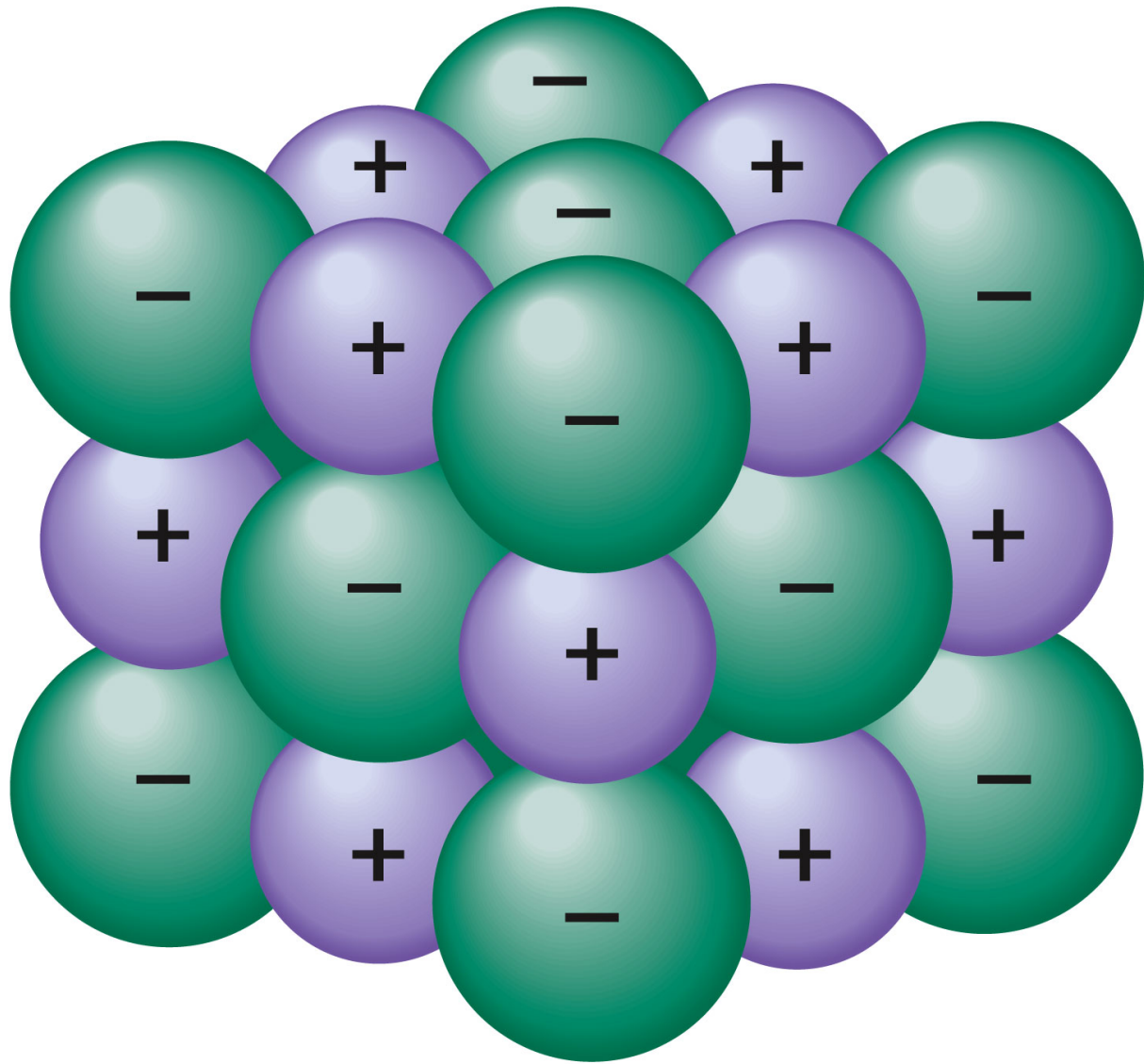
**Table 1.3**  **Valence Electrons of the First 18 Elements**

Group	I	II	III	IV	V	VI	VII	VIII
	H ·							He :
	Li ·	·Be ·	·B ·	·C ·	·N :	·O :	·F :	·Ne :
	Na ·	·Mg ·	·Al ·	·Si ·	·P :	·S :	·Cl :	·Ar :

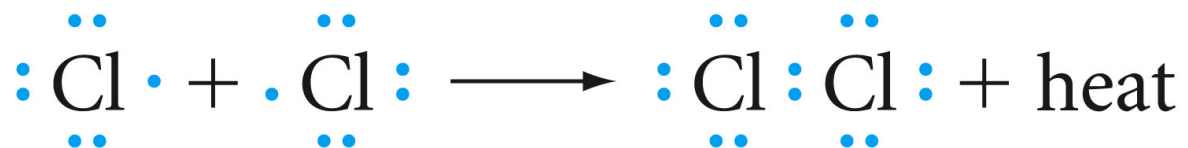
## Ionic Compounds



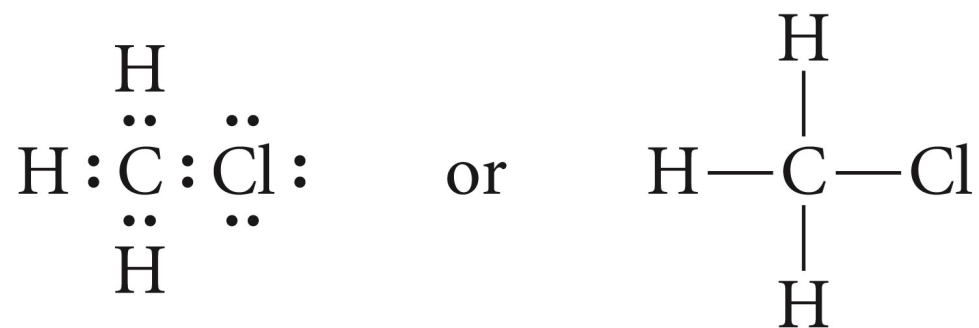




# The Covalent Bond

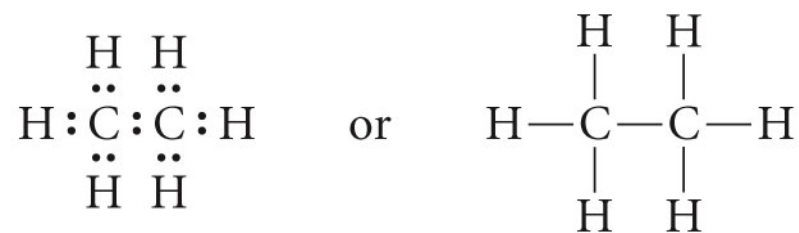




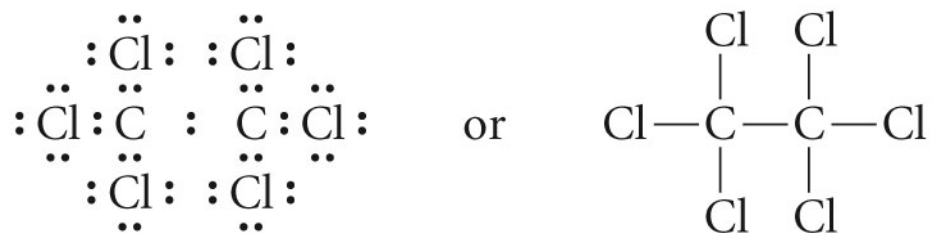


Draw the structures of dichloromethane and trichloromethane (chloroform)

# Carbon-Carbon Single Bonds



ethane



hexachloroethane

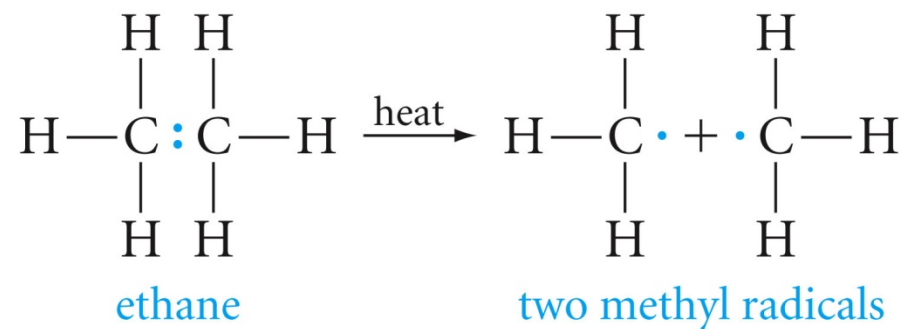
C-C      1.54 Å

H-H      0.74 Å

C-H      1.09 Å

Cl-Cl     1.98 Å





A radical is a molecular fragment with an odd number of electrons