

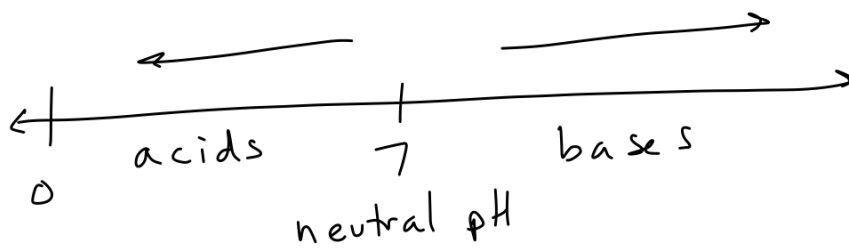
# Calculating pH

TH-GB week 4

$$pH = -\log [H^{\oplus}]$$

$$[H^{\oplus}] = 10^{-6} \quad pH = 6$$

$$[H^{\oplus}] = 10^{-11} \quad pH = 11$$



Neutral pH

$$[H^{\oplus}] = [OH^{\ominus}]$$

$$10^{(-7)} * 10^{(-7)} = 10^{-14}$$

$$[OH^{\ominus}] = 10^{(-3)}$$

$$[H^{\oplus}] = 10^{-11} \quad 14 - 3 = 11$$

$$pH = 11$$

$$[OH^{\ominus}] * [H^{\oplus}] = 10^{-14}$$

$$-3 + \underline{\quad} = -14$$

$$[OH^{\ominus}] = 10^{-4} \quad pH = 10$$

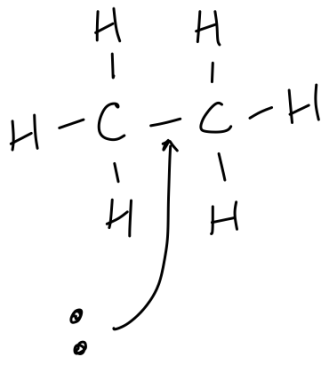
$$14 - 4 = 10$$

$$[H^{\oplus}] = 10^{(-4)}$$

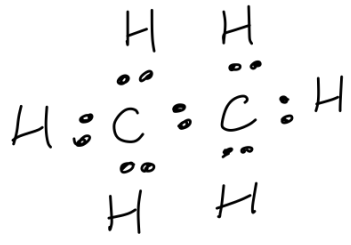
$$[OH^{\ominus}] = 10^{(-10)}$$

$$4 + 10 = 14$$

$$4 + \underline{\quad} = 14$$

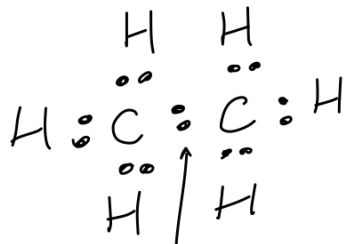


ethane

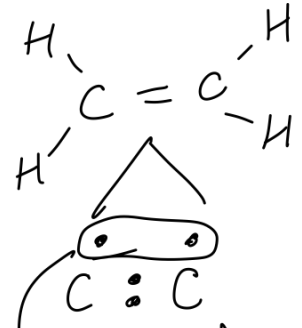


each bond is an overlapping space in which two electrons are shared.

covalent bond - a sharing of valence electrons

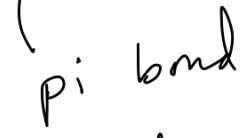


covalent "sigma" bond



double bond

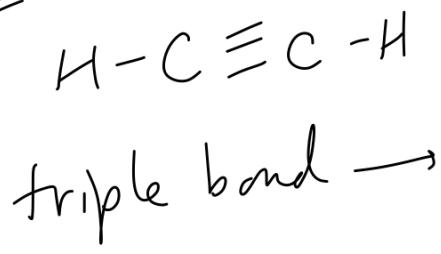
ethene  
double bond



pi bond

double bond - 1 sigma  
1 pi

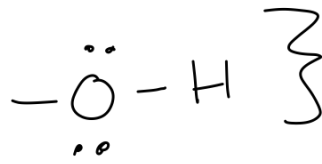
ethyne  
triple



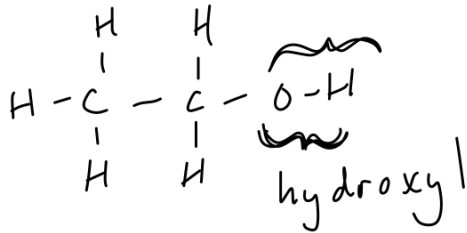
1 sigma  
2 pi

# Functional Groups

Hydroxyl



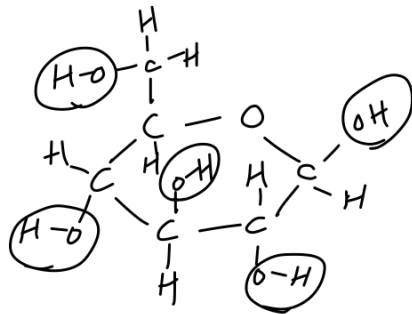
ethanol  
alcohol



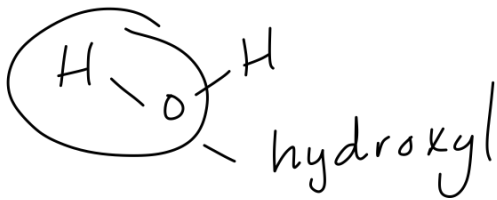
Classification → alcohol

polar  
dissolve in water

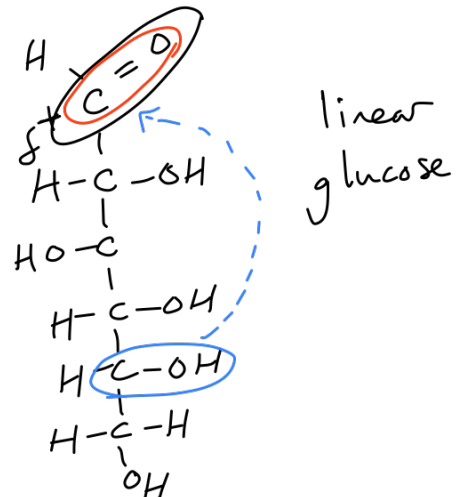
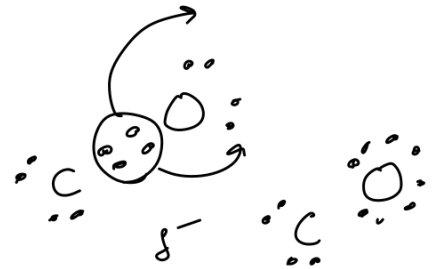
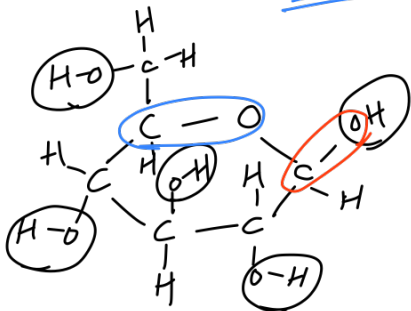
hydroxyls



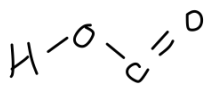
glucose  
sugar  
OH → sweetness



Carbonyl → very polar  
linker dissolve in water

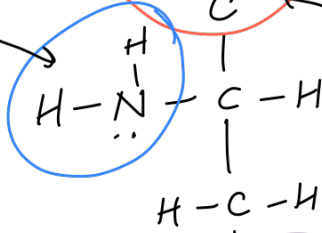


Carboxyl



acidic, polar  
dissolve in water  
linker

amino



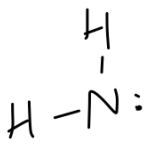
Amino Acid  
Cysteine

carboxylic acid



carboxyls and amino groups link together amino acids in poly peptide.

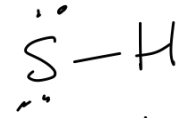
Amino



basic, polar  
dissolves readily  
in water.

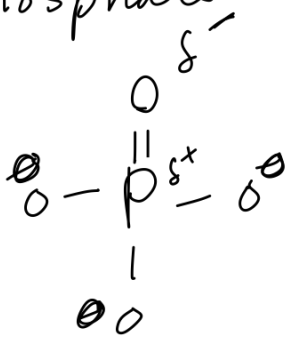
link

Sulfhydryl

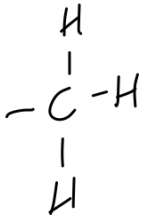


think of hydroxyl O-H  
with sulfur  
polar, dissolves readily  
in water

Phosphate



very polar, dissolve  
readily in water  
chief ingredients  
to ATP



Methyl group  $\text{CH}_3$   
Nonpolar, does not  
dissolve readily in water

Quiz 3 sep 24<sup>th</sup> HW  
online HW  
(sat) Quiz 4 Due Oct 1<sup>st</sup>