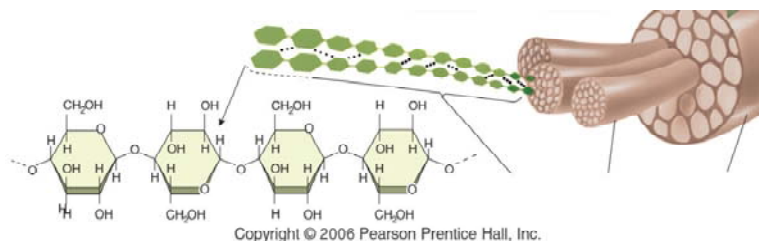


Chapter 2b

Carbon and Polymers



Outline

- Organic Chemistry
 - Role of Carbon
 - 7 Functional Groups
 - Examples Molecules
 - Polymer Concept

Organic Chemistry

Chemistry of Carbon

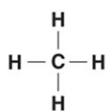
Carbon has valence # of 4

Molecular
Formula

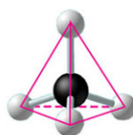


(a) Methane

Structural
Formula



Ball-and-Stick
Model

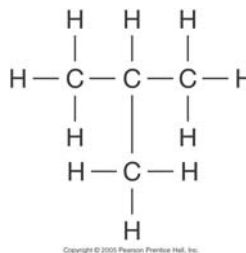
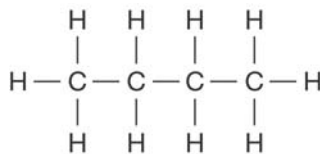


Space-Filling
Model

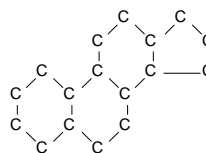
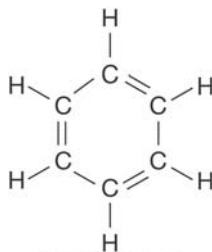


Carbon Chains and Rings

Chains



Rings

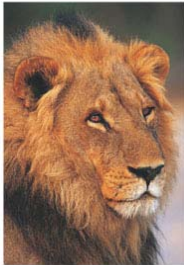
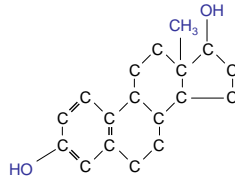


Functional Groups



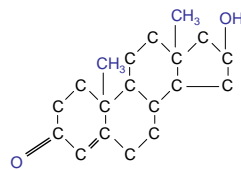
Female lion

Estrogen



Male lion

Testosterone



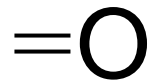
Six Functional Groups

- Hydroxyl
- Keto
- Methyl
- Carboxyl
- Amino Group
- Phosphate Group
- Structure?
- Hydrophilic?

Hydroxyl



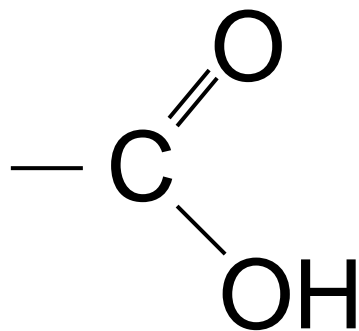
Keto



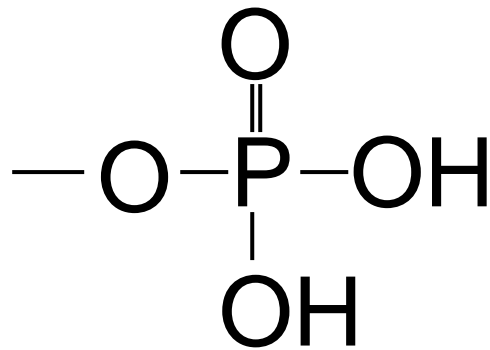
Methyl



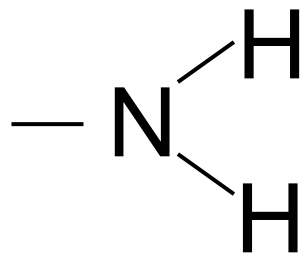
Carboxyl



Phosphate



Amino

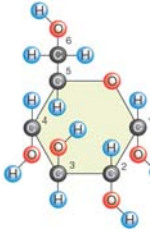


Example Structures

- Glucose
- Methionine
- ATP

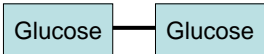
Macromolecules

Bio - Polymers



Glucose

Monomers
(Subunits)



Maltose

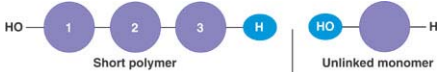
Dimers



Starch

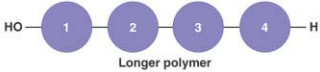
Polymers

Dehydration/Condensation Reactions



Dehydration removes a water molecule, forming a new bond

Monomers assemble to make Polymers



(a) Dehydration reaction in the synthesis of a polymer



Hydrolysis adds a water molecule, breaking a bond

Polymers break down to monomers



(b) Hydrolysis of a polymer