**Organic Chemistry**

**Organic Compounds** - have carbon bonded to other atoms and determine structure/function of living things

*What are inorganic compounds?*

Organic compounds features:

1.   
2.   
3.   
4.

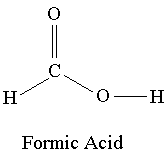
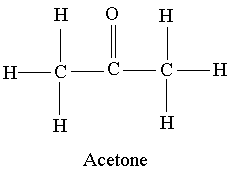
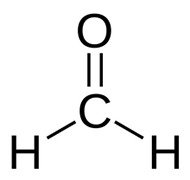
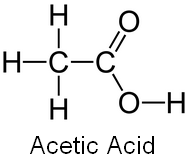
Examples of organic molecules:

Attached to the carbon skeleton is a **FUNCTIONAL GROUP**- which is the area that participates in chemical reactions

|  |  |  |  |
| --- | --- | --- | --- |
| Functional Group | | Name of compounds | Functions |
| Hydroxyl | **-OH** | Alcohols | hydrophilic, polar |
| Carbonyl | **-CO** | Aldehydes (when the =O occurs at the end of chain) Ketones (when the =O occurs in the middle of chain) | hydrophilic, polar |
| Carboxyl | **-COOH** | Carboxylic Acids | act as acids, donate protons |
| Amino | **-NH2** | Amines | act as bases, accept protons |

Types of alcohols:

What type of compounds are the following? How are they used?

**MACROMOLECULES fall into four major groups**

1. Carbohydrates 2. Lipids 3. Proteins 4. Nucleic Acids

**1. CARBOHYDRATES**

**monosaccharides**- simple ring sugars, ex:

**disaccharides** - two monosaccharides combined, ex:

**polysaccharides** - polymers (long chains of repeating units) of monosaccharides,

starch (plant energy storage)

glycogen (animal energy storage)

cellulose - structural molecule, plant cell walls

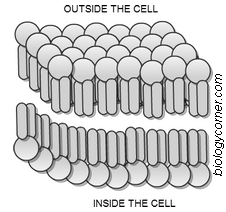
chitin - structural molecule, exoskeletons

**pentoses** - five carbon sugars; deoxyribose & ribose (DNA)

**2. Lipids**

Hydrophobic (insoluble in water)

Used for -

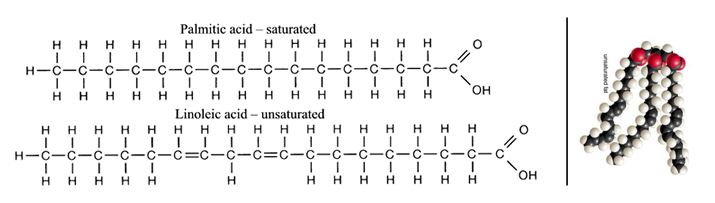
Fats & Oils are made of subunits - glycerol and fatty acids

**Waxes** – *mainly used for covering and protection*

**Phospholipids** - Important structural component of the cell membrane

**Steroids** - cholesterol & sex hormones  
 (estrogen & testosterone) – made of 4 fused rings

\***Saturated fats** contain no double bonds, **unsaturated** have double bonds that “kink” the molecule  
\*Saturated fats solidify at room temperature; unsaturated fats are liquid at room temperature



What is a trans fat?

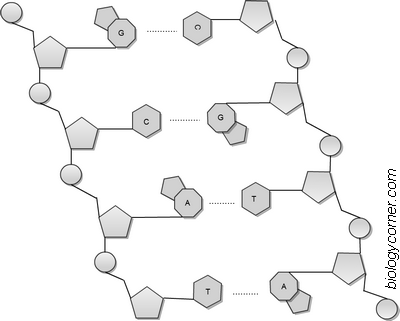
**3. Proteins**

* Polymers made of **amino acids**, which are joined by **peptide bonds  -**proteins are also called **polypeptides**
* Amino acids form a wide variety of structures, mainly building blocks for living tissue

Also used for:

* Proteins can be **denatured**:

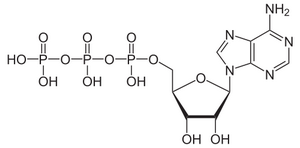
**Proteins have four shapes:**

**4. Nucleic Acids**

* Informational polymers made of individual **nucleotides**
* DNA (deoxyribonucleic acid) & RNA (ribonucleic acid)

   Each nucleotide consists of:

**ATP (adenosine triphosphate)** -

 <<<<<<<<<<<<< Molecule of ATP stores energy

QUIZ YOURSELF!

a.  carbohydrate               b.  lipids        c.  protein                   d.  nucleic acids

1.  contains adenine and thymine  
2.  lactose  
3.  chains of amino acids  
4.  long term energy storage  
5.  cholesterol  
6.  chains of fatty acids and glycerol  
7.  plant cell walls

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