

Biological Macromolecule	Elements Ratio	Function	Monomer	Examples
Carbohydrate -ose	CHO 1:2:1	<ul style="list-style-type: none"> <li>- Short term energy storage</li> <li>- Structure (cell walls &amp; exoskeletons)</li> </ul>	Monosaccharide	<ul style="list-style-type: none"> <li>-Glycogen</li> <li>-Chitin</li> <li>-Cellulose</li> <li>-Glucose fructose galactose</li> <li>-sucrose lactose maltose</li> </ul>
Lipids	CHO 1:2:very few	<ul style="list-style-type: none"> <li>- long term energy storage</li> <li>- Insulates body</li> <li>- Cushions body organs</li> </ul>	Triglyceride (Glycerol + 3 fatty acids)	Fats, Waxes, Oils, Steroids
Proteins	CHON No ratio	<ul style="list-style-type: none"> <li>- Transports O<sub>2</sub></li> <li>- Structural support</li> <li>- Enzymes (ase)</li> <li>- Receptors (cell membranes)</li> <li>- Defense</li> </ul>	Amino Acids (20)	<ul style="list-style-type: none"> <li>- Hemoglobin</li> <li>- Catalase</li> <li>- Antibodies</li> <li>- Keratin (hair, nails)</li> <li>- Actin/Myosin (muscles)</li> </ul>
Nucleic Acids	CHONP No ratio	<ul style="list-style-type: none"> <li>- Instructions for making proteins</li> <li>- Genetic stored</li> <li>- Genetic info transmitted</li> </ul>	Nucleotide (5-C sugar + phosphate + nitrogen base)	DNA  RNA

When testing a macromolecule in a lab setting for identification scientists use the following chemical indicators and compare color of substance in the test tube after the indicator has been added

**Carbs**

simple sugars      indicator is benedicts solution      (+) result      green, yellow, orange, brick red

starch      indicator is iodine solution      (+) result      black or blue

Protein      indicator is biuret solution      (+) result      light purple (lavender)

Lipids (fat)s      indicator is brown paper bag      (+) result      grease spot on paper bag

# Compound

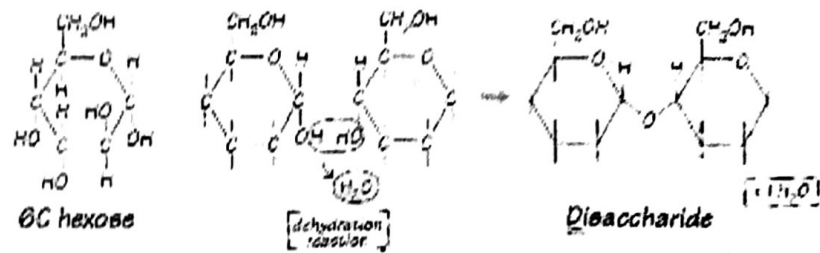
Basic components

Reaction

Product

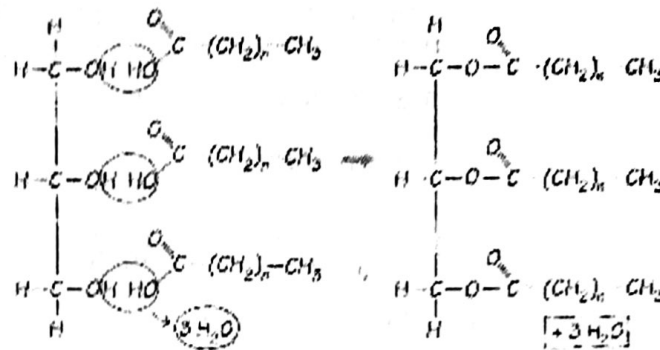
## Carbohydrates:

Sugars, starches, glycogen, cellulose



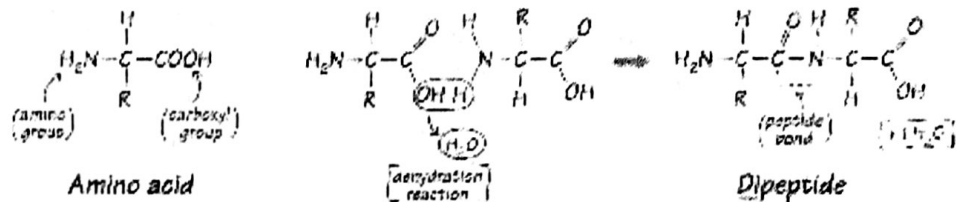
## Lipids:

Fats, oils, waxes, cholesterol



## Proteins:

Enzymes, structural proteins



## Nucleic acids:

DNA, RNA

