1. Hydrogen carbonate ions 2. Chloride ions 3. Phosphate ions	acids and protein formation ● Maintenance of the blood ph ● Balance positive charge of sodium and potassium ions in the cells ● Cell membrane formation, nucleic acid and ATP formation , bone formation
1. Hydroxide ions	● Catalysis of reaction, ph determination

Biological molecules:

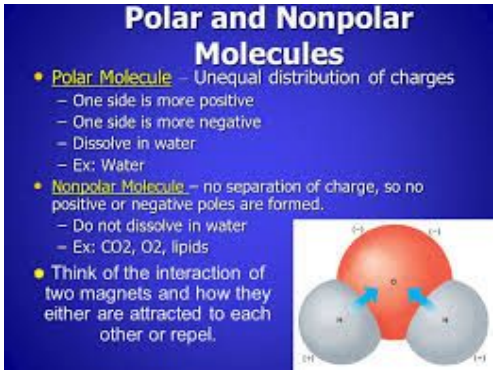
Elements in macromolecules & the percentage dry mass of each macromolecule in a cell

Macromolecule	Elements	% dry mass of a cell
Carbohydrates	CHO	15
Lipids	CHOP	10
Proteins	CHONS	50
Nucleic acids	CHONP	18

***Polymers*:**

Polymers are long chain molecules made up by joining individual molecules called monomers, in a repeating unit. (in carbohydrates the monomers are the sugars, in proteins the monomers are the amino acids).

Water:

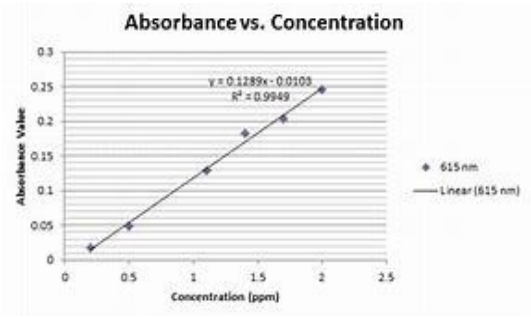


Oxygen and hydrogen are examples of of the elements that do not share the electrons equally in the covalent bond. Oxygen has always a much greater share in 0-H bond. The organic molecules that contain OH bond are called hydroxyl and so they are slightly polar.

- Polar molecules interact as the positive and negative regions of molecule attract each other and form hydrogen bonds. Hydrogen bonds are relatively weak interaction, they break and reform btw constantly moving the water molecules.
- Hydrogen bonds give water high specific heat capacity
- Hydrogen bonds give water high latent heat of evaporation.

Characteristics of water: .

1. High boiling point
2. Small molecules



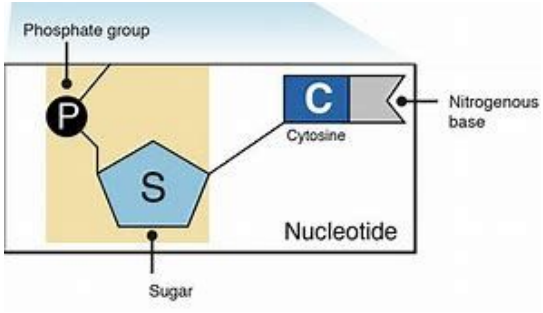
Biosensors can detect the chemicals in a solution:

- Device that uses a biological molecule such as enzyme to detect a chemical
- Biological molecule produces a signal which is converted to an electrical signal by transducer
- Electrical signal is then processed and can be used to workout the other information
- E.e. glucose biosensors : using the enzymes glucose oxidase and elctrodes. The enzyme catalyses the oxidation of glucose at the elctrodes, this creates a charge which is converted into the signal by electrodes

Chromatography :

1. Draw a line with pencil at the bottom of the page and put a concentrated spot of the mixture of the amino acids (roll the paper so that the spot will stand)
2. Add small amount of prepared solvent glacial ethanoic acid and waer is usually used for amino acids. Dip the paper in it and should be done in the fume cupboard. Cover with lid to stop it from evaporating
3. As solvent spreads different amino acids move up at different rates
4. When the solvent reached neary top take it out and leave it out to dry
5. Spray the paper with ninhydrin solution to turn them into purple so you can see

Nucleotides:



- A type of biological molecule
- Made from, pentose sugar (sugar with 5 carbon atoms), nitrogenous and a phosphate group
- Contains carbon, hydroge,oxygen and phosphorous