## Monomers and Polymers

Monomers are the smaller units from which larger molecules are made

Polymers are molecules made from a large number of monomers joined together

## Disaccharides

| | |
|---|---|
| Maltose | Glucose and Glucose |
| Sucrose | Glucose and Fructose |
| Lactose | Glucose and Galactose |

## Amylose

Polymer of alpha glucose

Coiled, alpha-helix structure

Not branched

1-4 glycosidic bonds only

Insoluble so doesn't affect water potential

Compact so a lot can be stored in a small space

Function: energy storage in plants

## Glycogen

Function: energy storage in animals

Polymers of alpha glucose

Branched structure, but more ends than amylopectin to reflect higher metabolic activity of animals

1-4 and 1-6 glycosidic bonds

Insoluble so doesn't affect water potential

Compact so a lot can be stored in a small space

Many ends can be acted on simultaneously by enzymes

## Test for sugars

Benedict's test for reducing sugars involves boiling with Benedict's solution, and the positive result is a coloured (non-blue) precipitate

Test for non-reducing sugars involves boiling with HCl, neutralising with NaOH and then repeating the Benedict's test

## Functions of Carbohydrates

Source of energy

Structural Components

Storage Compounds

Metabolite

Transport

Cell Recognition

## Condensation reactions of carbohydrates

Condensation reactions between monosaccharides forms glycosidic bonds

## Amylopectin

Function: energy storage in plants

Polymer of alpha glucose

Branched structure

1-4 and 1-6 glycosidic bonds

Large so insoluble so doesn't affect water potential

Many ends that can be acted on by enzymes to hydrolyse quickly

## Cellulose

Function: Structural components of plant cell walls

Polymer of beta glucose

Chains of alternately inverted beta glucose units

Hydrogen bonds between the chains increases collective strength

Forms microfibrils and then fibril structures which increases tensile strength

Long chains form a mesh structure and so the cell wall is permeable

## Test for starch

Add iodine solution to the sample

A positive result is a blue/black solution

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Add iodine solution to the sample

A positive result is a blue/black solution



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