CHIRUMALAR SCHOOL
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Presentation on

1.STARCH

and

2.CELLULOSE

WHAT IS STARCH ?

- Starch , a white, a granular, organic chemical that is produced by all green plants.
- Starch is a soft, white, tasteless powder that is insoluble in cold water, alcohol or other solvents.
- The basic chemical formula of the starch molecule is $(C_6H_{10}O_5)_n$

Starch – sources –fractions

- Starch is used for energy storage in plants.
- Potatoes, corn, wheat and rice are sources of starch.
- It is a polymer of glucose in which glucose molecules are lined by α(1,4) glycosidic bonds.
- Starch can be separated into two fractions namely, water soluble amylose and water insoluble amylopectin.
- Starch contains about 20 % of amylose and about 80% of amylocpectin.

Starch – Amylose – Amylopetin

- Amylose is composed of unbranched chains up to 4000 α-D-glucose molecules joinedby α(1,4)glycosidic bonds.
- Amylopetin contains chains up to 10000 α-D-glucose molecules linked by α(1,4)glycosidic bonds.
- In addition, there is a branching from linear chain.
- At branch points, new chains of 24 to 30 glucose molecules are linked by α(1,6)glycosidic bonds.
- With iodine solution amylose gives blue colour while amylopectin gives a purple colour.

STRUCTURE OF STARCH

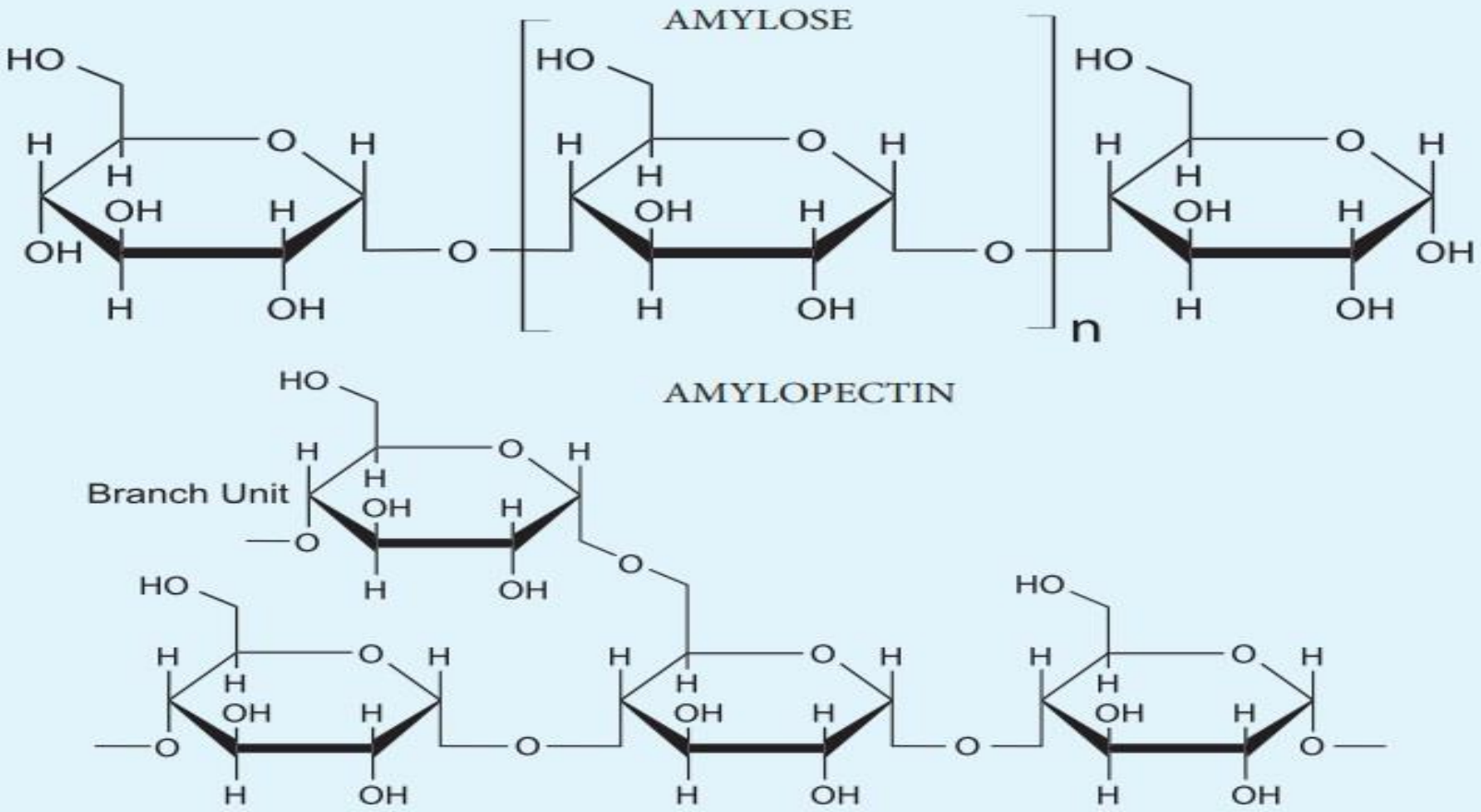
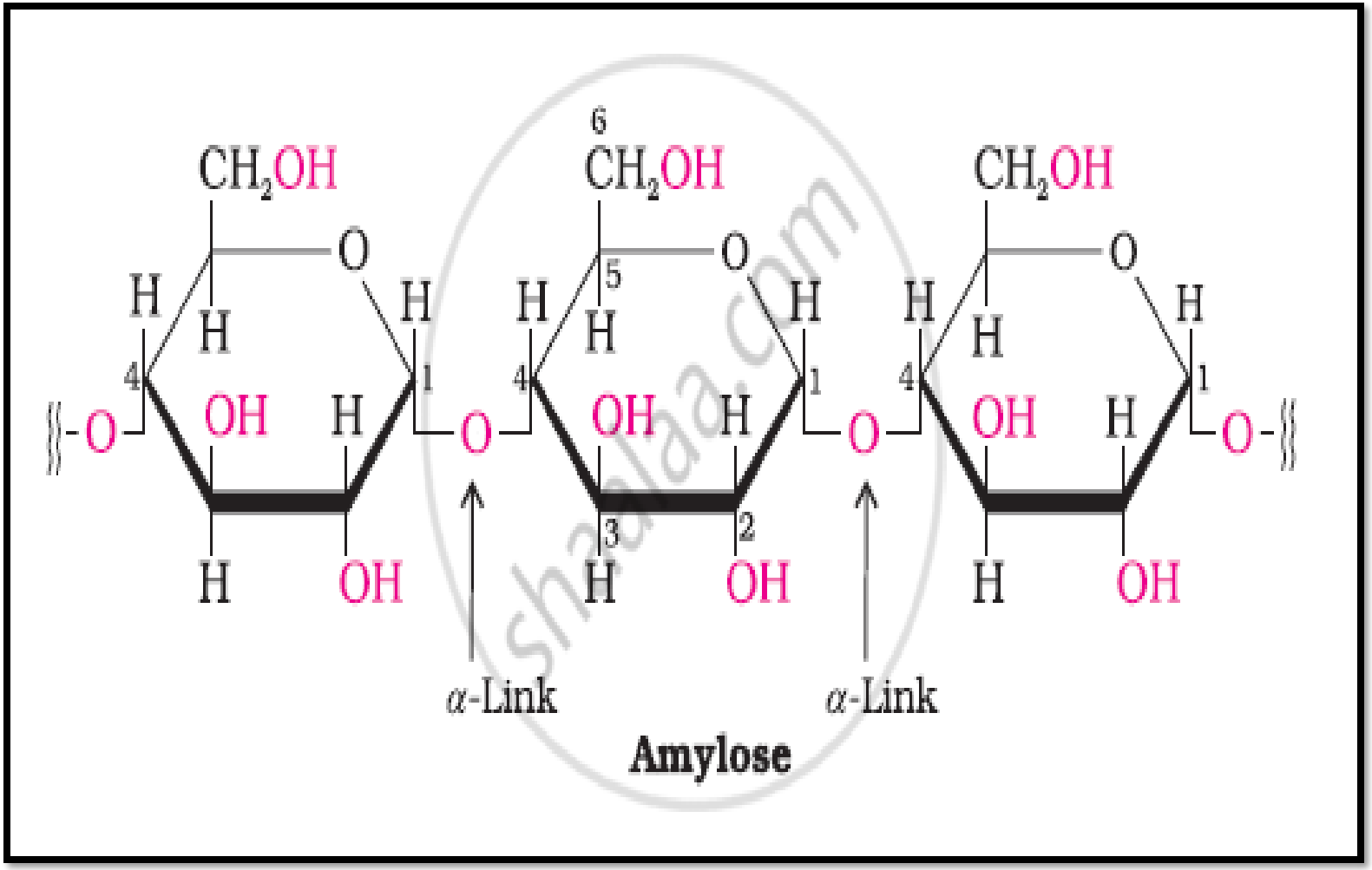


Figure 14.12 Structure of Starch (Amylose & Amylopectin)



α(1,4)glycosidic bond

What is cellulose?

- A Natural substance that forms the cell walls of all plants and trees are used in making plastics,papers etc.
- Cotton is almost pure cellulose.
- On hydrolysis cellulose yields D-glucose molecules.
- Cellulose is astraight chain polysaccharide.The glucose molecules are linked by β(1,4)glycosidic bond.
- Cellulose general formula is $(C_6H_{10}O_5)_n$.

Structure of cellulose

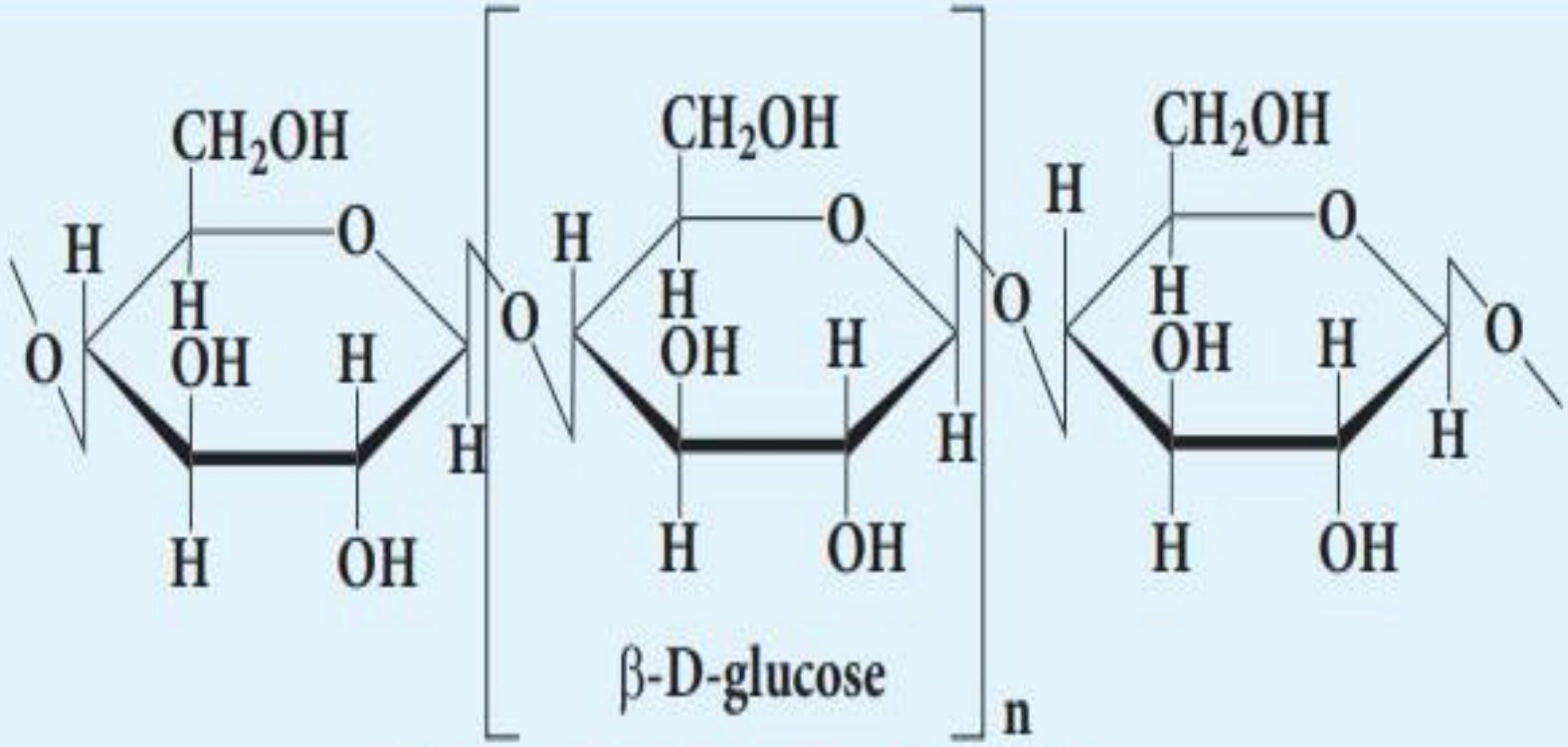


Figure 14.13 Structure of Cellulose

Difference Between Starch And Cellulose

Properties	Starch	Cellulose
Alpha/Beta	2 types of alpha glucose	1 type of beta glucose
Connection	By alpha linkage	By beta linkage
Digestion	Easily digested	Difficult to digest
Solubility	Dissolves in warm water	Does not dissolve in water

Difference Between Starch And Cellulose

Properties	Starch	Cellulose
Strength	Weaker than cellulose	Strong
Crystalline	Less crystalline	More crystalline than starch
Consumption	Can be consumed by humans	Cannot be consumed by humans
Linkage	Starch has alpha 1,4 linkage	Cellulose has beta 1,4 linkage
Uses	Plants use starch to store energy	Plants use cellulose to support structure

Sources

https://en.wikipedia.org/wiki/Starch
https://en.wikipedia.org/wiki/Cellulose