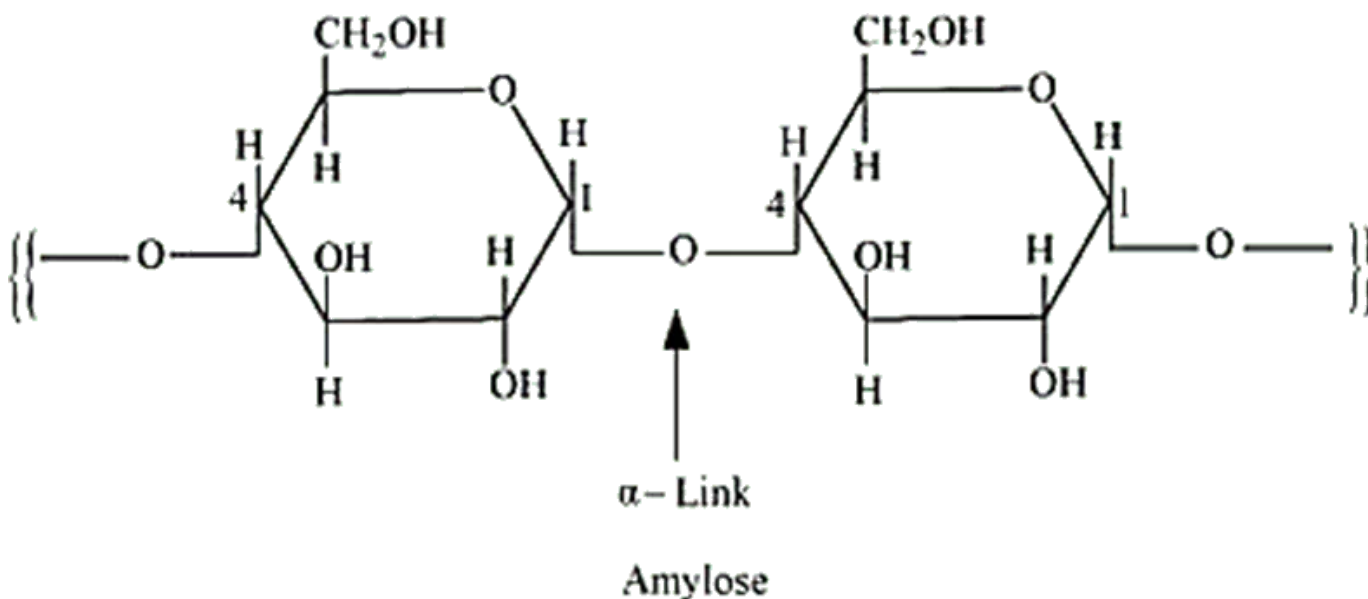


Chemistry Class 12 NCERT Solutions: Chapter 14 Biomolecules Part 3

Q: 8. What is the basic structural difference between starch and cellulose?

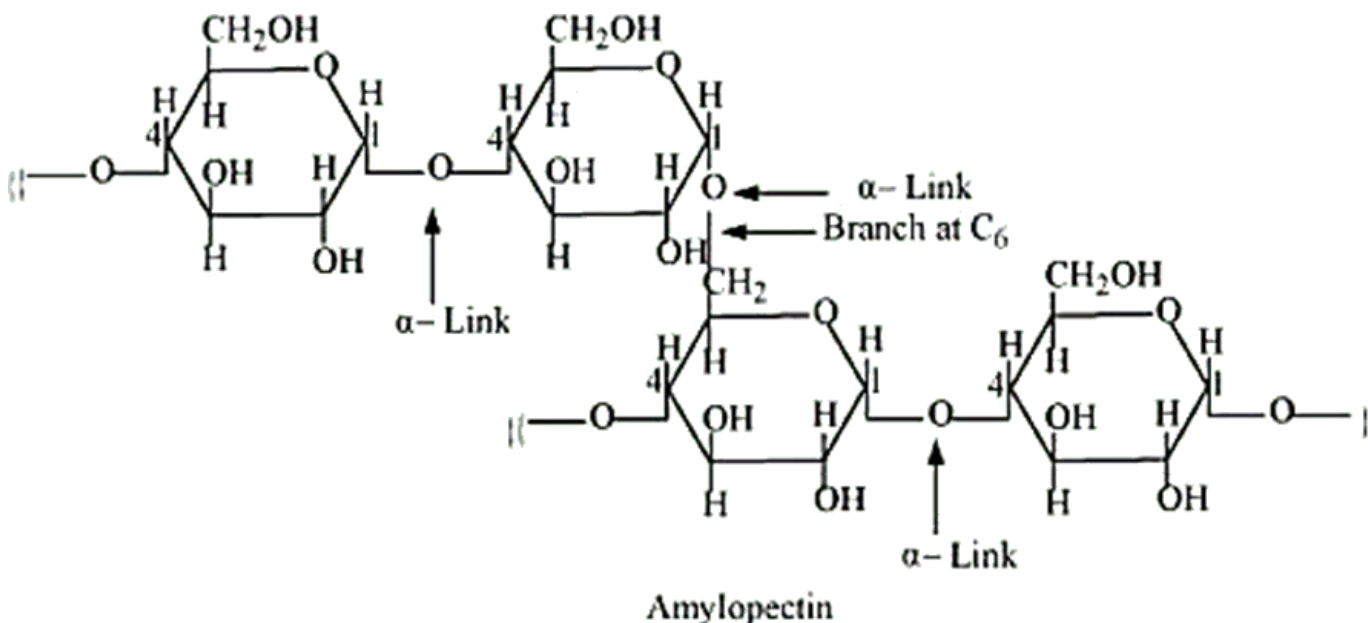
Answer:

Starch consists of two components – amylose and amylopectin. Amylose is a long linear chain of α -D-(+)-glucose units joined by C1 – C4 glycosidic linkage (α -link).



Q 8 1 Basic Structural of Starch and Cellulose

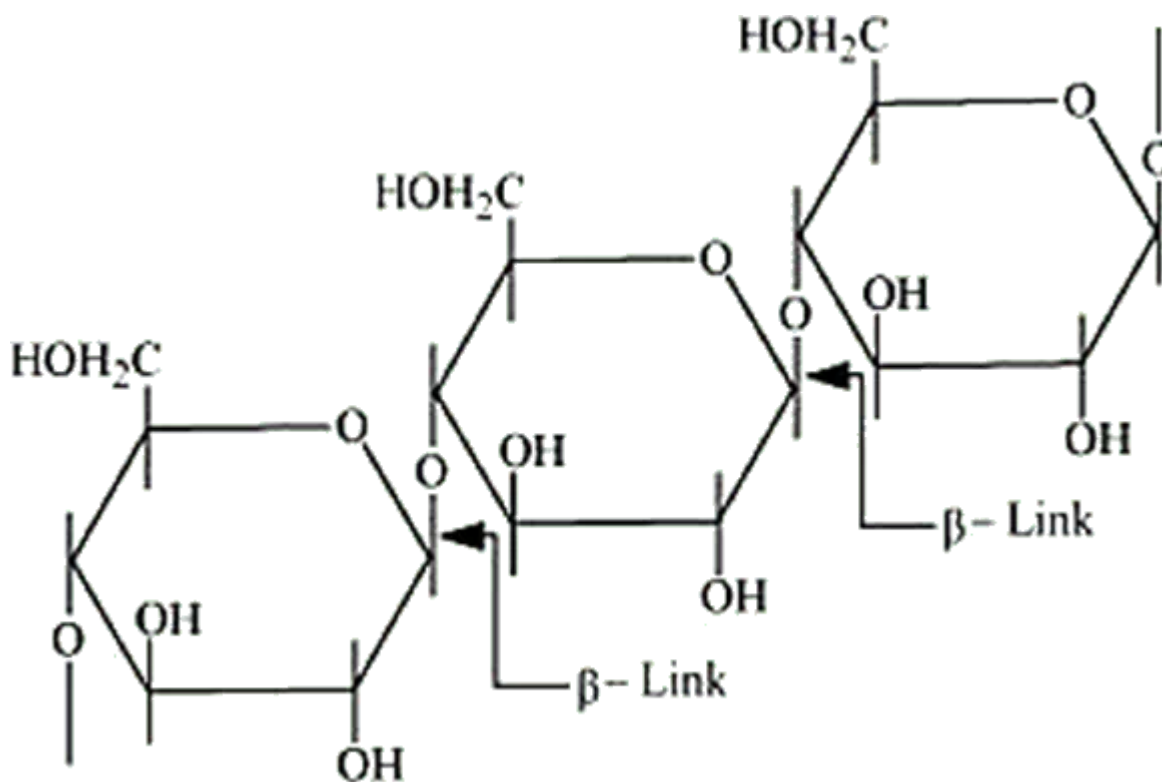
Amylopectin is a branched-chain polymer of α -D-glucose units, in which the chain is formed by C1 – C4 glycosidic linkage and the branching occurs by C1 – C6 glycosidic linkage.



Q 8 2 Basic Structural of Starch and Cellulose

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On the other hand, cellulose is a straight-chain polysaccharide of β - D - glucose units joined by C1 - C4 glycosidic linkage (β - link)



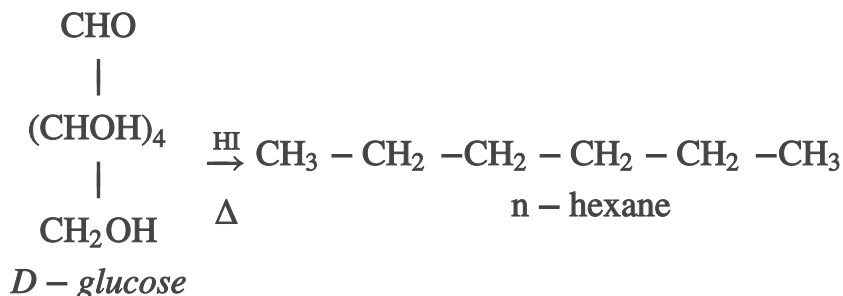
Q 8 3 Basic Structural of Starch and Cellulose

Q: 9. What happens when D-glucose is treated with the following reagents?

- (i) HI
- (ii) Bromine water
- (iii) HNO₃

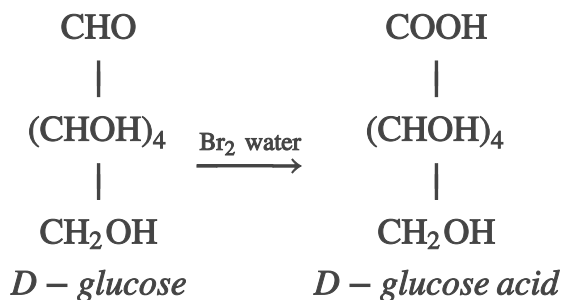
Answer:

(i) When D-glucose is heated with HI for a long time, n-hexane is formed.

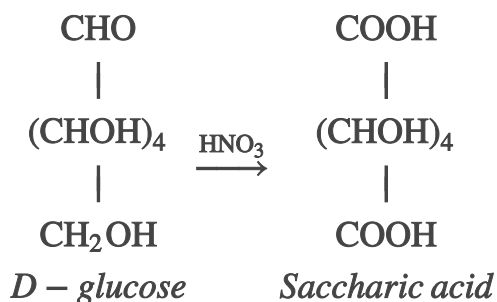


(ii) When D-glucose is treated with Br₂ water, D- gluconic acid is produced.

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(iii) On being treated with HNO_3 , D-glucose get oxidised to give saccharic acid.



Q: 10. Enumerate the reactions of D-glucose which cannot be explained by its open chain structure.

Answer:

(1) Aldehydes give 2, 4 – DNP test, Schiff's test, and react with NaHSO_4 to form the hydrogen sulphite addition product. However, glucose does not undergo these reactions.

(2) The pentaacetate of glucose does not react with hydroxylamine. This indicates that a free –CHO group is absent from glucose.

(3) Glucose exists in two crystalline forms – α and β . The α – form (m. p. = 419 K) crystallises from a concentrated solution of glucose at 303 K and the β – form (m. p = 423 K) crystallises from a hot and saturated aqueous solution at 371 K. This behaviour cannot be explained by the open chain structure of glucose.

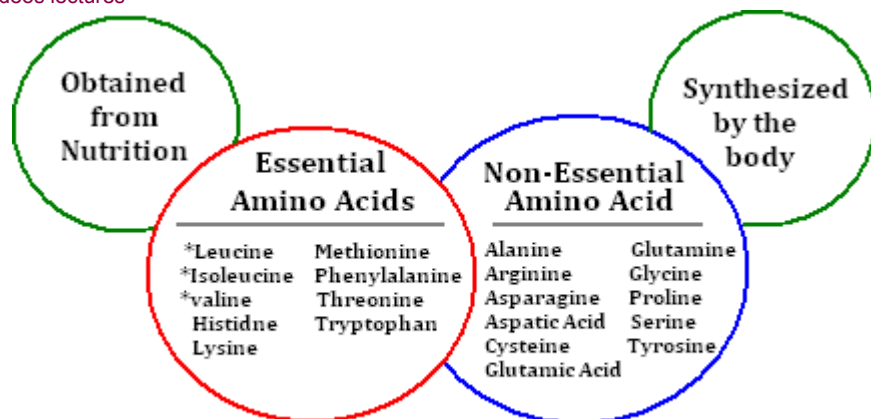
Q: 11. What are essential and non-essential amino acids? Give two examples of each type.

Answer:

Essential amino acids are required by the human body, but they cannot be synthesised in the body. They must be taken through food. For example: valine and leucine.

Non-essential amino acids are also required by the human body, but they can be synthesised in the body. For example: glycine and alanine.

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Amino acid in human body

Q 11 Amino Acids in Human Body