

Prof ANIL KUMAR zoology
B.Sc HONS Part-III Paper-VI

Topic: Give an account of various steps of Glycolysis

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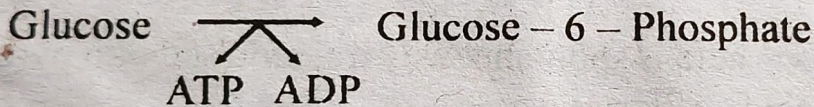
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Q. ■. Give an account of various steps of Glycolysis.

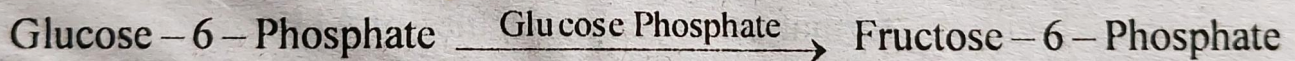
Ans. Glycolysis is a process by which glycogen or glucose or other sugars are converted into pyruvic acid. This process occurs in the cytoplasm of the cell. This process does not utilize oxygen. Hence this is an anaerobic process. This is also called Embden Meyerhof pathway.

Steps in glycolysis :

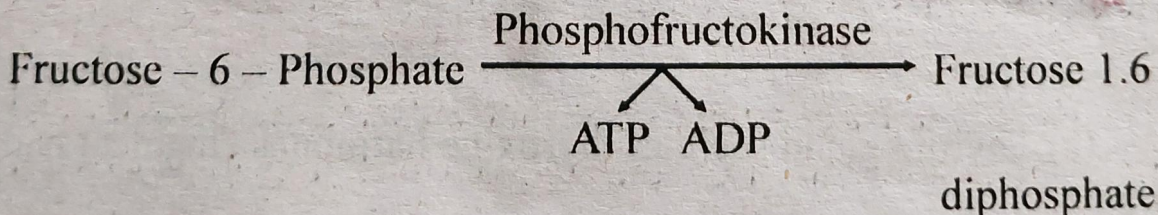
1. Glucose is phosphorylated by ATP in the presence of glucokinase to form glucose-6-phosphate.



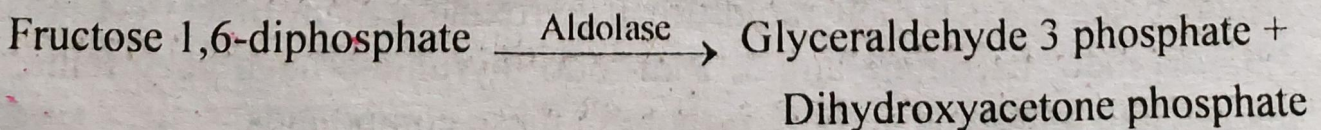
2. Glucose-6-phosphate is then converted into fructose 6-phosphate by the enzyme glucose phosphate isomerase.



3. Fructose-6-phosphate is then phosphorylated by ATP in the presence of phosphofructokinase to form fructose 1,6-diphosphate.



4. The fructose 1,6-diphosphate is split into two substances namely glyceraldehyde 3 phosphate and dihydroxyacetone phosphate.



5. The two molecules of glyceraldehydophosphate are phosphorylated and oxidised into two molecules of 1,3-diphosphoglyceric acid, catalysed by the enzyme phosphoglyceraldehyde dehydrogenase. NAD and inorganic phosphates are required.

Glyceraldehyde 3 phosphate $\xrightarrow{\text{Aldolase}}$ 1,3 diphosphoglyceraldehyde

1,3 diphosphoglyceraldehyde $\xrightarrow{-2H}$ 1,3-diphosphoglyceric acid

6. 1,3 diphosphoglyceric acid is converted into 3 phosphoglyceric acid by means of phosphoglycerate kinase in the presence of Mg^{++} .

1, 3-diphosphoglyceric acid $\xrightarrow[\text{ATP} \rightarrow \text{ADP}]{Mg^{++}}$ 3 phosphoglyceric acid.

7. 3-phosphoglyceric acid is converted to 2-phosphoglyceric acid by the enzyme phosphoglyceromutase utilizing 2,3 diphosphoglycerate as coenzyme.

3 Phosphoglyceric acid $\xrightarrow[\text{glycomutase}]{-2H}$ 2 Phosphoglyceric acid

8. 2 phosphoglyceric acid is converted into phosphoenol pyruvic acid by dehydration in the presence of enolase.

2 phosphoglyceric acid $\xrightarrow{\text{Enolase}}$ phosphoenol pyruvic acid