

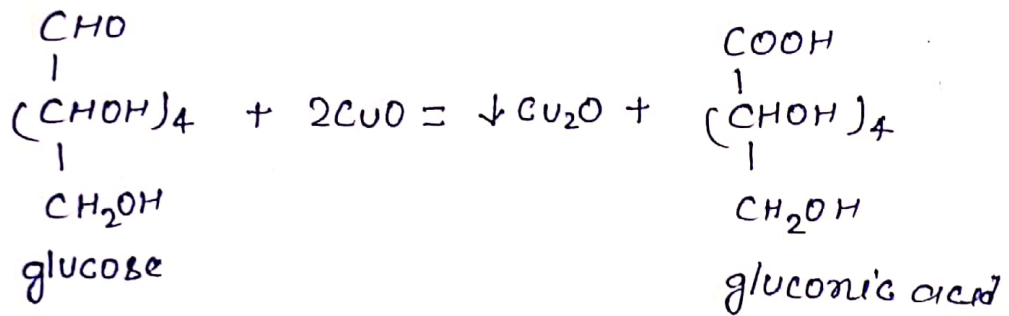
SUBJECT - CHEMISTRY  
CLASS - B.Sc (Sub/Gen) PART - II  
GROUP - C

TOPIC - The reactions of glucose with Fehling's Solution

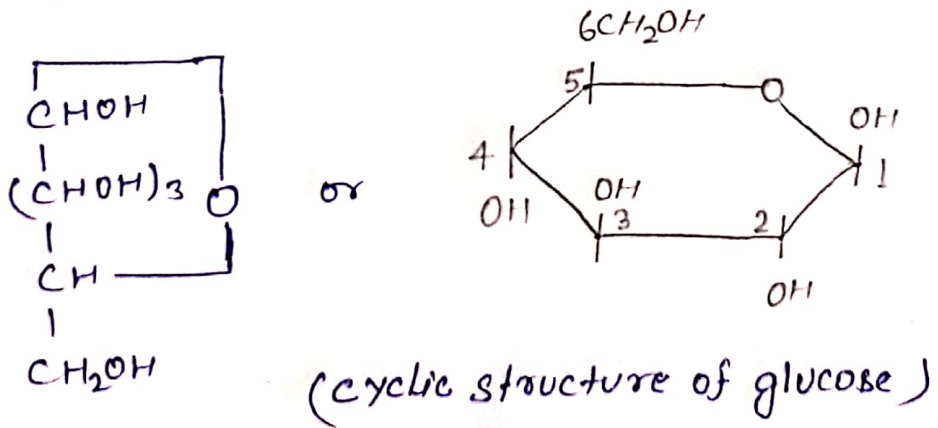
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Q Discuss the reactions of glucose with Fehling's Solution and Schiff's reagent.

Ans When glucose solution is warmed with Fehling's solution, red ppt of Cu<sub>2</sub>O is obtained just like aldehydes -



Glucose does not restore the pink colour of Schiff's reagent which shows that its aldehydic (-CHO) group is not free, rather it is involved in cyclisation with C<sub>5</sub> as shown below



Q Discuss the evidences against open chain structure of glucose.

- Ans (a) Even though an aldehydic group is present in glucose. It neither forms a bisulphite adduct, nor restores the pink colour of the Schiff's reagents.
- (b) Glucose exists in two isomeric forms:  $\alpha$  and  $\beta$ -glucose.  $\alpha$ -glucose has the specific rotation of  $+112^\circ$ . It is obtained by crystallising glucose from alcoholic solution.  $\beta$ -glucose has the specific rotation of  $+19^\circ$ . It is obtained by crystallising glucose from pyridine solution. This has also been confirmed by the formation of two isomeric  $\alpha$  and  $\beta$ -methyl glucosides on heating glucose with methanol and dry  $HCl(g)$ .
- (c) An aqueous solution of glucose shows mutarotation i.e. its specific rotation gradually falls from  $+112^\circ$  to  $52.5^\circ$  in case of  $\alpha$ -glucose and rises from  $+19^\circ$  to  $52.5^\circ$  in case of  $\beta$ -glucose.