A reducing sugar is a carbohydrate that is oxidized by a weak oxidizing agent (an oxidizing agent capable of oxidizing aldehydes but not alcohols, such as the Tollen’s reagent) in basic aqueous solution. The characteristic property of reducing sugars is that, in aqueous medium, they generate one or more compounds containing an aldehyde group.

eg. 1: α-D-glucose, which contains a hemiacetal group and, therefore, reacts with water to give an open-chain form containing an aldehyde group.

\[
\text{H}_2\text{O} \rightarrow \text{H}_2\text{O} \rightarrow \text{oxidizing agent} \rightarrow \text{H}_2\text{O}
\]

eg. 2: β-D-glucose, which contains a hemiacetal group and, therefore, reacts with water to give an open-chain form containing an aldehyde group.
eg. 3: α-D-fructose, which contains a hemiketal group and, therefore, reacts with water to generate an open-chain form, which, in basic medium, is converted to compounds containing an aldehyde group.
eg. 4: maltose, which contains a hemiacetal group and, therefore, reacts with water to generate an open-chain form containing an aldehyde group.
see also nonreducing sugar

Contributors

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