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Sucrose

Sucrose is the ordinary table sugar which we eat everyday.

The most important sources are sugar cane and sugar beets. other sources are maple saps, honey and fruit juices. The primary use of sugar is as food in various forms.

Constitution or Structure of Sucrose.

(1) Elemental analysis and molecular weight determination show that the molecular formula of sucrose is $C_{12}H_{22}O_{11}$.

(2) On hydrolysis with acids or enzymes, sucrose gives equal parts of D-Glucose and D-fructose, which

thus constitute the two monosaccharide units of sucrose

(3) Sucrose neither reacts with phenylhydrazine nor reduce fehling's solution indicating that the carbonyl group of both the monosaccharides are involved in linkage. i.e- the glucose is linked via its C_1 ($-CHOH$) to the C_2 ($CH_2OH-\underset{|}{C}-OH$) of fructose.

(4) Sucrose is hydrolysed by maltase but not by emulsin. thus indicating an α-D-glucose unit. On the other hand, sucrose is also hydrolysed by an enzyme takainvertase which is believed to be specific for β-fructofuranosides thus indicating a β-D-fructofuranose unit in sucrose. The above stereochemical aspects has been confirmed by Hudson's isorotation rule.