

SH 12% اظہار حیات

① Mono sugars = ① sugar acids "Oxd sugars"

→ done by oxd agents :-

① Weak. → For c # 1 "easy convert C⁰ to cooh "1 step" → "rate" → sonic Acid.

② strong → For c # 1 → 1 step "C^P"
"KMnO₄, OsO₃" → c # 6 → 2 step "Roff"

③ enzyme → For c # 6 No c # 1 → Aric Acid

→ this Formalose

→ uric Acid.

but For ketose → we convert ketose to aldose by transfer e for c # 2 to c # 1, "indirect oxd"

→ (chemical test) ① Benedict → ⊕ For aldehyde
"Cu⁺²" precipitate Red.

② Tollens test → ⊕ For aldehyde.
"Ag(NH₃)⁺²" precipitate (Ag⁺) as mirror.

→ this test gives lactone "produced by oxd. cyclic ester, contain. cooh + oH groups".

* Note = Vitamin C "ascorbic Acid" → unsaturated lactone

→ important for immune system and act as anti-oxidant and for collagen.

When vitamin C oxidized by air, it becomes inactive

→ leads to scurvy + ↓ collagen → tears for tissues

② Sugar Alcohols = "secondary Alcohol produced by Reduction of Ketose. ex: D-sorbose → D-sorbitol"

③ Deoxy Sugars = Reduced sugars "-O₂, → +H₂"
→ in DNA → it is deoxy sugars derived from Ribose "ATP"
in c # 2 "Ribose → RNA.
deoxy Ribose → DNA"

④ Sugar esters = +Pou⁻³ at c # 6 or c # 1.

→ c # 6 → gives G6P-B. by phospho ester linkage.

→ c # 1 → gives G1P-D. by phospho acetal linkage.

⑤ Important Note = +Pou⁻³ to the c # 6 → important for glycolysis

→ in general ⇒ phosphorylation is important for metabolism +Pou⁻³

⑥ glycosides = 2 types

↳ o-linkage
↳ N-linkage

→ A o-linkage =

⇒ Between o in c # 1 "anomeric carbon" with oH Group in other molecule by glycosidic bond, this bond is important to give other molecule, like polysaccharide, disaccharide.

→ B N-linkage = c # 1 "anomeric" with NH Group ⇒ it "N-linkage" present in DNA and RNA "c # 2 with N in sugars".

glycosides = can be → A Purinosides "5.c" =

↳ this sugar derived from Puranose.

B pyriminosides "6.c" → derived from pyranoses.

⑦ Amino sugars = c # 2 → Replacing oH by NH₂ Group.

→ 2-glucosamine → from glucose + c=c by Amide bond.
2-galactosamine → from galactose + c=c by Amide bond

Sialic Acid = N-acetylneuraminic acid → derived from N-acetylamine

with acetyl group at c # 4 by amide bond

Disaccharides = 2 monomers of sugars. → dehydration reaction

Sugars	units	Bonds	Refining Sugars	Nature
Sucrose	α-D-glucose "Glc" with D-Glc β-D-Fructose "Fru"	α, β "1-2"	No	Yes
Lactose "milk sugar"	β-D-galactose D-glucose	β (1-4)	Yes	Yes
Maltose	α-D-glucose D-glucose	α (1-4)	Yes	Yes

① Sucralose = artificial one → it likes sucrose, but displeased off by GI.
used for people who need to lose weight, and resort at sweet bread like splend.

Clinical problems = ① lactose intolerance * → people can't drink milk.
→ enzyme called lactase = "β-galactosidase". From intestinal cells → Stark Gain

→ Lactose deficiency → lactase in intestinal → diarrhea "flou"
we can avoid this problems by drink yogurt or eat cheese or drink milk
that contain ↑ lactase or contain ↓ lactase.

② galactosemia → "genetic problem" = galactose accumulation, then galactose
convert to alcohol called gal-fetal → braks osmotic pressure → damaged cell

⇒ galactosemia causes = problems in Brain with ① Retardation. ② Cataract.

Oligosaccharides "3-10 Sugars" =

① Raffinose = made from 3 sugars "galactose, glucose, fructose" by 1,6 and 1,2 glycoside bonds.
↳ when we eat "Raffinose", it causes blatting "flat"
→ because of α-galactosides.

We use oligosaccharides as drugs =
① antibiotics → streptomycin + gentamicin

② cancer therapy → Doxorubicin.

③ C.V.D → Digoxin.