not mitochondria.
present.

Glucose uptake
Km value low

Glut-4

- Skeletal, cardiac Tissue.
- Km - 5 (90-70)

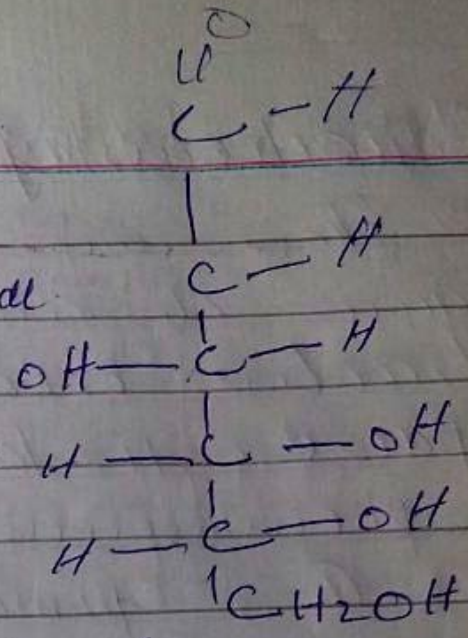
Gluct-5

Fructose absorption.

⇒ Na^+ Glucose Transport (Simporter) pump
- Energy required.
- inside cell

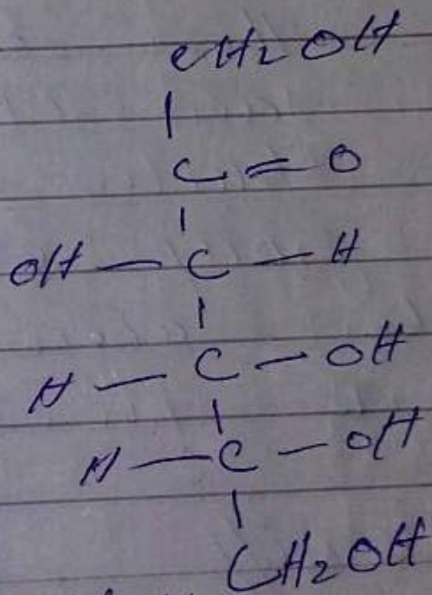
store
↓
Lymphatic syst
↓
Blood.

Glucose



60 – 110 mg/dl
starving
80 – 140 mg/dl.

· Ketonic form
fructose.



→ in fruit available.

→ lactose
disaccharide
4.5 – 5%
in milk
sugar

— B-glucose homopolys—
— produce bacteria.
Leuconostoc mesentroict

— sucrose as a E.
— polymerisation.
— formed Dextrain
— osmotic p low.

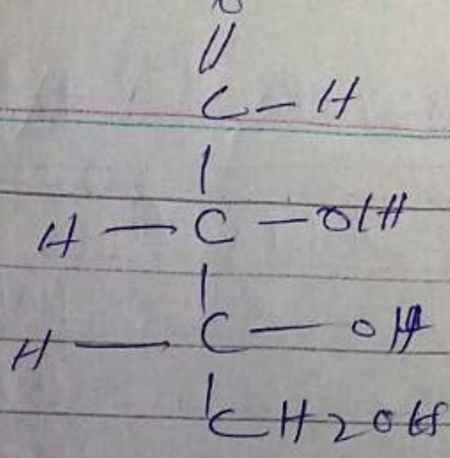
Hypovolemic shock.
Severe loss of blood during accident.
— Blood transfusion agent used.
— Desentigration rate low.

Disadvantages
— not Grouping ABO
— not aglutinati

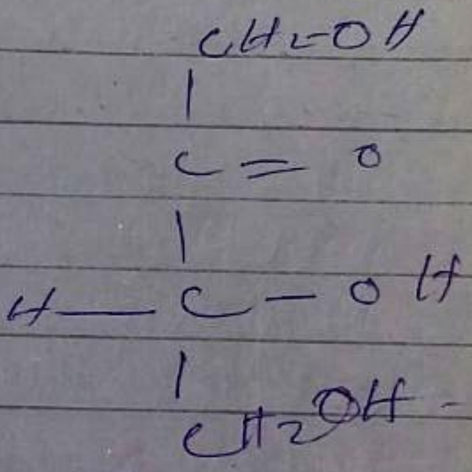
Heteropolysaccharides
Different made up of simple repeating units of carbohydrate.

Tetrose

Aldehyde erythrose



Ketonic form erythrulose



Ribose

Aldehyde

one c

add.

Ribulose

one c

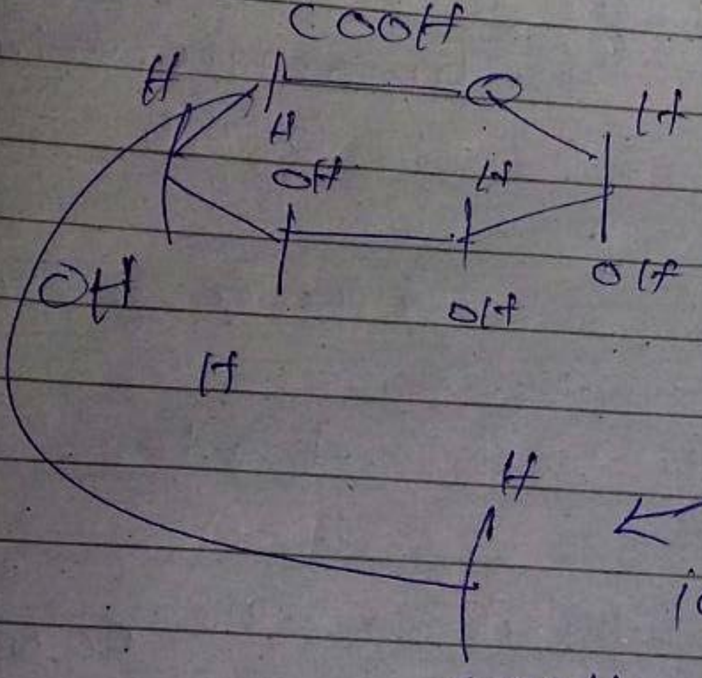
add.

5C

DNA, RNA

Reducing Agent.

i) C-4 sulphated.
ii) C-4 " (Keratin sulph...



← Gluconic acid

← ichronic acid

Corleeration sulph...

(iii) Sulphate by C-6
→ Gluconic acid
– anticoagulant.
β-Heparin. property

(iv) D- Shark cartilage separated,

C2 or 3 sulphated

Dextrorotatory D-Glucose

$\underline{\underline{5C}} = H-C-OH$

→ OH Right side

L-Glucose

If 5C rotate
OH on left side
reversing H and
OH changed of
chiral carbon.

mutase
enzyme
changed D to
L

most of OH on Right
side have D-Glucose
If left side
L-Glucose

⟹ sign

degree of
rotation
90°

2-17

5% $CuSO_4$ soluti

5g ⟶ first 20ml. 2nd. upto 100

70% ethanol soluti

v/v 70% ethanol
30% water.

5g 5% NaCl in NaOH.
5g in 95g NaOH

② **Molar Solution:-** M

no. of moles of solute dissolve in 1 litre / dm

$1L = 1dm^3 = 1000ml = 1$

$$M = \frac{\text{the no. of moles of solute}}{1 dm^3 \text{ of solution}}$$

$$M = \frac{\text{mass of solute}}{\text{Formula mass of solute}} \times \frac{1}{1 \text{ lit}}$$

Spectroscopy measurement

→ Glucose + Galactose
→ 2 Glucose.
→ 2 glucose.
convert into
monosacharid
Absorption occur in
monosacharide form.
→ Diffusion — High → low
fasilit — → Transport sys
— Glut 1, 2, 3, 4, 5
Glucose Transporter, — 17
Glut – 1 – kidney.
– RBCs.
Through carrier protein
pinle state.
— low Km value
for uptake.

Glut. 2
Liver pancreas,
Km value more
glucose level High.

Glu – 3
Brain, Neuro cell, RBC.
Km value lowest.

decarboxylase.
E_1

Pyruvate Dehydrogenase (14-3-17)

Pyruvate
↓
acetyl coA

complex
→ (E_1, E_2, E_3)

$CH_3-\overset{O}{\overset{\|}{C}}-SH-L-SA$.

— FAD → $FADH_2$
— NAD → Niacin vitamin.
— TPP

2 - Acetyl CoA
2 - NADH

$CH_3-\overset{O}{\overset{\|}{C}}-SCoA$ (2C)
↓ Kreb cycle consu

$CH_3-\overset{O}{\overset{\|}{C}}-SCoA$ (2C) +

COOH
|
CH_2 (4C)
|
C=O oxaloacetate
|
COOH

citrate synthase

↓

COOH
|
CH_2
|
(OH) — C — COOH
|
CH_2
|
COOH

citrate (6C)
↓
Irreversible
Energetic Reactions

(Regulate)

molar c

$$pH = pKa + \log \frac{(Salt)}{(Acid)}$$

pKa = Titration.

Surface Tension quality log k

weak acid

Difference marginal CH_3COOH (4.6) pk

Basic buffer

NH_4OH weak base

NH_4Cl → HCl. Strong Acid.

Na c

Stro

Acid

conjuga

Buffering

make

pKa, pk

one …

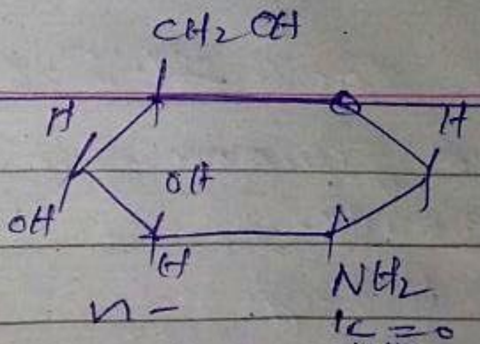
above …

below …

Make 0.5 molar acet

Buffer when pH 4.8

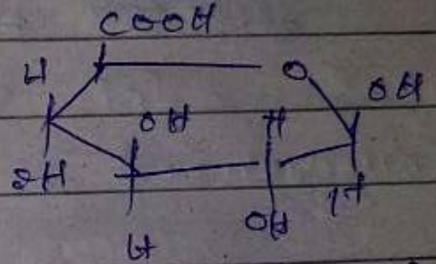
pKa 4.6 for some



n-

n-acetyl Glucosamine

D-Glucosmican



β, 1,3 – B, 1,4 linkage

Functions:

- Lubricating agent
- Spindle fibre.
- Arthritis, injection
- Hyaluridase.

Beneath skin layer

Digest.

- Semelian fluid
- Help in fertilis
- Hyaluronic acid digest
- Amphibian (morphos

Normal Solution:

$$N = \frac{\text{The no. of equivalent solute}}{1\ dm^3 \text{ of soln.}}$$

$$\text{no. of Equivalent} = \frac{\text{mass of solute}}{\text{Equivalent mass}}$$

$$\text{Equivalent mass} = \frac{\text{Formula mass of solute}}{n}$$

n = The no. of replaceable H+ ions in case of acids. OH⁻ ions in case of bases, cation in salt

$HCl = n = 1$

$H_2SO_4 = n = 2$

$H_3PO_4 = n = 3$.

$NaOH = n = 1$

$CaOH = n = 2$

$Al(OH)_3 = 1$

$$N = \frac{\text{mass of solute}}{\frac{\text{formula mass of solute}}{n}} \times \ldots$$

Principles of Biochemistry 6-2-17

Solution

Homogeneous mixture of

Measure - 4 ways.

1- Percentage solution

2- Molar Solution.

3- Normal solution

4- Molal solution

① Percentage solution.

① $\frac{\text{weight of solute (g)}}{\text{volume of solution (ml)}} \times 100$ % w/v

% v/v

%

Solute Solute

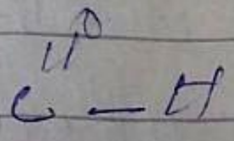
Ingredient which has capacity to dissolving in Solution

2) v/v $\frac{\text{Volume of solute (ml)}}{\text{Vol. of solution}} \times 100$

3) w/w $\frac{\text{weight of solute}}{\text{weight of solution}} \times 100$

Principles of Biochemistry 13-2-17

carbohydrate

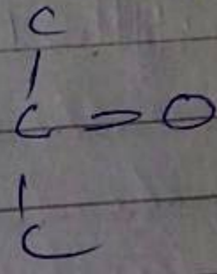


Poly-Hydroxy

Having 3-

— Aldehyde

— Ketone group.



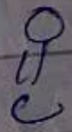
→ Glucose

Sucrose

maltose.

carbon

group



monosaccharides?

Alde —

keto —

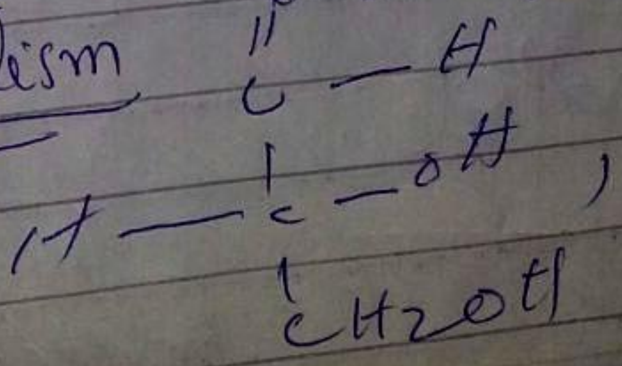
Trioses.

— Glyceraldehyde

— Dihydroxyac alo

Glucose metabolism

aldehyde



$\underline{58.5}$

make 1N soln of NaCl.
for 1L of solution -

$$1N = \frac{\text{mass of solute}}{49} \times \frac{1}{1}$$

mass of H_2SO_4 = 49g

$$V = \frac{m}{d}$$

$$V = \frac{49}{1.8} =$$

$$N = \frac{\text{mass of solute}}{\text{Equivalent mass}} \times \frac{1}{\text{Litre}}$$

Molal Solute.

no. of moles of solute dissolved in one kg

molality = m.

$$m = \frac{\text{The no. of solute}}{\text{1kg of solvent}}$$

$CH_3COOH \rightarrow 60g$

Buffer = Acid + salt

salt = x

0.5 = Acid + x

Acid = 0.5 − x

$$pH = pK_a \log \frac{(salt)}{(Acid)}$$

$$= \frac{(x)}{(1-x)}$$

pH

$$4.8 - 4.6 = \log \frac{(x)}{(1-x)}$$

$$0.2 = \log \frac{(x)}{(1-x)}$$

$$\text{Antilog } 0.2 = \frac{(x)}{(1-x)}$$

$$1.58 = \frac{(x)}{(1-x)}$$

$1.58(1-x) = x$ (1.05)

$1.58 - 1.58x = x$

$1.58 = x + 1.58x$

$= x(1+1.58)$

$= x(2.58)$

$x = \frac{1.58}{2.58}$

$x = 0.612\ M$

Salt = 0.612M

Acid = (1 − 0.612)

= 0.388 M

$M_a = \frac{\text{mass of acid}}{\text{formula mass of A}} \times \frac{1}{\text{dm}^3}$

$0.388 = \frac{\text{mass}}{60} \times \frac{1}{0.5}$

mass = 11.64/1.05 = 11.08 m

$$m = \frac{\text{mass of solute}}{\text{formula mass of solute}} \times \frac{1}{\text{1kg of sol}}$$

make 0.5 molal solution of NaOH - for 500 kg soln.

$$0.5 = \frac{\text{mass of NaOH}}{40} \times \frac{1}{0.5\,kg}$$

mass of NaOH = 0.5 × 40 × 0.5

= 10 g.

+

500 ml water

~~Starch~~ S

Stock solution

maximum known conc. of a solution.

make 0.2 molar solution of NaOH for 500mL solution

$$0.2 = \frac{\text{Mass NaOH}}{40} \times \frac{1}{\substack{\text{Volume} \\ 0.5}}$$

$$\frac{500}{1000} = 0.5$$

mass of NaOH = 0.2 × 0.5 × 40 = 4g
I took 4g NaOH.

Make 0.5 molar solution of H_2SO_4 for 600 ml of solution.

98

$$0.5 = \frac{\text{mass of } H_2SO_4}{98} \times \frac{1}{0.6\text{ml}}$$

$$= 15.97$$

$$V = \frac{m}{d}$$

$$0.5 \times 98 \times 0.6 = 29.4$$

$$\frac{29.4}{1.84} = 15.97\text{ml}$$

Biochemistry

28-02-17

→ Chondroitin Sulphate
N- acetyl Galactosamine
+ Glucornic acid
β 1,3 , β 1,4

→ cornea, eyes
Non - sulphate group

Keratin sulphate.
— wall of Aorta.

" " Glucosamine (C sulph
+ Galactose

Type 1 → Aspargine
N-Glycosidic
linkage
cartilage

Type 2 → K.S → O- Glycosidic
serine, throni

Skelleton tissue

Make of 0.1 M solution of NaOH for 100mL from the stock of 10M NaOH solution.

Stock	Dilute
M_1V_1	M_2V_2
$10 \times V_1$	0.1×100

$V_1 = 10/10 = $ 1mL + 99mL Distilled water dissolved

Buffer Solution:

The solution which resist the pH when added acid and base

Ander H. HH equation

- acidic buffer
- Base buffer

→ Glucose Active site

Liver ↑ Glucose

Glucose R Protein — inside ... Blob

out in cytoplasm GK

GK

→ G-6-P

(2) Fructose 6-P ← isomerase

(3) ↑ Higher

mutase → position change

isomerase → function group change

3rd Reaction.

Fructose 6-P → fr. 1.6-Bis

ATP ADP

Phosphofructokinase 1.

NADH ⊖, citrate ⊖, ⊖ — Higher level of E

AMP ⊕, ADP ⊕, Fructo 2,6 Bisph

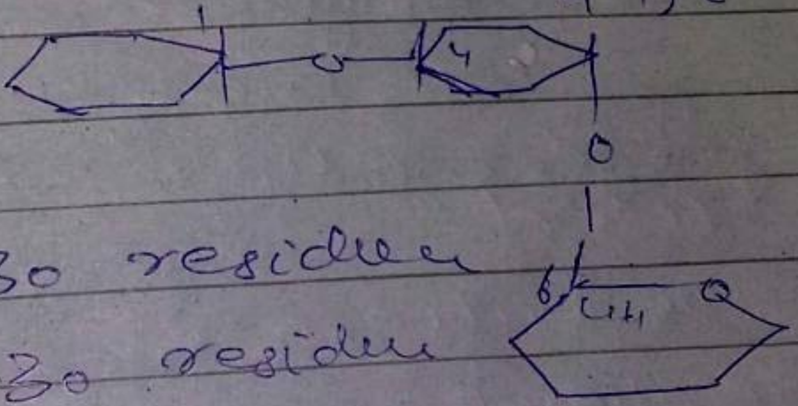
liver

Polysaccharides 21-2-17

Starch, less more.

formed in) Amylose & Amylopectin
Spiral ring

	Amylose	Amylopectin
	15-20%	80-85%
	60000 D	50000 D
	Soluble in H_2O	insoluble in H_2O
	Straight chain	Branched
	α 1,4 Glycosidic linkage	α, 1,4 ly... α 1,6 "



24 - 30 residues
18 - 30 residues

I_2, Blue (I_2) Blue violet purple violet

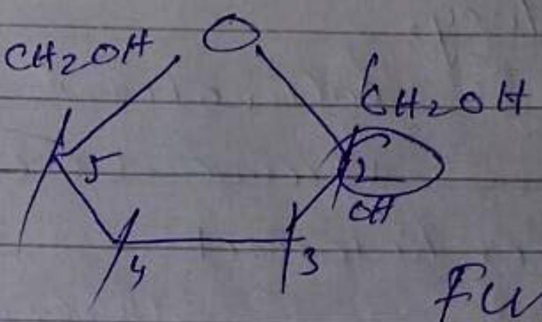
α - amylase
Random
cleavage Dextrin, maltose

mutarotation

If α and β available.

Fructose

2nd C carbonyl group.



Furanose

L-fructose

Aldehyd

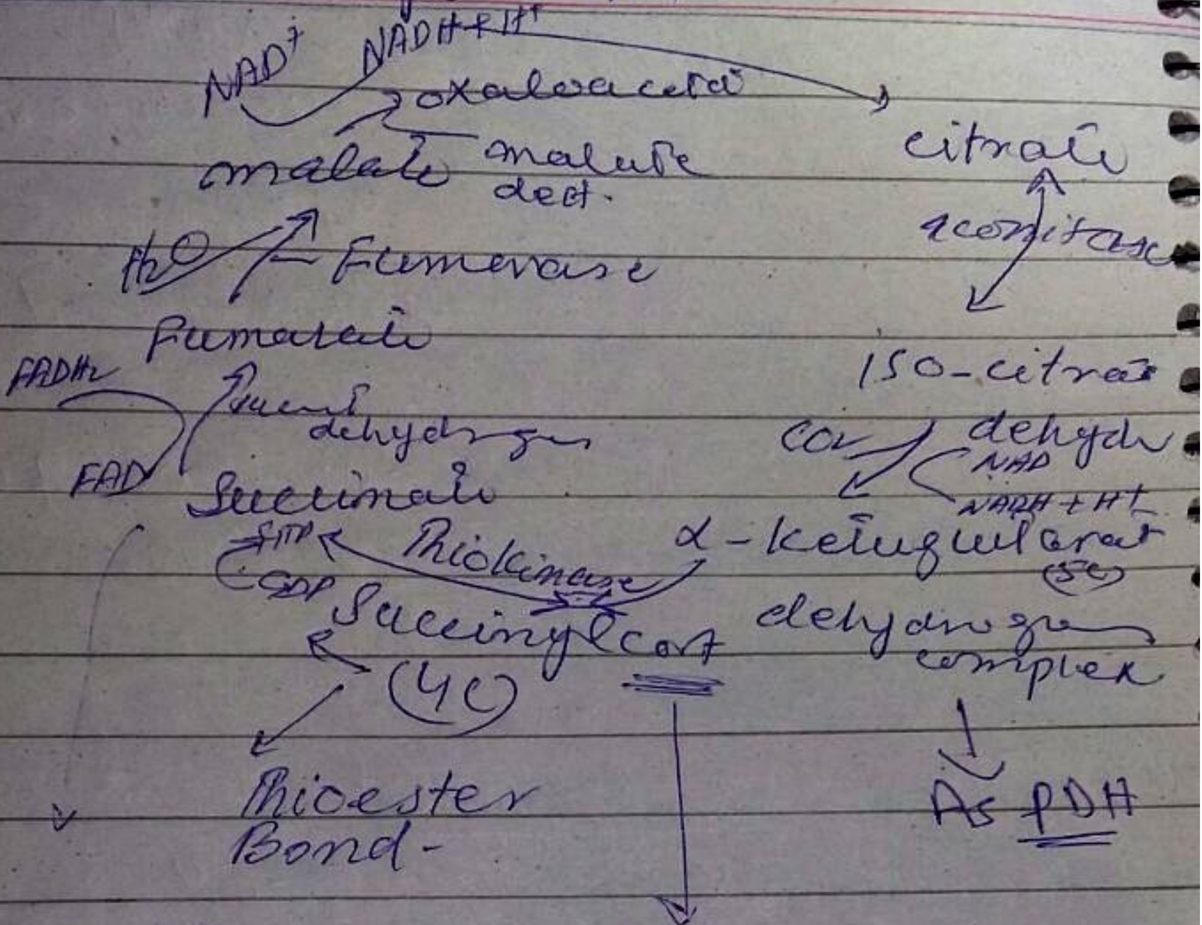
1 C chiral

5 Total chiral carbon atom in ring form

2^4

$2^5 = 32$

2 Acetyl CoA + oxaloacetate



COOH
|
CH_2
|
CH_2
|
COOH
Fumaric

- Fe rich
- ETC
complex
Succinate
Dehydrogenase

$CH_3-\overset{O}{\overset{||}{C}}-SCoA$
Acetyl CoA.

Biochemistry:

6-3.17

Glycolysis

Digestion G. into 2 molecules of Pyruvic acid and 2 ATP formed.

→ Availability →important (1,3,10)

→ Phosphorylation.

- medulla — IRReversible
- Retina of Eye — Regulator
- Testicular T → Rate li.
- RBC. → committed
- 40% Brain not contain mitochondria.

Phosphorylation: Glucose —Hexokinase (Every) / Glucokinase. (Liver, Pancreas)— G.6.P.

ATP → ADP.

→ negative charge Cell entrance.

→ Hexokinase not spec. for substrate. 6-P

→ Glucokinase sp. 4 glucose,

Heparin

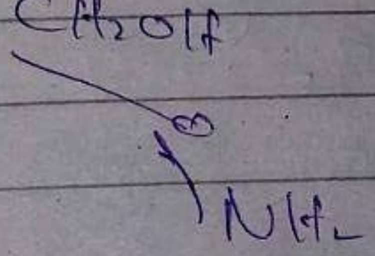
Anticoagulant.

— Spleem secrete.

— Liver. secrete.

— Blood.

N-acetyl + Glucosamin not present



Glucosone + ile acid.

Higly sulphated.

C-2,4 sulphated.

$S = O$

⇒ more negative charge.

1,4 α. Glycosidic linkage

α - (1 carbon $\overset{OH}{\underset{H}{|}}$) β

→ (1 carbon $\overset{H}{\underset{OH}{|}}$)

→ 90% pure form

idronic acid.

→ epimerase.

Recom-d carbohydrate diet

→ 300g

fat → 90-100 g

protein. 90-100g

→ Triming

cutting

non-reducing agent.

(Ptylin) α-Amylase)

→ Starch digestion.

→ stomach

Digestion stop.

carbohydr

→ Duodenum

pancreatic jui

Steriochemistry of carbohydrates.

⇒ These are comp. have same ch. comp. but diff structure orientation in space. is known stereoisomers

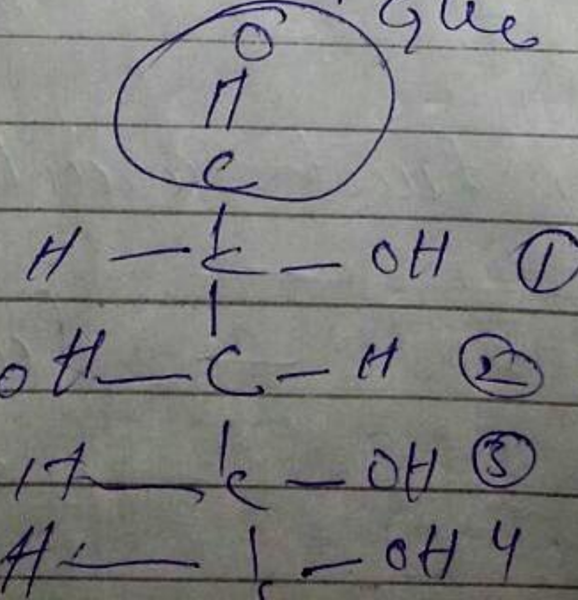
phenomenon is St.

1) → epimerism
2) → enantiomerism
3) → Anomerism.

These are cmp which have same ch. comp. but diff structure of H and OH group on any chiral carbon atom known as epimers. phenomenon epimerism

Glu

four diff groups attache -d.



chiral C atom

3 – Alose

Position 2. H and OH
– mannose
epimers of
Glucose
If 4 C. H and OH
Galactose.
formed

Role

– Vont Hoff Rule
Chiral C more
isomers more

n = chiral C

$$- 2^n$$

Glucose – $2^4 = 16$
isomers formed.

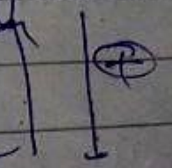
(2) EnA –
same chem comp. but
diff struct on of OH
and H and on
penultemate carbon
and last carbon.

Hexo — not. Hormal regulated enzyme and
Km value — less

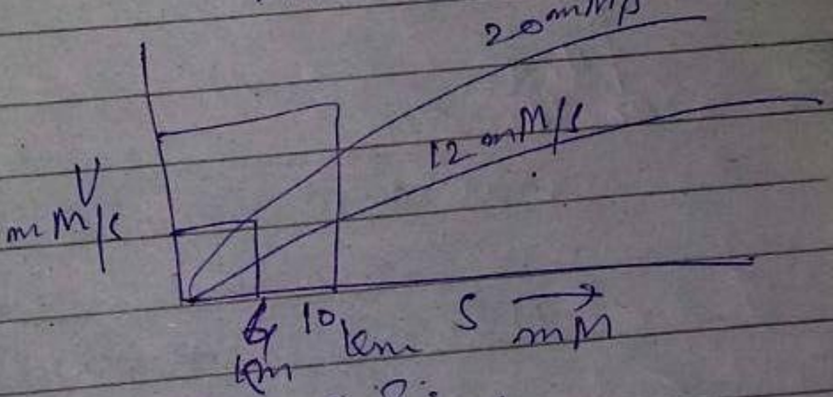
Glucokinase
more Km
Vmax

Activated

Through β- phosphorylation.



Km value
Half of the max at the substrate
Attain Vmax.



Alosteric Regulation
Due to effect or cofactor-
site available with active site.
Glucose 6 - Phosph
altered active
site Blocked.

no-Hormonal regul[ation] in Krebs cycle

citrate synthase
- (−) ATP ↑
- (−) NADH ↑
- (−) succinyl
- (−) GTP ↑
- (−) Fatty Acyl [CoA]

Activate (+)

AMP, ADP — low leve[l]

Ca^{++}

Isomerisation

citrate ⟷ iso-citrate

Aconitase

iso-citrate dehydrogenase

NAD^+ → $NADH + H^+$

CO_2

↓

α-ketoglutarate

COOH
|
CH — C[OOH]
|
CH — C[OOH]
|
C = O
|
COOH

α-ketoglutarate:

COOH
|
C = O
|
C — COOH
|
C — COOH.

*

Steriochemistry of carbohydrates

⇒ These are comp. have same ch. comp. but diff structure orientation in space. is known stereoisomerism phenomenon is St

1) → epimerism
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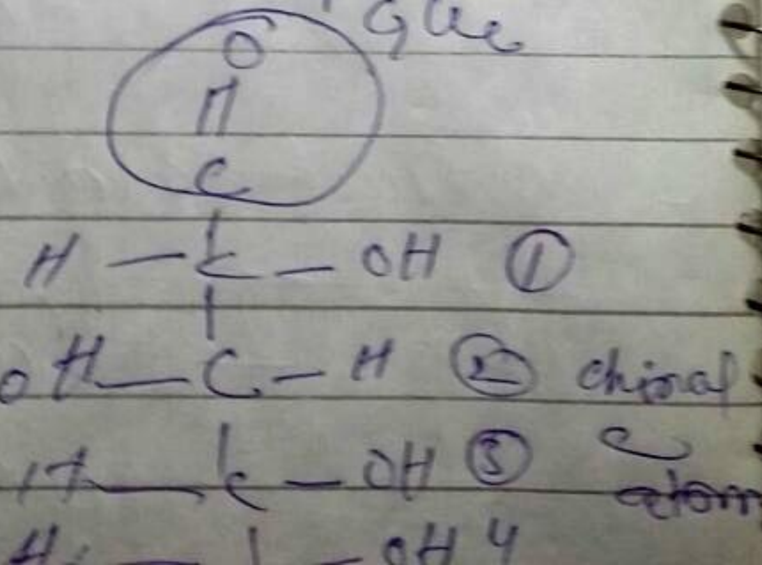
these are cmp which have same ch. comp. but diff structure of H and OH group on any chiral carbon atom known as epimers. phen epimerism

Glu

four diff groups attach to C.



Bicarbonated ions. (neutralise)
co-factor
(Cl⁻)
for Amylase

6 – 8 pH work
enzyme.

Pancreatic Enzyme.
Dextrin, starch
↳ maltose isomalt..
convert.

Starch
end product-
maltose, isomaltose

Jejunum
Disacharads. ↓
Branch
✓.
residue
Fruits
juice
Sucrose → Fruits
Lactose → Milk.
– Sucrase
– Lactase
– maltase
– isomaltase

glucose + fructose

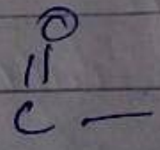
instrument

Polarimeter

Right sid
rotate D-

Anomer

ch comp. sam
diff st. OH. on
anomeric c atom.



note

Anomeric c in ca
of aldehyde. 1st.
ketone case.
2nd c.

Fischer Projection

straight ch

Howarth's project.
Ring str

β amylase.
non-reducing agent.
remove disaccharide
Store, liver and muscles.
Glycogen (not act alkali)
— Highly branched.
1~~2~~ - 18 Structure
8 — 12
Similar to
Amylopectin.
— For energy purpose.
Glycogenesis (formation).
Glycogenolysis.
Break d.
Heat required to H_2O.
I_2 → Reddish color
→ Alkali not react with Glycogen.
Quinoline
fructose.
Homopolysacch.
Laxative: Any drug for constipation

★

Steriochemistry of carbohydrate.

⇒ Those org comp. have same ch. comp. but diff structure orientation in space, is known stereoisomerism phenomenon is St.

1 → epimerism
2) → enantiomerism
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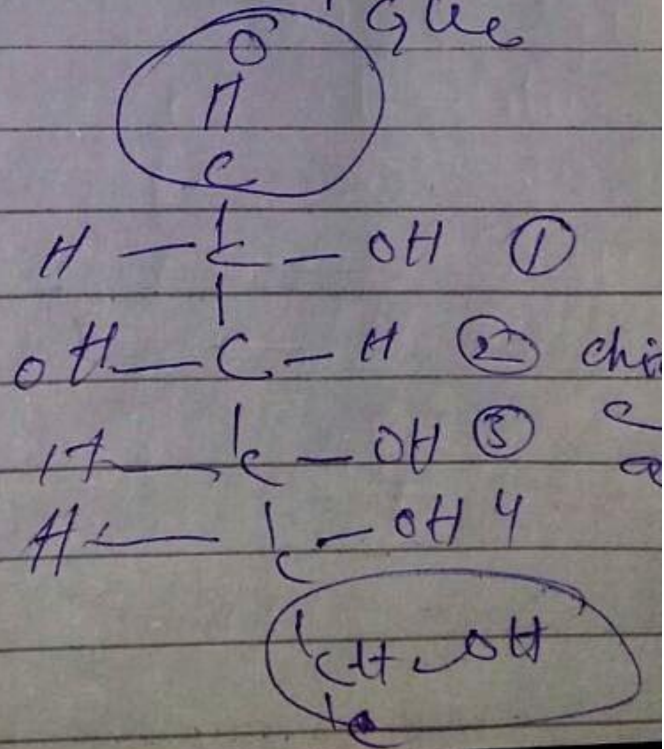
These are comp which have same ch. comp. but diff structure of H and OH group on any chiral carbon atom known as epimers. phen epimerism

four diff groups attach to C.



2 Pyr —— ⟶ Acetyl coA.

⇒ iso-citrate dehydrogenase
= citrate synthase

3 NADH
1 FADH
1 GTP
⟶ Substrate level.

– 5 steps energy provide Reaction
+6 +6 ATP + 24 ATP

→ 36 ATP
$6CO_2$.

Shuttling
2 ATP.
Glycol
2 ATP

⇒ proton produced

CO_2, H_2O

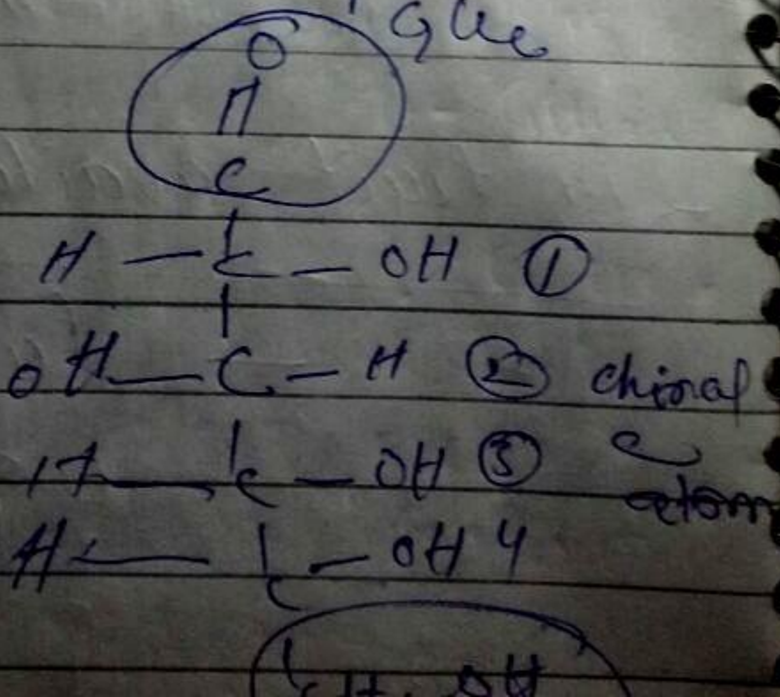
Steriochemistry of Carbohydrate

⇒ These are comp. have same ch. comp. but diff structure orientation in space. is known Stereoisomerism phenomenon is st

1. → epimerism
2. → enantiomerism
3. → Anomerism.

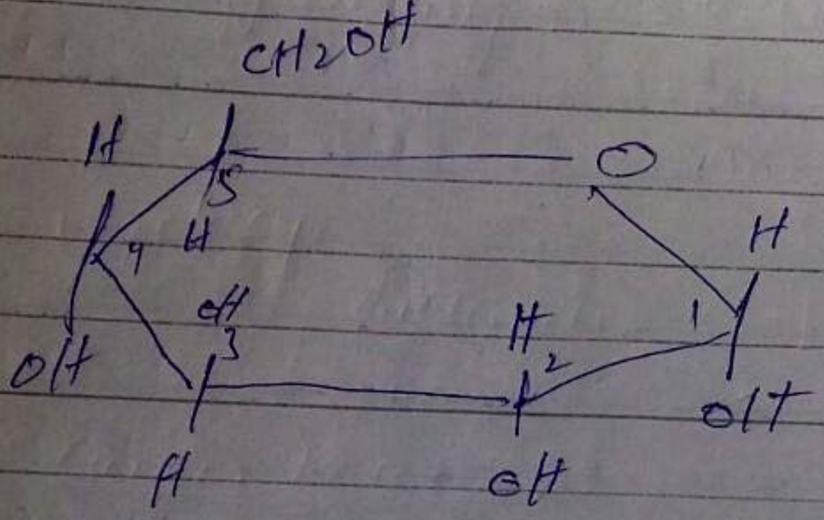
These are cmp which have same ch. comp. but structure of H and group on any chiral carbon atom known as epimeris. phen epimerism

r diff ups ale d.



Left side

Right side below



α- Glucose.

Pyranose Trans "

1 – 6 c
orientation
diff-

β – Glucose
cis – Glucose

1 – 6 c
orientation
OH same side