

SUCCUS CERASI

- ▶ ***Prunus cerasus*** (Rosaceae) (Vişne) fresh fruits are compressed to obtain juice
- ▶ Ripe fruits are collected, seed and stems are removed, compressed and mixed with %0.1 benzoic acid (to obtain clear juice pectin is hydrolysis enzymatically) and leaved
- ▶ Filtered and mixed with ethanol as its half of volume. If it is clear for 30 min. Filtered and obtained
- ▶ **Malic acid percentage must be %1 at least**
- ▶ Used as aromatizer in syrups

Succus Rubi Idae

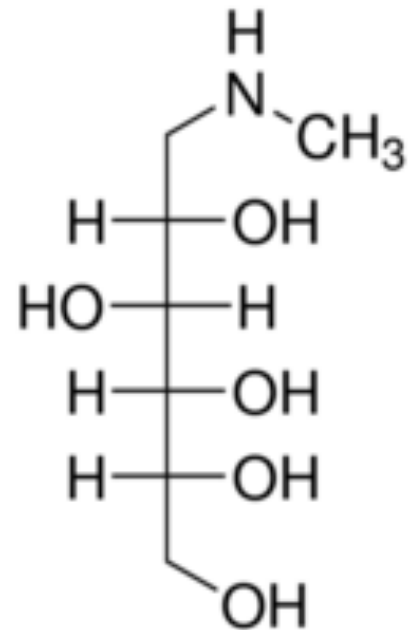
- ▶ ***Rubus idaeus*** (raspberry, ahududu) or ***Rubus strigosus*** fruits
- ▶ Citric acid contain must be at least %1.5
- ▶ **Malic acid, fructose, sucrose, pectin**
- ▶ Used as aromatizer in syrups

SACCHARUM USTUM

- ▶ Prepared from heating of glucose. Dark brown-black colour, hot taste and occurs homogeneous mass. Characteristic smell
- ▶ %0.1 solution in water is yellow-brown colour
- ▶ In pharmacy it is used as coloring agent

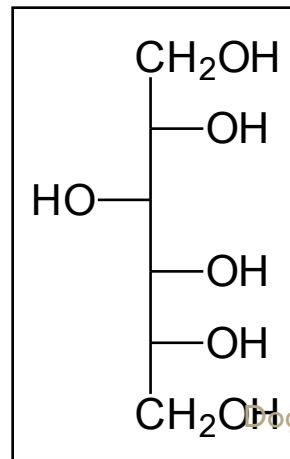
Meglumine, N-methyl glucamine

- Meglumine is an amino sugar derived from glucose
- It's used in pharmaceutical technology as an excipient



D-sorbitol

- This polyalcohol occurs naturally in fruits of various Rosaceae, particularly *Sorbus aucuparia* L.
- Industrially it is obtained by catalytic hydrogenation under pressure or by electrolytic reduction of D-glucose

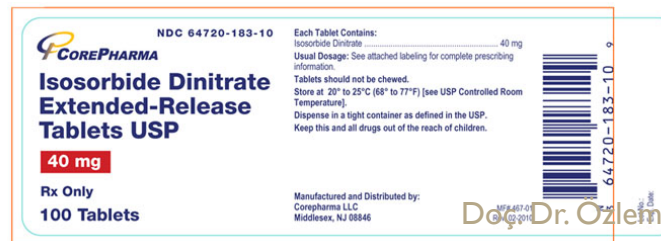


- It is used for diabetic patients
- % 70 solution is laxative and used for constipation
- Tweens are prepared from sorbitol and fatty acids which are used in pharmaceutical technology
- % 50 solution is osmotic diuretic

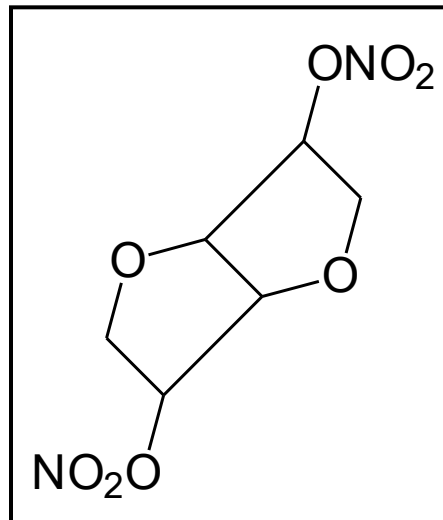
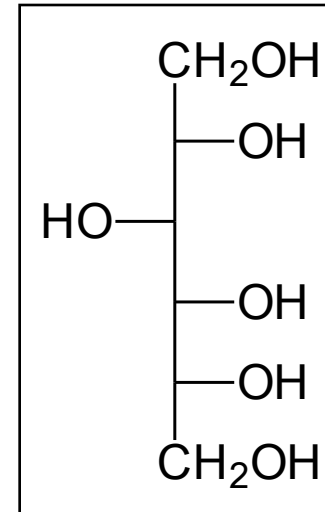
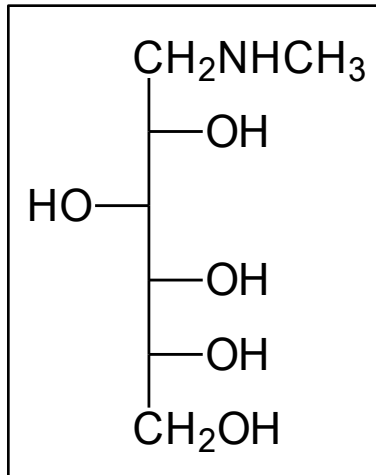
- ▶ Used in glaucoma
- ▶ In urology combined with mannitol as antiseptic solution
- ▶ In surgery of prostate and bladder sorbitol is used as solution for cleaning

▶ Isosorbide dinitrate

- ▶ Isosorbide derivative prepared by HNO_3
- ▶ Sublingual tablets used for cardiac failure and angina
- ▶ Coronary vasodilator



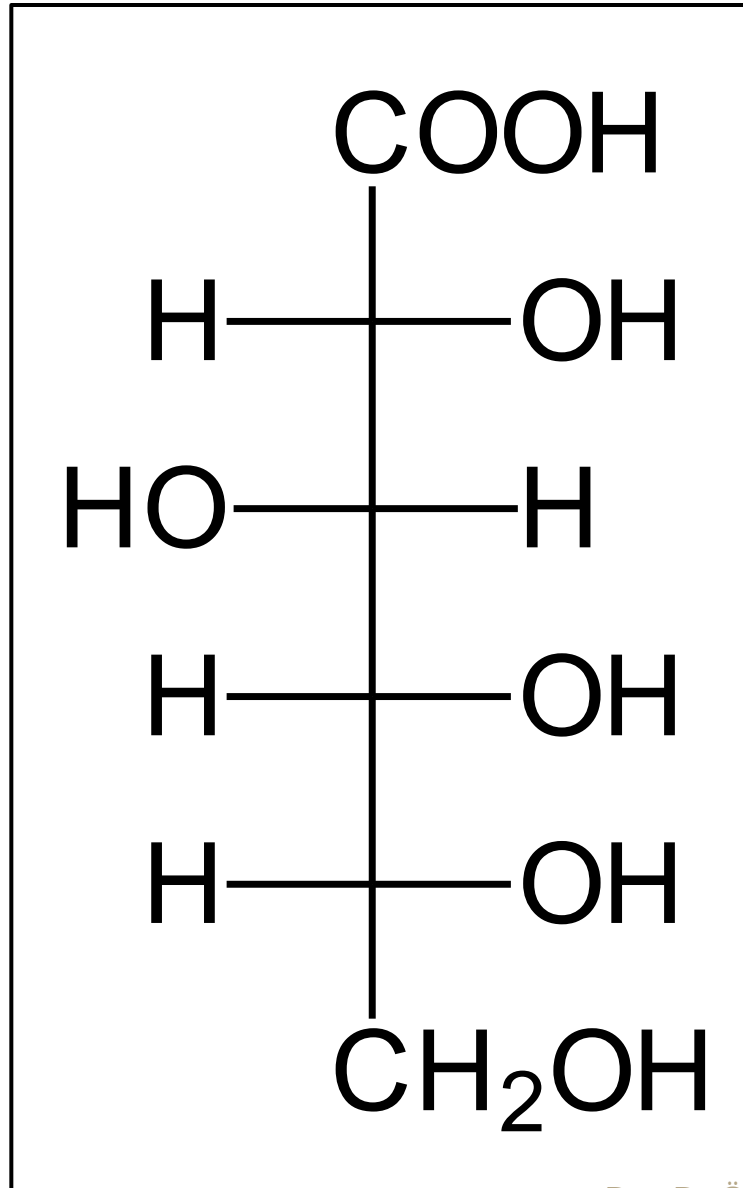
MEGLUMINE, D-SORBITOL, Isosorbid dinitrate



▶ I) GLUCONIC ACID

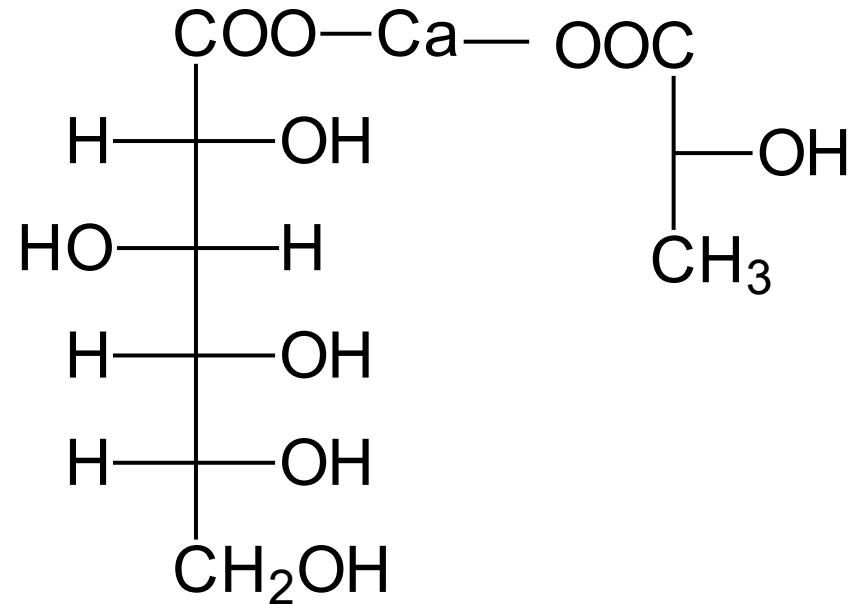
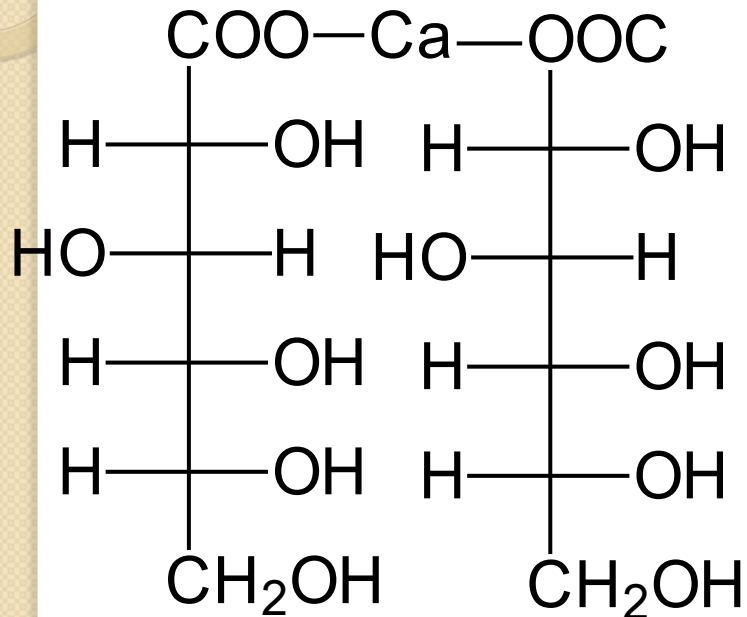
- ▶ **Gluconic acid occurred from biological oxidation of glucose**
Acetobacter xylinum (Bacterium xylinum) or Aspergillus niger
- ▶ **Oxidation of sucrose and starch also resulted in gluconic acid**

GLUCONIC ACID



- ▶ **2) Calcii Gluconas (TF) Calcium gluconate**
- ▶ ***Aspergillus niger* or Br_2 is used for oxidation together with CaCO_3**
- ▶ **No specific odour and taste, white crystalline, soluble in water slightly**
- ▶ **IM or IV form are used in absence of calcium such as tetany**
- ▶ **Calcium Glucolactobionate is also used as the same purpose**

Calcium Gluconate and Ca Glucolactobionate



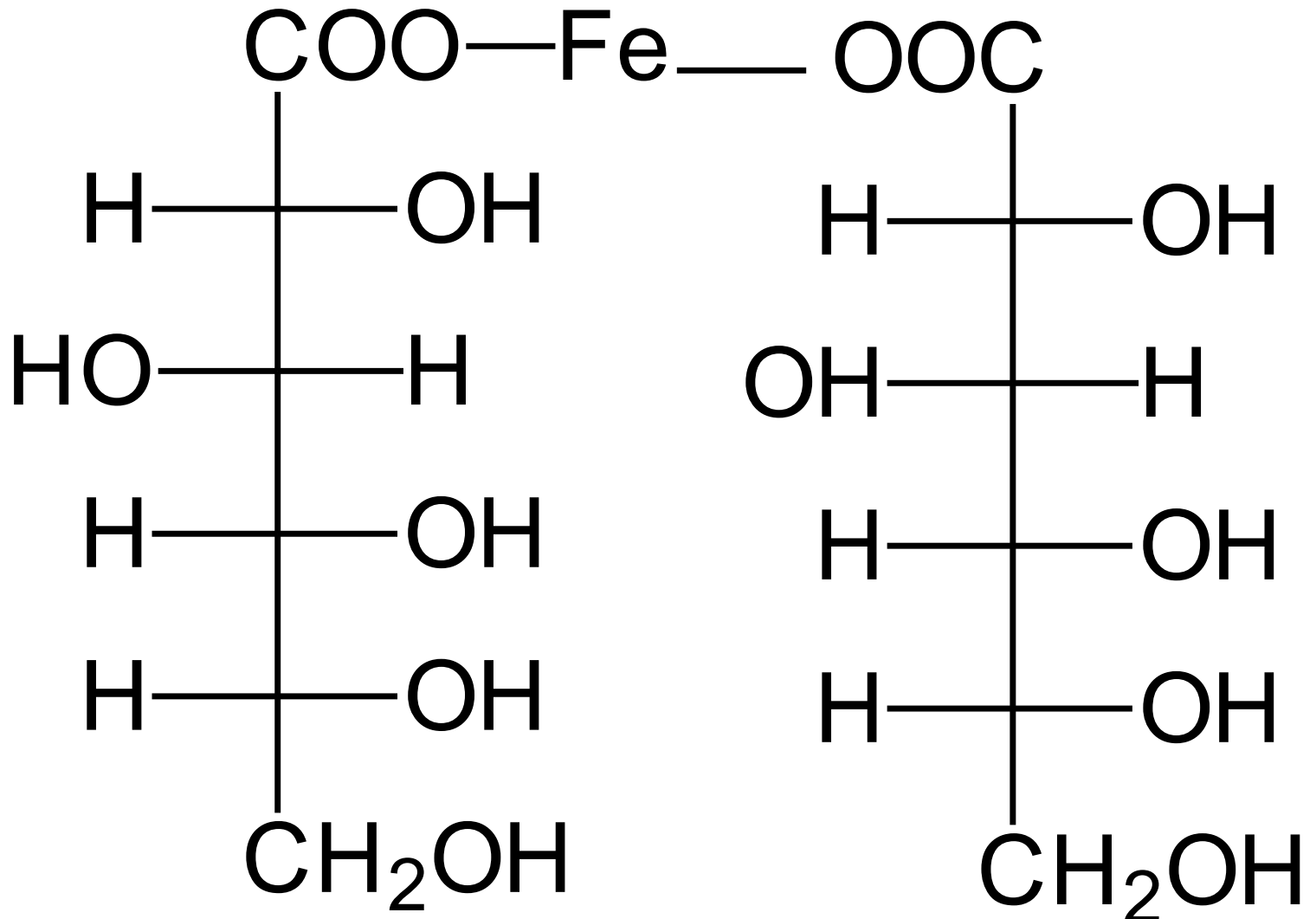
▶ **3) Ferrosi Gluconas (TF) Ferrous Gluconate**

- ▶ **a) Ca-gluconate water solution + FeSO_4 ... CaSO_4 as precipitate, then filter and concentrated ferrous gluconate obtained as precipitate**
- ▶ **b) Na-gluconate + FeCO_3**
- ▶ **c) Gluconic acid + reduced Fe**
- ▶ **Greenish yellow or yellow-grey powder and smell like a caramel**
- ▶ **Used in anemia, prevent or treatment of low blood levels of iron**

▶ 4) Potassium Gluconate

- ▶ **Gluconic acid+KOH neutralisation**
- ▶ **As potassium supplement**
- ▶ **Low levels of potassium treatment due to Digitalis or thiazide usage**

Ferrous Gluconate



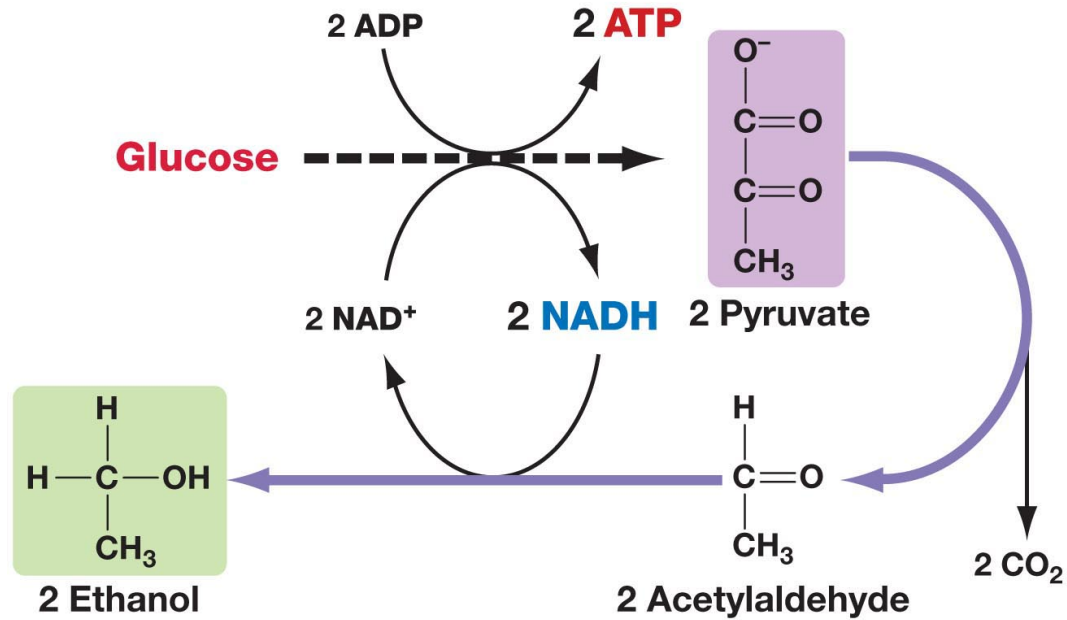
Fermentation products of glucose

- ▶ **Fermentation, chemical process by which molecules such as glucose are broken down anaerobically. Fermentation is derived from fervere (kaynamak)**
- ▶ **Microorganisms are playing an important role**
- ▶ **Products are alcohols, organic acids, amino acids, vitamins, steroids and others**

Ethanol

- ▶ “Aqua vital” obtained in 12th century and used as tonic
- ▶ Alcohol fermentation is known as Lose of CO_2 from hexoses which resulted in occuring 2 molecule of ethanol (ethyl alcohol) $2\text{C}_2\text{H}_5\text{OH}$
- ▶ 1) *Vitis vinifera* (*Saccharomyces ellipsoideus* is used)
- ▶ 2) Saccharification

Alcohol fermentation



© 2011 Pearson Education, Inc.

- ▶ **Gelatinization of starch will be produced by hot water and hydrolyzed with diluted HCl or enzymes; amylase or diastase**
- ▶ **Amylodextrin, erythrodextrin, achrodextrin are produced**
- ▶ **Maltose are hydrolysed by brewers yeast to glucose and glucose is used for fermentation to product ethyl alcohol**

- ▶ Fermentation of xylose by ***Torula utilis***, a fungi is also resulted in occurrence of ethly alcohol
- ▶ ***Cladonia rangiferina*** lichen
- ▶ From algae
- ▶ In paper industry, sodium sulphite solution contains glucose can be fermentated

- ▶ **Glycerol, amyl alcohol, asetic acid, succinic acid and aldehydes are occurs as by-products together with ethyl alcohol**
- ▶ **Conditions of the fermentation can be changed for obtaining different products. For example if the medium is alkali and sulphide ions are added the maim product will be glycerol**
- ▶ **Asetic acid is occured as main product by *Mycoderma aceti* and acetaldehyde as by-products**

- ▶ **Production of ethyl alcohol**
- ▶ **After fermentation medium contains %15 ethyl alcohol**
- ▶ **Other products are removed from medium by fractional distillation**
- ▶ **First product. aldehyde+ethylacetate**
- ▶ **Medium product.....Ethylalcohol (%96)**
- ▶ **Last product.....Amyl alcohol**

Turkish Pharmacopoeia

- ▶ **ETANOLUM.....%95-96 v/v**
(%92.5-95.0 w/w)
- ▶ **ETHANOLUM ABSOLUTUM.....**
%99 v/v
- ▶ **ETHANOLUM DILUTUM..**
%69.1-71.0 v/v

- ▶ **Pharmacy and industry**
- ▶ **Central nervous system depressant**
- ▶ **Anesthetic for surgery as IV**
- ▶ **%70 solution is antiseptic externally**
- ▶ **% 50 solution astringent and hygroscopic**
- ▶ **%25 solution antypyretic**
- ▶ **Vasodilator**
- ▶ **Sedative**

Usage:

- ▶ **Preparation of alcoholature, alcoholate, tincture and alcohol extracts**
- ▶ **CHCl_3 and CHI_3 production**
- ▶ **parfumery**
- ▶ **By-products production such as amyl alcohol**

VINUM (TK) Wine

- ▶ ***Saccharomyces*** species are used for fermentation of glucose containing plant juice
- ▶ **Normal Wine %12 EtOH**
- ▶ **Strong Wine % 20 EtOH**

- ▶ **Vinum album (White wine)**
- ▶ **Vinum forte austerum (Strong wine)**
- ▶ **Vinum forte dulce (Sweet strong wine)**
- ▶ **Vinum rubrum (Red wine)**
- ▶ **Vinum spumans (Sparkling wine)**
- ▶ **are recorded in Turkish Codex**

Usage of wine

- ▶ **Preparation of tonic drugs**
- ▶ **Solvent for pharmaceutical preparations**
- ▶ **Wine stone, by-product obtained from wine production is used in pharmacy and food industry**

Potassium bitartrate (Wine stone)

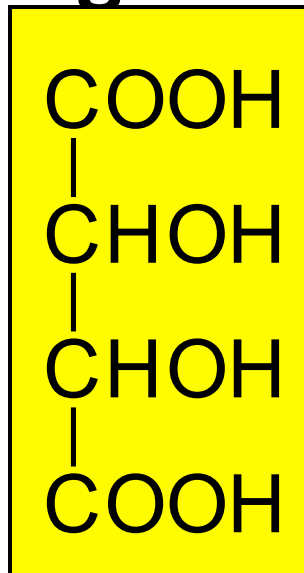
- ▶ **By-product obtained from retention bond sides.**
- ▶ **%80-85 Potassium bitartrate**
- ▶ **After cleaning wine stone is used in food industry and production of tartaric acid**

- ▶ **Wine stone is dissolved in alkali water solution and filtered. Decoloring and acidified to obtain potassium bitartrate**
- ▶ **Used as laxative in pharmacy**
- ▶ **Baking powder is prepared for food industry**

ACIDUM TARTARICUM (TF)

Tartaric acid

- ▶ **Obtained by cleaning of wine stone or by fermentation**
- ▶ **NaHCO₃ and citric acid together are used for preparation of effervescent granules and powder**

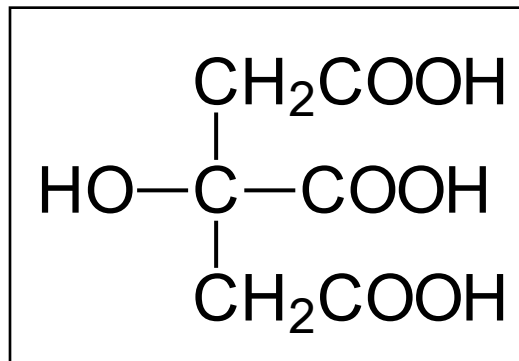


ACCIDUM CITRICUM (TF) Citric acid

- ▶ Obtained by *Aspergillus niger* fermentation
- ▶ Citric acid is obtained from Lemon juice in first time isolation
- ▶ Lemon juice + CaCO_3 Ca-Sitrat
collapse + diluted H_2SO_4 CaSO_4
collapse.....filtered.....Filtrate.....
concentrated.....Citric acid in crystalline.

Citric acid usage

- ▶ **Effervescent granules**
- ▶ **Preparation of solutions**
- ▶ **Preparation of syrups**
- ▶ **Salt of lemon in food industry**



ACIDUM LACTICUM (TF) Lactic acid

- ▶ **Obtained from milk in first time**
- ▶ **Glucose or hydrolysed starch solution is used**
- ▶ **%10-15 Glucose solution pH 5.5-6 50⁰C *Lactobacillus thermophilus* or *Lactobacillus delbruckii* fermentation resulted%80-90 lactic acid**
- ▶ ***Rhizopus orizae* is used ...%75 lactic acid obtained**

- ▶ **Lactic acid obtained by different methods after fermentation; water solution can be extracted by isopropyl alcohol, after evaporation ester form obtained and obtained by distillation**
- ▶ **Acidity is obtained by lactic acid in baby foods**
- ▶ **Ca and Na are prepared**
- ▶ **%1-2 solutions are used as spermatocyte.**

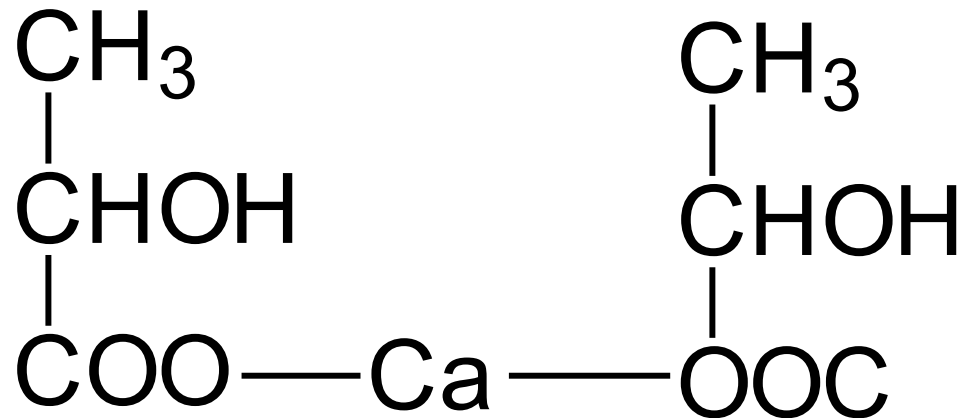
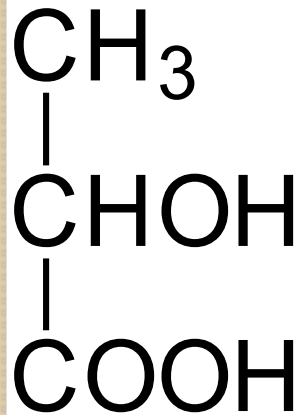
CALCII LACTAS (TF) Calcium lactate

- ▶ **Before fermentation finishing step as lactic acid formation, calcium lactate is obtained, contains 5 molecule of water**
- ▶ **White crystalline powder or granules**
- ▶ **Diluted lactic acid and CaCO_3 neutralisation is another way for obtaining**
- ▶ **In bone diseases usage together with vitamin A and D**
- ▶ **Ca supplement in tetany and urticaria**

Sodium lactate

- ▶ **Sodium salts in officinal lactic acid solutions**
- ▶ **“Natrii Lactatis Injunctia Composita” is recorded in Turkish Pharmacopoeia**
- ▶ **Used for acidosis treatment and acid-alkali balance**

Lactic acid, Calcium lactate



LAEVULOSUM, Fructose, Fruktoz

- ▶ **Present practically in all fruits.**
- ▶ **In plants D-fructofuranose form is found**
- ▶ **Rotate the plane of polarised light to the left**
- ▶ **α -D fructopyranose and β -D fructofuranose forms are found in nature**
- ▶ **Pyranose form is found in honey, flowers nectarium and fruits juice**

- ▶ **Furanose form found in sucrose and inulin**
- ▶ **SELIWANOFF** reaction is used for identification
- ▶ **Colourless, odourless and soluble in water easily**
- ▶ **Sucrose + Dil.HCl...hydrolysis.....Fructose (precipitate)**
- ▶ **Glucose in liquid**
- ▶ **Complex suspension.....CO₂ added...CaCO₃ (precipitate)**
- ▶ **Filter subjected to ion exchange column and decoloring...concentrated... fructose**

Usage

- ▶ **Fructofuranose form is used as sweetener for diabetic patients**
- ▶ **Intestinal resobtion is slow and does not trigger insulin secretion, therefore used for parenteral feeding as two times concentration of glucose for giving low amount of water**

LAEVULKOSUM, LEVÜLOZ, FRUKTOZ

