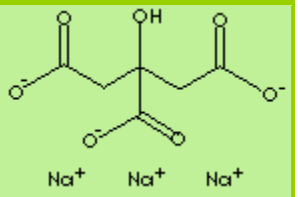
# TRISODIUM CITRATE DIHYDRATE




| PRODUCT IDENTIFICATION | |
|---|---|
| CAS NO. | 6132-04-3 |
| EINECS NO. | 200-675-3 |
| FORMULA | $HOC(COONa)(CH_2COONa)_2.2H_2O$ |
| MOL WT. | 294.10 |
| H.S. CODE | 2916.31 |
| TOXICITY | |
| SYNONYMS | Sodium Citrate Dihydrate; 2-Hydroxy-1,2,3-propanetricarboxylic acid, trisodium salt, dihydrate; |
| DERIVATION | |
| CLASSIFICATION | |

| PHYSICAL AND CHEMICAL PROPERTIES | |
|---|---|
| PHYSICAL STATE | Odourless, white solid in various forms |
| MELTING POINT | 150 C |
| BOILING POINT | Decomposes |
| SPECIFIC GRAVITY | 1.665 |
| SOLUBILITY IN WATER | 71gr/100ml at 25 C (but insoluble in ethanol) |
| PH | 7.0-9.0 (5% solution) |
| VAPOR DENSITY | |
| AUTOIGNITION | |
| NFPA RATINGS | Health: 1 Flammability: 0 Reactivity: 0 |
| REFACTIVE INDEX | |
| FLASH POINT | |
| STABILITY | Stable under ordinary conditions but caking may occur on prolonged storage |

APPLICATIONS

pH buffering, anticoagulant agent, flavor enhancer and modifier, promotes sucrose inversion, stabilizer of emulsified fats in the food, beverage and pharmaceutical industries. also used as a bio-degradable builder in detergents.

| SALES SPECIFICATION | |
|---|---|
| BIBLIOGRAPHY | FCC IV/ USP24 / BP93 |
| IDENTIFICATION | Passes test |
| APPEARANCE | white granular crystals or white crystalline powder |
| ASSAY | 99.0-100.5 % (180 C 18 Hours) |
| LOSS ON DRYING | 10.0 - 13.0% |
| ALKALINITY | Passes test |
| TARTARATE | Passes test |
| OXALATES | 100ppm max |
| CHLORIDE | 50ppm max |
| SULFATES | 150ppm max |
| ARSENIC | 1ppm max |
| HEAVY METALS | 5ppm max |
| LEAD | 0.5ppm max |
| IRON | 5ppm max |
| SOLUTION CLARITY | 98 min (%T in 420 nm, 40% Sol.) |

TRANSPORTATION

| | |
|---|---|
| PACKING | 25kgs in Bag |
| HAZARD CLASS | Not regulated |
| UN NO. | |

## GENERAL DESCRIPTION OF CITRIC ACID

Citric Acid (2-Hydroxy-1,2,3-propanetricarboxylic acid, in IUPAC naming) is a colourless crystalline organic compound belong to carboxylic acid family. It exists in all plants (especially in lemons and limes) and in many animal tissues and fluids. In biochemistry, it is involved in important metabolism of almost all living things; the Krebs cycle (also called citric acid cycle or tricarboxylic acid cycle), a part of the process by which animals convert food to energy. Citric acid works as a preservative ( or as an antioxidant) and cleaning agent in nature. It is commercially obtained by fermentation process of glucose with the aid of the mold Aspergillus niger and can be obtained synthetically from acetone or glycerol. It can be used as an sour taste enhancer in foods and soft drinks. The three carboxy groups lose protons in solution; resulting in the excellent pH control as a buffer in acidic solutions. It is used as a flavouring, stabilizing agent and acidulant (to control acidity) in food industry, in metal-cleaning compositions as it chelates metals. Citric acid is available in forms of anhydrous primarily and in monohydrate, the crystallized form from water. The hydrated form will be converted to the anhydrous form above 74 C. Citrate is a salt or ester of citric acid. Citrates are formed by replacing the acidic one, two, or all three of the carboxylic hydrogens in citric acid by metals or organic radicals to produce an extensive series of salts, esters, and mixed (double) salts. Cirrates are used in food, cosmetics, pharmaceutical and medicine industries as well as in plastic industry; nutrient or food additives having functions of acidity regulator, sequestering and stabilizing agent, antioxidants synergist, firming agent; anticoagulant for stored whole blood and red cells and also for blood specimens as citrates chelate metal ions and saline cathartics, effervescent medicines; high boiling solvent, plasticizer and resin for food contact plastics.

## GENERAL DESCRIPTION OF BUFFER

Buffer is a substance, generally a solution, that can keep its pH constant, despite the addition of strong acids or strong bases and external influences of temperature, pressure, volume, redox potential. Buffer prevents change in the concentration of another chemical substance, e.g., proton donor and acceptor systems that prevent marked changes in hydrogen ion concentration (pH). Many acid-base reactions take place in living organisms. However, for organisms to perform certain vital functions, the body fluids associated with these functions must maintain a constant pH. For example, blood must maintain a pH of close to 7.4 in order to carry oxygen from the lungs to cells; blood is therefore a powerful buffer. The commonest buffer in chemical solution systems is the acid-base buffer.

· Bicarbonate buffer; a buffer system composed of bicarbonate ions and dissolved carbon dioxide; in the body, this system is an important factor in determining the pH of the blood as the concentration of bicarbonate ions is regulated by the kidneys and of carbon dioxide by the respiratory system.

· Cacodylate buffer; one containing an organic arsenical salt, used in preparing fixatives for electron microscopy.

· Phosphate buffer, a buffer system composed of $KH_2PO_4$ and $Na_2HPO_4$; in the body, it is important in regulating the pH of the renal tubular fluids; when

0.025 molal (equimolal of the potassium and sodium salts), the pH is 6.865 at 25 C.

· Protein buffer, a buffer system involving proton donor and proton acceptor groups of the amino acid residues of proteins.

· TRIS buffer (tromethamine): an amine base used intravenously as an alkalizer for the correction of metabolic acidosis. The pH values of all buffers are temperature- and concentration-dependent. For Tris buffers, pH increases about 0.03 unit per C temperature decrease, and decreases 0.03-0.05 unit per ten-fold dilution.

· Veronal buffer; a barbital buffer commonly used in the preparation of fixatives for electron microscopy.