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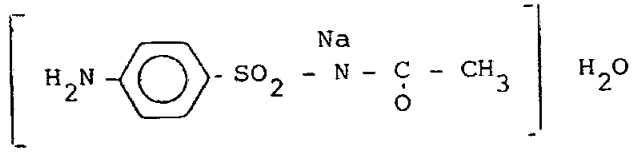
APPENDIX

SULFACETAMIDE SODIUM B.P.



Mol. wt. 254.24 $C_8H_9N_2NaO_3S \cdot H_2O$

N'-acetylsulphanilamide sodium, N-sulphanilylacetamide monosodium salt

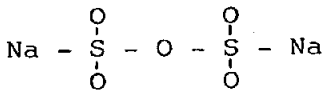
Sulphacetamide sodium B.P., it occurs as a white or yellowish-white crystals or a crystalline powder with a slightly bitter taste. It slowly darkens on exposure to light and moist air. It absorbs carbon dioxide and becomes less soluble. It is soluble in 1.5 parts of water at 20°C, slightly soluble in alcohol; practically insoluble in chloroform and ether. A 5% solution has a pH of 8 to 9.5.

Sulphacetamide sodium is used mainly by local application in infections or injuries of the eyes. In the treatment of acute conjunctivities and in the prophylaxis of ocular infections after injuries or burns.

Category: Sulfonamide is used mainly in the treatment of infections of the eye.

Usual dose: A 10% solution is applied every 2 hours, or a 30% solution is used twice daily. Ointments containing 2.5, 6 or 10% are also used.

SODIUM METABISULFITE B.P.



Mol. wt. 190.10 $Na_2 S_2 O_5$

Sodium Metabisulphite; Sodium Pyrosulphite

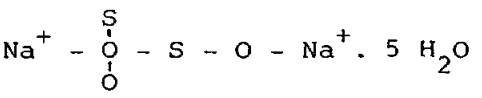
This compound is a colorless prismatic crystal or white or creamy-white crystalline powder with a sulphurous odour and acid, saline taste. It usually contains small amount of sodium sulphite and sodium sulphate. It should contain an amount of $Na_2 S_2O_3$ equivalent to not less than 66.0% and not more than 67.4% of SO_2. It is soluble in 2 part of water at 20°C; less soluble in alcohol. Approximate pH value of 1% aqueous solution is about 4.3. Sodium metabisulphite decomposes in air, especially on heating, and appreciable amount may be lost during sterilization before the substance has had time to exert its antioxidant effect; decomposition in solution is accompanied by a fall in pH.

Sodium metabisulfite is widely employed in pharmaceutical preparation, especially in those containing substances which are readily oxidised to form colored decomposition products. A chelating agent such as disodium edetate is sometimes used in conjunction with sodium metabisulphite to remove heavy metallic ions which often catalyse oxidation reactions. In the formulation of a pharmaceutical preparation, the minimum concentration should be chosen which will give the desired antioxidant effect. Preparations containing sodium metabisulphite should be thoroughly tested to determine its effect on the active constituents and other ingredients.

Category: An antoxidant and reducing agent

Usual dose: It is often used in concentration of 0.1% but concentrations of 0.01 to 1% have been employed although an amount equivalent to 0.2% SO_2 is allowed officially.

SODIUM THIOSULPHATE BP., U.S.P.



Mol. wt. 248.2 $Na_2 S_2 O_3 . 5 H_2O$

Sodium thiosulphate; Sodium Hyposulphate

It occurs in large, transparent, colorless, monoclinic prisms. It is efforescent in warm dry air and slightly hygroscopic in moist air. It is soluble in less than 1 part of water at 20°C. It is parctically insoluble in alcohol. Approximate pH value of 1% aqueous solution is about 6.5 to 8. Aqueous neutral or alkaline solution of the salt decomposeson boiling because of the reduction to sulfide and the oxidation to sulfate.

$$4\ Na_2 S_2 O_3 \longrightarrow 3Na_2 S O_4 + Na_2 S_5 \qquad (1)$$

$$Na_2 S_5 \longrightarrow Na_2 S + S \qquad (2)$$

$$Na_2 S_5 + 4O_2 \longrightarrow Na_2 S + 4 S O_2 \qquad (3)$$

Sodium thiosulfate contains sulfur in two different oxidation states. According to the structure shown above, the oxidized sulfur atom is in a + 6 state resisting further oxidation, which the remaining sulfur atom is in a zero oxidation state. This allows the compound to act as a reducing agent or as an antioxidant. Its reducing properties are illustrated by its application as the titrating reagent in iodine determinations.

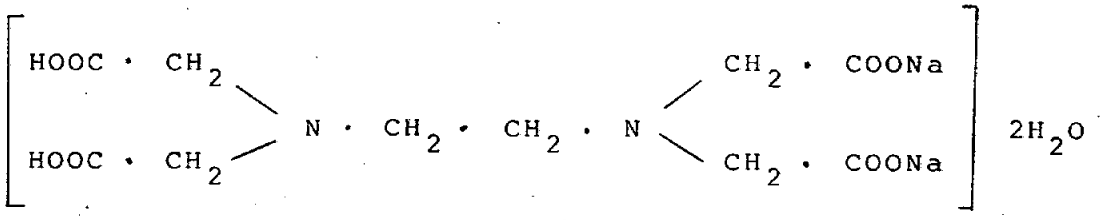
$$I_2 + 2\ Na_2 S_2O_3 \longrightarrow 2\ Na\ I + Na_2 S_4 O_6 \quad \text{(sodium tetrathionate)}$$

Sodium thiosulfate has an important use as an antidote in the treatment of cyanide poisoning, and is also an effective antidote for iodine preparation. It is useful in the topical treatment of possibly most other dermatophytoses. The action is probably attibutable to slow release of colloidal sulfur.

Usual dose: Sodium thiosulfate has also been used as a reducing agent in medicines, usually in concentration of 0.01 to 0.2%.

Intravenous use for cyanide poisoning is 12.5 g in 10 min. It is also used for topical treatment as antifungal action as 2 to 50% solution, applied to the affected area serveral times a day.

DISODIUM EDETATE B.P.



Mol. wt. 372.2 $C_{20}H_{14}N_2Na_2O_8 \cdot 2H_2O$

Disodium dihydrogen ethylenediamine-NNN'N'-tetra-acetic dihydrate, Sodium Edetate.

It occurs as a white adourless crystaline powder with a slightly acid taste. It is soluble in 11 parts of water at 20°C, slightly soluble in alcohol; insoluble in chloroform and ether. A 5% solution has a pH of 4 to 5.5.

Disodium edetate is a chelating agent which forms complexes with divalent and trivalent metals. Disodium edetate is also used as an antioxidant synergist in aqueous preparations. It acts by removing traces of heavy methals which often catalyse oxidation reaction; a concentration of 0.01 to 0.05% is usually effective in enhancing stability.

Disodium edetate is poorly absorbed after oral administration and is usually administered by intravenons injection (it is mainly used in the treatment of hypercalcemia). When administered slowly by intravenous injection it chelates calcium ions, thereby decreasing the serum calcium concentration. The complex thus formed is not metabolised in the body and is almost completely excreted in the urine within 6 hours. Disodium edetate is also used as a 0.4% solution in the treatment of

calcium deposits from fire burns of the eye and in the treatment of calcified corneal opacities.

Category: It is a chelating agent, used as an antioxidant synergist and in the treatment of hypercalcemia.

Usual dose: Concentrations of 0.01 to 0.05% are used for antioxidant synergist. For hypercalcemia, 50 mg per kg body weight is given daily by slow intravenous infusion.

VITA

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