INDUSTRIAL CLEANING

Sodium Gluconate

Sodium gluconate is widely used in industrial cleaning formulations across several applications. Gluconate in an alkaline solution is used to clean metal, glass bottles and food industry equipment.

Sodium gluconate is used because of its excellent chelating properties. This makes it desirable in areas where hard water is an issue. Calcium, magnesium and iron deposits can ruin materials due to rust or scale that can build up. Gluconate removes those ions thus preventing problems before they happen.

Because gluconate can sequester divalent and trivalent metals it is a key ingredient in alkaline detergents for metal cleaning. It has the ability to solubilize and strip metallic compounds from valued materials.

In the food industry, hard water is a concern as well as soils (grease, protein, fat). Gluconate enhances the cleaners ability to saponify or emulsify these substances .

Bottle Washing

The use of gluconate in bottle washing is particularly desirable in areas containing hard water or iron which can form rust or scale on equipment such as washer chains, pockets, heating coils, tanks and carrier sections.

As a sequestrant in a caustic bottle washing, gluconate has been found to

- Prevent precipitation of the hardness constituents of water (calcium and magnesium) that t cause bottle haze.
- Eliminate rust spots on bottle necks
- Increase the efficiency of aluminum label removal
- Provide free rinsing reducing caustic carry-over
- Lower maintenance cost

Several factors need to be considered in order to obtain maximum efficiency including type of equipment, temperature, caustic concentration, hours of operation and cleaning amount.

Gluconate sequesters calcium and magnesium on a one to one mole basis in 1 to 5% caustic solutions. Approximately 100 parts gluconate will sequester 20 parts calcium.

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Because the gluconate anion is the active sequestrant, it does not matter whether the gluconate is introduced as sodium gluconate crystals, liquid gluconate or gluconic acid. Each product form does have a different use level based on molecular weight. Each pound of sodium gluconate crystal is equivalent to 1.8 lbs gluconic acid or 1.66 lbs liquid gluconate

The table below shows usages based on water hardness and product used.

Corrosion Inhibition

Sodium gluconate is an excellent chelator and as such, provides a degree of protection against corrosion of the re-bar used in concrete.[2]

In addition to concrete, the inclusion of gluconates can modify the physical characteristics of mortar, grout and various masonry products.

Specifications

Sodium gluconate is available is solid or liquid form. Sodium Gluconate FCC comes in both granular and powder form. Liquid Gluconate 60 (LT) is available in drums, totes or bulk. Gluconic Acid 50% is also available in drums or bulk. In addition, S-45 (~30% gluconate) is widely used in the concrete industry.

References

1 Ramachandran, V.S. and M.S. Lowery. Conduction Calorimetric Investigation of the Effect of Retarders on the Hydration of Portland Cement. Thermochimica Acta, 195 (1992) 378-387.

2 Patent: 5,750,053 - (1998) Miksic et al. Corrosion Inhibitor For Reducing Corrosion in Metallic Concrete Reinforcements

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