PMP FERMENTATION PRODUCTS

DE-ICING

Sodium Gluconate has seen increasing use as part of a de-icing solution. These solutions are applied to bridges, roads, guardrails and overpasses, not only to melt the ice and snow but to help protect the infrastructure itself. These structures are particularly prone to oxidative corrosion. This occurs because air from the atmosphere will dissolve in the snow and ice. The dissolved oxygen will diffuse into the metal inducing corrosion.

CORROSION INHIBITION

The corrosion can be inhibited by dissolving sodium gluconate in concentrations above 100 ppm. This will generate the formation of a thin protective film on those metal surfaces. This film inhibits the diffusion of the dissolved oxygen to the metal surface lowering the corrosion rate of the metal.

MECHANISM

Corrosion inhibition has been attributed to many of the metal salts of gluconic acid including sodium, potassium, calcium, manganese, cobalt, cadmium and zinc. Tests have been conducted in both fresh and sea water. Rajendran et al proposed the following mechanism of corrosion inhibition by calcium gluconate. When mild steel is immersed in a solution containing 60 ppm Cl- and 200 ppm calcium gluconate, the calcium gluconate diffuses from the bulk of the solution to the metal surface. On the metal surface, an Fe2+ - gluconate complex is formed on the anodic regions and Ca2+ is released.

Thus, it is concluded that the protective film consists of Fe2+ - gluconate complex and Ca(OH)2. This same general mechanism is probably similar with other metal salts of gluconic acid, including sodium.

Sodium gluconate and gluconic acid are non-toxic, non-corrosive, biodegradable and bio-renewable.

FORMULATIONS

Many of the formulations are a mixture of gluconate, salt brine and some other ingredients. Individual companies, in consultation with their respective state DOTs determine the final formulation. Recent data suggests that use of gluconate in these solutions, may reduce corrosion on the trucks themselves, thus saving valuable equipment and reducing costs to municipalities.

Sodium Gluconate is available in solid or liquid forms.

Technical and Food Grades available.

AVAILABILITY

Sodium Gluconate is available in a variety of packaging styles.

GRANULAR is packaged in 50 lb or 25 kg polyethylene lined, multi-walled paper bags or in coated, woven polypropylene bulk bags.

POWDER is packaged in 125 lb polyethylene-lined fiber drums.

Liquid Gluconate is available in drums, totes or in bulk as 60, 60LT or 70.

GLUCONIC ACID 50% is a technical grade product available in **DRUMS, TOTES** or **BULK**

GLUCONIC ACID 50% FCC is a food grade product available in **DRUMS, TOTES** or **BULK**.

GLUCONIC ACID 50% FCC ORG is approved for use in organic applications and is available in **DRUMS AND TOTES**.

TO ORDER: (800) 558-1031 | INQUIRIES: info@pmpinc.com

PMP

900 NE Adams St., Peoria, Illinois 61603

(309) 637-0400 www.pmpinc.com

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