VERSENE™ CA Food-Grade EDTA

Beverages

Stabilizing Color, Flavor, Clarity and Vitamin Content
When you use VERSENE CA food-grade EDTA chelating agent in your beverage product, you're helping to ensure consumers enjoy the same bright, distinct tastes and colors you worked to create. And VERSENE CA chelating agent can help preserve the potency of important vitamin additives such as Vitamins C, A, D, and E.

Why Metals are a Problem
Metal ions, such as iron, copper, and zinc (from sources including packaging, process water, or raw materials) are often present in products. These metal ions are highly reactive in beverages; they initiate and catalyze oxidation of flavors and colors. This is a particular problem with certified colors and when any ascorbic acid (Vitamin C) or benzoate preservatives are present. Even at levels below 0.1 ppm, metal ions can cause discoloration, flavor change or degradation of the vitamin content.

How VERSENE CA Food-grade EDTA can Help
VERSENE CA food-grade EDTA (ethylenediaminetetraacetate) preferentially binds with free iron, copper and other trace metal ions (as well as metals in a number of naturally occurring enzymes) to form stable ring structures. The chelated metals cannot react and cause product degradation, so shelf life is extended, and beverages are of the highest quality.

Unmatched pH Stability
EDTA forms extremely stable complexes with metals across a very wide pH range. Although citric acid, phosphates, and lactates are sometimes promoted as metal ion control agents in food applications, they can't match the performance of EDTA, particularly at acidic pH.

Outstanding Performance in Beverages Fortified with Vitamin C
In Vitamin C-fortified beverages, uncontrolled metal ions can interact with the Vitamin C to destabilize flavors, deteriorate colors, reduce shelf life, and degrade benzoate. VERSENE CA food-grade EDTA prevents these effects while preserving the nutrient value of the Vitamin C. See Figure 1.

Other Vitamins Preserved
By chelating iron and other metals, VERSENE CA food-grade EDTA also preserves the antioxidant qualities of Vitamins A, D, and E. And EDTA can also help maintain Vitamin B potency.

VERSENE™ CA Food-grade EDTA

VERSENE CA food-grade EDTA offers excellent processing flexibility. It's a white crystalline powder which dissolves readily in water. VERSENE CA is essentially odorless, colorless, and tasteless at recommended use levels. And it's Kosher-certified. Table 1 provides typical properties for VERSENE CA food-grade EDTA.

FDA Status

Table 2 lists the specific FDA-allowed beverage uses for VERSENE CA food-grade EDTA under FDA Food Additive Regulation 21 CFR 172.120. For a complete listing of current FDA regulations covering the use of EDTA, contact Dow at the numbers shown on this bulletin.

For Formulation and Other Assistance, Contact Dow

Dow is known throughout the beverage industry for its technical expertise in the use of VERSENE CA food-grade EDTA chelating agent in beverage formulations and for helping companies produce the high-quality beverages consumers expect.

To learn more about VERSENE CA food-grade EDTA and how you can take advantage of our valuable support services, contact us using the numbers below. We'll be happy to answer your questions, provide additional literature, and send a sample of VERSENE CA for your evaluation.

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Table 1: Typical Properties[1] of VERSENE CA Food-grade EDTA[2]

Product	Composition	Minimum Active Ingredients (Food Chemicals Codex)	Molecular Weight	Bulk Density	pH, 1% Solution
VERSENE CA ($CaNa_2EDTA•2H_2O$)	Calcium chelate of disodium ethylenediamine-tetraacetate, dihydrate	97-102.0%	410	641 kg/m^3 40 lb./ft.^{3}	6.5-7.5

[1] The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications.
[2] Meets all requirements for the Food Chemicals Codex (FCC) and the Joint FAO/WHO Expert Committee on Food Additives (JECFA).

Table 2: Direct Beverage Uses for VERSENE CA Food-grade EDTA Cleared by U.S. Food and Drug Administration

Food	Limitation (ppm)[1]	Use
Carbonated soft drinks	33	Promote flavor retention
Fermented malt beverages	25	Antigushing agent
Distilled alcoholic beverages	25	Promote stability of color, flavor and/or product clarity

[1] Calculated as anhydrous calcium EDTA

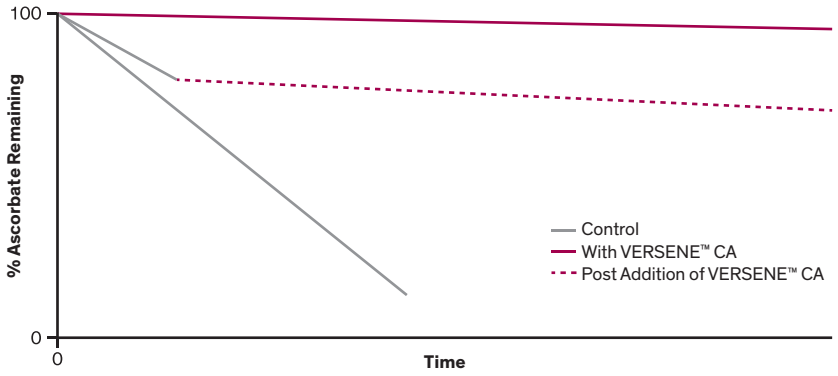

Figure 1: Ascorbate degradation with time in the presence and absence of VERSENE CA.

Interested in Learning More?

To learn more about VERSENE chelating agents and our supporting services, call us toll-free at +1 (800) 447-4369 or visit www.versene.com. We'll be happy to answer your questions, provide additional literature, and send samples of VERSENE products for your evaluation.

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