

Calcium Disodium EDTA (Food Grade) — Catalogue No. BA-1024

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Product Information

Product name	Calcium Disodium EDTA (Food Grade)
Catalogue number	BA-1024
Other names	Calcium disodium ethylenediaminetetraacetate; edetate calcium disodium; sodium calcium edetate; CaNa_2EDTA
INS / E number	385 / E385
CAS No.	62-33-9 (anhydrous); 23411-34-9 (hydrate)
EC No.	200-529-9
Formula	$\text{C}_{10}\text{H}_{12}\text{CaN}_2\text{Na}_2\text{O}_8 \cdot 2\text{H}_2\text{O}$ (mainly dihydrate)
Molecular weight	410.30 g/mol (dihydrate); 374.27 g/mol (anhydrous)
Functional class	Sequestrant, preservative, antioxidant synergist

Description and Intended Use

Calcium disodium EDTA is a white, odourless, crystalline powder or granule with a faint saline taste. It is freely soluble in water. It is used in food and beverage manufacturing to bind trace metal ions that cause oxidation, rancidity, off-flavours and discolouration. In Australia and New Zealand it is food additive 385, permitted only in the foods and at the levels listed in Schedule 15 of the Food Standards Code.

Mode of Action

EDTA is a hexadentate ligand that forms stable 1:1 complexes with metal ions through two nitrogen atoms and four carboxylate groups. CaNa_2EDTA is supplied already bound to calcium (log K 10.7). Metals that bind more strongly, such as Fe^{3+} (log K 25.1) and Cu^{2+} (18.8), displace the calcium and are held in an inactive form. This stops them catalysing lipid oxidation and colour reactions, without removing calcium from the food.

Specifications

Parameter	Specification	Method
Appearance	White powder or granules	Visual
Identification (Ca, Na, chelating activity)	Positive	JECFA / FCC
Assay	$\geq 99.0\%$	Complexometric titration
Chelated calcium	9.8–10.2%	Titration
pH (1% solution)	6.5–7.5	Potentiometric
Water	$\leq 13.0\%$	Karl Fischer
Water-insoluble matter	$\leq 0.01\%$	Gravimetric
Nitrilotriacetic acid	$\leq 0.1\%$	JECFA / FCC

Parameter	Specification	Method
Magnesium-chelating substances	Passes test	JECFA / FCC
Lead	≤ 2 mg/kg	AAS / ICP
Arsenic	≤ 1 mg/kg	AAS / ICP
Cadmium	≤ 1 mg/kg	AAS / ICP

This is a chemical food additive, so microbiological (CFU) testing is not part of the release specification.

Regulatory Status and Use Levels

Jurisdiction	Status	Examples of maximum levels
Australia / New Zealand	Food additive 385; Standard 1.3.1 and Schedule 15	Specified foods including fully preserved fish, fruit drinks, water-based flavoured drinks, sauces and toppings: 33–250 mg/kg
Codex (GSFA)	INS 385	e.g. canned molluscs up to 340 mg/kg
USA	21 CFR 172.120 (designated foods)	Canned clams 340 ppm; canned crabmeat 275 ppm; canned shrimp 250 ppm
European Union	E385; Regulation (EC) No 1333/2008 and (EU) No 231/2012	Limited categories only
JECFA	ADI 0–2.5 mg/kg bw	No excess disodium EDTA should remain in foods

Limits are expressed as anhydrous CaNa_2EDTA in the final food. Always confirm the current Schedule 15 entry for your food category.

Directions for Use

- Calculate the dose from the maximum permitted level for your food category. 1.10 g of the dihydrate supplies 1.00 g of anhydrous CaNa_2EDTA .
- Dissolve in water first as a 1–10% stock solution.
- Add early to the aqueous phase of the product and mix thoroughly.
- Use the lowest level that achieves the technical effect.
- Declare as "385" or by name in the ingredient list.

Metal Binding Strength

Metal ion	log K (EDTA, 25 °C)	Exchanged by CaNa_2EDTA ?
Fe^{3+}	25.1	Yes
Cu^{2+}	18.8	Yes
Zn^{2+}	16.5	Yes
Fe^{2+}	14.3	Yes
Mn^{2+}	13.9	Yes
Ca^{2+}	10.7	Carrier ion
Mg^{2+}	8.7	No

Storage and Shelf Life

Storage	Store at 15–25 °C in the original, tightly closed container. Keep dry and away from direct sunlight.
Shelf life	3 years from the date of manufacture when stored as directed.
Incompatibilities	Strong oxidising agents; reactive metals such as aluminium, zinc and copper.

Safety

The powder is classified as a skin and eye irritant, a skin sensitiser and a respiratory irritant (GHS07, Warning). Avoid breathing dust and wear gloves and eye protection when handling. Read the Safety Data Sheet before use.

References

- JECFA. Toxicological evaluation of ethylenediaminetetraacetate, disodium and calcium disodium salts. WHO Food Additives Series 5; 1974.
- JECFA. Calcium disodium ethylenediaminetetraacetate — specifications. FAO JECFA Monographs 1; 2006.
- Food Standards Australia New Zealand. Australia New Zealand Food Standards Code — Standard 1.3.1 and Schedule 15.
- US Food and Drug Administration. 21 CFR 172.120 — Calcium disodium EDTA.
- Codex Alimentarius Commission. General Standard for Food Additives (CXS 192-1995).
- Martell AE, Smith RM. Critical Stability Constants, Vol. 1: Amino Acids. New York: Plenum Press.
- Foreman H, Vier M, Magee M. The metabolism of C14-labeled ethylenediaminetetraacetic acid in the rat. J Biol Chem. 1953;203:1045–1053.

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