

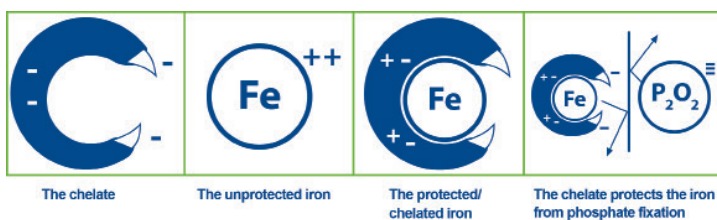


Chelated Micronutrient Solutions

The Performance Edge: Patented Dual Chelation

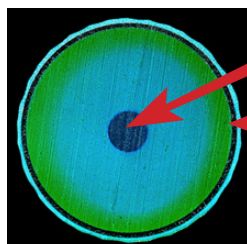
What is a chelate?

The word chelate (pronounced: “key-late”) is derived from the Greek word “chele” which literally means “claw”. Hence, chelate refers to the pincer-like manner in which a metal nutrient ion is encircled by the larger organic molecule (the claw), usually called a ligand or chelator.



Chelated micronutrients are protected from oxidation, precipitation, and immobilization in certain conditions because the organic molecule (the ligand) can combine and form a ring encircling the micronutrient. The pincer-like manner in which the micronutrient is bonded to the ligand changes the micronutrient’s surface property and favors the uptake efficiency of foliarly applied micronutrients.

Chelation occurs when certain large molecules form multiple bonds with a micronutrient, protecting it from reacting with other elements in the nutrient solution and increasing its availability to the plant.



Chelated metal being protected from attraction to other materials.

A good chelating agent protects the metal from all sides.

Why are Krystal Klear® micronutrient solutions so effective?

Dual Chelation: Utilizes patented, biodegradable IDS in conjunction with EDTA to maximize the benefits of both chelating agents.

Stability Constant, which refers to the equilibrium state of a metal cation and a ligand to form a chelating complex: A good stability constant is one in which the bond is strong enough to hold the metal in solution but not so strong that it doesn’t release the metal when applied.

Number of ligands: This refers to the ligands or “legs” that bond the metal to the chelating agents. For example, EDTA has 6 and LidoQuest® IDS-40 has 5 ligands while citric acid has 3 carboxylic ligands and glucoheptonate has 1. The higher the number of legs means more cation surface area is covered.

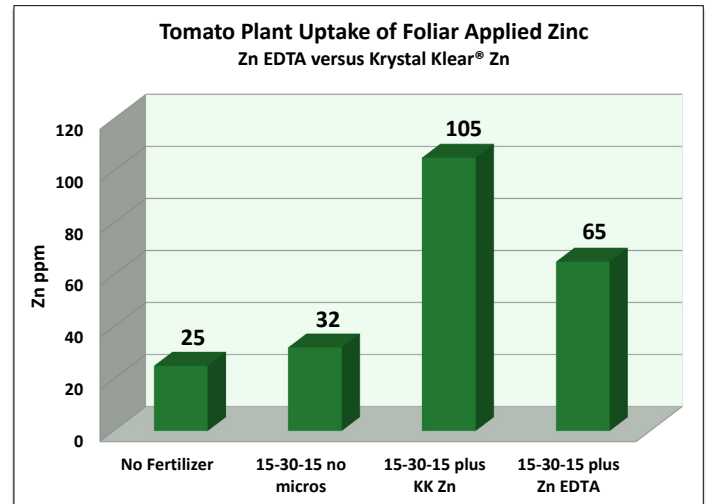
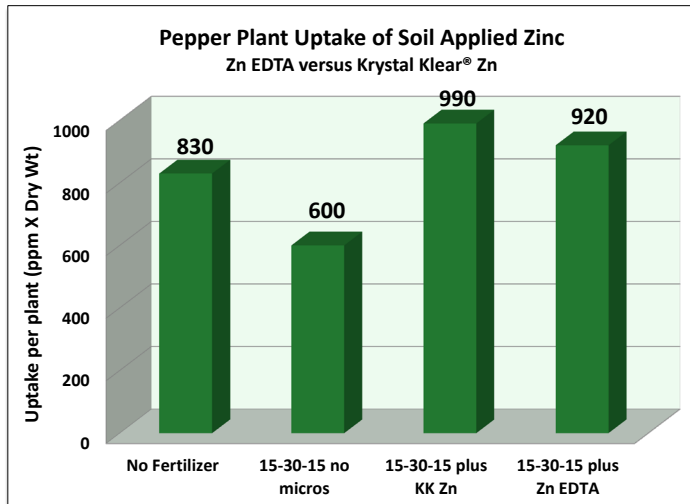
That is why both EDTA and LidoQuest® IDS-40 chelated metals are stable in orthophosphate solutions for an extended period while others fall apart and precipitate over time.



PERFORMANCE
NUTRITION®

Performance Nutrition is a division of LidoChem, Inc.

Performance Nutrition® Field Performance - Krystal Klear Zinc Products



Only Krystal Klear with LidoQuest IDS-40 says Yes! to all your chelated micronutrients needs!

LidoQuest IDS-40 vs. Other Chelating Agents

Options	LidoQuest IDS-40	EDTA	DTPA • HeEDTA EDDHA	Citric Acid	Glucosheptonate
Stable at pH =/ < 6	Yes	Yes	Yes	Yes	Yes
Effective at pH > 6	Yes	No	Yes	No	No
Can be soil applied	Yes	Yes	Yes	Yes	Yes
Can be foliar applied	Yes	Yes	No	Yes	Yes
Biodegradable	Yes	No	No	Yes	Yes
Ortho-Phosphate Compatible	Yes	Yes	Yes	No	No
Economical	Yes	Yes	No	Yes	Yes

Krystal Klear patented chelated micronutrient solutions for Agriculture

Krystal Klear Agra Mix 2% Cu, 2% Mn, 2% Zn and 0.5% B

Krystal Klear Agra Mix II 2% B, 2% Mn, 2% Zn and 0.5% Cu

Krystal Klear Agra Mix III 2% B, 0.5% Cu, 0.25% Fe, 2% Mn and 2% Zn

Krystal Klear Crop Mix 4% Zn, 1% Mn, 0.5% Cu and 0.1% B

Krystal Klear Crop Mix II 0.1% B, 0.5% Cu, 0.25% Fe, 1% Mn and 4% Zn

Krystal Klear B 5% B

Krystal Klear Cu 5% Cu

Krystal Klear Fe 4% Fe

Krystal Klear Mn 5% Mn

Krystal Klear Zn 9% Zn