

Meet Akzo Nobel

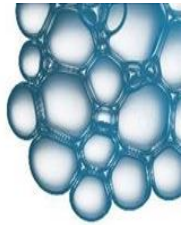
Origins in 1646; More than 350 years of history and cutting-edge innovation

Leading global paints and coatings company and a major producer of specialty chemicals

Consistently ranked as one of the leaders in the area of sustainability; No. 2 on the Dow Jones Sustainability Index

Passionate about innovation, with 4,000 scientists at over 160 laboratories

Committed to our customers and society through our brands and hands-on community projects



Meet Akzo Nobel

AkzoNobel 2016

AkzoNobel



Trusted portfolio of global brands

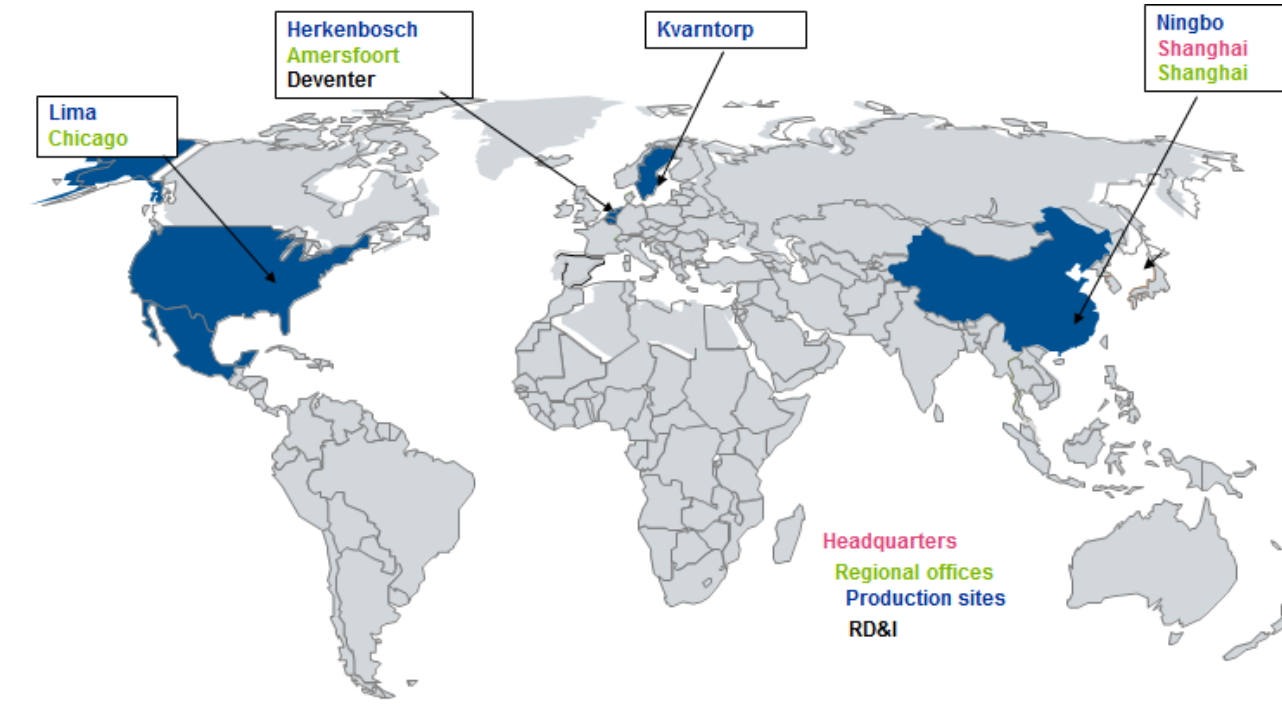


Meet Chelates and Micronutrients AkzoNobel



We have a truly global presence producing well established brands

AkzoNobel



Where are Chelates used

Agriculture

Building & Construction

Cleaning & Detergents

Feed & Food additives

Gas sweetening

Metal plating & Electronics

Oil industry

Personal care

Pharma

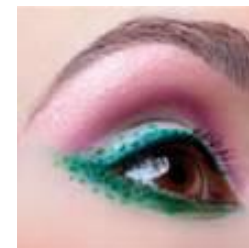
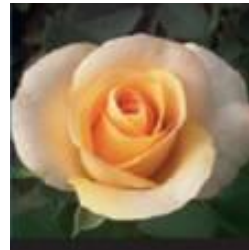
Photography

Polymer production

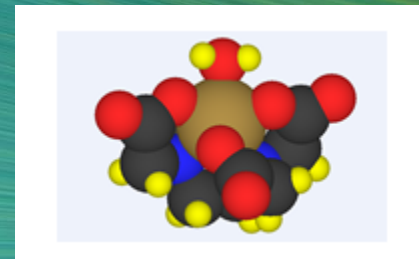
Printing inks

Pulp & Paper

Textiles



The most bio-available iron against anemia



What is a metal chelate?

Metal ion

+

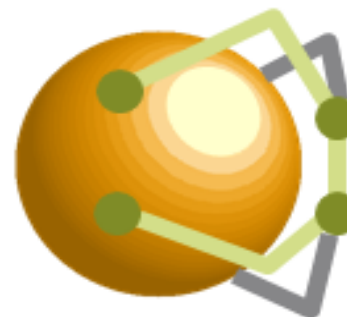
Chelating agent



Metal Chelate



+



Food fortification

The most efficient way of preventing and treating iron deficiency anemia is through food fortification

The main challenge is avoiding undesirable color and flavor changes of the fortified food

Also iron fortification should not cause metallic taste or teeth staining

And most important: the iron should be effective!

WHO recommendation:

Nutrient	Flour Extraction rate	Compound	Level of nutrient to be added in parts per million (ppm) by estimated average per capita wheat flour availability (g/day) ^a			
			<75 ^b g/day	75-149 g/day	150-300 g/day	>300 g/day
Iron	Low	NaFeEDTA	40	40	20	15
		Ferrous Sulfate	60	60	30	20
		Ferrous Fumarate	60	60	30	20
	High	Electrolytic Iron	NR ^c	NR ^c	60	40
		NaFeEDTA	40	40	20	15

Iron sources

Relative bioavailability of iron compounds

Water soluble	Fe (%)	RBV in man
<u>FeNaEDTA</u> (***)	13	200-400
Ferrous sulphate.7H ₂ O	20	100
Ferrous <u>gluconate</u>	12	89
Soluble in dilute acid	Fe (%)	RBV in man
Ferrous <u>fumarate</u>	33	100
Ferrous succinate	35	92
Ferrous <u>saccharate</u>	10	74
Water insoluble	Fe (%)	RBV in man
Ferric pyrophosphate	25	21~75
Ferric orthophosphate	28	25~32
Elemental iron:		
Electrolytic iron	98	5~100
Carbonyl iron	98	5~20
Reduced	97	13~148

Source: R. Hurrell, 1999. Mineral Fortification of Foods
 (***) Lavrisse et al. (1977), Viteri et al. (1978), el Guindi et al. (1988), MacPhail et al (1992), Hurrell et al (2000), Huo et al. (2002)

Why FeNaEDTA for food/four fortification:

- Completely water soluble
- Highly effective, even in presence of phytate
- No teeth staining
- Virtually inert to almost all other food ingredients
- No metallic taste
- No digestive effects
- High bioavailability



Suitable application area's

Wheat and maize flour

Derived products: bread, biscuits, pasta, instant noodles and cereals

Wheat, maize and rice: 3 main staple foods globally

Condiments

Soy sauce, fish sauce, bouillon cubes and salt

Drinks

Powdered beverages, milk and ready-to-serve lemonades (Cola, beer, sport drinks)

Supplements

Ferrazone can be used in iron containing food supplements under various forms (like syrups, sprays, tablets and powder sachets)

Products containing Ferrazone



LAFERGIN

Soluzione INNOVATIVA ad elevato assorbimento intestinale e biodisponibilità per l'ANEMIA SIDEROPENICA

Ferrazone[®]
(Sodio Ferrico-EDTA)
Lattoferrina
Vitamina B₁₂
Vitamina C

Modaltà d'uso:
1 compressa/die

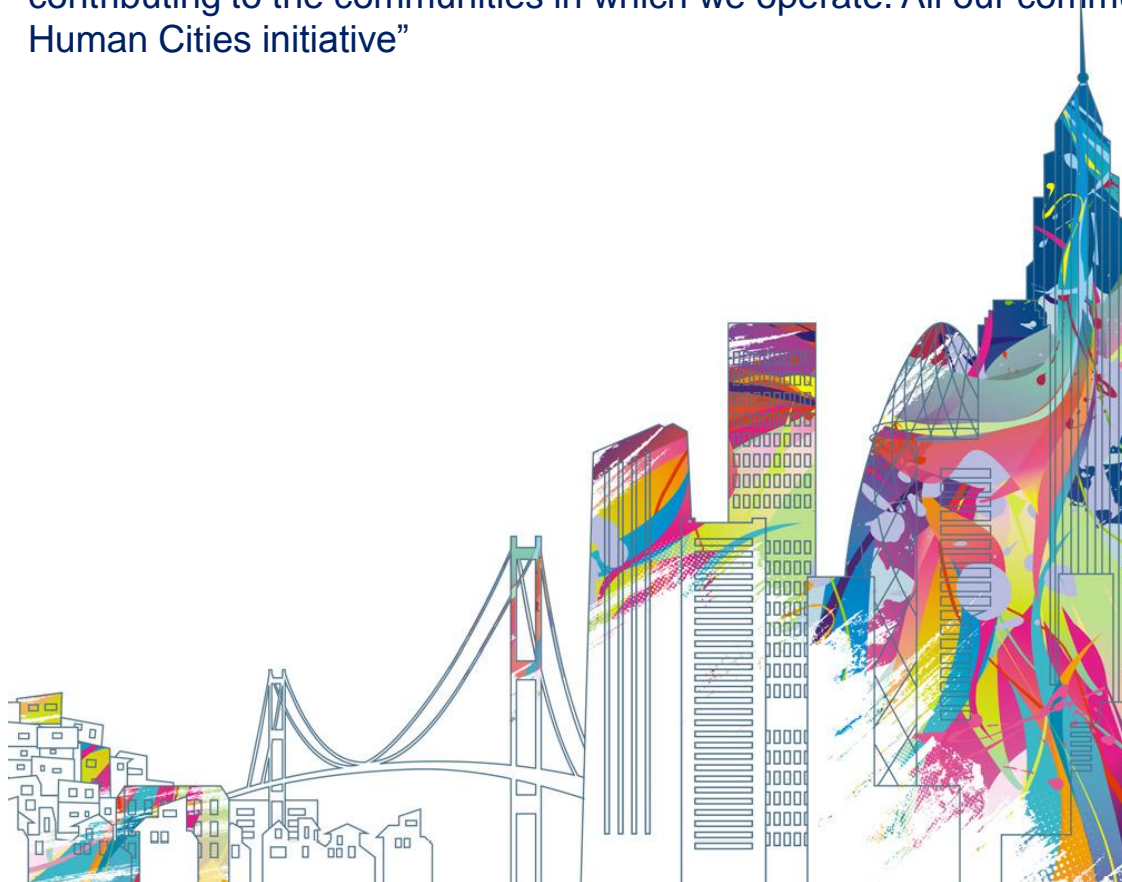
Vantaggi:

- basso dosaggio (Fe³⁺ = 7,8mg)
- elevata compliance
- assenza di retrogusto e di effetti collaterali

Vantaguardo
Pharmaceuticals

Our commitment to society; human cities

“As a global company, we fully understand our role and responsibilities when it comes to society and contributing to the communities in which we operate. All our community activities are guided by our Human Cities initiative”



Our commitment to society; human cities

Supporting the fight against malnutrition

Partnerships

AIM : Amsterdam Initiative against Malnutrition; Quality Improvement Network project
(GAIN, DSM, AkzoNobel, Bless Agrifood Laboratory, Intertek Food Services)

Longstanding relationship/sponsorship

Smarter Futures: promotion of flour and maize fortification in Africa

Cooperation

BioAnalyt: field testing of micronutrients, AN validated the Fe-EDTA method in flour; currently worked on improving the acceleration of the iron Check field test



iCheck Iron portable single wavelength photometer, pre-calibrated for quantitative measurement of iron.



Method: Colorimetric reaction of iron with bathophenanthroline, extraction of the red complex into the upper organic phase and detection with 525 nm.

Measurement range: 1.5 – 12.0 mg/L

Coefficient of variation in liquid sample: 7%

Pearson correlation when compared to AAS: $R^2=0.93$

Reference:

Rapid quantification of iron content in fish sauce and soy sauce: A promising tool for monitoring fortification programs. A. Laillou, et al. Food and Nutrition Bulletin, vol. 34, no. 2 (supplement) , 2013





Wheat and
maize flour



Vitamin
Premix



Beverages

Fe



Fish and Soy
Sauces



Corn Soya Blend
(CSB)



Lipid Nutrient
Supplement (LNS)

iCheck Iron Measures iron in wide range premixes and foods

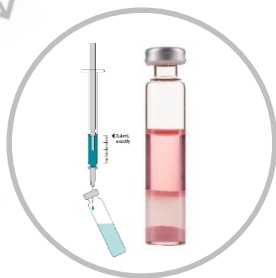
iCheck Iron measures following types of iron:

- Iron EDTA
- Iron sulfate
- Iron fumarate
- Intrinsic iron
- *NOT: Elemental or electrolytic iron*





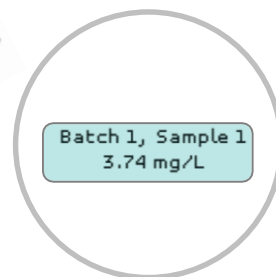
Iron in food



Formation of red iron-bathophenanthroline complex and extraction into the upper organic phase



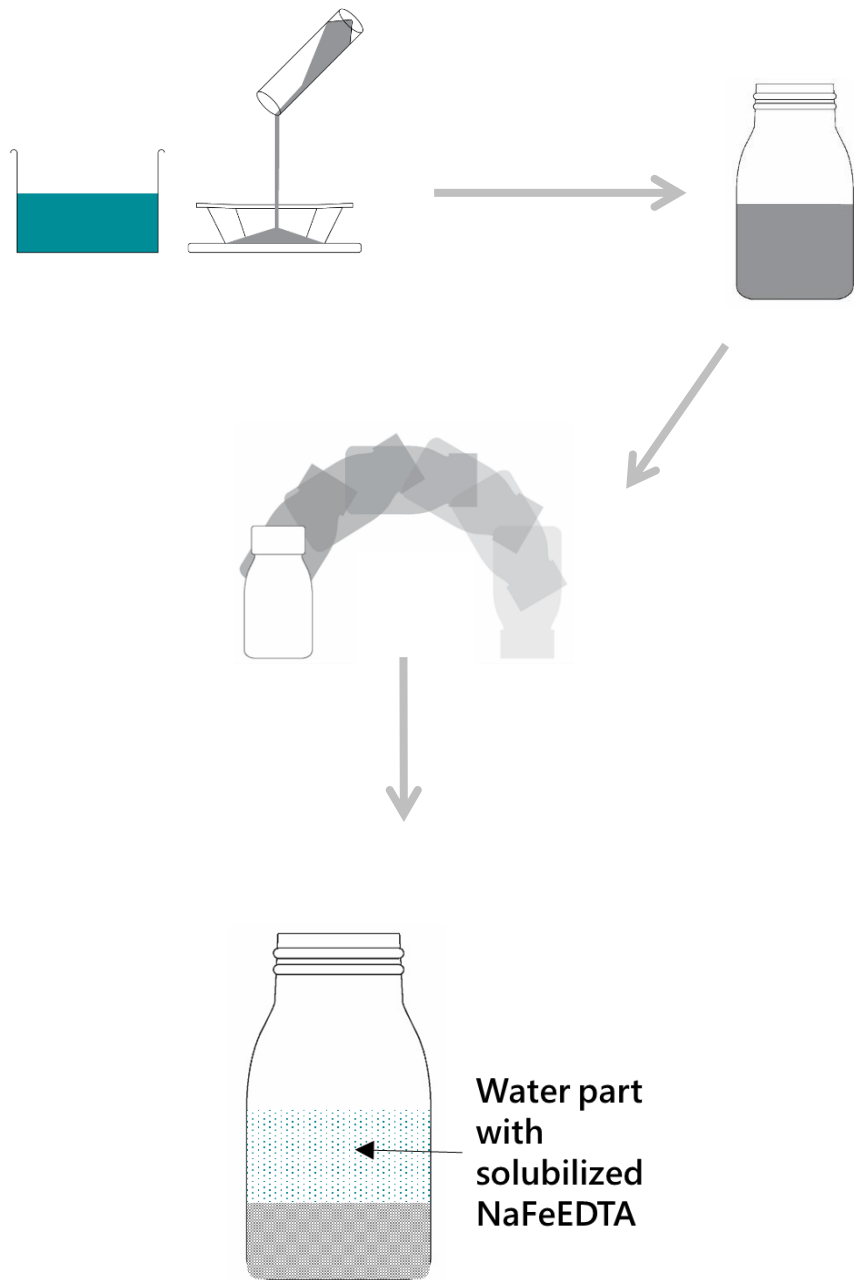
iCheck Iron measures absorption of 525 nm by the red complex.



Software converts the intensity of light emission into mg/L.

iCheck Iron Science behind iron determination.

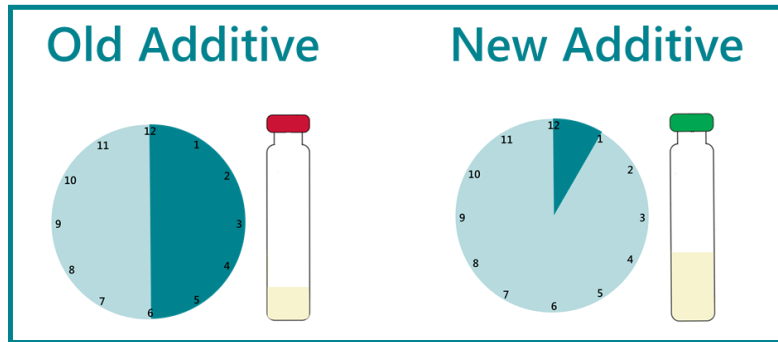




iCheck Iron

Sample preparation including precipitation or filtration of flour suspension allows for differentiation of NaFeEDTA from ferrous sulfate, ferrous fumarate, elemental iron and other iron compounds with poor iron solubility in water





iCheck Iron
performance was drastically improved by AkzoNobel who discovered faster method for NaFeEDTA. With new additive NaFeEDTA can now be measured after only 10 minutes.

- BioAnalyt has commercialized the new Additive from January 2017.
- iCheck Iron reagent vials are now supplied with new Additive that enables iron results with NaFeEDTA after 10 minutes.
- *All other forms of iron - ferrous fumarate, ferrous sulfate and intrinsic iron, require 60 min.*



For Technical Support visit our:

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or email:

support@bioanalyt.com

Contact for orders:

E-mail: contact@bioanalyt.com

www.bioanalyt.com

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BioAnalyt
measure for life

Thank you!

