

TRAACS[®]

The Real Amino Acid Chelate System - Advantages!

Albion[®] has been manufacturing and selling mineral amino acid chelates for a long time. Our first chelates were for the animal industry, followed by chelates for the human industry, and then for the foliar or plant industry. The terms “chelate” or “mineral amino acid chelate” get bounced around the industry consistently, but how many really know what these terms mean? Let alone, why they should be valued and so on? Albion’s brand of chelates is called **TRAACS[®]** - The Real Amino Acid Chelate System.

What is a Mineral Amino Acid Chelate?

Balchem’s Albion brand adheres to the definition of a mineral amino acid chelate as adopted by the National Nutritional Food Association (NNFA, now the Natural Products Association) in 1996. Chemically, a mineral amino acid chelate is the product resulting from the balanced chemical reaction of a metal ion with amino acids having proper mole ratios forming chemical bonds between the metal and the carboxyl and amino groups of the amino acid. The resulting molecule, known as an amino acid chelate, has a five-member heterocyclic ring structure.

The chemical structure of the TRAACS chelate is illustrated in the diagram on the right:

Additionally, Balchem’s Albion brand of chelates is a nutritionally functional chelate that has following important nutritional characteristics:

1. Must have a molecular weight of less than 800 Daltons;
2. Must be electrically neutral, non-ionizing, less reactive;
3. Must have the proper stability constant - to avoid competitive chemical reactions in the gut prior to absorption; and
4. Must have an easy-to-metabolize ligand that has nutritive value - higher nutrient density, due to the amino acid ligand being utilized as nutrition. Picolinates and EDTA chelates can’t make this claim.

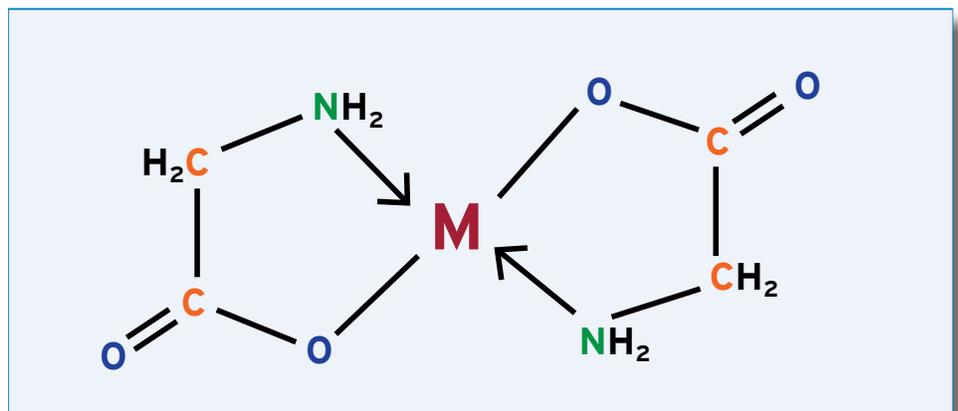
- Our minerals are supported by over 160 clinical studies.
- Albion chelates have been given CAS registry numbers.
- Our chelates are Kosher-Parve and Halal certified.
- Albion chelates have been chemically validated via FT-IR, and each lot is validated via this test.
- Virtually all published research on mineral amino acid chelates has been done using Albion chelates.

Importance of the Chemical Structure of the TRAACS’ Chelates

The chemical structure of TRAACS chelates meets the NNFA Board of Directors definition of a mineral amino acid chelate. In addition, Albion chelates possess the factors that make TRAACS chelates nutritionally functional. The chemical structure,

Factors that make the Albion TRAACS chelates stand out:

- Albion has over 150 patents in the mineral chelate field.



nutritional functionality, and the six factors listed above give Albion chelates these advantages over other 'so-called' chelates and mineral salt forms:

1. Higher bioavailability
2. Easier to tolerate - no gastric discomfort
3. Higher degree of safety
4. Non interactive with gastric components as well as food and other dietary items ingested with them
5. Superior physiological benefits
6. 100% nutrient density.



Scientific or Clinical Support for the Advantages of Albion Chelates

Albion's TRAACS chelates have been thoroughly tested to give support to their advantages over other mineral forms. One of the most important advantages is their higher bioavailability as shown in the following clinical studies:

A bioavailability study comparing two oral formulations containing zinc (Zn bis-glycinate vs. Zn gluconate) after a single administration to twelve healthy female volunteers

Int J Vitam Nutr Res. 2007; 77(4):243-8 (ISSN: 0300-9831)

Gandia P; Bour D; Maurette JM; Donazzolo Y; Duchène P; Béjot M; Houin G

<http://www.ncbi.nlm.nih.gov/pubmed/18271278>

Bis-glycinate administration was safe and well tolerated and bis-glycinate significantly increased the oral bioavailability of zinc (+43.4%) compared with the gluconate.

Availability of Calcium Sources: The Limited role of solubility

Calcif Tissue Int. (1990) 46:300-304

Heaney RP, Recker RR, and Weaver C

<http://www.ncbi.nlm.nih.gov/pubmed/2110852>

This study found that the fractional absorptions from four calcium sources



was as follows: 1) Calcium Bisglycinate Chelate 44%; 2) Calcium Citrate 24.2%; 3) Calcium Carbonate 23.5%; and 4) Hydroxyapatite 16.6%. These data show that the Albion chelated calcium was by far the most bioavailable.



Albion chelates are easy to tolerate, unlike many other minerals forms. Other forms of iron and zinc are known to cause gastric discomfort. Iron salts are known to cause constipation and stomach distress. Zinc salts can cause nausea and vomiting. Calcium salts (like the carbonates) can give rise to acid rebound, and magnesium salts have been known to cause diarrhea. Albion chelates do not cause these GI side effects. Tolerability of Albion chelates were investigated in these clinical studies:

Tolerability of Iron, a Comparison of Bis-Glycino Iron II (Ferrochel®) and Ferrous Sulfate

Clinical Therapeutics, Vol. 13, No. 5, 1991

Coplin M. and Schuette S., et al.

<http://www.ncbi.nlm.nih.gov/pubmed/1799918>

In this study, a significant number of women preferred the chelate over the sulfate preparation. This preference appeared

to be related to the lower number of side effects experienced with the chelate.

A bioavailability Study Comparing Two Oral Preparations of Zinc

(ISSN 0300-9831)

Int J Vitam Nutr Res. 2007; 77(4):243-8

Gandia P, et al

<http://www.ncbi.nlm.nih.gov/pubmed/18271278>

The increase in bioavailability seen for zinc bisglycinate over zinc gluconate was +43.4%. Zinc bisglycinate was very well tolerated.



Questions have been asked about the safety of Albion's TRAACS mineral forms. Since they are so well absorbed, are they safe? This is most often a concern in regards to minerals like iron. Certain iron salts have been seen to cause iron toxicity problems. The safety of Albion mineral amino acid chelates has been demonstrated in specific toxicology testing. Both short and longer term testing has shown the safety of Ferrochel. Multiple clinical studies have shown that the absorption of iron from Ferrochel is regulated by the body's iron content. The clinical evidence

of Albion's ferrous bisglycinate chelate is demonstrated in the studies cited below:

Opinion of the Scientific Panel on Food Additives, Flavourings, Processing Aids, in Contact with Foods Related to Ferrous Bisglycinate as a source of Iron for Use in the Manufacturing of Foods and in Food Supplements

The EFSA Journal (2006) 299, 1-17
http://www.efsa.europa.eu/sites/default/files/scientific_output/files/main_documents/299.pdf

Ferrous bisglycinate does not present a safety concern, as a source of iron in foods intended for the general population, food supplements, and foods for particular nutritional uses, including foods intended for infants and young children, meeting the specifications proposed.

Toxicology and Safety Evaluation of Ferrochel and Other Iron Amino Acid Chelates

Arch. Latin Americanos de Nutricion Supp. Vol. 51, no 1, 2001
Jeppsen R
<http://www.ncbi.nlm.nih.gov/pubmed/11688078>

This article gives a detailed review of the acute and sub-chronic toxicity studies on Ferrochel. In addition, Ferrochel's self-affirmation of GRAS status for use as food fortificant or dietary supplement was acknowledged by the US FDA with no questions or concerns.

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One of the most outstanding advantages of the Albion TRAACS minerals rests on the ability to deliver superior physiological benefits. After all, isn't that the reason for taking vitamin and minerals supplements? Albion chelates meet the consumer's need for physiological benefits, and in a superior way as demonstrated by the following clinical studies:

Enhanced Aerobic Exercise Performance in Women by a Combination of Three Mineral Chelates (from Albion) Plus Two Conditionally Essential Nutrients

Exp. Bio. April, 2014
DiSilvestro R
http://www.fasebj.org/content/28/1_Supplement/634.7?related-urls=yes&legid=fasebj;28/1_Supplement/634.7

A combination of certain mineral complexes (Albion chelates) and 2 non-essential organic nutrients improved aerobic exercise performance in young physically fit adult women.

Longitudinal Changes of Manganese-dependent Superoxide Dismutase and Other Indices of Manganese and Iron Status in Women

Am J Clin Nut 1992; 55:747-52
Davis CD and Greger JL
<http://www.ncbi.nlm.nih.gov/pubmed/1550052>

This work demonstrated that lymphocytic MnSOD activity can be used with serum manganese to monitor manganese exposure in humans.

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A key reason for the higher bioavailability of Albion chelates is their non-interaction with gastric components and many additional co-ingested dietary components. Mineral salts are highly impacted in a negative way by gastric components and many other co-ingested dietary components. Below are two citations that illustrate this feature of Albion chelates:

Advantages and Limitations of Iron Amino Acid Chelates as Iron fortificants

Nutrition Reviews Vol. 60, No.7, 2002
Allen L
<http://onlinelibrary.wiley.com/doi/10.1301/002966402320285047/pdf>

The author concludes bioavailability advantages for Ferrochel over iron salts is especially evident in foods containing phytates, as well as dairy products. Its limitation in high fat foods is due to the redox potential of the compound.

Iron Amino Acid Chelates

In J Vitam Nutr Res; 74(6),2004
Hertrampf E, Olivares M
<http://www.ncbi.nlm.nih.gov/pubmed/15743019>

The reviewers in this article point out that ferrous bisglycinate had positive impacts in fortification of liquid milk, various other dairy products, wheat flour sweet rolls and micronutrient beverages. Positive opinions were expressed concerning the safety, organoleptic properties, and stability of products fortified with ferrous bisglycinate chelates are given.

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Finally, Albion's chelates possess 100% nutrient density - all of the components that form an Albion TRAACS minerals have nutritional value. They are composed of a mineral and one of several amino acids needed to form proteins, enzymes, and other biochemical factors: glycine, glutamine, or lysine. Other chelates, such as picolates and EDTA compounds, offer only the mineral nutrients. Picolinic acid and EDTA are xenobiotics - possessing no nutritional value - and they are capable of pulling minerals out of the body. Only Albion chelates are nutritionally functional!

These factors prove that Albion TRAACS minerals are the best choice to be included in mineral supplements as well as many foods and beverages.

BALCHEM[™]
Human Nutrition & Pharma


ALBION[®]
MINERALS

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The Mineral People[®]

ALBION[®] RESEARCH NOTES

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RESEARCH NOTES

