

MINERALS... TRACE MINERALS... ULTRA TRACE MINERALS Is Supplementation Safe?

There are 106 elements listed in the Periodic Table of Elements. What is an element? According to *The Random House Dictionary of the English Language*, an element is: "Any of a class of substances, of which 106 are now recognized, that cannot be separated into similar substances by chemical means". Of the 106 elements, 16 are man made, 22 are non-metals, and 68 are metals. The elements hydrogen, helium, nitrogen, oxygen, neon, argon, krypton, xenon, and radon are gasses that are excluded from the term "mineral". Carbon, the key element to organic substance, is also excluded from the term "mineral". If one is counting, of the 106, one would subtract the man made (16), the gasses (9), and carbon (1), leaving 80 elements that one might refer to as minerals. Some might argue against the inclusion of the halogens (fluorine, chlorine, bromine, iodine, and astatine) as minerals, but for the sake of this physiological discussion, it is just as well to include them. Over time, man has come to realize that there are certain of these elements that are essential to the health and development of the human body. Of these 80 elements, how many are essential to the nutritional support of the human body? An essential nutrient must be ingested because the body cannot synthesize it. We have chosen to call these types of elements: mineral nutrients.

According to the National Research Council of these 80 elements the following have been found to be of nutritional value:

Macro Minerals: Calcium, phosphorus, magnesium, sodium, potassium, sulfur, chloride

Trace Elements: Iron, zinc, iodine, selenium, copper, manganese, fluoride, chromium, molybdenum, iodine

Ultra Trace Elements: Note that deficiencies for these have not been established in human beings. There are no data from which a human requirement could be estimated, and no provisional allowance can be given. Evidence for a requirement in laboratory animals has been developed. Boron, silicon, nickel, and arsenic have been found in animals, and are believed to be essential for these animals. For cadmium, lead, lithium, tin, and vanadium, evidence for requirements and essentialness is weak. Cobalt might have relevance to strict vegetarians whose intake of cobalt containing vitamin B₁₂ is severely limited.

The above listing from the National Research Council totals 25 minerals or elements that have or may have some nutritional value in human beings. Of the ultra trace elements, only boron has had a demonstrated deficiency in humans, and cobalt has a hypothetical deficiency potential in vitamin B₁₂ deficiency. For any of the eight other ultra trace elements, essentialness to the human diet has never been demonstrated. When physiological responses are seen for them, one must ask whether these are physiological, pharmacological, or toxicological. For all practical purposes, there are only 17 minerals or elements of substantiated nutritional value. There are 63 others that are all questionable. Of the ultra trace elements, vanadium, nickel, and tin have recently gained some acceptance in the area of nutritional supplementation. Silicon is needed, but its abundance makes one question whether supplementation is generally warranted. The nutritional needs for arsenic, cadmium, lead, and lithium are clouded by their well known toxic properties. Even with the most nutritionally essential minerals, there is a potential for toxicities or untoward effects. One can get too much of even a good thing. How much worse is it to get too much of a known (or unknown) bad thing than not enough?

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Many people are fearful of taking supplemental iron. They fear side effects from consuming too much of this essential mineral nutrient. Yet, some companies are marketing nutritional products that reportedly contain all the natural elements for which essentialness have not been established. Some report having as many as 72 different minerals and others even more. Some tout their silver content. Why would people who want to supplement their diets with minerals that have well documented toxic effects, when they already fear consuming too much of an essential mineral? What about too much of a bad thing?

There are well researched scientific textbooks written on the dangers of the intake of elements or minerals that have not been found to be of any nutritional value. Some are pharmacology books; most are toxicology books. Even for some of the well accepted trace elements, there are narrow margins between what is a beneficial and what is a harmful or toxic intake? Consider the caution one should take in regards to intake levels of copper, zinc, selenium, or vanadium. Most people are careful about their copper/zinc intake ratios. With that in mind, how should one feel about his/her intake of caesium/thallium? Many are

offended by the dangers of pollution in the water supply with heavy metal contamination or overexposure to known toxic substances. Why wouldn't they feel the same about supplementation of known toxic substances?

Why would someone who is careful about his health and nutritional intake, who is worried about pollution and environmental toxins willingly, supplement his diet with elements or minerals that have no known nutritional value, but well documented toxic effects?

BEFORE SUPPLEMENTING, CONSIDER THIS

As mentioned earlier, even with minerals or trace elements of known nutritional need, there can be a fine line between safe and harmful intake. A reputable nutritional supplement company makes every effort to bring the public products that contain the minerals that one needs at safe levels. Some companies are marketing minerals that have no known nutritional value, and in most cases, these non-nutritive minerals present a danger to the body if ingested and absorbed. A review of some of the leading publications in the realm of toxicology has the following to say about some of these non-nutritive minerals.

Silver

Silver does not occur regularly in animal or human tissue. Silver can be absorbed from the lungs and

gastrointestinal system. The major effect of excessive absorption of silver is generalized impregnation of the tissues where it forms an insoluble complex with the elastic fibers resulting in argyria. It accumulates in the spleen, liver, bone marrow, lungs, muscle, and skin. Lesions of the kidney and lungs, as well as arteriosclerosis have been attributed to industrial and medicinal silver exposure. When colloidal silver was given to experimental animals it produced death due to pulmonary edema and congestion. Hemolysis and resulting bone marrow hyperplasia have been reported with silver. Chronic bronchitis has been reported from the medicinal use of colloidal silver. J. Doull, et al., (Casarett and Doull's Toxicology, The Basic Science of Poisons. Third Edition, 1986, p. 625).

Gold

Dermatitis and stomatitis are the most frequently reported side effects of gold. The oral use of gold has resulted in proteinuria and nephritic syndrome, which morphologically consists of an immune complex glomerulonephritis (a type of kidney disease) with granular deposits in the kidney. It is believed that the gold forms a gold/protein complex that becomes deposited in the kidney tissues. It is known to cause bone marrow toxin, which is capable of causing bone marrow failure. Gold has a very long biological half life, and detectable levels can be demonstrated for ten months after usage. Gold is known to cause immune system suppression. (Op. Cit., p. 621)

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Aluminum

The toxicity of aluminum may be divided into three major categories: [1] The effect of aluminum compounds on the gastrointestinal (GI) tract. [2] The effect of inhalation of aluminum compounds; and [3] Systemic toxicity. For our purposes, we need not cover the inhalation effects.

Aluminum compounds can affect absorption of other elements in the GI tract and alter intestinal function. Aluminum inhibits absorption of fluoride, and can decrease the absorption of calcium and iron. In addition, its binding of phosphorus has led to phosphate depletion and osteomalacia. It is known to inhibit acetylcholine-induced contraction that may result in constipation. It is thought to cause dementia in humans. Progressive and fatal neurologic syndromes have been associated with the long term use of aluminum, causing speech disorders, followed by dementia, convulsions, and myoclonus. (Op. Cit., p 619-620)

Lithium

As a drug, lithium carbonate is used in the treatment of depression. There must be careful monitoring of usage to produce optimal therapeutic value and not produce toxicity. Even then, many cases of toxicity occur. Lithium is readily absorbed from the gastrointestinal tract. Lithium has been found to cause the following toxic responses: neuromuscular changes (tremor, muscle hyperirritability, seizures, ataxia); central nervous system changes (blackout spells, epileptic seizures, slurred speech, coma, psychosomatic retardation, increased thirst); cardiovascular changes (cardiac arrhythmia, hypertension, circulatory collapse);

anorexia, nausea and vomiting, and kidney damage. Long term ingestion at supposedly safe dosages has caused nephrotoxicity (renal tubular defects), nephrogenic diabetes insipidus, and interstitial nephritis. (Op. Cit., p. 621-622)

Thallium

Thallium salts were first used as pesticides in Germany, and were particularly effective as a rodenticide. Due to human and animal poisonings associated with thallium's use in pesticides and rodenticide, its use as such was banned by the U.S. Department of Agriculture in 1965. Thallium acts as a cumulative poison, due to its extremely slow excretion rate. It can be absorbed through the skin, as well as the gastrointestinal (GI) tract. Thallium's absorption rate from the gastrointestinal tract is almost 100%. Thallium is a potent neurotoxin. Initial acute toxic exposure results in nausea and vomiting. These symptoms may subside and be followed in 7 - 14 days by gastrointestinal pain, constipation, bloating, and bleeding. Coma, delirium, hallucinations, more G.I. bleeding, and seizures can occur.

The clinical manifestations of thallium poisoning appear gradually over the course of a few weeks. Neurologic symptoms occur after the first week as paresthesias and neuritis, particularly in the lower extremities. This is followed by polyneuritis; alopecia is common, ataxia, tremors, and more painful neuritis. The neurology becomes further spread and more pronounced, leading to facial paralysis and other facial control problems, as well as psychological and emotional changes with intense depression

and psychosis. Recovery is slow and requires months.

Additional never damages can lead to electrocardiographic changes, hypertension, and paralytic ileus. Death may occur due to cardiac dysrhythmia, shock, coma, and renal failure. (J.B.Sullivan, et al., ed. Sullivan and Krieger's Hazardous Materials Toxicology, Clinical Principles of Environmental Health, Williams & Wilkins, 1992, p. 908-910)

COLLOIDAL MINERALS

According to Dorland's Illustrated Medical Dictionary, 24th Edition, a colloid is:

"A state of matter in which the matter is dispersed in or distributed throughout some medium called the dispersion medium. The matter thus dispersed is called the disperse phase of the colloid system. The particles of the disperse phase are larger than the ordinary crystalloid molecule, but not large enough to settle out under the influence of gravity."

The current edition of Random House Dictionary of the English Language says this about colloids:

Physical chemistry A. a colloidal system, one in which a finely divided solid is suspended in a liquid: such colloids range from solutions to gels. B. a colloidal suspension C. a substance that when suspended in a liquid will not diffuse easily through vegetable or animal membrane.

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During the lecture by Dr. Joel Wallach, as heard on the tape entitled, "Dead Doctors Don't Lie", the doctor stated that colloidal minerals are so small that they require no effort to be absorbed. The hype behind the colloidal minerals tells us that the particles are so small that they have direct permeability into your body's tissues. Yet, in the definition of colloids from Random House, under section C, we are told that the colloidal substances. . . "will not diffuse easily through vegetable or animal membrane".

Dr. Wallach further states that colloidal minerals are absorbed at a rate of 98%. Why not 100%? Since there is no scientific documentation on colloidal mineral absorption besides his say so, shouldn't the sky be the limit? By definition, a colloidal mineral is that mineral finely divided and suspended in a liquid. Why suspended? Why not dissolved? Because the mineral forms in the

colloidal minerals are not soluble, that's why. When a mineral form is dissolved in a liquid, it then exists in its smallest possible form - either as a part of a bioavailable molecule or as a positively charged atom (cat ion). When the other mineral forms present themselves to the absorptive surfaces of the intestine, they are in their smallest possible form or liquid form. Colloidal minerals are much larger in size than other mineral forms. According to Remington's Pharmaceutical Sciences, colloidal mineral particles each consist of many aggregates, and each aggregate contains many molecules. Obviously, colloidal minerals exist in particle sizes many times larger than the other mineral forms.

In addition, Dr. Wallach states that the colloidal minerals are negatively charged, and thus are strongly attracted to the positively charged surfaces of the intestinal lining, where absorption takes place. A quick review

of the basic physiology of absorption will tell you that the intestinal lining has a negative charge, not a positive charge, as stated by Dr. Wallach. If colloidal minerals are negatively charged, they would be repelled by the intestinal lining, not attracted to it, making their absorption impossible.

By the way, just what is the chemical makeup of a colloidal mineral? The word colloidal describes the physical form, not the chemical form for the mineral. Are they oxides (iron rust)? Free metals? Metal ore? Many are even toxic elements! Their marketers claim them to somehow be of negative charge. One text states that they are clay minerals extracted by organic acids (probably humic and fulvic acids). Most people taking colloidal minerals really don't know what they are putting in their bodies. This probably doesn't matter. After all, these colloidal minerals are not really absorbed anyway. Could that be a safety factor?!

EMPHASIS SHOULD BE ON ELIMINATING INTAKE

As one can see from these brief toxicological reviews on just a few non-nutritive minerals, it is not a good idea to ingest such substances. Before taking a supplement which has a mineral content that contains large quantities of non-nutritive minerals, one needs to take a close look at the logic for such a choice. A quick review of the toxicology listings for most of these non-nutritive minerals will demonstrate that even though no nutritive value has been found, man has unfortunately and accidentally found negative, toxic, and even deadly effects when these minerals are ingested. Government

agencies have placed environmental restrictions on many of these metals, like beryllium, thallium, tellurium, and others. It seems illogical to knowingly supplement one's diet based on hearsay and twisted rationale with minerals that science and human suffering have already demonstrated that we should avoid. These types of minerals should be removed from the diet as much as possible - *not added to it!*

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SAFETY FIRST WITH ALBION MINERALS

Albion Laboratories prides itself in offering to its customers only minerals of proven nutritive benefit.

Albion's patented mineral amino acid chelates are the finest and purest possible form of mineral available. We use only the highest USP grade starting materials. These minerals are known for their safety from non-nutritive mineral contamination.

Look to Albion Laboratories for your safest and most effective choice in mineral supplementation.

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