

Micro Trace Minerals Laboratory

environmental & clinical laboratory

Röhrenstrasse 20, 91217 Hersbruck, Germany
P.O.Box 4613; Boulder, CO 80306-4613, USA



MINERAL ANALYSIS

Childs' Hair

		Lab Number		1KH229325	
Doctor/Clinic	Synlab MVZ Leinfelden GmbH			Test Date	04.02.2020
Patient Name	870903593200 Albana Kemali	Sex	f	D.O.B.	13.11.2013
Clinical Information	As confirmed			Page	1/4

	Acceptable Range	Test Value		
Essential Trace Elements (ppm = mg/kg = mcg/g)				
Chromium (Cr)	0,020 --- 0,150	0,082		
Cobalt (Co)	< 0,150	0,049		
Copper (Cu)	6,700 --- 37,000	13,957		
Iodine (I)	0,150 --- 3,500	1,755		
Iron (Fe)	7,700 --- 15,000	12,093		
Manganese (Mn)	0,070 --- 0,500	0,402		
Molybdenum (Mo)	0,020 --- 1,000	0,041		
Selenium (Se)	0,400 --- 1,400	0,487		
Vanadium (V)	0,010 --- 0,150	0,030		
Zinc (Zn)	110,000 --- 227,000	167,031		
Essential Macroelements (ppm = mg/kg = mcg/g)				
Calcium (Ca)	200,000 --- 850,000	1.057,247		
Magnesium (Mg)	20,000 --- 115,000	96,509		
Nonessential Trace Elements (ppm = mg/kg = mcg/g)				
Boron (B)	< 2,000	1,077		
Germanium (Ge)	< 0,500	0,020		
Lithium (Li)	< 0,200	0,014		
Strontium (Sr)	0,110 --- 4,280	6,647		
Tungsten (W)	< 0,020	0,007		
Potentially Toxic Elements (ppm = mg/kg = mcg/g)				
Aluminum (Al)	< 8,000	6,691		
Antimony (Sb)	< 0,200	0,061		

n.n. = not detected, < x = below Detection Limit

Quality control: Dipl. Ing. Friedle, Accreditation: DIN EN ISO 17025; Validation: Dr. E. Blaurock-Busch PhD

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Acceptable Range

Test Value

Potentially Toxic Elements (ppm = mg/kg = mcg/g)

Arsenic-total (As)	< 0,200	9,531	↑	
Barium (Ba)	< 2,650	0,668		
Beryllium (Be)	< 0,030	< 0,010		
Bismuth (Bi)	< 0,179	0,326	↑	
Cadmium (Cd)	< 0,200	0,030		
Lead (Pb)	< 3,000	0,855		
Mercury (Hg)	< 0,300	0,313	↑	
Nickel (Ni)	< 0,850	0,233		
Palladium (Pd)	< 0,100	< 0,050		
Platinum (Pt)	< 0,070	< 0,005		
Silver (Ag)	< 1,000	0,085		
Thallium (Tl)	< 0,010	< 0,001		
Tin (Sn)	< 0,930	0,418		
Titanium (Ti)	< 0,650	0,320		
Uranium (U)	< 0,100	0,011		
Zirconium (Zr)	< 1,470	0,131		

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This Analysis Determined The Following Mineral Deficiencies And Excesses. Since it is difficult to distinguish treated samples from untreated ones, it is assumed that the spectroanalytical analysis was performed on chemically untreated hair as requested in our laboratory brochure. Chemically treated hair does not provide reliable results and MTM does not assume responsibility for data obtained from treated hair. The information contained in this elemental analysis report is designed as an interpretive adjunct to normally conducted diagnostic procedures. The data and information provided here is based on information related to the health of children. The findings are best viewed in the context of a medical examination and history.

ARSENIC (As):

All the biochemical actions of arsenic are attributed to its trivalent forms, widely found in polluted environments. Inorganic arsenic, or arsenite, does accumulate in tissues and ranks second among heavy metals causing death. Arsenite rapidly leaves the blood to be deposited in vital organs and tissues such as hair, skin and nails.

TOXICITY SYMPTOMS have been associated with hair loss, confusion, constipation, delayed wound healing, dermatitis, diarrhea, drowsiness, edema, fatigue, muscle pains, numbness, seizures, and weakness. Chronic arsenic exposure is known to cause anemias, bone marrow depression, cancers of the respiratory tract, skin and neurological problems. Long-term exposure to small amounts of arsenic increase hair and urine levels; however considerate chronic exposure results in hair loss. Hair or nails are known to be used in forensic medicine to establish long-term, chronic exposure and slow-rate poisoning. SOURCE: Smelters, industrial pollution, arsenic-containing paint, polluted water and fish.

BLOOD LEVELS are not known to increase until toxicity has been reached. Urine measurements are used to monitor chelation therapy.

THERAPEUTIC CONSIDERATION: Cases of chronic exposure respond well to antioxidant therapy, especially ascorbic acid, calcium ascorbate, all tocopherols (vitamin E) and an increased intake of sulfur-containing amino acids and vitamin B6. Arsenic suppresses iodine and selenium. In severe cases, DMPS chelation is recommended.

BISMUTH (Bi):

Bismuth is used as a coloring agent in cosmetics and burn ointments. It is used in used in surgical dressings and in the treatment of warts, to regulate stool odor and consistency in colostomy patients and in the treatment of gastric and duodenal ulcers.

It is considered nonessential, but can be found in human tissue. Toxicity symptoms are known for some bismuth compounds: nephropathy, encephalopathy, osteoarthritis, gingivitis, stomatitis and colitis. The route of excretion is from blood to bile. Some bismuth salts may cause sensitivity. The use of bismuth iodoform paraffin packs in surgical dressings and the use of bismuth-containing skin creams have led to bismuth encephalopathy. Occupational exposure is rare. Minor ingestion of bismuth compounds may cause nausea and epigastric discomfort. More substantial ingestion may cause vomiting and abdominal pain, usually within hours, preceding features of nephrotoxicity and neurotoxicity.

THERAPEUTIC CONSIDERATION: Check blood and stool levels for immediate exposure, hair for long-term, chronic exposure. Research indicates that chelation therapy with DMPS or DMSA may be indicated in severe cases of toxicity.

CALCIUM (Ca):

High tissue levels of chemically untreated hair reflect malabsorption problems and a masked deficiency, which is caused by calcium being drawn from bones and redistributed into other tissues such as hair. Thus, high hair levels reflect bone withdrawal and osteoporotic tendency. Calcium deficiency symptoms such as unhealthy hair, nail and teeth, muscle cramping at night, insomnia, menstrual problems, nervousness and irritability may be present. When such deficiency symptoms are present, moderate calcium supplementation is recommended in combination with a low fat diet and increased activity level. To further support the calcium absorption and to normalize tissue levels, digestive aids and an increased intake of lecithin are recommended.

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MERCURY (Hg):

Circulating metals in blood 'feed' the hair root. Therefore, hair reflects long-term or chronic exposure. Early symptoms of mercury overexposure include insomnia, dizziness, fatigue, drowsiness, weakness, depression, tremors loss of appetite, loss of memory, nervousness, headache, dermatitis, numbness, and tingling of lips and feet, emotional instability and kidney damage.

SYMPTOMS OF ACUTE TOXICITY: Loss of teeth, extreme tremor, mental and emotional disorders, kidney failure.

SOURCES: Overexposure may stem from paints, explosives, electrical apparatus, batteries, mercurial diuretics, fungicides, fluorescent lamps, cosmetics, hair dyes, amalgams in dentistry, contaminated seafood, and petroleum products. Vaccines containing thimerosal are another source of exposure. Improper disposal of broken mercury thermometers and other apparatuses that use mercury including button cells and tube lights may also result in mercury exposure.

THERAPEUTIC RECOMMENDATION: Increased oral intake of cysteine and antioxidant intake, especially selenium and vitamin E can support mercury detoxification. Chelating agents such as DMPS or DMSA effectively bind mercury, resulting in an increased urinary excretion, a sign of the detoxification process.

STRONTIUM (Sr):

Strontium possesses physiological and chemical properties similar to calcium. Strontium is poorly absorbed by humans, and the intestinal uptake lies between 5-25%. Of that, about 99% is found in bone and teeth. People living in areas where high levels are found in the water supply, show higher tissue levels. The daily intake varies considerably from 1 mg/day to 4.7 mg/day, according to geography. Strontium can interfere with the calcium metabolism, leading to bone disorders, incl. rickets.

THERAPEUTIC CONSIDERATION: Strontium may compete with the calcium absorption and storage in bone and teeth and when high hair strontium levels are followed by high hair calcium level, the need for an increased calcium supply is indicated. Algae and fibrous cellulose reduce strontium and calcium utilization.

The following nutritional program is suitable for children 2 to 12 years of age. For a child under 2 years of age the following recommended dosage have to be adjusted, depending on the child's health, weight and condition. The outlined nutritional support program is recommended for 3-4 months, after which a repeat analysis is recommended. A follow-up test would evaluate and determine this child's ability to digest and absorb nutrients. This program has should be supervised by a licensed health care provider. If any questions or problems arise, consult your doctor.

Bismuth (Bi)

To check extend of exposure, check urine levels. To reduce uptake, increase antioxidant intake. Ask your physician about detoxification treatment.

Calcium (Ca)

To improve calcium utilization, reduce consumption of dairy products. Avoid fatty foods and increase intake of fiber. Support digestive function. Physical activity greatly aids calcium utilization. Check magnesium and vitamin D intake as they improve calcium utilization.

Mercury (Hg)

Mercury increases the need for sulfur and sulfur-containing amino acids such as methionine, selenium and vitamin E. Ask your physician about detoxification treatments.

Strontium (Sr)

Water and soil can be a source of strontium exposure, depending on the area's geology. Strontium and calcium are handled similarly by the human body and when the dietary intake of strontium is high, strontium begins to replace calcium in developing bone. Hence calcium deficiency increases strontium absorption. Check calcium status and vitamin D level. An increased intake of vitamin D3 and calcium, vegetable fiber, and seaweed can normalize strontium levels.

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