ZEO

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How was it formed?

Zeolites are naturally formed with the reaction of fresh underground waters or sea water with volcanic ash. Their formation takes 50 to 10,000 years.

Zeolites are crystals with micro pores and they have well-defined structures.

It is a mineral which consists of silica (the largest trace element in human body) and alumina tetrahedra.

ZEOLİT Nedir, Nasıl Oluşmuştur?

- Zeolitler doğal olarak taze yeraltı suları veya deniz suyunun volkanik kül ile reaksiyona girmesi ile oluşur.
- Oluşumunun tamamlanması 50 ila 10.000 yıl arasında sürer.
- Zeolitler iyi tanımlanmış yapılara sahip, mikro gözenekli kristallerdir.
- Silika (insan vücudundaki en büyük iz elementten) ve alüminatetrahedra'dan oluşan bir mineraldir.

What is Zeolite?

- Zeolite is a Clinoptilolite which is a member of aluminosilicates family.
- Basic structural motive of zeolites express SiO4 tetrahedra.
- Two adjoint SiO4 tetrahedra are bound with a shared oxygen atom on top of tetrahedron.
- Tetrahedra forms a complex three dimensional silicate network that covers comparatively bigger gaps (they are named zeolite gaps).
- The appearance is a thin dust between white and light green.
- The chemical formula of natural Clinoptilolite is as below:
- **SiO_4 i AlO_4 tethrahedra $CaAl_2Si_7O_{18}$**

Zeolite Nedir?

- Zeolit, aluminosilikatlar sınıfındaki aileye mensup bir **Clinoptilolit'**tir.
- Zeolitlerin temel Yapısal motifi **SiO_4** tetrahedrayı ifade eder.
- İki bitişik **SiO_4** tetrahedra, tetrahedronun tepesinde paylaşılan bir oksijen atomuyla bağlanır.
- Tetrahedra, göreceli olarak büyük boşlukları **(zeolit boşlukları olarak adlandırılır)** kapatan bir kompleks üç boyutlu silikat iskelet (ağ) oluşturur.
- Görünümü beyaz ile açık yeşil arası ince tozdur.
- Doğal Clinoptilolit, kimyasal formülü şu şekildedir;

SiO_4 i AlO_4 tethrahedra $CaAl_2Si_7O_{18}$

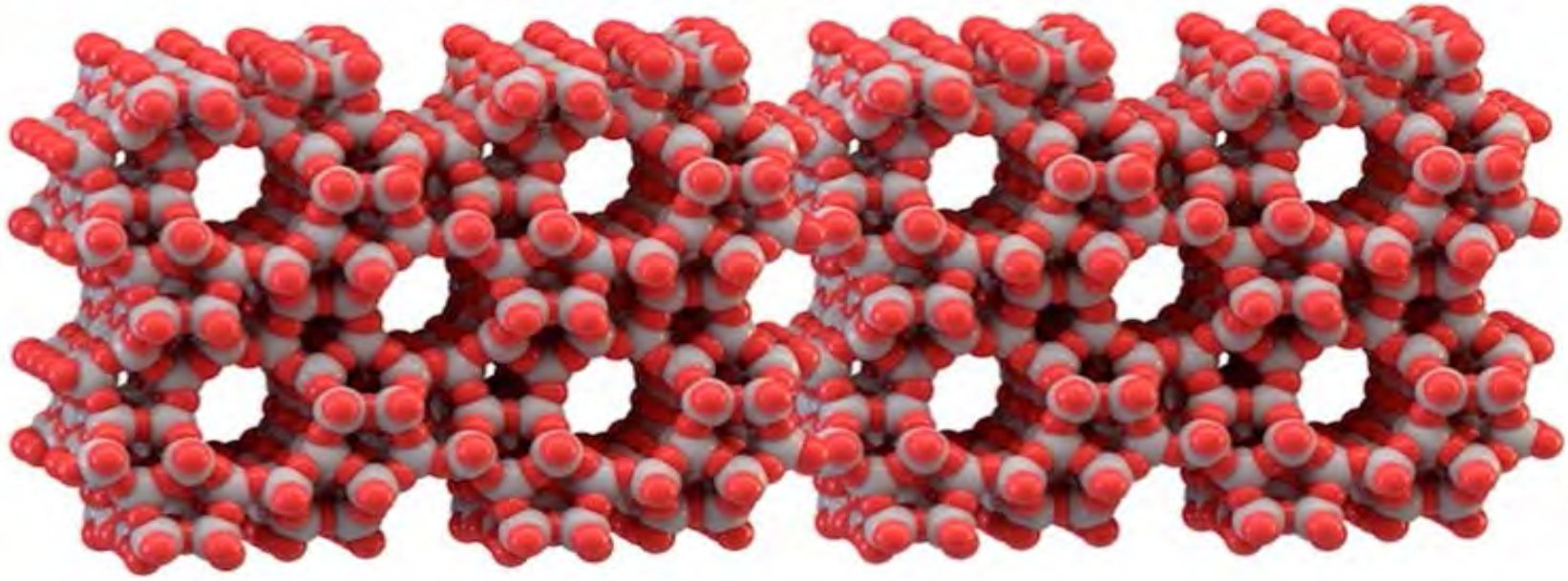
Boiling Rock

- Zeolite comes from two Greek words that mean “boiling rock”.
- It was produced by Swedish Scientist Cronstedt in 1756.
- There are 150 different zeolites.
- Apart from health area, zeolites are largely used in industry in animal food, petrochemistry, water purification systems, and filtering swimming pools etc.

Kaynar Taş

- Zeolit adı **"kaynar taş"** anlamına gelen iki Yunanca sözcükten gelmektedir.
- İlk defa 1756 yılında İsveçli bilim adamı **Cronstedt** tarafından üretilmiştir.
- 150 farklı Zeolit vardır.
- Zeolitler sağlık alanı dışında, Hayvan yemi, petrokimya, su arıtma sistemleri ve yüzme havuzlarının filtrasyonu gibi alanlarda ve endüstride yaygın olarak kullanılmaktadır.

ZEOLITE MOLECULE STRUCTURE IS LIKE A SIEVE THAT CAPTURES TOXINS

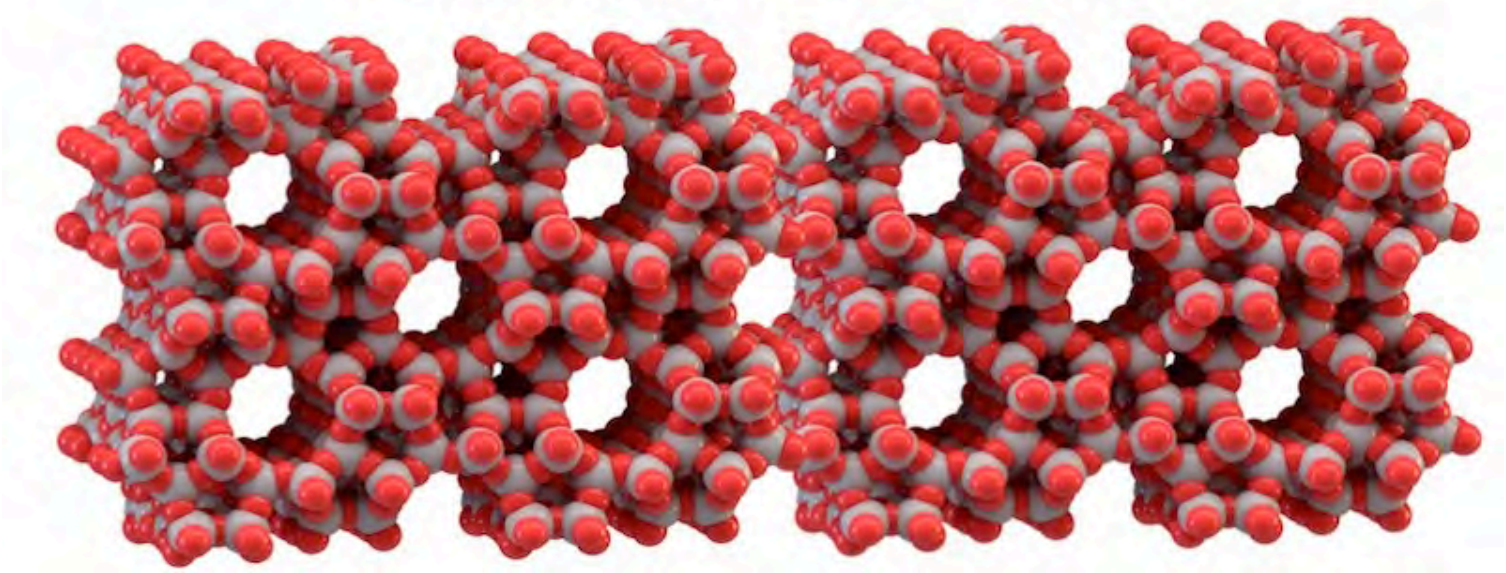


Zeolite is a mineral that has negative ionic charge. Natural zeolite has a very special structure that consists of big empty areas or cages. It may attract positively charged ions in large quantities thanks to its negatively charged grizzly structure and keep them in Zeolite cage.

Zeolite acts like a magnet and attracts positively charged toxins into its cage and it removes them from the body in a safe and natural way.

ZEOLİT MOLEKÜL YAPISI

TOKSİNLERİ YAKALAYAN BİR ELEK GİBİDİR.



Zeolit negatif iyon yüküne sahip bir mineraldir. Doğal Zeolit, büyük boş alanlar veya kafeslerden oluşan çok özel bir yapıya sahiptir. Negatif yüklü bu elek yapısı ile birlikte, büyük miktarda pozitif yüklü iyonların çekilmesi ve Zeolit kafesine tutulması sağlanır.

Zeolit bir mıknatıs gibi davranır ve pozitif yüklü toksinleri üzerine çekerek onları kafeslerine alır, güvenli ve doğal olarak vücuttan çıkarır

Aluminum Silicate

- Aluminum silicates may have two or three dimensions.
- Clays have a two-dimensional layer structure .
- Zeolites have a three-dimensional “solid” framework.
- Third dimension allows more surface area for cation change. For this reason, chemical reaction increases.
- Quartz also has a three-dimensional “solid” framework. However, it lacks Cation Exchange Capacity as it does not have any aluminum atoms.

Alüminyum Silikat

- Alüminyum silikatlar iki veya üç boyuta sahip olabilir.
- Killerin iki boyutlu bir "tabaka" yapısı vardır.
- **Zeolitlerin üç boyutlu "katı" bir çerçevesi vardır.**
- Üçüncü boyut, katyon değişiminin gerçek-leşmesi için daha fazla yüzey alanına izin verir, bu nedenle kimyasal reaksiyon artar.
- Kuvars da üç boyutlu bir "katı" çerçeve içerir ancak alüminyum atomları olmadığı için Katyon Değiştirme kapasitesine sahip değildir.

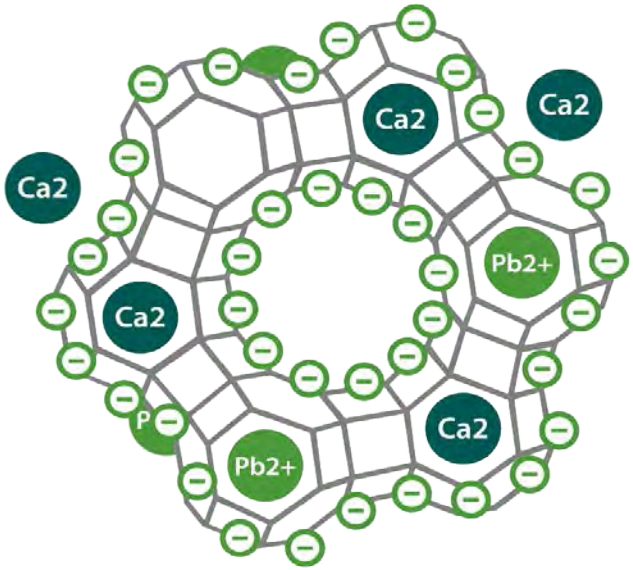
Zeolite Properties

- It does not immediately dissolve in water.
- It is an inorganic compound.
- 10% clinoptilolite slurry in water has a pH value of 7 to 8.
- Zeolites work in form of ion exchange.
- It works as absorbant and adsorbent. It absorbs smaller molecules and attaches to bigger molecules.

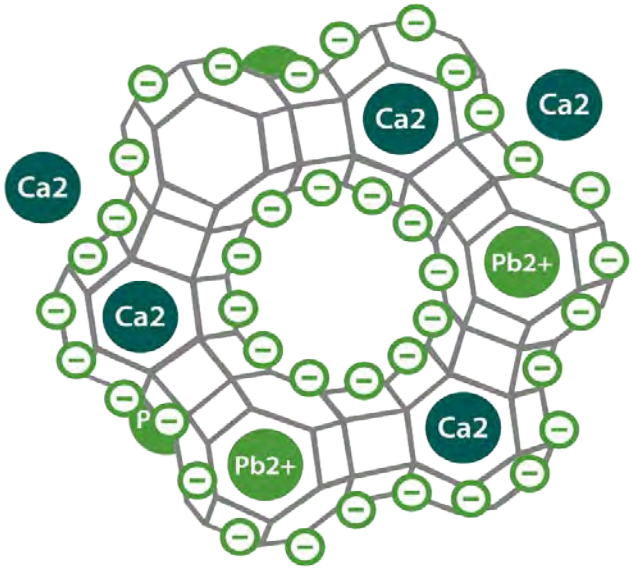
Zeolit Özellikleri

- Suda çözünmez.
- İnorganik bileşiktir.
- Sudaki %10 Clinoptilolit bulamacının pH değeri 7 - 8 arasındadır.
- **Zeolitler iyon değişimi şeklinde çalışırlar.**
- Absorban ve Adsorban olarak çalışır. Küçük molekülleri içine alır, büyük moleküllere bağlanarak etki gösterir.

What is ion exchange?



- Zeolite has a perfect molecular structure to catch and remove heavy metals in body without decreasing healthy ions and minerals.
- It accomplishes that as it works with ion exchange principle.
- Clays – such as Bentonit – lacks that property which is their biggest disadvantage compared to Zeolite.



- Zeolit, sağlıklı iyonlar ve mineralleri eksiltmeden vücudun ağır metallerini yakalamak ve uzaklaştırmak için mükemmel bir moleküler yapıya sahiptir.
- Bunu sağlayan, iyon değişimi prensibinde çalışmasıdır.
- Bentonit gibi killerin Zeolite göre en büyük dezavantajı budur.

Is Zeolite Safe?

Zeolite is 100% safe in every usage dose.

Zeolite is completely removed from body in 6 to 8 hours.

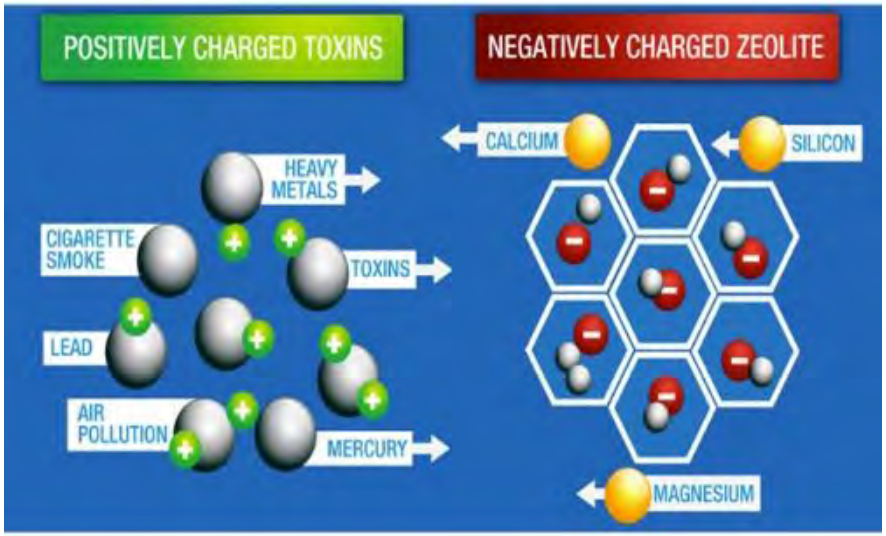
It is safe for children, pregnant and breastfeeding women.

It is also safe to take it along with many medications. However, you need to take them at least one hour apart.

Zeofit Güvenli mi?

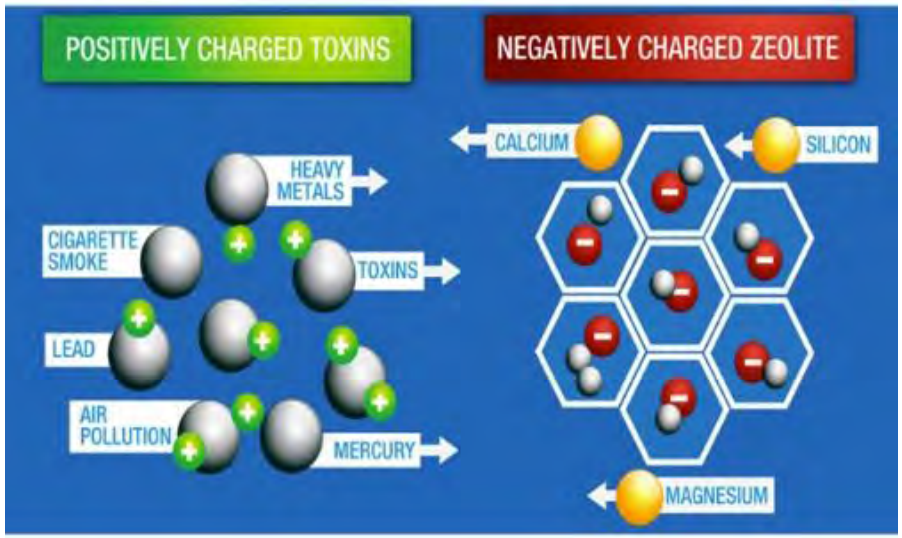
- Zeolit her kullanım dozunda % 100 güvenlidir.
- Zeolit 6-8 saat içerisinde vücuttan tamamen atılır.
- Çocuklar, hamile kadınlar ve emziren anneler için de güvenlidir.
- Çoğu ilaçla almak da güvenlidir. Ancak ilaçlar ile arasında en az bir saat zaman olmalıdır.

Why Should Zeolite be Preferred?



- Zeolite is the most natural and effecient detox method
- It strongly attaches to materials such as toxins, heavy metals and harmful fungus and bacteria. It does not leave them and removes them from the body.
- It does not allow tight junction metals to move from a harmless area to another area where they can be more harmful.
- With its mineral exchange method, it does not remove beneficial minerals from the body unlike other methods.
- It is safe in every age group.

Zeolit Neden Tercih Edilmelidir?



- **Zeolit en doğal ve en etkili detoks yöntemidir.**
- Toksin, ağır metal ve zararlı mantar, bakteri gibi maddelere güçlü bir şekilde bağlanır ve onları bırakmadan vücuttan attırır.
- Sıkı bağlanım metallerin zararsız bir yerden daha zarar vereceği başka bir yere hareketine izin vermez.
- Mineral değişimi yöntemi ile çalışması diğer yöntemlerde olduğu gibi yararlı mineralleri vücuttan eksiltmez .
- Her yaş grubunda güvenle kullanılabilir

Zeolite properties

- Zeolite becomes more efficient as the size of its particle becomes smaller.
- Natural clinoptilolite is micronized to a nano size so that the particle size is between 1-10 µm - by using a special technology.
- Clinoptilolite may be used in humans after special purification and activization processes apart from its micro size.
- Zeolite to be used for health should be pharma quality
- It should be in line with regulations. Heavy metal quantity should be in standard values.

Zeolit Özellikleri

- **Zeolitin parça boyutu küçüldükçe etkinliği artar.**
- Doğal Clinoptilolit özel bir teknoloji ile parçacık boyutu 1-10 µm arasında olacak şekilde Nano boyutuna mikronize edilir.
- Clinoptilolit küçük boyutu dışında özel arındırma ve aktifleştirme işlemlerinden geçirildikten sonra insanda kullanılabilir.
- Sağlık için kullanılacak zeolit farma kalite olmalıdır.
- Yönetmeliklere uygun olmalıdır. Ağır metal miktarı standart değerlerde olmalıdır.

Why detox?

Because toxins are almost everywhere:

- *Food (pesticide, herbicide, chemicals)*
- *Air we breathe (pollutants)*
- *Home appliances (sofa, beds, paint)*
- *Water (common source of heavy metals)*
- *Cosmetics*

Neden Detoks?

Çünkü toksinler neredeyse her yerde bulunurlar

- Gıda (böcek öldürücü ilaçlar, herbisitler, kimyasal katkılar)
- Nefes aldığınız hava (kirleticiler)
- Ev eşyaları (kanepeler, yataklar, boya)
- Su (ağır metallerin ortak kaynağı)
- Kozmetikler

WE CANNOT AVOID BEING POLLUTED, THEN WE NEED TO CLEAN OURSELVES UP

- The problem is not being able to escape from toxins. Toxins accumulate in body over time. Then, more serious problems occur.
- Even in small quantities, these toxins may harm memory, negatively affect intestines, decrease your energy and make it difficult to lose weight.
- It is completely impossible to avoid toxin accumulation in today's living conditions. For this reason, it is vital to clear these toxins off our body.

KİRLENMEKTEN KAÇAMIYORUZ, ÖYLEYSE TEMİZLENMELİYİZ.

- **Sorun, toksinlere maruz kalmaktan kaçamamaktır.** Zamanla toksinler vücutta birikirler. İşte o zaman daha büyük sorunlar ortaya çıkar…
- Az miktarda olsa bile, bu toksinler hafızayı bozabilir, bağırsak sağlığınızı olumsuz etkileyebilir, enerji seviyenizi düşürebilir ve kilo vermeyi zorlaştırabilir.
- *Toksinlerin birikimini önlemek günümüz şartlarında tamamen imkansızdır. Bu nedenle bu toksinleri vücudunuzdan temizlemek çok önemlidir.*

Benefits of Zeolite

- It has a strong detox effect.
- It alkalizes the body.
- It supports intestines.
- It strengthens the immune system.
- It improves the state of mind.
- It has antioxidant effect.
- It sooths allergic reactions.

Zeolitin Faydaları

- Güçlü bir Detoks etkisi vardır.
- Vücudu alkalize eder
- Bağırsakları destekler.
- Bağışıklık sistemini güçlendirir.
- Ruh halini iyileştirir.
- Antioksidan etki gösterir
- Alerji reaksiyonlarını yatıştırır.

Zeolite does selective chelation.

Zeolite allows Selective Chelation. It means:

Its affinity is not the same as heavy metals in the environment. According to the study, which was proven with Atomic Absorption Spectroscopy, metals with the most affinity are ranked from the biggest to smallest below:

Hg> Pb> Sn> Cd> As> Al> Sb> Fe> Ni

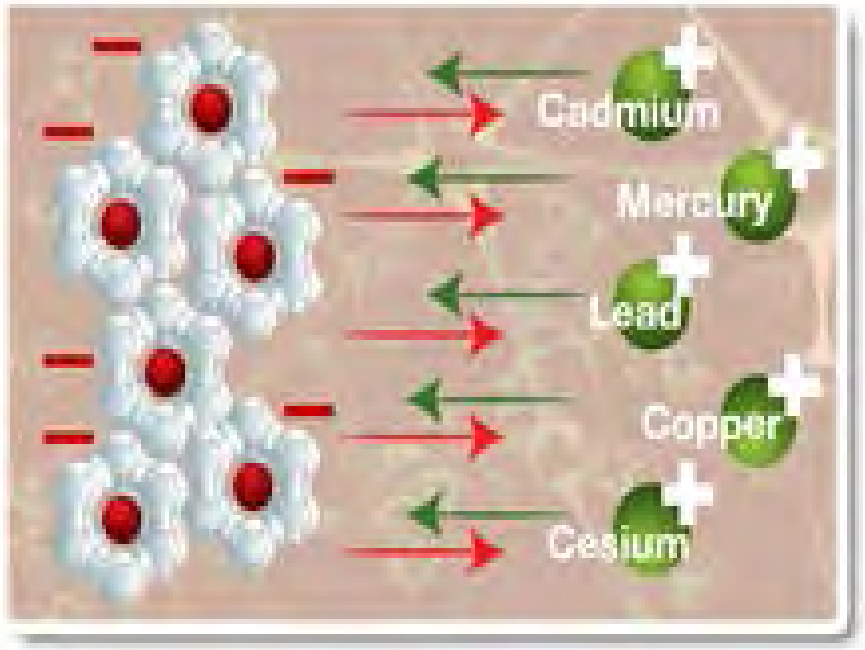
Zeolit Seçici Şelasyon Yapar

<u>Zeolit Seçici şelasyona izin verir. Bunun anlamı şudur</u>

Ortamdaki ağır metallere affinitesi aynı değildir. Atomik Absorpsiyon Spektroskopisi ile doğrulanan çalışmaya göre en fazla afinitesi olan metaller büyükten küçüğe aşağıdaki gibi sıralanır.

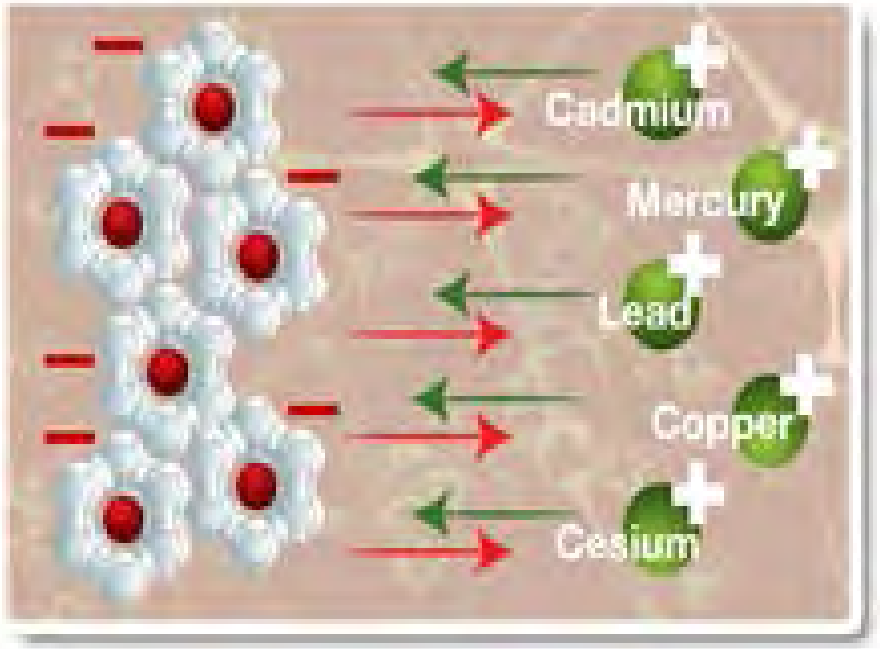
Hg> Pb> Sn> Cd> As> Al> Sb> Fe> Ni

Zeolite & Heavy Metal



- In physiological conditions, exchange of heavy metal ions that are bound with zeolite cannot be taken back.
- Clinoptilolite is a very strong hayfork for the heavy metals in intestine. Integrating a hayfork into the body results in the activization of the transmission processes in the body. In this way, heavy metals are moved to the intestine and exchange of ions with zeolite may takes place there.
- Attached heavy metals are removed through digestion and cycle starts again with new clinoptilolite. An efficient detoxification is ensured.

Zeolit ve Ağır Metal



- Fizyolojik koşullarda, zeolit ile bağlanan ağır metal iyonlarının verişimi geri döndürülemez.
- Clinoptilolit bağırsaktaki ağır metaller için güçlü bir drendir. Vücuda bir drenin dahil edilmesi, vücutta iletim süreçlerinin etkinleştirilmesiyle sonuçlanır ve böylece ağır metaller bağırsağa taşınır ve burada zeolitle iyon değişimi gerçekleşebilir.
- Bağlanan ağır metaller sindirim yoluyla uzaklaştırılır ve yeni Clinoptilolit ile döngü tekrar başlar. Bu şekilde vücutta etkin bir detoksifikasyon sağlanır.

ZEOLITE & DETOX

Biol Trace Elem Res. 2012 Jun;147(1-3):180-8. doi: 10.1007/s12011-011-9278-4. Epub 2011 Dec 7.

Modified natural clinoptilolite detoxifies small mammal's organism loaded with lead I. Lead disposition and kinetic model for lead bioaccumulation.

Beltcheva M[1], Metcheva R, Popov N, Teodorova SE, Heredia-Rojas JA, Rodríguez-de la Fuente AO, Rodríguez-Flores LE, Topashka-Ancheva M.

Author information

Abstract

Zeolites, especially clinoptilolites, have wide application in removing heavy metals from different solutions and wastewater. The detoxification capacity of the clinoptilolite sorbent KLS-10-MA, a modified natural Bulgarian zeolite, applied as a food supplement in conditions of an ecotoxicological experiment with conventional food and lead was demonstrated for the first time. Laboratory mice, inbred imprinting control region strain, were used in a 90-day ecotoxicological experiment. Animals were divided into four experimental groups. Lead bioaccumulations in exposed and non-supplemented/supplemented with KLS-10-MA animals were compared. As additional control, healthy animals non-exposed to Pb were fed with conventional forage mixed with 12.5% KLS-10-MA. The dietary inclusion of the sorbent reduced Pb concentrations in exposed and supplemented mice by 84%, 89%, 91%, 77%, and 88% in carcass, liver, kidneys, bones, and feces, respectively. A mathematical model was proposed to outline the common trends of bone Pb bioaccumulation in exposed and non-supplemented/supplemented animals. Characteristic parameters of the kinetics of Pb concentrations were determined. Based on the model, the coefficient of absorption of Pb by gastrointestinal mucosa in the supplemented mice was found-η = 3.53% (versus η = 15% in non-supplemented ones). The present study clearly indicates that there is a realistic perspective to create a new drug based on modified natural clinoptilolites in cases of chronic heavy metal intoxication, without negatively affecting the environment.

PMID: 22147334 DOI: 10.1007/s12011-011-9278-4

Biol Trace Elem Res. 2012 Jun;147(1-3):206-16. doi: 10.1007/s12011-011-9289-1. Epub 2011 Dec 6.

Modified natural clinoptilolite detoxifies small mammal's organism loaded with lead II: genetic, cell, and physiological effects.

Topashka-Ancheva M[1], Beltcheva M, Metcheva R, Rojas JA, Rodriguez-De la Fuente AO, Gerasimova T, Rodríguez-Flores LE, Teodorova SE.

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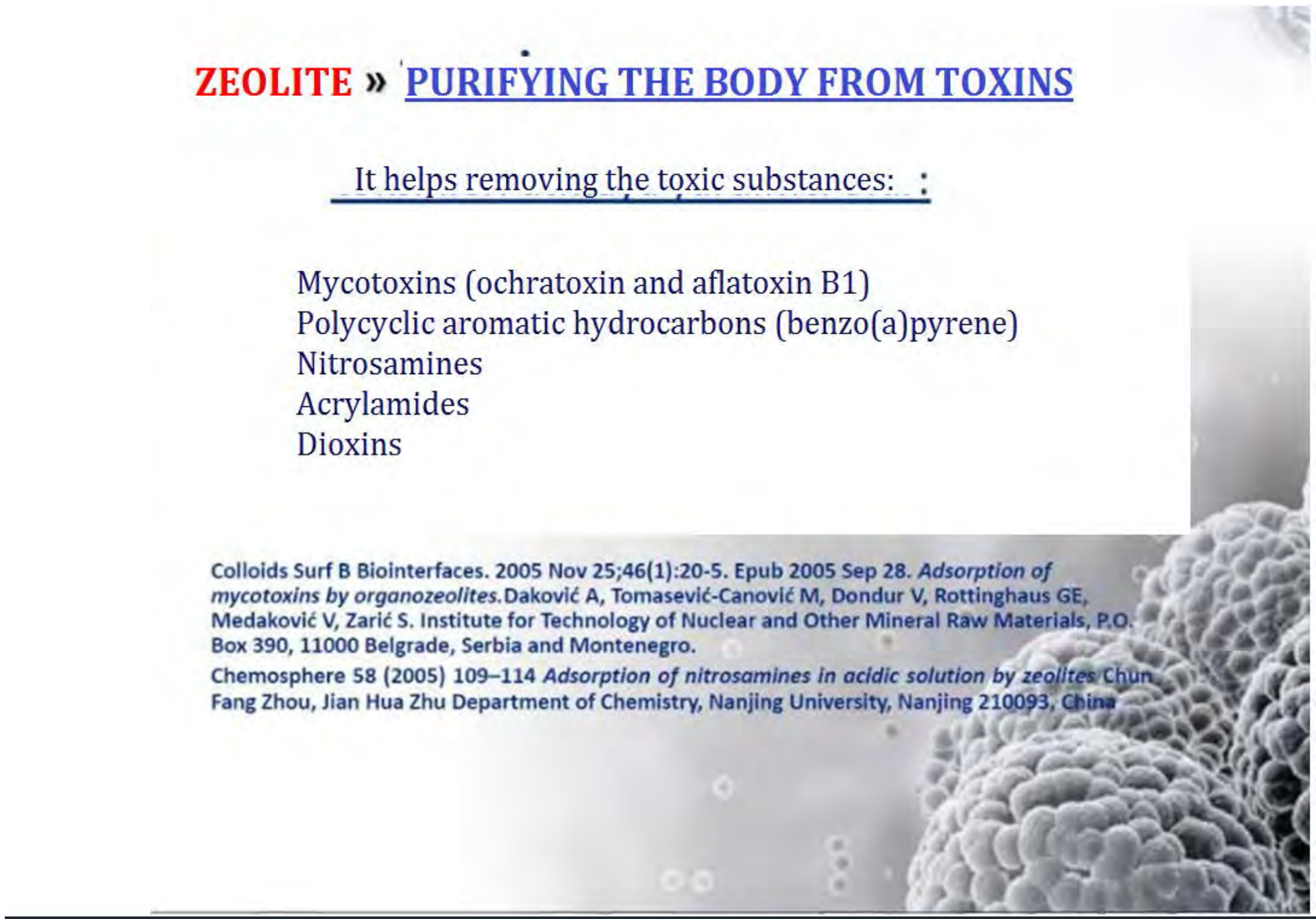
ZEOLITE » PURIFYING THE BODY FROM TOXINS

It helps removing the toxic substances: :

Mycotoxins (ochratoxin and aflatoxin B1)
Polycyclic aromatic hydrocarbons (benzo(a)pyrene)
Nitrosamines
Acrylamides
Dioxins



Colloids Surf B Biointerfaces. 2005 Nov 25;46(1):20-5. Epub 2005 Sep 28. *Adsorption of mycotoxins by organozeolites.* Daković A, Tomasević-Canović M, Dondur V, Rottinghaus GE, Medaković V, Zarić S. Institute for Technology of Nuclear and Other Mineral Raw Materials, P.O. Box 390, 11000 Belgrade, Serbia and Montenegro.

Chemosphere 58 (2005) 109–114 *Adsorption of nitrosamines in acidic solution by zeolites* Chun Fang Zhou, Jian Hua Zhu Department of Chemistry, Nanjing University, Nanjing 210093, China

ZEOLİT » TOKSİNLERDEN ARINMA

toksinleri atmaya yardımcı olur:

Mikotoksinler (okratoksin ve aflatoksin B1)

Polisilik Aromatik Hidrokarbonlar (benzo[a]piren)

Nitroaminler

Akrilamidler

Diyoksinler

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How does Zeolite work?

Absorption

adsorption

ion exchange

- Big molecules and particles (for ex: bacteria and viruses) are attached to the surface of zeolite particles through adsorption.
- Small molecules (for ex: ammonia, heavy metal and toxins) are attached to the zeolite micro pores on clinoptilolite surface through absorption.
- Cations of toxic heavy metals (for ex: Hg2+, Cd2+, Pb2 etc.) are attached to micro pores through ion exchange. During this process, clinoptilolite leaves some of the minerals such as Calcium (Ca2+), Magnesium (Mg2+), Sodium (Na+) and Potassium (K+) from its metal cations
- This process which is called ion exchange is the exchange of harmful materials with beneficial minerals.

Zeolit Nasıl Çalışır

Absorpsiyon

Adsorpsiyon İyon Değişimi

- Büyük moleküller ve parçacıklar **(örn. bakteriler ve virüsler),** zeolit parçacıkların yüzeyinde adsorpsiyon yoluyla bağlanırlar .
- Küçük moleküller **(örn. Amonyak , ağır metal , toksinler)**, zeolit mikro gözeneklerinin içine absorpsiyon yoluyla Clinoptilolit üzerinde bağlanırlar.
- Toksik ağır metallerin katyonları **(örn.. Hg2+, Cd2+, Pb2+ gibi)**, iyon alışverişi yoluyla mikro gözeneklere bağlanırlar . Bu işlem sırasında Clinoptilolit kendi metal katyonlarından [kalsiyum (Ca2+), magnezyum (Mg2+), sodyum (Na+) ve potasyum (K+)] gibi mineralleri ortama bırakır.
- İyon değişimi olarak adlandırılan bu işlem bir çeşit zararlı madde ile faydalı minerallerin vücuttaki değiş tokuşudur.

Why is Zeolite Valuable?

Silicon structure in Zeolite is electrically neutral. However, aluminum building block carries a negative charge and it forms charged areas throughout its crystal structure.

A three-dimensional framework produces a clear negative charge which holds environmental pollutants and balanced with changeable cations such as calcium, magnesium and phosphate.

Clinoptilolite attracts positive minerals such as calcium, magnesium, potassium, sodium and iron. These common positive cations exchange with heavy metals such as cadmium, mercury, nickel and arsenic. These heavy metals are removed from the body safely.

Smaller ions such as mercury and cadmium are tightly attracted into zeolite cage and held safely so that they can be removed from the body in a safe manner.

Zeolite Değer Veren şey Nedir?

- Zeolit'teki silikon yapı taşı elektriksel olarak nötrdür, ancak alüminyum yapı taşı negatif bir yük taşır ve bu da tüm kristal yapısında yüklü bölgeler oluşturur.
- Cu boyutlu bir çerçeve, çevresel kirleticileri tutan ve değiştirilebilir katyonlar olan Kalsiyum, Magnesuim, Fosfat ile dengelenen net negatif yük üretir.
- Clinoptilolit kalsiyum, magnezyum, potasyum, sodyum ve demir gibi pozitif mineralleri çeker. Bu yaygın pozitif katyonlar daha sonra kadmiyum, civa, nikel ve arsenik gibi ağır metallerle yer değiştirir ve vücuttan güvenli bir şekilde çıkarılır.
- Cıva ve Kadmiyum gibi daha küçük ıyonlar zeolit kafesin içine sıkıca çekilir ve güvenli bir şekilde ortadan kaldırılması için güvenli bir şekilde tutulur.

NATURAL MICRONIZED ZEOLITE CLINPTILOLITE; ROLE IN «SPORTS» NUTRITION

Natural zeolites are volcanic-derived crystalline compounds with microporous structures of Si- and Al-tetrahedrons (SiO_4, AlO_4) bound together by common oxygen atoms to form an open crystal structure [1]. The arrangement of atoms influences the binding capacities of zeolite mineral microporous structures, resembling cage structure. Also, the zeolites ion exchange capacity and cationic exchange within its pores/channels mainly depend on its silicon to aluminum ratio which is further more important for stability of structure. Animal studies have shown that natural zeolite-clinoptilolite has immunostimulatory effects, modulates inflammatory pathways, reduces plaque generation in brain, which posits its use as an adjuvant in therapeutic approaches in the future [2-6].

Concerning sports nutrition, the effects of zeolite in the gut, its effects on inflammatory metabolism and antioxidant activity, and performance effects are of particular importance. Interestingly, an oral application of the unique ADMT-zeolite clinoptilolite in a randomized human clinical trial indicates a positive impact on the intestinal tract due to integrity improvement of the intestinal wall in physically active population [7]. This human study showed that clinoptilolite supplementation exerted beneficial effects on intestinal integrity as demonstrated by decreased concentrations of tight junction modulator zonulin. This was accompanied by anti-inflammatory effects in this aerobically trained subjects [7]. Previous preclinical studies in animal model support this finding additionally by suggesting a positive effect for the intestinal microbiome [8].

Why is zeolite role here important? Athletic performance, recovery, and even the type of sport athlete's play have been linked to certain microbes and intestinal barrier integrity. Recent findings show that the bloom in particular bacteria (Lactobacillus) is a response to the increased lactic acid levels in the body because it's their food source [9]. Likewise, a increase of certain probiotic strains like Lactobacillus reuteri ATCC and Lactobacillus Plantarum can reduce inflammation in gut [10], increased bone density [11] and boost of testosterone [12]. For elite sports, endurance athletes including runners and triathletes have a high prevalence of gut complaints [13]. Such complications are due to altered blood flow from viscera to skeletal muscle or heart [14]. These exercise-induced reductions in intestinal blood flow as well as exercise-linked thermal damage to the intestinal mucosa may cause disruption of the intestinal barrier, followed by inflammatory response in the whole body.

As zeolite clinoptilolite in various experiments supported activity of Lactoacillus strains [15,16] and promoted gut health it represents a valid supplementation strategy to improve or maintain sports performance.

Clinoptilolite breaks down into bioavailable ortho-silicic acid (H_4SiO_4) in the digestive system. Such process readily provides additional source of bioavailable silicon to the organism [17]. Silicon administration in a controlled clinical study resulted in a significant increase in femoral bone mineral density in osteoporotic women [18]. The direct relationship between the content of silicon and bone formation has been demonstrated by Moukarzel et al. [19]. A randomized controlled animal study of aged castrated rats found that long-term preventive treatment with silicon prevented partial femoral bone loss and had a positive effect on bone turnover [20].

Dietary silicon is associated with postmenopausal bone turnover and bone mineral density in women when the risk of osteoporosis increases. In addition, a cohort study of 3198 middle-aged women (50–62 years) showed that silicon interacts with estrogen status on bone mineral density, suggesting that estrogen status is important for the metabolism of silicon in bone health [21]. Finally, silicon deficiency has been found to be connected with bone defects and impaired synthesis of connective tissue compounds, such as collagen and glycosaminoglycans [22-24], crucial elements for cartilage and tendons. Therefore, supplementation of silicon from bioavailable source such as micronized clinoptilolite is strongly advised.

Conclusion

Micronized Zeolite Clinoptilolite is essential part of sports/-performance nutrition due to its ability to promote gut health, development of favorable microbiome (especially lactic acid eating bacteria), increased bone mineralization (injury reduc-tion) and improved synthesis of connective tissues.

References

1. Breck DW. Crystalline molecular sieves. J Chem Educ. 1964;41:678–89.
2. Pavelic K, Katic M, Sverko V, Marotti T, Bosnjak B, Balog T, et al. Immunostimulatory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability. J Cancer Res Clin Oncol. 2002;128:37–44.
3. Pavelic K, Hadzija M, Bedrica L, Pavelic J, Dikic I, Katic M, et al. Natural zeolite clinoptilolite: new adjuvant in anticancer therapy. J Mol Med. 2001;78:708–20.
4. Concepcion-Rosebal B, Rodriges-Fluentes G, Simon-Carballo R. Development and featuring of the zeolitic active principle FZ: a glucose adsorbent. Zeolites. 1997;19(1):47–50.
5. Rodriguez-Fluentes G, Barrios MA, Iraizoz A, Perdomo I, Cedre B. Enterex–anti-diarrheic drug based on purified natural clinoptilolite. Zeolites. 1997;19(5–6):441–8.
6. Montinaro M, Uberti D, Maccarinelli G, Bonini SA, Ferrari-Toninelli G, Memo M. Dietary zeolite supplementation reduces oxidative damage and plaque generation in the brain of an Alzheimer's disease mouse model. Life Sci. 2013;92(17-19):903–10.
7. Lamprecht, M.; Bogner, S.; Steinbauer, K.; Schuetz, B.; Greilberger, J.F.; Leber, B.; Wagner, B.; Zinser, E.; Petek, T.; Wallner-Liebmann, S.; et al. Effects of zeolite supplementation on parameters of intestinal barrier integrity, inflammation, redoxbiology and performance in aerobically trained subjects. J. Int. Soc. Sports Nutr. 2015, 12, 40.
8. Wu, Q.J.; Wang, L.C.; Zhou, Y.M.; Zhang, J.F.; Wang, T. Effects of clinoptilolite and modified clinoptilolite on the growth performance, intestinal microflora, and gut parameters of broilers. Poult. Sci. 2013, 92, 684–692.
9. Monda, V., Villano, I., Messina, A., Valenzano, A., Esposito, T., Moscatelli, F., … Messina, G. (2017). Exercise Modifies the Gut Microbiota with Positive Health Effects. Oxidative Medicine and Cellular Longevity, 2017, 1–8. doi:10.1155/2017/3831972
10. Liu, Y., Fatheree, N. Y., Mangalat, N., & Rhoads, J. M. (2010). Human-derived probiotic Lactobacillus reuteri strains differentially reduce intestinal inflammation. American Journal of Physiology-Gastrointestinal and Liver Physiology, 299(5), G1087–G1096. doi:10.1152/ajpgi.00124.2010
11. McCabe, L. R., Irwin, R., Schaefer, L., & Britton, R. A. (2013). Probiotic use decreases intestinal inflammation and increases bone density in healthy male but not female mice. Journal of Cellular Physiology, 228(8), 1793–1798. doi:10.1002/jcp.24340
12. Poutahidis, T., Kleinewietfeld, M., Smillie, C., Levkovich, T., Perrotta, A., Bhela, S., … Erdman, S. E. (2013). Microbial Reprogramming Inhibits Western Diet-Associated Obesity. PLoS ONE, 8(7), e68596. doi:10.1371/journal.pone.0068596
13. Rehrer NJ, Brouns F, Beckers EJ, Frey WO, Villiger B, Riddoch CJ, Menheere PP, Saris WH: Physiological changes and gastro-intestinal symptoms as a result of ultra-endurance running. Eur J Appl Physiol Occup Physiol. 1992, 64: 1-8. 10.1007/BF00376431.

Örneğin, yapılan bazı bilimsel çalışmalarda, zeolitin, önemli absorpsiyon ve adsorpsiyon faaliyetleri nedeniyle, mikotoksinler (aflotoksin B1 gibi), polisiklik aromatik hidrokarbonlar (piren veya benzo(α)piren gibi), nitrosaminler, arsenik bileşikleri, zararlı aminler (kadaverin ve putresin gibi alifatik aminler ve ayrıca anilin gibi aromatik aminler), dioksinler (örn. 2,3,7,8-tetrakloro-dibenzo-*p*-dioksin) ve başka birçok toksin türü (2-17) gibi zararlı bileşiklerin uzaklaştırılmasında güçlü bir ajan olarak hareket edebilir (2-17).

(2) M. Panayotova, B. Velikov: Kinetics of heavy metal ions removal by use of natural zeolite, J. Environ. Sci. Health A Tox. Hazard Subst. Environ. Eng. 37 (2003) 139-147.

(17) Y. Guan, Y. Liu, W. Wu, K. Sun, Y. Li, P. Ying, Z. Feng, C. Li: Dibenzodioxin Adsorption on Inorganic Materials, Langmuir 21 (2005) 3887-3880.

ZEOLİT » BAĞIŞIKLIĞIN UYARILMASINA YARDIMCI OLUR

- Artırılmış makrofaj ve dendritik hücre (DC) yanıtı (süperoksit üretimi)
- CD4 ve CD8 proliferasyonu (çoğalma)
- Yüksek allojenik graft-versus-host (GVH) reaksiyonu gibi süreçlerin tetiklenmesi bağırsakla ilişkili lenfoid dokusuna (GALT) nüfuzu

- J Cancer Res Clin Oncol. 2002 Jan;128(1):37-44. Epub 2001 Nov 10. ***Immunostimulatory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability.*** Pavelic K, Katic M, Sverko V, Marotti T, Bosnjak B, Balog T, Stojkovic R, Radacic M, Colic M, Poljak-Blazi M. Rudjer Boskovic Institute, Division of Molecular Medicine, Bijenicka 54, HR-10000 Zagreb, Croatia.
- Adv Ther. 2004 Mar-Apr;21(2):135-47. ***Dietary supplementation with the tribomechanically activated zeolite clinoptilolite in immunodeficiency: effects on the immune system.*** Ivkovic S, Deutsch U, Silberbach A, Walraph E, Mannel M.Megamin GmbH, Berlin, Germany

ZEOLİT » ANTİOKSİDAN ENZİMLER

- Zeolit Süperoksit Dismutaz (SOD), Katalaz ve Glutatyon Peroksidaz (GSH) enzimlerinin dolaylı olarak artmasını destekler.
- Oksidasyon, peroksidasyon ve lipid peroksidasyonu azalmasına yardımcı olur.

- Anticancer Res. 2003 Mar-Apr;23(2B):1589-95. ***Anticancer and antioxidative effects of micronized zeolite clinoptilolite.*** Zarkovic N, Zarkovic K, Kralj M, Borovic S, Sabolovic S, Blazi MP, Cipak A, Pavelic K.Ruder Boskovic Institute, Division of Molecular Medicine, Bijenicka 54, HR-10000 Zagreb, Croatia.
- FREE RADICAL BIOLOGY AND MEDICINE 33-09/2002: ***The effect of TMAZ on TAS of Healthy individuals and patients with malignant diseases.*** Ivkovic S, Zabcic D. Megamin International

ZEOLIT VE ANTIOKSİDAN ETKİSİ

Tavuklarda yapılan çalışmada zeolit'in antioksidan kapasiteyi arttırdığı görülmüştür.

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Abstract

The objective of this study was to compare the effects of natural clinoptilolite and modified clinoptilolite on growth performance and antioxidant capacity in broiler chicks. Two hundred forty 1-day-old commercial Arbor Acres broilers were randomly distributed into three treatments, each of which had eight replicates. Each replicate contains 10 chicks. Control (CON) group fed with the basal diets, natural clinoptilolite (NCLI) group fed basal diets with 2 % natural clinoptilolite, and modified clinoptilolite (MCLI) group fed basal diets with 2 % modified clinoptilolite for 42 days. The results showed that the 2 % supplementation of natural clinoptilolite and modified clinoptilolite had no adverse effect on growth performance of broilers at 42 days of age. Relative weights of organs were not influenced by dietary treatments at 21 and 42 days. The activity of total nitric oxide synthase was significantly ($P < 0.05$) decreased in MCLI group than CON group at 21 days of age. At 21 and 42 days, the activities of glutathione peroxidase, catalase, total superoxide dismutase, total antioxidant capacity (T-AOC) were significantly ($P < 0.05$) increased in NCLI and MCLI groups than the CON group while there was no difference in T-AOC between CON and NCLI groups. The malondialdehyde content was significantly ($P < 0.05$) decreased in NCLI and MCLI groups than the CON group. It was concluded that the addition of 2 % natural clinoptilolite and modified clinoptilolite to diet can improve antioxidant capacity in broilers, although their effects on growth performance was negligible.

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14. Qarnar MI, Read AE: Effects of exercise on mesenteric blood flow in man. Gut. 1987, 28: 583-587. 10.1136/gut.28.5.583.
15. Moretti, A. F., Gamba, R. R., Puppo, J., Malo, N., Gómez-Zavaglia, A., Peláez, Á. L., & Golowczyc, M. A. (2017). Incorporation of Lactobacillus plantarum and zeolites in poultry feed can reduce aflatoxin B1 levels. Journal of Food Science and Technology, 55(1), 431–436. doi:10.1007/s13197-017-2923-y
16. Hassanzadeh, Azad & Khiabani, Mahmoud & Sadrnia, Mahshidsadat & Divband, Baharak & Rahmanpour, Omid & Jabbari, Vahid & Gholizadeh, Pourya & Kafil, Hossein. (2017). Immobilization and microencapsulation of Lactobacillus caseii and Lactobacillus plantarum using zeolite base and evaluating their viability in gastroesophageal-intestine simulated condition. Ars Pharmaceutica. 2017. 10.4321/S2340-98942017000400003.
17. O'Connor CI, Nielsen BD, Woodward AD, Spooner HS, Ventura BA, Turner KK: Mineral balance in horses fed two supplemental silicon sources. J Anim Physiol Anim Nutr (Berl). 2008, 92 (2): 173-181. 10.1111/j.1439-0396.2007.00724.x
18. Eisinger J, Clairet D: Effects of silicon, fluoride, etidronate and magnesium on bone mineral density: a retrospective study. Magnes Res. 1993, 6 (3): 247-249.
19. Moukarzel AA, Song M, Buchman AL, Ament ME: Silicon deficiency may be involved in bone disease of parenteral nutrition. J Am Coll Nutr. 1992, 11: 584-
20. Calomme M, Geusens P, Demeester N, Behets GJ, D'Haese P, Sindambiwe JB: Partial prevention of long-term femoral bone loss in aged ovariectomized rats supplemented with choline-stabilized orthosilicic acid. Calcif Tissue Int. 2006, 78 (4)
21. Macdonald HM, Hardcastle AC, Jugdaohsingh R, Fraser WD, Reid DM, Powell JJ: Dietary silicon interacts with oestrogen to influence bone health: Evidence from the Aberdeen Prospective Osteoporosis Screening Study. Bone. 2012, 50 (3): 681-687. 10.1016/j.bone.2011.11.020.
22. Carlisle EM: Silicon: a possible factor in bone calcification. Science. 1970, 167: 279-280. 10.1126/science.167.3916.279.
23. Carlisle EM: In vivo requirement for silicon in articular cartilage and connective tissue formation in the chick. J Nutr. 1976, 106: 478-484.
24. Carlisle EM: Biochemical and morphological changes associated with long bone abnormalities in silicon deficiency. J Nutr. 1980, 110: 1046-1055.

For instance, according to some scientific studies zeolite may be used as a very powerful agent to ward off many harmful compounds such as mycotoxins, (such as aflotoxin B1), polycyclic aromatic hydrocarbons (such as pyrene or benzo(a)pyrene), nitrosamines, arsenic compounds, harmful amines (aliphatic amines such as kadeverine and putrescine and aromatic amines such as aniline) dioxins (for ex: 2,3,7,8 – tetrachloro-dibenzo –p-dioxin) and many other dioxin types (2-17) due to its important absorption and adsorption activities. (2-17)

(2) M. Panayotova, B. Velikov: Kinetics of heavy metal ions removal by use of natural zeolite, J. Environ. Sci. Health A Tox. Hazard Subst. Environ. Eng. 37 (2003) 139-147.

(17) Y. Guan, Y. Liu, W. Wu, K. Sun, Y. Li, P. Ying, Z. Feng, C. Li: Dibenzodioxin Adsorption on Inorganic Materials, Langmuir 21 (2005) 3887-3880.

ZEOLİT » HELPS STIMULATING INTESTINES

- Increased macrophage and dendritic cell (DC) response (superoxide production),
- CD4 and CD8 proliferation (multiplying)
- Triggering processes such as high allogenic graft-versus-host (GVH) reaction, and (GALT) penetration to lymphoid tissue related to intestines.

J Cancer Res Clin Oncol. 2002 Jan;128(1):37-44. Epub 2001 Nov 10. ***Immunostimulatory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability.*** Pavelic K, Katic M, Sverko V, Marotti T, Bosnjak B, Balog T, Stojkovic R, Radacic M, Colic M, Poljak-Blazi M. Rudjer Boskovic Institute, Division of Molecular Medicine, Bijenicka 54, HR-10000 Zagreb, Croatia.

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ZEOLİT» KEMİK İYİLEŞMESİ

- Kalsiyum içerdiği için hızlı kemik iyileşmesi ve kemik rezorbsiyonu azalmasına katkıda bulunur.

- J Cell Biochem. 1995 May;58(1):39-46. ***Zeolite A inhibits osteoclast-mediated bone resorption in vitro***. Schütze N, Oursler MJ, Nolan J, Riggs BL, Spelsberg TC. Department of Biochemistry, Mayo Clinic, Rochester, Minnesota 55905, USA.
- ***Autocrine signals promote osteoblast survival in culture*** A Tumber, M C Meikle and P A Hill Bone Biology Unit, Department of Orthodontics and Paediatric Dentistry, Guy's, King's and St Thomas' Hospital's Medical and Dental Schools, Guy's Hospital, St Thomas' Street, London SE1 9RT, UK
- Adv Drug Deliv Rev. 2005 May 25;57(7):959-71. Epub 2005 Apr 15. ***Mechanism of osteoclast mediated bone resorption--rationale for the design of new therapeutics.*** Väänänen K. Department of Anatomy, Institute of Biomedicine, University of Turku, FI-20700 Turku, Finland. kalervo.vaananen@utu.fi

ZEOLİT » ANTIOXIDANT ENZYMES

- Zeolite Superoxide Distumase (SOD) indirectly supports the increase of Catalase and Glutathione Peroxidase (GSH) enzymes
- It helps the decrease of oxidation, peroxidation and lipid peroxidation.

- Anticancer Res. 2003 Mar-Apr;23(2B):1589-95. ***Anticancer and antioxidative effects of micronized zeolite clinoptilolite.*** Zarkovic N, Zarkovic K, Kralj M, Borovic S, Sabolovic S, Blazi MP, Cipak A, Pavelic K.Ruder Boskovic Institute, Division of Molecular Medicine, Bijenicka 54, HR-10000 Zagreb, Croatia.
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ZEOLITE & ANTIOXIDANT EFFECT

In the study which is carried out with chickens, it has been seen that zeolite increases the antioxidant capacity.

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ZEOLİT» BONE HEALING

- As it contains calcium, it contributes to a fast bone healing and a decrease in bone resorption.

- J Cell Biochem. 1995 May;58(1):39-46. ***Zeolite A inhibits osteoclast-mediated bone resorption in vitro***. Schütze N, Oursler MJ, Nolan J, Riggs BL, Spelsberg TC. Department of Biochemistry, Mayo Clinic, Rochester, Minnesota 55905, USA.
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DOES ZEOLITE ATTACH TO BASIC HEAVY METALS?

In respect to basic metal ions, surprisingly low attaching capacity was identified. Iron, manganese and zinc was tested. According to the normal values of these ions, no effect or a very low effect was observed.

Ruder Boskovic Institute in Croatia played a role in organizing the preclinical tests of Zeolite. Zeolite – which is used for medical purposes – was processed with a special micronizationsystem. After the process, its surface area increased by several folds. The material is grinded to several sizes – about 15% of which is nano particles (as small as 100 nm).
For months, it was tested on mice and rats to see toxic effects. No toxic effect was seen.

ZEOLİT TEMEL METALLERE BAĞLANIR MI?

Temel metal iyonlar bakımından şaşırtıcı ölçüde düşük bağlanma kapasitesi tespit edilmiştir. Demir, manganez ve çinko test edildi. Bu iyonların normal değeri nedeniyle hiç veya çok düşük bir etki gözlemlenmiştir.

Hırvatistan'daki Ruder Bošković Enstitüsü, zeolitin klinik öncesi testlerinin gerçekleştirilmesinde rol aldı. Tıbbi amaçlar doğrultusunda kullanılan zeolit, bir özel mikronizasyon sistemiyle (DMT) işlemden geçirildi ve bu işlem sonucunda yüzey alanı birkaç kat artırıldı ve malzeme yaklaşık %15'i nano parçacıklar halinde (100 nm kadar küçük) olmak üzere çeşitli boyutlara kadar öğütüldü.
Aylarca fareler ve sıçanlar üzerindeki toksik etkiye ilişkin olarak yapılan testlerden sonra herhangi bir toksik etki görülmedi.

Zeolite's effect on intestinal permeability through zonulin

Effects of zeolite supplementation on parameters of intestinal barrier integrity, inflammation, redoxbiology and performance in aerobically trained subjects

Manfred Lamprecht, Simon Bogner, Kurt Steinbauer, Burkhard Schuetz, Joachim F. Greilberger, Bettina Leber, Bernhard Wagner, Erwin Zinser, Thomas Petek, Sandra Wallner-Liebmann, Tanja Oberwinkler, Norbert Bachl, and Gert Schippinger

Abstract

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Background

Zeolites are crystalline compounds with microporous structures of Si-tetrahedrons. In the gut, these silicates could act as adsorbents, ion-exchangers, catalysts, detergents or anti-diarrheic agents. This study evaluated whether zeolite supplementation affects biomarkers of intestinal wall permeability and parameters of oxidation and inflammation in aerobically trained individuals, and whether it could improve their performance.

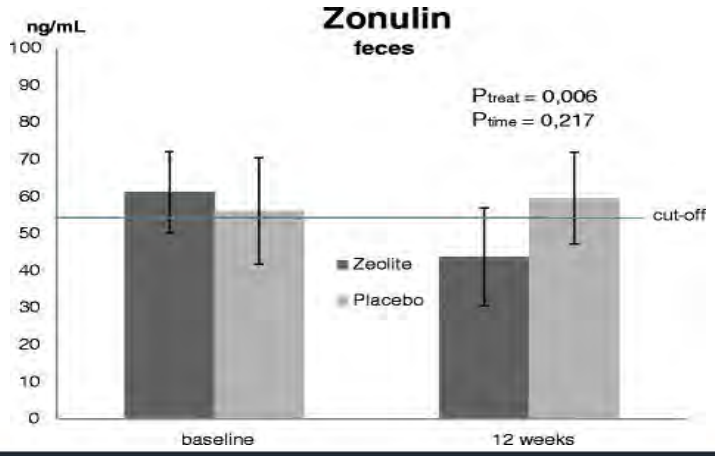
Methods

In a randomized, double-blinded, placebo controlled trial, 52 endurance trained men and women, similar in body fat, non-smokers, 20–50 years, received 1.85 g of zeolite per day for 12 weeks. Stool samples for determination of intestinal wall integrity biomarkers were collected. From blood, markers of redox biology, inflammation, and DNA damage were determined at the beginning and the end of the study. In addition, VO_{2max} and maximum performance were evaluated at baseline and after 12 weeks of treatment. For statistical analyses a 2-factor ANOVA was used.

Results

At baseline both groups showed slightly increased stool zonulin concentrations above normal. After 12 weeks with zeolite zonulin was significantly ($p < 0.05$) decreased in the supplemented group. IL-10 increased tendentially ($p < 0.1$) in the zeolite group. There were no significant changes observed in the other measured parameters.

- In a randomized, double-blind , placebo controlled study, 52 educated men and women who have similar body-fat ratios, who do not smoke and who are between 20-50 received 1.85 grams of Zeolite everyday for 12 weeks.
- In order to identify intestinal wall integrity, feces samples biomarkers were collected. At the beginning and end of the study, redox biology, inflammation and DNA damage markers were identified through the blood. Additionally, VO 2 max and maximum performance was evaluated at the beginning and after 12 weeks of treatment.
- Twelve weeks of Zeolite supplement created positive effects on the integrity of intestine wall through a drop in zonulin.
- Light anti-inflammatory effects accompanied it in the cohort of individuals.



ZEO

Zeolit'in Zonulin Üzerinden Geçirgen Bağırsak Etkisi

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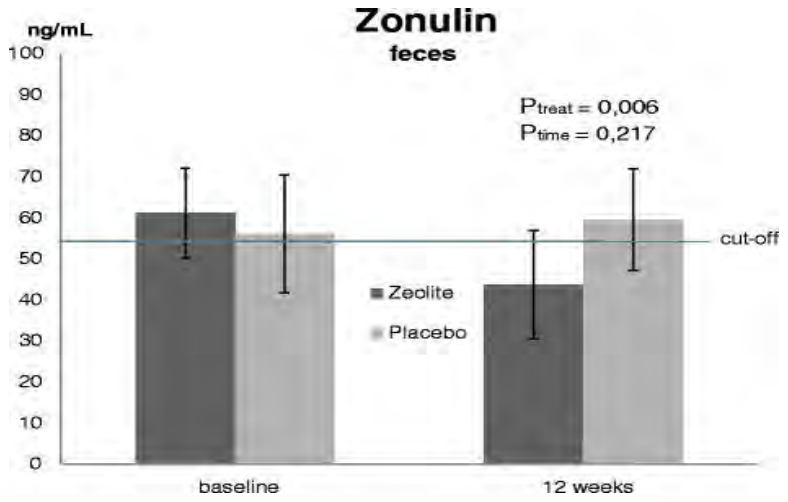
- Bir randomize, çift-kör, plasebo kontrollü bir çalışmada, benzer vücut yağ oranlı , sigara içmeyen, 20-50 yaş, içindeki 52 eğitimli erkek ve kadın , 12 hafta boyunca günde zeolit 1.85 g aldı.
- Bağırsak duvar bütünlüğünün belirlenmesi için dışkı örnekleri biyobelirteçleri toplandı. Çalışmanın başında ve sonunda kandan redoks biyolojisi, inflamasyon ve DNA hasarı belirteçleri belirlendi. Ek olarak, VO 2max ve maksimum performans başlangıçta ve 12 haftalık tedaviden sonra değerlendirildi.
- On iki hafta süren zeolit takviyesi, zonulin miktarının düşüşü sonucu bağırsak duvarı bütünlüğü üzerinde yararlı etkiler yaratmıştır. Buna, ayrıca bu bireylerin kohortunda hafif anti-enflamatuar etkileri de eşlik etti.



ZEO

Zeolite & effect on intestine inflammation

Vet Immunol Immunopathol. 2013 May 15;153(1-2):70-6. doi: 10.1016/j.vetimm.2013.02.006. Epub 2013 Feb 13.

The effects of natural and modified clinoptilolite on intestinal barrier function and immune response to LPS in broiler chickens.

Wu QJ[1], Zhou YM, Wu YN, Zhang LL, Wang T.

Author information

Abstract

The protection of intestinal barrier function and the anti-inflammatory effects of natural clinoptilolite (NCLI) and modified clinoptilolite (MCLI) were investigated in broilers that were repeatedly challenged with lipopolysaccharide (LPS). A total of 288 1-d-old broiler chicks were divided equally into three treatment groups: control, NCLI-treated (2%) and MCLI-treated (2%). Half of the birds from each treatment group were challenged with 0.9% NaCl solution or LPS (250μg/kg body weight, administered orally) at 16, 18 and 21d of age. The results indicated that, prior to LPS challenge, the diet had no effect on bird growth performance (P>0.05). The oral administration of LPS was also not associated with any significant changes in poultry performance (P>0.05). In LPS-challenged birds that were pretreated with NCLI (2%) or MCLI (2%), the LPS-induced increases in the plasma and intestinal mucosa concentrations of TNF-α, IL-1β, IL-2, IL-6, IL-4 and IL-10 were dramatically attenuated. Additionally, significant decreases in the plasma d-lactic acid and diamine oxidase (DAO) levels were found in birds that were pretreated with NCLI or MCLI. Furthermore, both NCLI and MCLI reduced the sICAM-1 concentration in the intestinal mucosa. In conclusion, NCLI and MCLI are able to prevent the LPS-induced intestinal mucosa damage and inflammatory response in vivo. These beneficial effects suggest that NCLI and MCLI act as anti-inflammatory agents in part by inhibiting neutrophil infiltration and hyperactivation and by suppressing the secretion of various plasma and intestinal mucosa inflammatory mediators.

PMID: 23453767 DOI: 10.1016/j.vetimm.2013.02.006

In the study conducted on chickens, it was seen that Zeolite may prevent LPS originated intestinal mucosa damage and inflammatory response as in vivo.

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Zeolit ve Bagırsak Inflamasyon Etkisi

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Tavuklarda yapılan çalışmada, zeolit, in vivo olarak LPS kaynaklı intestinal mukoza hasarını ve inflamatuar yanıtı önleyebilir. Bu yararlı etkiler, zeolit'in, nötrofil infiltrasyonunu ve hiperaktivasyonunu inhibe ederek ve çeşitli plazma ve intestinal mukoza inflamatuar mediatörlerinin salgılanmasını bastırarak anti-enflamatuar ajanlar olarak hareket ettiğini göstermektedir.

Effects of zeolite supplementation on parameters of intestinal barrier integrity, inflammation, redoxbiology and performance in aerobically trained subjects

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Zeolite increases the removal of heavy metals through urine

Clinoptilolite suspension as an agent to increase urinary excretion of toxic heavy metals

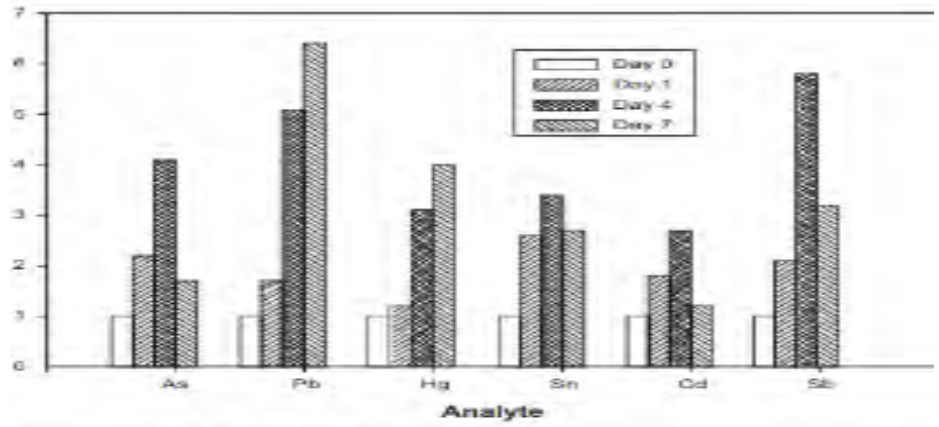
Abstract | Metrics | Get Permission

Authors Flowers J, Lonky SA, Deitsch EJ
Published 4 November 2009 Volume 2009:1 Pages 11—18
DOI https://doi.org/10.2147/NDS.S8043
Review by Single-blind
Peer reviewer comments 4
Altmetric 15

James L Flowers[1], Stewart A Lonky[2], Erik J Deitsch[3]

[1]Eno Research and Development, Inc., Hillsborough, NC, USA; [2]University of California at Los Angeles, Los Angeles, CA, USA; [3]Wellness Industries, LLC, Parkland, FL USA

Abstract: Effective treatment of chronic illness resulting from the long-term buildup of heavy metals in the body, such as chelation therapy, presents numerous clinical challenges, including undesirable side effects and unpredictable efficacy. Use of a naturally occurring zeolite, clinoptilolite, to remove these toxic substances may offer an efficacious and safe alternative to the traditional approaches. This study was designed to evaluate the ability of activated clinoptilolite suspended in water (ACS) to remove heavy metals from the body through urinary excretion without the undesirable removal of physiologically important electrolytes. The protocol utilized two treatment groups, each consisting of eleven healthy men aged 36 to 70 years. Volunteers were given a commercially available version of the study substance for seven days (Group 1) and 30 days (Group 2) and urine samples were collected at specified time points in the study. Changes in urinary concentration of the heavy metals were measured by inductively coupled plasma mass spectrometry and compared to the baseline. Also, serum samples were obtained from five individuals in each group and serum electrolytes were measured prior to and after taking the product. Participants in both groups had increased concentrations of heavy metals in the urine with the peak excretion at around day 4. No clinically significant alterations in serum electrolyte levels were seen at either seven or 30 days on ACS. In conclusion, this study demonstrates that the daily use of an activated clinoptilolite suspension



In the study about the detoxification potential of zeolite – which was published in 2009 – the effect of zeolite on removing toxic metals through urinary system was investigated. The study shows that daily use of clinoptilolite is a safe and potentially effective way of removing toxic metals from the body through urinary system.

Zeolit Ağır Metallerin İdrarla Atılımını Artırır

excretion of toxic heavy metals

Abstract | Metrics | Get Permission

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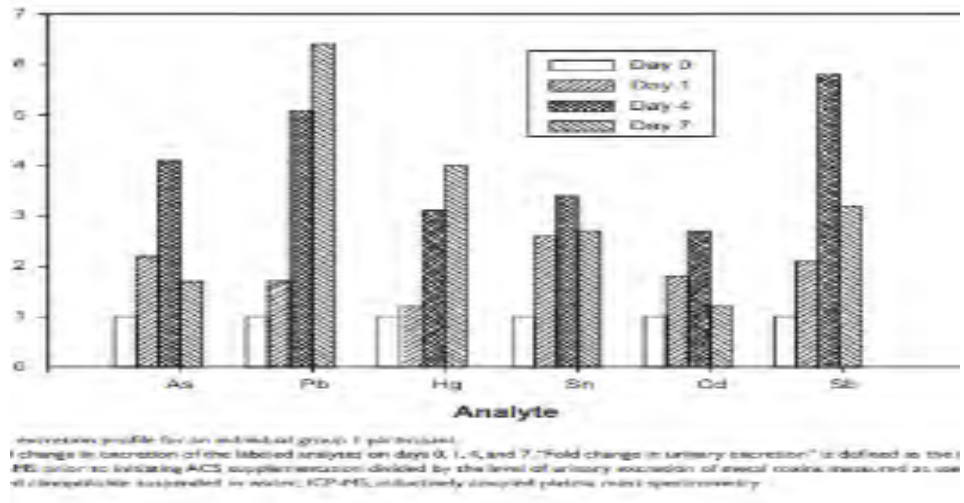

Zeolitin detoksifikasyon potansiyeli konusunda 2009 yılında yayınlanan bir çalışmada; zeolitlerin toksik metalleri idrar yoluyla ortadan kaldırma etkisi incelendi.

Çalışma, aktive edilmiş klinoptilolitin her gün kullanılmasının, idrara çıkma yoluyla toksik metallerin vücuttan atılmasını artırmada güvenli ve potansiyel olarak etkili bir yöntem olduğunu göstermiştir.

ZEO

Zeolite & Alcohol

After 25 grams of ethanol consumption, 5 grams of Zeolite was given and a respective ethanol decrease of 43%, 35% 41% and 34% was observed in both women and men in measurements conducted 30, 60, 90 and 120 minutes.

2.5 grams of clinoptilolite consumption did not cause a statistical meaningful drop in blood ethanol.

Especially, blood ethanol drop was more meaningful in men. In our study, clinoptilolite decreases alcohol level in blood and it proves and emphasizes the capability of decreasing the absorption of the alcohol.

J Physiol Pharmacol. 2015 Jun;66(3):441-7.

A pilot study on the ability of clinoptilolite to absorb ethanol in vivo in healthy drinkers: effect of gender.

Federico A[1], Dallio M[2], Gravina AG[2], Iannotta C[3], Romano M[2], Rossetti G[2], Somalvico F[4], Tuccillo C[2], Loguercio C[2].

Author information

Abstract

Zeolites are microscopic minerals of volcanic origin, and the zeolite most commonly used in medicine is clinoptilolite. Over the years, clinoptilolite has been tested in several ways: as an antioxidant, as an adjuvant in anticancer therapy due to its ability to capture chemotoxins, as an antidiarrhoeal agent and as a chelating agent for heavy metals. The aim of this study was to evaluate the ability of clinoptilolite to absorb ethanol in vivo in healthy drinkers. We enrolled 12 healthy drinkers in this study. The study was conducted as follows: phase 1: consumption of a hydroalcoholic solution containing 25 g of ethanol; phase 2: use of a 16.25 mL medical device containing clinoptilolite (2.5 g of clinoptilolite within a single-dose sachet) + consumption of a hydroalcoholic solution containing 25 g of ethanol; phase 3: use of a 32.5 mL medical device (5 g of clinoptilolite within a single-dose sachet) + consumption of a hydroalcoholic solution containing 25 g of ethanol. At the time of blood sampling, alcohol ingestion was also measured using an Alcolmeter instrument, and the results showed that the two methods overlapped. Reductions of 43%, 35%, 41% and 34% in blood ethanol at 30, 60, 90 and 120 minutes, respectively, were observed after the consumption of 5 g of clinoptilolite + 25 g of ethanol in both males and females, whereas the consumption of 2.5 g of clinoptilolite did not result in a statistically significant reduction in blood ethanol. In particular, the blood ethanol reduction was more significant in males. Our study highlights and confirms the ability of clinoptilolite to decrease the absorption of ingested ethanol by reducing blood alcohol levels. This effect was statistically significant at a dose of 5 g.

PMID: 26084226

Zeolit ve Alkol

25 gr etanol tüketiminden sonra 5 gr zeolite verilip sırayla 30, 60 , 90 ,120 dakika sonra yapılan ölçümlerde , hem kadınlarda hem de erkeklerde kan etanolünde sırasıyla %43, %35, %41 ve %34 azalma, gözlenmiştir.

2.5 g klinoptilolit tüketimi, kan etanolünde
istatistiksel olarak anlamlı bir düşüşe neden olmamıştır.

Özellikle, erkeklerde kan etanol azaltımı
Daha anlamlıydı. Çalışmamızda klinoptilolitin Kandaki alkol düzeyini azaltarak içilen etanolün emilimini azaltma kabiliyeti vurgulanmakta ve onaylanmaktadır.

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Zeolite & Diarrhea

A new anti-diarrhea medication for humans is developed based on the physical and chemical properties of purified natural zeolite. The medication successfully passed a series of physical, chemical, technological, pharmacological, microbiological and clinical tests in order to satisfy the requirements of Cuba Medicine Quality Institute.

Zeolite has a positive effect on diarrhea condition.

Zeolite dust is a fast and effective method to fight diarrhea. As a matter of fact, half a tea spoon will stop diarrhea shorter than an hour and end related cramps.

Enterex: Anti-diarrheic drug based on purified natural clinoptilolite

G. Rodríguez-Fuentes, M.A. Barrios, A. Iraizoz, I. Perdomo, B. Cedré

Show more

https://doi.org/10.1016/S0144-2449(97)00087-0

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A new anti-diarrheic drug for humans has been developed based on the physical and chemical properties of the purified natural clinoptilolite NZ. A series of physical, chemical, technological, pharmacological, microbiological, and clinical studies were successfully conducted to meet the requirements of the Cuban Drug Quality Agency. The most important results concerning the properties and biological mechanism of NZ are decribed in this paper.

Zeolit ve Diare

Saflaştırılmış doğal zeolitten fiziksel ve kimyasal özelliklerine dayalı olarak insanlar için yeni bir anti diyare ilaç geliştirilmiştir.

Küba İlaç Kalite Kurumu'nun gereksinimlerini karşılamak için bir dizi fiziksel, kimyasal, teknolojik, farmakolojik, mikrobiyolojik ve klinik çalışma başarıyla gerçekleştirilmiştir. Zeolit diare durumunda olumlu etkiye sahiptir.

Zeolit tozu, ishale karşı hızlı ve etkili bir yöntemdir. Hatta yarım çay kaşığı diyareyi bir saatten daha kısa sürede durdurup ve onunla ilişkili kramp ağrısını da bitirebilir.

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Zeolite & Reflux

Heartburn (44%), ailment (54%) and pain (56%) decreased in patients who receive 1,5 gr Zeolite daily.

They stated that there is a significant drop (P = 0.05) in the severity of symptoms.

Days without symptoms increased by 41% compared to the group that received placebo. This is above the efficacy of proton pump inhibitor.

In NSAID study, gastric symptom severity decreased; whereas in the group that used potential clinoptilolite, mucosal erosion severity – ranked by gastroenterologist - decreased significantly. (P = 0.05).

Clin Exp Gastroenterol. 2014 Jul 1;7:215-20. doi: 10.2147/CEG.S51222. eCollection 2014.

Potentiated clinoptilolite: artificially enhanced aluminosilicate reduces symptoms associated with endoscopically negative gastroesophageal reflux disease and nonsteroidal anti-inflammatory drug induced gastritis.

Potgieter W[1], Samuels CS[1], Snyman JR[1].

Author information

Abstract

PURPOSE: The cation exchanger, a potentiated clinoptilolite (Absorbatox™ 2.4D), is a synthetically enhanced aluminosilicate. The aim of this study was to evaluate the possible benefits of a potentiated clinoptilolite as a gastroprotective agent in reducing the severity of clinical symptoms and signs associated with 1) endoscopically negative gastroesophageal reflux disease (ENGORD) and 2) nonsteroidal anti-inflammatory drug (NSAID) medication.

METHODS AND PATIENTS: Two randomized, double-blind, placebo-controlled, pilot studies, the ENGORD and NSAID studies, were conducted. After initial negative gastroscopy, a total of 25 patients suffering from ENGORD were randomized to receive either placebo capsules or 750 mg Absorbatox twice daily for 14 days. The NSAID study recruited 23 healthy patients who received orally either 1,500 mg Absorbatox or placebo three times daily, plus 500 mg naproxen twice daily. Patients underwent gastroscopic evaluation of their stomach linings prior to and on day 14 of the study. Gastric biopsies were obtained and evaluated via the upgraded Sydney system, whereas visible gastric events and status of the gastric mucosa were evaluated via a 0-3 rating scale. During both studies, patients recorded gastric symptoms in a daily symptom diary.

RESULTS: In the ENGORD study, patients who received the potentiated clinoptilolite reported a significant reduction (P≤0.05) in severity of symptoms including reduction in heartburn (44%), discomfort (54%), and pain (56%). Symptom-free days improved by 41% compared to the group who received placebo (not significant). This was over and above the benefits seen with the proton pump inhibitor. In the NSAID study, the reduction in gastric symptom severity was echoed in the group who received the potentiated clinoptilolite. Treatment with the potentiated clinoptilolite resulted in significant prevention (P≤0.05) of mucosal erosion severity as graded by the gastroenterologist.

CONCLUSION: Absorbatox is a nonabsorbable aluminosilicate with potential gastroprotective benefits as it protected against ENGORD symptoms and NSAID-induced gastric events. The exact mechanism of action is not clear but may be due to its binding to hydrogen ions and biologically active amines and nitrates.

KEYWORDS: cation exchanger; endoscopy; gastro-protective agent; zeolite

PMID: 25061329 PMCID: PMC4087055 DOI: 10.2147/CEG.S51222

Zeolit ve Reflü

Zeolit günlük 1.5 gr alan hastalar, heartburn (%44), rahatsızlık (%54) ve ağrı (%56) oranında azaldı.

Semptomların şiddetinde önemli bir azalma (P = 0.05) bildirdiler.

Semptomsuz günler plasebo alan gruba göre %41 arttı. Bu, proton pompası inhibitörü ile görülen faydaların üzerindedir.

NSAID çalışmasında, gastrik semptom şiddetindeki azalma, potansiyelli klinoptiloliti alan grupta, Gastroenterology tarafından derecelenen mukozal erozyon şiddetini önemli ölçüde önlendi (P = 0.05).

Clin Exp Gastroenterol. 2014 Jul 1;7:215-20. doi: 10.2147/CEG.S51222. eCollection 2014.

Potentiated clinoptilolite: artificially enhanced aluminosilicate reduces symptoms associated with endoscopically negative gastroesophageal reflux disease and nonsteroidal anti-inflammatory drug induced gastritis.

Potgieter W[1], Samuels CS[1], Snyman JR[1].

Author information

Abstract

PURPOSE: The cation exchanger, a potentiated clinoptilolite (Absorbatox™ 2.4D), is a synthetically enhanced aluminosilicate. The aim of this study was to evaluate the possible benefits of a potentiated clinoptilolite as a gastroprotective agent in reducing the severity of clinical symptoms and signs associated with 1) endoscopically negative gastroesophageal reflux disease (ENGORD) and 2) nonsteroidal anti-inflammatory drug (NSAID) medication.

METHODS AND PATIENTS: Two randomized, double-blind, placebo-controlled, pilot studies, the ENGORD and NSAID studies, were conducted. After initial negative gastroscopy, a total of 25 patients suffering from ENGORD were randomized to receive either placebo capsules or 750 mg Absorbatox twice daily for 14 days. The NSAID study recruited 23 healthy patients who received orally either 1,500 mg Absorbatox or placebo three times daily, plus 500 mg naproxen twice daily. Patients underwent gastroscopic evaluation of their stomach linings prior to and on day 14 of the study. Gastric biopsies were obtained and evaluated via the upgraded Sydney system, whereas visible gastric events and status of the gastric mucosa were evaluated via a 0-3 rating scale. During both studies, patients recorded gastric symptoms in a daily symptom diary.

RESULTS: In the ENGORD study, patients who received the potentiated clinoptilolite reported a significant reduction ($P \leq 0.05$) in severity of symptoms including reduction in heartburn (44%), discomfort (54%), and pain (56%). Symptom-free days improved by 41% compared to the group who received placebo (not significant). This was over and above the benefits seen with the proton pump inhibitor. In the NSAID study, the reduction in gastric symptom severity was echoed in the group who received the potentiated clinoptilolite. Treatment with the potentiated clinoptilolite resulted in significant prevention ($P \leq 0.05$) of mucosal erosion severity as graded by the gastroenterologist.

CONCLUSION: Absorbatox is a nonabsorbable aluminosilicate with potential gastroprotective benefits as it protected against ENGORD symptoms and NSAID-induced gastric events. The exact mechanism of action is not clear but may be due to its binding to hydrogen ions and biologically active amines and nitrates.

KEYWORDS: cation exchanger; endoscopy; gastro-protective agent; zeolite

PMID: 25061329 PMCID: PMC4087055 DOI: 10.2147/CEG.S51222

Zeolite & Alzheimers

The study conducted on mice shows that Zeolite is a new potential adjuvant to fight oxidative stress and plaque accumulation in neurodegenerative diseases.

Life Sci. 2013 May 20;92(17-19):903-10. doi: 10.1016/j.lfs.2013.03.008. Epub 2013 Apr 3.

Dietary zeolite supplementation reduces oxidative damage and plaque generation in the brain of an Alzheimer's disease mouse model.

Montinaro M[1], Uberti D, Maccarinelli G, Bonini SA, Ferrari-Toninelli G, Memo M.

Author information

Abstract

AIM: Oxidative stress is considered one of the main events that lead to aging and neurodegeneration. Antioxidant treatments used to counteract oxidative damage have been associated with a wide variety of side effects or at the utmost to be ineffective. The aim of the present study was to investigate the antioxidant property of a natural mineral, the tribomechanically micronized zeolite (MZ).

MAIN METHODS: Cell death and oxidative stress were assessed in retinoic acid differentiated SH-SY5Y cells, a neuronal-like cell line, after a pro-oxidant stimulus. In vivo evaluation of antioxidant activity and amyloidogenic processing of beta amyloid have been evaluated in a transgenic model of aging related neurodegeneration, the APPswePS1dE9 transgenic mice (tg mice) after a five-month long period of water supplementation with MZ.

KEY FINDINGS: The study showed that 24h of cell pretreatment with MZ (1) protected the cells by radical oxygen species (ROS)-induced cell death and moreover (2) induced a reduction of the mitochondrial ROS production following a pro-oxidant stimulation. Looking for an antioxidant effect of MZ in vivo, we found (3) an increased activity of the endogenous antioxidant enzyme superoxide dismutase (SOD) in the hippocampus of tg mice and (4) a reduction in amyloid levels and plaque load in MZ treated tg mice compared to control tg mice.

SIGNIFICANCE: Our results suggest MZ as a novel potential adjuvant in counteracting oxidative stress and plaque accumulation in the field of neurodegenerative diseases.

PMID: 23562853 DOI: 10.1016/j.lfs.2013.03.008

Zeolit ve Alzheimer

Fareler üzerinde yapılan çalışma sonuçları, Zeolit'in nörodejeneratif hastalıklar alanında oksidatif stres ve plak birikimine karşı koymada yeni bir potansiyel adjuvan olduğunu göstermektedir.

Life Sci. 2013 May 20;92(17-19):903-10. doi: 10.1016/j.lfs.2013.03.008. Epub 2013 Apr 3.

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ZEOLITE & PH

It helps balancing of pH level of the body with a healthy alkalinity.

Zeolite tampons between pH 7.35 and 7.45 which is the most appropriate alkaline level for human body.

Zeolite attracts excessive protons which cause acidity and tampons them.

It is effective in many ailments from acid reflux, Candida and Arthritis.

Zeolit ve Ph

- Vücudun pH seviyelerinin sağlıklı bir alkalinite ile dengelenmesine yardımcı olur.
- Zeolit, sistemi insan vücudu için en uygun pH olan hafif alkalin seviye olan pH 7.35 ila 7.45 arasında tamponlar.
- Zeolit, asiditeye neden olan aşırı protonları çeker ve tamponlar.
- Asit reflü, Candida ve Artrite kadar pek çok rahatsızlıkta etkili olur.

Urine & Feces

- Zeolites are unique mineral groups that are in shape of honeycomb structure and which have negative charge. The distinctive structure ensures that zeolite has a strong osmotic effect to catch positively charged heavy metals, environmental toxins and free radicals.
- Zeolite has small gaps that incorporates negatively charged compounds which attract and catch toxins and free radicals powerfully.
- After Zeolite catches toxins, it keeps them with its magnetic energy before they are disposed through digestion system. 60% of disposal is through urine and 40% is through feces.

İdrar ve Dışkı

- Zeolitler, petek yapılı ve negatif manyetik yüke sahip benzersiz mineral gruplarıdır. Bu ayırt edici yapı, zeolitin, pozitif yüklü ağır metaller, çevresel toksinler ve serbest radikalleri yakalamak için güçlü bir ozmotik etkiye sahip olmasını sağlar.
- Zeolit, toksinleri ve serbest radikalleri kuvvetle çeken ve yakalanan bu negatif yüklü bileşikleri içeren küçük boşluklara sahiptir.
- Zeolit toksinleri yakaladıktan sonra, normal sindirim yoluyla vücudun dışına atılana kadar manyetik enerjileri ile tutar. Boşaltımın yaklaşık% 60'ı idrar yoluyla,% 40'ı da dışkı yoluyla yaparlar.

Zeolite & Kidney Health

- Zeolite promotes the pH balance of the body by providing alkalizing minerals and supporting the kidney function.
- Alkalized minerals help the tamponing of acids into the body. Alkalized minerals – calcium, potassium, and magnesium – are available in the cage structure of Zeolite. Zeolite provides the body with beneficial minerals and absorbs harmful toxin in return.
- The most important role that Zeolite plays in alkalizing the body is about the effect it creates in kidneys. It protects the internal pH of kidneys.
- Heavy metals harm kidney functions. Zeolite may help removing heavy metals from the body and supports optimal kidney health. Your kidneys balance pH of the body.

Zeolit ve Böbrek Sağlığı

- Zeolitin, alkalileştirici mineraller sağlayarak ve böbrek fonksiyonunu destekleyerek vücudun pH dengesine yardımcı olmasıdır.
- Alkalize mineraller, vücuda asit tamponlamasına yardımcı olurlar. Zeolit'in kafes yapısı içinde, alkalize edici mineraller kalsiyum, potasyum ve magnezyum, mevcuttur. Zeolit vücuda yararlı mineral verir ve karşılığında kötü toksini alır.
- Vücutun alkalileştirilmesinde zeolitin oynadığı en büyük rolü, böbreklerde oluşturduğu etki ile ilgilidir. Böbreklerin iç pH'nı korur.
- Ağır metaller böbrek fonksiyonlarını bozarlar. Zeolit, vücudunuza ağır metallerden kurtulmasına yardımcı olabileceğinden optimal böbrek sağlığını destekler, böbrekleriniz vücudunuzun pH'sını dengeler.

Zeolite & Cancer

- Research shows that Zeolite (Clinoptilolite) might play an important role in arranging the system and other processes about intestines.
- It is reported that silica and aluminum silicates act as unspecific immune stimulators and they can activate comparatively larger parts of T cell population.
- Some studies – conducted on mice – shows that anti-metastatic activity of Zeolite might contribute to unspecific immune response through macrophage and T cell activation.

K.Pavelic, M.Katic, V.Sverko, T.Marotti, B.Bosnjak, T.Balog, R.Stojkovic, M.Radacic, M.Colic, M.Poljak-Blazi, Immunostimualtory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability. J Cancer Cancer Res Clin Oncol (2002) 128: 37-44

Zeolit ve Kanser

- Yapılan çalışmalar, Zeolit (Clinoptilolit) in, sisteminin düzenlenmesinde ve bağırsaklarla ilgili diğer süreçlerinde önemli bir rol oynayabileceği göstermektedir.
- Silikanın ve alüminyum-silikatların süper-antikorlar şekilde spesifik olmayan immun uyarıcılar olarak hareket ettikleri ve **T** hücre popülasyonunun göreceli olarak büyük kısımlarını aktive edebildiği rapor edilmiştir.
- Fareler üzerinde yapılan bazı çalışmalar, zeolit' in anti-metastatik aktivitesinin, makrofajların ve T hücrelerinin aktivasyonu yoluyla, spesifik olmayan immun cevaba katkıda bulunduklarını göstermektedir.

K.Pavelic, M.Katic, V.Sverko, T.Marotti, B.Bosnjak, T.Balog, R.Stojkovic, M.Radacic, M.Colic, M.Poljak-Blazi, Immunostimualtory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability. J Cancer Cancer Res Clin Oncol (2002) 128: 37-44

Zeolite & Cancer

The interaction of MZ with lipid peroxidation might explain some of the beneficial effects of this special zeolite combined cancer theraphy.

J Mol Med (Berl). 2001;78(12):708-20.

Natural zeolite clinoptilolite: new adjuvant in anticancer therapy.

Pavelić K[1], Hadzija M, Bedrica L, Pavelić J, Dikić I, Katić M, Kralj M, Bosnar MH, Kapitanović S, Poljak-Blazi M, Krizanac S, Stojković R, Jurin M, Subotić B, Colić M.

Author information

Abstract

Natural silicate materials, including zeolite clinoptilolite, have been shown to exhibit diverse biological activities and have been used successfully as a vaccine adjuvant and for the treatment of diarrhea. We report a novel use of finely ground clinoptilolite as a potential adjuvant in anticancer therapy. Clinoptilolite treatment of mice and dogs suffering from a variety of tumor types led to improvement in the overall health status, prolongation of life-span, and decrease in tumors size. Local application of clinoptilolite to skin cancers of dogs effectively reduced tumor formation and growth. In addition, toxicology studies on mice and rats demonstrated that the treatment does not have negative effects. In vitro tissue culture studies showed that finely ground clinoptilolite inhibits protein kinase B (c-Akt), induces expression of p21WAF1/CIP1 and p27KIP1 tumor suppressor proteins, and blocks cell growth in several cancer cell lines. These data indicate that clinoptilolite treatment might affect cancer growth by attenuating survival signals and inducing tumor suppressor genes in treated cells.

Anticancer Res. 2003 Mar-Apr;23(2B):1589-95.

Anticancer and antioxidative effects of micronized zeolite clinoptilolite.

Zarkovic N[1], Zarkovic K, Kralj M, Borovic S, Sabolovic S, Blazi MP, Cipak A, Pavelic K.

Author information

Abstract

BACKGROUND: Treatment of cancer-bearing mice and dogs with micronized zeolite clinoptilolite (MZ) led to improvement of the overall health status, prolongation of life span and decrease of tumor size in some cases. It also reduced lipid peroxidation in the liver of mice.

MATERIALS AND METHODS: The experiments were performed on various tumor cell cultures and tumor-bearing animals. Immunohistochemistry was used to analyze if MZ could interfere with Doxorubicin-induced lipid peroxidation and consequential production of 4-hydroxynonenal (HNE).

RESULTS: MZ reduced the metabolic rate of cancer cells and increased binding of HNE to albumin in vitro. It selectively reduced generation of HNE in vivo in tumor stroma after Doxorubicin treatment leaving onset of lipid peroxidation intact in malignant cells. Combined treatment with Doxorubicin and MZ resulted in strong reduction of the pulmonary metastasis count increasing anticancer effects of Doxorubicin.

CONCLUSION: Interference of MZ with lipid peroxidation might explain some of the beneficial effects of this particular zeolite in combined cancer therapy.

PMID: 12820427

It was shown that it inhibits protein kinase B (c-Akt).

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It demonstrates that clinoptilolite treatment may affect cancer growth by decreasing surviving signals and inducing tumor suppressor genes in treated cells.

MZ'nin lipid eroksi-dasyonu ile etkileşimi, bu özel zeolitin kombine kanser terapisinde yararlı etkilerinin bazılarını açıklayabilir.

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PMID: 11434724

Protein kinaz B'yi (c-Akt) inhibe ettiğini göstermiştir.

p21WAF1 / CIP1 ve p27KIP1 tümör süpresör proteinlerinin ekspresyonunu indükler ve birkaç kanser hücre hattında hücre büyümesini bloke eder.

Klinoptilolit tedavisinin, hayatta kalma sinyallerini azaltarak ve tedavi edilen hücrelerde tümör baskılayıcı genleri indükleyerek kanser büyümesini etkileyebileceğini göstermektedir.

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PMID: 12820427

Zeolite and its Effect of Decreasing Metastases

J Cancer Res Clin Oncol. 2002 Jan;128(1):37-44. Epub 2001 Nov 10.

Immunostimulatory effect of natural clinoptilolite as a possible mechanism of its antimetastatic ability.

Pavelic K[1], Katic M, Sverko V, Marotti T, Bosnjak B, Balog T, Stojkovic R, Radacic M, Colic M, Poljak-Blazi M.

Author information

Abstract

PURPOSE: Many biochemical processes are closely related to ion exchange, adsorption, and catalysis. Zeolites reversibly bind small molecules such as oxygen or nitric oxide; they possess size and shape selectivity, the possibility of metalloenzyme mimicry, and immunomodulatory activity. These properties make them interesting for pharmaceutical industry and medicine.

METHODS: The experiments were performed on mice. Different biochemical and molecular methods were used.

RESULTS: Micronized zeolite (MZ) administered by gastric intubation to mice injected with melanoma cells significantly reduced the number of melanoma metastases. In mice fed MZ for 28 days, concentration of lipid-bound sialic acid (LSA) in serum increased, but lipid peroxidation in liver decreased. The lymphocytes from lymph nodes of these mice provoked a significantly higher alogeneic graft-versus-host (GVH) reaction than cells of control mice. After i.p. application of MZ, the number of peritoneal macrophages, as well as their production of superoxide anion, increased. However, NO generation was totally abolished. At the same time, translocation of p65 (NFkappaB subunit) to the nucleus of splenic cells was observed.

CONCLUSION: Here we report antimetastatic and immunostimulatory effect of MZ and we propose a possible mechanism of its action.

PMID: 11862470 DOI: 10.1007/s00432-001-0301-6

- Mice that were injected with melanoma were also given micronized zeolite (MZ) through gastric intubation. It was seen that melanoma metastases dropped significantly.
- Mice that were fed with MZ for 28 days had higher concentration of lipid bound sialic acid (LSA) in serum. However, there was a drop in lipid peroxidation in liver. Lymphocyte in those mice's lymph node stimulated a much higher allogenic graft-versus-host (GVH) reaction compared to the cells of control mice.
- After the thread implementation of MZ, peritoneum macrophage number and their superoxide production increased. However, NO generation was completely removed. At the same time, p65 (sub-unit of NF-kB) translocation to spleen cell nuclei was observed.

Zeolit ve Metastaz Azaltma Etkisi

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- Melanom hücreleri ile enjekte edilen farelere gastrik entübasyon ile uygulanan mikronize zeolit (MZ), **melanoma metastazlarının sayısını önemli ölçüde azaltmıştır.**
- 28 gün boyunca MZ ile beslenen farelerde serumdaki lipid-bağlı sialik asit (LSA) konsantrasyonu artmış, ancak karaciğerde lipit peroksidasyonu azalmıştır. Bu farelerin lenf düğümlerinden lenfositler, kontrol farelerinin hücrelerinden çok daha yüksek bir alogeneik graft-versus-host (GVH) reaksiyonu uyandırdı
- MZ'nin ip uygulamasından sonra, periton makrofajlarının sayısı ve bunların süperoksit anyonu üretimi artmıştır. Ancak, NO nesil tamamen kaldırıldı. Aynı zamanda, p65'in (NFkappaB alt birimi) dalak hücrelerinin çekirdeğine translokasyonu gözlendi.

Life Sci. 2003 Sep 5;73(16):2059-69.

The effect of natural clinoptilolite on the serotonergic receptors in the brain of mice with mammary carcinoma.

Mück-Seler D[1], Pivac N.

Author information

Abstract

The ex vivo effect of tribomechanically micronized zeolite (MZ) on the binding of 3H-8-OH-DPAT to 5-HT(1A) and 3H-5-HT to 5-HT(1B) receptors was investigated in the brain of nontumorous (control) and mammary carcinoma bearing female mice. During 14 and 28 days mice were fed with standard food, standard food supplemented with 25% of MZ, or standard food supplemented with 25% of non tribomechanically micronized zeolite (non-MZ). A reduced binding of 3H-8-OH-DPAT to 5-HT(1A) receptors in mammary carcinoma bearing mice was found when compared to control mice fed with standard food for 28 days, suggesting a time dependent alteration of 5-HT(1A) receptors in mammary carcinoma. The addition of MZ for 28 days in these mice abolished the decrease in 5-HT(1A) receptors binding, indicating a possible beneficial effect of MZ, at least on 5-HT(1A) receptors in mammary carcinoma bearing mice. The preliminary data show that MZ administered as a food supplement (25%) for 14 days induced a transient decrease in the binding of 3H-5-HT to brain 5-HT(1B) receptors only in control, but not in tumor-bearing mice, that disappeared after 28 days of MZ-supplemented food administration. The mechanism of the indirect action of MZ on the brain serotonergic receptors might be achieved by the alterations in the electrolytes balance, and/or by the regulation of the immune system.

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PMID: 12899929

Zeolite & Radiation Effect

J Environ Radioact. 2015 Jun;144:103-12. doi: 10.1016/j.jenvrad.2015.03.012. Epub 2015 Mar 28.

Returning land contaminated as a result of radiation accidents to farming use.

Voronina AV[1], Blinova MO[2], Semenishchev VS[2], Gupta DK[3].

⊕ Author information

Abstract

An assessment is given of the possibility of sorbents based on natural aluminosilicates (glauconite and clinoptilolite) being used for remediation of radioactively contaminated land with the aim of returning it to farming use. A comparative study of selectivity and reversibility of radiocaesium and radiostrontium sorption by natural aluminosilicates as well as by modified ferrocyanide sorbents based on these aluminosilicates was made. It was found that surface modification of aluminosilicates by ferrocyanides increases the selectivity of synthesized sorbents to caesium by 100-1000 times, increases sorption capacity and makes caesium sorption almost irreversible, whereas, selectivity of these sorbents to strontium radionuclides remains approximately the same as for natural aluminosilicates. The caesium distribution coefficient for mixed nickel-potassium ferrocyanide on glauconite is 10((5.0±0.6)) L kg(-1), the static exchange capacity (SEC) is 63 mg g(-1); for mixed nickel-potassium ferrocyanide based on clinoptilolite caesium distribution coefficients in various concentration ranges are 10((7.0±1.0)), 10((5.7±0.4)) and 10((3.2±0.7)) L kg(-1), total SEC was 500 mg g(-1). Caesium leaching by various leaching solutions from saturated mixed nickel-potassium ferrocyanide based on clinoptilolite was lower than 2%; from saturated mixed nickel-potassium ferrocyanide based on glauconite it was 1.5-14.6%. Ferrocyanide sorbents, based on glauconite and clinoptilolite are recommended for remediation of land, contaminated by caesium as a result of the Fukushima accident in Japan. Use of these sorbents should decrease the transfer of caesium to agricultural vegetation up to a factor of 20.

KEYWORDS: Caesium and strontium; Radiation accident; Radioactively contaminated lands; Radionuclides in vegetation; Remediation; Sorbents

PMID: 25827577 DOI: 10.1016/j.jenvrad.2015.03.012

An evaluation was made on the possibility of sorbents based on natural aluminosilicates (glauconite and clinoptilolite) which can be used to regain a radoactively polluted field for farming.

After the Fukushima accident in Japan, ferrocyanic absorbers which are based on glauconite and clinoptilolite are recommended to improve the field polluted with cesium.

Zeolite helps preventing the radiation poisoning. (for example X Ray and medical scannings).

After nuclear disasters in Japan and Russia, zeolite was used in order to clean polluted water and areas. It was added to food to give a detox to children exposed to radiation.

This mineral ash may bind radiation and remove it from the body. For this reason, it was used to turn radioactive iodine storing in thyroids into contrast.

Zeolit ve Radyasyon Etkisi

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⊕ Author information

Abstract

An assessment is given of the possibility of sorbents based on natural aluminosilicates (glauconite and clinoptilolite) being used for remediation of radioactively contaminated land with the aim of returning it to farming use. A comparative study of selectivity and reversibility of radiocaesium and radiostrontium sorption by natural aluminosilicates as well as by modified ferrocyanide sorbents based on these aluminosilicates was made. It was found that surface modification of aluminosilicates by ferrocyanides increases the selectivity of synthesized sorbents to caesium by 100-1000 times, increases sorption capacity and makes caesium sorption almost irreversible, whereas, selectivity of these sorbents to strontium radionuclides remains approximately the same as for natural aluminosilicates. The caesium distribution coefficient for mixed nickel-potassium ferrocyanide on glauconite is 10((5.0±0.6)) L kg(-1), the static exchange capacity (SEC) is 63 mg g(-1); for mixed nickel-potassium ferrocyanide based on clinoptilolite caesium distribution coefficients in various concentration ranges are 10((7.0±1.0)), 10((5.7±0.4)) and 10((3.2±0.7)) L kg(-1), total SEC was 500 mg g(-1). Caesium leaching by various leaching solutions from saturated mixed nickel-potassium ferrocyanide based on clinoptilolite was lower than 2%; from saturated mixed nickel-potassium ferrocyanide based on glauconite it was 1.5-14.6%. Ferrocyanide sorbents, based on glauconite and clinoptilolite are recommended for remediation of land, contaminated by caesium as a result of the Fukushima accident in Japan. Use of these sorbents should decrease the transfer of caesium to agricultural vegetation up to a factor of 20.

KEYWORDS: Caesium and strontium; Radiation accident; Radioactively contaminated lands; Radionuclides in vegetation; Remediation; Sorbents

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Radyoaktif olarak kirlenmiş arazinin çiftçilik kullanımına geri kazandırılması amacıyla kullanılan doğal alüminosilikatlara (glaukonit ve klinoptilolit) dayanan sorbentlerin olasılığı hakkında bir değerlendirme yapılmıştır.

Japonya'daki Fukushima kazası sonucu, sezyum ile kirlenmiş olan arazinin iyileştirilmesi için glokonit ve klinoptilolite dayalı ferrosiyanid emiciler önerilir.

Zeolit radyasyon zehirlenmesini ortadan kaldırmaya yardımcı olur (örneğin röntgen ve tıbbi taramalar).

Japonya ve Rusya'da, nükleer felaketlerden sonra, kirlenmiş su ve alanları temizlemek için zeolit kullanıldı. Radyasyona maruz kalan çocukları detoks yapmak için yemeğe eklendi.

Bu madensel kül radyosyonu bağlayıp vücuttan atabilir. Bu nedenle, tiroidlerde radyoaktif iyot depolamalarını da kontrast haline getirmek için kullanılmıştır.

Zeolite & Germs

In addition to improving your immune system, zeolite is a very strong antimicrobial substance. This means it has the potential of dealing with harmful bacteria, viruses and fungus.

As a matter of fact, zeolites are so effective that they are used for the treatments of urinary track infections and teeth plaque formation. Both stem from pathogenic germs.

Another research showed that zeolite has antiviral properties due to its potential of absorbing viral particles into zeolite cages.

Research shows that zeolite may decrease pathogenic bacteria. What makes Zeolite better is that it does not negatively affect beneficial germs in intestines.

Zeolit ve Mikroplar

Bağışıklık sağlığınızı iyileştirmenin yanı sıra, zeolit güçlü bir antimikrobiyal maddedir. Bu, potansiyel olarak zararlı bakteriler, virüsler ve mantarlarla mücadele edebileceği anlamına gelir.

Aslında, zeolitler o kadar etkilidir ki idrar yolu enfeksiyonlarını (İYE'ler) ve diş plak oluşumlarını tedavi etmek için kullanılmıştır. Her ikisi de patojenik mikroplardan kaynaklanır.

Başka bir araştırma, zeolitin viral parçacıkları zeolit kafesleri içinde emme potansiyeli nedeniyle antiviral özelliklere sahip olduğunu bulmuştur.

Çalışmalar zeolitin patojen bakterileri azaltabileceğini göstermektedir. ***Zeoliti daha da iyi yapan şey, bağırsağınızdaki yararlı mikropları olumsuz etkilememesidir.***

Zeolite & Anti-viral Effect

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Antiviral properties of clinoptilolite

Magdalena Grce *, Krešimir Pavelić

"Ruđjer Boskovic" Institute, Division of Molecular Medicine, Bijenicka 54, HR-10002 Zagreb, Croatia

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Abstract

The aim of this study was to evaluate the antiviral properties of clinoptilolite, a natural non-toxic zeolite. Herein, a fine powder of micronized zeolite (MZ) was obtained by tribomechanical micronization of natural clinoptilolite. Different viral suspensions were treated with MZ in concentrations ranging from 0.5 to 50 mg/ml. The viral proliferation was evaluated by optical microscope as percentage of cytopathic effect (CPE). Human adenovirus 5, herpes simplex virus type 1 (HSV 1) and human enteroviruses (coxsackievirus B5 and echovirus 7) were used in the antiviral assay. Concentrations of 0.5 and 5 mg/ml of MZ induced a very low antiviral effect or the antiviral was not observed at all, while concentrations of 12, 25 and 50 mg/ml of MZ induced a significant inhibitory effect upon viral proliferation. MZ inhibited the viral proliferation of HSV 1, coxsackievirus B5 and echovirus 7 more efficiently than adenovirus 5. The antiviral effect of MZ seems to be non-specific and is more likely based on the incorporation of viral particles into pores of MZ aggregates than ion exchange properties of clinoptilolite. Our preliminary results indicate a possibility of therapeutical application of MZ, either locally (skin) against herpesvirus infections or orally in cases of adenovirus or enterovirus infections. Futhermore, MZ could also be used in purification of drinking water from different viruses.

Keywords: Clinoptilolite; Micronized zeolite (MZ); Antiviral properties; Cytopathic effect (CPE)

- The unique structure of zeolite is the reason behind its success of removing all harmful bacteria, viruses, fungus and germs from the body. It may not be an immediate effect but it will be prominent after a monthly supplement.
- Zeolite is a product with antiviral effect. Clinoptilolite is effective for herpes lesions on skin, for adenovirus or enterovirus infections in mouth.
- Zeolite usage ensures a fast treatment for upper respiratory track infections.

Zeolit ve Anti-viral Etki

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Keywords: Clinoptilolite; Micronized zeolite (MZ); Antiviral properties; Cytopathic effect (CPE)

- Zeolitin benzersiz yapısı, zararlı bakteriler, virüsler ve mantar da dahil olmak üzere mikropları vücuttan uzaklaştırmada başarılı olmasının nedenidir. Etki derhal olmayabilir, ancak yaklaşık bir aylık destek sonrasında belirginleşir.
- Zeolit antiviral etkisi olan bir üründür. Clinoptilolit ciltte herpes lezyonlarında ağızda adenovirüs veya enterovirüs enfeksiyonlarında etkilidir.
- Üst solunum yolu enfeksiyonlarında zeolit kullanımı hızlı bir iyileşmeyi sağlar.

Drink A lot of Water !

You need more water when you use zeolite.

Zeolite may cause dehydration. Therefore, it is important to drink more water and appropriately hydrate the body

Bol Su İçin

- *Zeolit kullanırken su ihtiyacı artar.*
- *Zeolit dehidrasyona neden olabilir,*
- *Ekstra su içmek ve vücudu uygun bir şekilde hidrate etmek önemlidir.*

Do we see a healing crisis when using Zeolite?

What is Jarisch-Herxheimer Reaction or Healing Crisis?

Jarisch-Herxheimer Reaction or Healing Crisis means individual's feeling sick during detox. When people are exposed to toxins – removed from their cells – they may have headache, body ache and symptoms similar to cold.

Is Jarisch-Herxheimer Reaction Possible When Using Zeolite?

Zeolite has a very strong cage structure that protects its bound with toxin. It means your body is never exposed to toxin. There is no danger that the bound between Zeolite and toxin will break. Zeolite does not let go of toxin after it catches it. For this reason, there is no healing crisis. Toxin, which is captured by zeolite, is removed from the body 6 or 8 hours after taking the supplement.

Zeolit Kullanırken İyileşme Krizi Görülür mü?

Jarisch-Herxheimer Tepkisi veya Şifa Krizi Nedir?

Jarisch-Herxheimer Reaksiyonu veya Şifa Krizi, olarak adlandırılan , kişinin detoks yaparken kendisini hasta hissetmesi durumudur. Detoks sırasında insanlar, hücrelerden çıkarılan toksinlere maruz kaldıklarında baş ağrısı, vücut ağrısı ve gribe benzer belirtiler hissederler.

Zeoliti kullanırken Jarisch-Herxheimer Reaksiyonu yaşanırmı?

Zeolit, toksin ile arasındaki bağı koruyan çok güçlü bir kafes yapısına sahiptir. Bu vücudunuzun hiçbir zaman toksine maruz kalmadığı anlamına gelir ve Zeolit ile toksin arasındaki bağın kırılma tehlikesi yoktur. Zeolit toksini yakaladıktan sonra bırakmaz ve bu nedenle iyileşme krizi görülmez. Zeolit tarafından yakalanan herhangi bir toksin, takviyeyi aldıktan sonra 6 ila 8 saat içerisinde vücuda uzaklaştırılır.

www.zeo11.com
zeo@zeo11.com