ZeolithMED®
VULKANMINERALIEN

Product description
Natural clinoptilolite zeolite powder

MATERIAL DESIGNATIONS

Type of mineral	Clinoptilolite
Chemical type	Molecular sieve
Chemical formula	$(Na, K)_4\ Ca\ Al_6\ Si_{30}\ O_{72}$ x 24 H_2O
Structural formula	$M_{x/n}\ [(AlO_2)\ x\ (SiO_2)\ y\ ]\ z\ H_2O$

CHEMICAL COMPOSITION

SiO_2	76,18 %
Al_2O_3	13,94 %
K_2O	3,12 %
CaO	3,00 %
Fe_2O_3	1,47 %
MgO	0,96 %
Na_2O	0,94 %
TiO_2	0,20 %
SrO	0,03 %
P_2O_5	0,03 %
MnO	0,01 %
RbO_2	0,01 %
ZrO_2	0,01 %
MoO_3	0,01 %
Cl	0,01 %

SM mg/kg	Cd	0,036 ppm	EN ISO 5961
(TS)	Pb	< 15 ppm	Pharm Eur. 1388
	As	< 3 ppm	Pharm Eur. 1388
Heavy metal as lead		< 50 ppm	Pharm Eur. 0467

IMPORTANT PROPERTIES

Colour	light grey
Form	powder
Specific weight	2,4 g/cm³
Bulk density	0,9 – 1,1 g/cm³
Specific surface area	50 – 65 m²/g
Porosity	44 %
Water content	< 7 %
Water absorption capacity	34–36 %
Thermal resistance	up to 450°C
Solubility	insoluble in water
Acid and alkaline resistance	
PH level	6,8 – 7,2
Microbiological contamination	TAMC: < 100 KBE/g TYMC: 15 KBE/g
Binding capacity to histamine	83,5 %

CATION EXCHANGE CAPACITY CEC

Total cation exchange capacity	150 meq/100g
Ca^{2+}	0,64 – 0,98 mol/kg
Mg^{2+}	0,06 – 0,19 mol/kg
K^+	0,22 – 0,45 mol/kg
Na^+	0,01 – 0,19 mol/kg

INGREDIENTS

Clinoptilolite	87 ± 3 %
Montmorillonite, feldspar, quartz, carbonate	10 – 13 %

SELECTIVITY SEQUENCE

Cs>Rb>K>NH_4>Pb>Ag>Ba>Na>Sr>Ca>Li>Cd>Cu>Zn
(by Veretenina et. Al. 2003)

H_2O=Fe=Pb>Co>Cu>Ag>Cd>Zn>NH_4
(by Goronkhov et. al. 1982)

PHYSICO-MECHANICAL PROPERTIES

Specific activities of natural radionuclides	Iod-131	< 3 Bq/kg
	Cäsium-134	< 3 Bq/kg
	Cäsium-137	< 3 Bq/kg
Mechanical compressive strength	< 20 MPa	
Abrasion	no more than 4 %	
Hardness on Mohs scale	4	

PARTICLE SIZE DISTRIBUTION

d10 (10%)	4,88 µm
Granulation	27,08 µm
d90 (90%)	93,04 µm

Our clinoptilolite-zeolite powder is a 100% pure natural mineral without any additives and is mined in the Carpathian Mountains, east of the well-known reposity in Košice (Slovakia). It is micronized and activated, whereby the natural crystal lattice structure of the minerals remains unchanged. It does not contain nanoparticles. Our zeolite powderis tested in German accredited laboratories for its identity, purity and pharmaceutical quality. It complies with the quality critieria of the European and British Pharmacopoeia. It is not toxic, explosive, or flammable.

In the EU, zeolite is solely an additive in animal feed for all animal species (1g568) in the additive category “technological additives“ as a “binding agent“ as well as a “release agent“ and not approved for human intake. In the USA, zeolite is registered under the code (CFR 21) 182.2727 and aluminium silicate under (CFR 21) 182.2227 by the FDA (Food and Drug Administation) as safe for humans.

This information has been collected through laboratory analyses and statements from the manufacturers/suppliers available to us. It corresponds to our current knowledge and experience and represents average values. Since we have no influence on the processing and use of our products, the user must determine their suitability independently. Existing rights, regulations and laws must be observed.

As of 04/2018

BentonitMED®
VULKANMINERALIEN

Product description
Natural montmorillonite bentonite

PRIMARY MINERAL

Montmorillonite	> 95 %

CHEMICAL COMPOSITION

SiO_2	64,48 %
CaO	2,48 %
P_2O_5	0,14 %
SO_3	0,12 %
Al_2O_3	18,02 %
Na_2O	3,27 %
MnO	0,02 %
MgO	6,69 %
TiO_2	0,31 %
SrO	0,07 %
Cl	0,06 %
Fe_2O_3	3,86 %
K_2O	0,43 %
ZrO	0,03 %
Nb_2O_3	0,01 %

SPECIFIC ACTIVITIES OF NATURAL RADIONUCLIDES

Iod-131	< 3 Bq/kg
Cäsium-134	< 3 Bq/kg
Cäsium-137	< 3 Bq/kg

SOLUBILITY

Bentonite is virtually insoluble in water and aqueous suspensions. In the presence of a small amount of water, the bentonite swells up and forms a pliable mass.

TYPICAL PROPERTIES

Colour	white-grey
Form	very fine, homogenous powder
Water content	8 – 10 %
Melting point/ melting range	> 450 °C, EU A.1
Loss on ignition	approx. 5 %
Density	2,6 g/ cm^3
Swollen volume	approx. 33 ml
pH value (KCL)	10
Larger particles	wet sieving with a 75µm sieve < 0,1 g = 0,5 %
Granulation	16,10 µm
Heavy metals	< 50 ppm
Loss on drying	5,4 %
Sedimentation volume	protrusion < 2 ml
Potential Cation Exchange Capacity CEC	33 mmol*z/100g
Microbiological contamination	TAMC: 8 x 10^2 KBE/g TYMC: 5 KBE/g
Binding capacity to histamine	84 %

Our bentonite is a natural clay of pharmaceutical quality, and is mined in Europe. It is an ultra-fine ground, sand-free calcium-sodium bentonite with a large proportion of montmorillonite.

Our bentonite complies with the guidelines of the European Pharmacopeia and the British Pharmacopoeia, monograph “Bentonite”.

This information is taken from the data and laboratory analyses made available to us by the manufacturer/ supplier. It complies with our current knowledge and experience and represents average values. As we have no influence on the processing and usage of our products, the user must take personal responsibility for the suitability of the product. Existing rights, regulations and laws must be observed.

As of 04/2018