

## 1. GENERAL INFORMATION

<b>Chemical name</b>	: Hydrated sodium-potassium-calcium-alumino-silicate	<b>CAS No</b>	: 12173-10-3
<b>Chemical family</b>	: Natural zeolite		
<b>Chemical abstract name</b>	: Clinoptilolite		
<b>Chemical formula</b>	: $(\text{Na}_{0.5}\text{K}_{2.5})(\text{Ca}_{1.0}\text{Mg}_{0.5})(\text{Al}_6\text{Si}_{30})\text{O}_{72}\cdot 24\text{H}_2\text{O}$		

## 2. MINERAL CONTENT

<b>Clinoptilolite</b>	85.0	<b>Rutile</b>	0.1 – 0.35
<b>Clay</b>	5.0	<b>Plagioclase</b>	3.0-4.0
<b>Cristobalite</b>	9.0		

\* Studies on identification and the origin, petrographic and mineralogical analysis of the rock samples with X-Ray Diffractometer.

## 3. CHEMICAL COMPOSITION

<b>SiO<sub>2</sub></b>	68.6	<b>BaO</b>	<0.01	<b>SiO<sub>2</sub> / Al<sub>2</sub>O<sub>3</sub></b>	5.0 - 6.3	<b>Mg</b>	0.1 - 0.6
<b>Al<sub>2</sub>O<sub>3</sub></b>	12.4	<b>SrO</b>	0.03	<b>Na + K / Ca + Mg</b>	1.4 - 2.2	<b>Ca</b>	0.9 - 1.3
<b>Fe<sub>2</sub>O<sub>3</sub></b>	1.21	<b>P<sub>2</sub>O<sub>5</sub></b>	0.01	<b>Si</b>	29.4 - 30.1	<b>Na</b>	0.2 - 0.5
<b>MnO</b>	0.01	<b>CaO</b>	2.57	<b>Al</b>	5.6 - 6.1		
<b>TiO<sub>2</sub></b>	0.08	<b>Na<sub>2</sub>O</b>	1.08	<b>Fe</b>	0.05 - 0.25		
<b>MgO</b>	0.81	<b>K<sub>2</sub>O</b>	2.83	<b>K</b>	1.9 - 2.7		

- Analyzed with XRF spectrophotometry. The values are given for reference purposes.

## 4. PHYSICAL CHARACTERISTICS

<b>Appearance</b>	Granular or powder form	<b>Color</b>	Light Green
<b>Standard Particle Sizes</b>	Micronized for animal feed additives, industrial applications	<b>Moisture content</b>	< 1.5%
	0-1 mm for animal feed additives		
	1-3 mm for soil conditioner, filter media, animal litter	<b>pH</b>	6.5 – 7.5
	Other sizes could be produced upon request for any other application (animal litter, filter media, etc.)	<b>Solubility in water</b>	Insoluble
<b>Mineral content</b>	Clinoptilolite group 70-85 % / Reactive components 85 – 95 %	<b>Water retention capacity</b>	35 – 75%
<b>Bulk density</b>	0.6 – 1.0 g/cm <sup>3</sup>	<b>Porosity</b>	35% (average)
<b>Specific gravity</b>	2.0 – 2.6 g/cm <sup>3</sup>	<b>Melting point</b>	1.150 °C
<b>Thermal stability</b>	Stable up to 840 °C	<b>Surface area (BET)</b>	40 - 44 m <sup>2</sup> /g

## 5. CATION EXCHANGE CAPACITY

1.6-2.0 meq/g NH<sub>4</sub><sup>+</sup> - Ammonium (Kjeldah distillation method)

### Main Exchangeable Cations

NH<sub>4</sub>, Cs, Pb, As, K, Na, Ca, Ag, Cd, Zn, Ba, Sr, Cu, Hg, Mg, Fe, Co, Al, Cr

(Selectivity of above cations is a function of hydrated molecular size and relative concentrations)

### Selectivity

Cs>Pb>NH<sub>4</sub><sup>+</sup>>Cu>Zn>Sr>Cd>Ni>Co

### Primary Absorbing Gases

CO, CO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, HCHO, Ar, O<sub>2</sub>, N<sub>2</sub>, H<sub>2</sub>O, He, H<sub>2</sub>, Kr, Xe, CH<sub>2</sub>OH

The above information is intended as general information. Due to the nature of the product the values may vary. It is the customer's responsibility to decide on the suitability and effectiveness of the product before use. WaterEquip has the right to change the above mentioned features.

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