

Zeolit

Datablad Zeolit-Klinoptilolit



Zeo-Concept ECE AB

Material name	Natural zeolite		
Chemical name	Hydrated aluminosilicate of alkaline metals and alkaline earth metals		
Mineral form	Clinoptilolite		
Empirical formula	$\text{Ca}_{1,8} \text{K}_{1,8} \text{Na}_{0,2} \text{Mg}_{0,2} \text{Al}_6 \text{Si}_{30} \text{O}_{72} \cdot 24\text{H}_2\text{O} [1]$ $(\text{Na}_{0,21} \text{K}_{1,74}) (\text{Ca}_{1,71} \text{Mg}_{0,31}) (\text{H}_2\text{O})_{18,28} [\text{Al}_{6,11} \text{Si}_{29,90} \text{O}_{72}] [2]$ $(\text{Na}_{0,08} \text{K}_{0,35}) (\text{Ca}_{0,44} \text{Mg}_{0,08}) [\text{Al}_{1,47} \text{Si}_{7,53} \text{O}_{18}] \cdot 4,34 \text{H}_2\text{O} [3]$		
General formula	$(\text{Ca}, \text{K}_2, \text{Na}_2, \text{Mg})_4 \text{Al}_8 \text{Si}_{40} \text{O}_{96} \cdot 24\text{H}_2\text{O}$		
CHEMICAL COMPOSITION			
SiO ₂	65.00 – 71.30 %	MgO	0.60 – 1.20 %
Al ₂ O ₃	11.50 – 13.10 %	Na ₂ O	0.20 – 1.30 %
CaO	2.70 – 5.20 %	TiO ₂	0.10 – 0.30 %
K ₂ O	2.20 – 3.40 %		
Fe ₂ O ₃	0.70 – 1.90 %	Si/Al	4.80 – 5.40
MINERAL COMPOSITION			
Clinoptilolite	84 %	Plagioclase	3 - 4 %
Cristobalite	8 %	Rutile	0,10 – 0,30 %
Clay mica	4 %	Quartz	Traces
ION EXCHANGEABILITY PROPERTIES			
Total exchange	Ca ²⁺ 0.64 – 0.98 mol.kg ⁻¹	Mg ²⁺ 0.06 – 0.19 mol.kg ⁻¹	
	K ⁺ 0.22 – 0.45 mol.kg ⁻¹	Na ⁺ 0,01 – 0,19 mol.kg ⁻¹	
Cation exchange capacity (CEC)	1.20 – 1.50 mol.kg ⁻¹		
H ₂ O vapours sorbed by dehydrated rock at a relative moisture of 52 %	7,50 – 8,50 g H ₂ O.100g ⁻¹		
at a relative moisture of 98 %	13,50 – 14,50 g H ₂ O.100g ⁻¹		
SELECTIVITY			
$\text{Cs}^+ > \text{Pb}^{2+} > \text{NH}_4^+ > \text{Cu}^{2+} > \text{Zn}^{2+}, \text{Sr}^{2+}, \text{Cd}^{2+} > \text{Ni}^{2+} > \text{Co}^{2+} [4]$ $\text{NH}_4^+ > \text{K}^+ > \text{Mg}^{2+} > \text{Ca}^{2+} [4]$ $\text{Cs}^+ > \text{NH}_4^+ > \text{Pb}^{2+} > \text{K}^+ > \text{Na}^+ > \text{Ca}^{2+} > \text{Mg}^{2+} > \text{Ba}^{2+} > \text{Cu}^{2+} > \text{Zn}^{2+}$			
PHYSICAL AND MECHANICAL PROPERTIES			
Softing point	1260° C	Porosity	24 – 32 %
Melting point	1340° C	Effective Diameter of Pores	0,4 nm (4 Å)
Flow temperature	1420° C	Compactness	70 %
Compressive strength	33 MPa	Whiteness	70 %
Specific gravity	2200-2440 kg.m ⁻³	Mohs hardness	1.5 – 2.5
Volume density	1600-1800 kg.m ⁻³	Gridability as per VTI	kVTI = 1.628
Appearance and odour	Grey-green with no odour	Physical state (20° C)	solid
DATA ON REACTIVITY			
Acid stability	79.50 %	No dangerous decomposition	
Thermal stability	up to 400° C	No dangerous polymerisation	
Specific surface (BET)	30 – 60 m ² /g		
Solubility in water	none		