AGRITEC, INC

Bear River Zeolite (BRZ)

ALL NATURAL ZEOLITE…the answer for:

- Environmental Cleanup
- Water Filtration
- Sewage Treatment
- Pellet Binders
- Building Materials
- Soil Amendments
- Odor Control
- Gas Separation
- Desiccants
- Flow Agents
- Fertilizer
- Animal Nutrition
- AG Chemical Carrier
- Catalysts
- Aquaculture

Zeolite refers to a group of minerals that are basically hydrated calcium potassium sodium aluminosilicates in which the water is held in cavities in the lattice. The lattices are negatively charged and they loosely hold cautions such as calcium, sodium, ammonium, and potassium and also water. Their ability to exchange one cation for another is known as their “cation-exchange capacity” or “CEC”.

Cation-exchange capacity is a measure of the number of cations per unit weight available for exchange, usually expressed as milliequivalents per 100 grams of material. The zeolites are also referred to as “molecular sieves,” because the channel ways within the crystalline structure are extremely small, they can be used to separate large molecules in a mixture from smaller molecules.

USES OF BRZ

Environmental Cleanup

The cation exchange capability of BRZ makes it an excellent candidate for the cleanup of oil, diesel, and gasoline spills; PCBs; soluble heavy metals such as mercury, chromium; lead, zinc, arsenic, molybdenum, nickel, cobalt, antimony, silver, and uranium from water; feed lots; leaching of nitrogen fertilizers into the groundwater; organically polluted water; acid mine drainage; smelter slags; metal contaminated blast sand; metal plating sludge; contaminated soils; solidification and stabilization of hazardous waste; oil refinery and oil field sludge; leach residues; batteries; (PCBs), possibly MTBE and various other organic toxins, and SR, Cs, and various other radioactive isotopes from waste.

Soil Amendment

The ability of BRZ to hold ammonium and its high potash content, low sodium content, and ability to hold water make BRZ an excellent soil amendment for golf courses, sports fields, parks, common areas, lawns, gardens, and all sandy soils.

Fertilizer

The ability of BRZ to load with 1.8 to 2.1% nitrogen in the form of ammonium makes it excellent for fertilizer applications. The nitrogen is not water-soluble. The zeolite holds the nitrogen in the root zone of the plant. In typical nitrogen fertilizer applications, as much as 35% of the nitrogen leaches out below the growth zone and reports to the aquifer to create nitrite and nitrate contamination. Consequently, the zeolite reduces the amount of nitrogen needed. BRZ contains approximately 3.47%potassium, which is an important nutrient in fertilizers. The zeolite holds at least 65% of its weight in water that protects the plant against drought. Zeollites have been successfully used for golf courses, sports fields, parks and common areas, and high value crops.

Odor Control

One of the major causes of odor around animals is the generation of ammonium from urea and excrement. Essential advantages of using zeolite for odor control of cattle, hog, and poultry feed lots are as follows: it captures ammonium and prevents the formation of ammonia that causes the noxious odor, it removes moisture, it prevents the leaching of the nitrogen to the groundwater, and the ammoniated zeolite then becomes a secondary merchantable product as a fertilizer. Typical applications are for composting cattle, horse, and hog manure; poultry; cats (“kitty litter”); personal items; room air cleaners, carpet cleaning for pets, diapers, horse stalls, veterinary clinics, and bathrooms.

Animal Nutrition

Generally, the feeding of zeolite to animals has resulted in faster growth rates and weight gains, improved feed efficiency, less diarrhea and other health problems, potential lesser use of antibiotics, and drier and less odoriferous excrement. It is a myco-toxin, ochra-toxin, fumonisin-toxin, and zearalenone.

Catalysts and Petroleum Refining

Although most of the zeolites used in the petroleum industry are synthetic, more natural zeolites are being used. Typical applications include: removing water and carbon dioxide from gaseous hydrocarbons, removing hydrochloric acid from gas streams, assisting in hydrogen or chlorine drying, assisting in chlorinated and fluorinated hydrocarbon purification, catalysis and natural gas separation.

Gas Separation

Zeolites have been used for the separation of gases such as nitrogen, carbon dioxide, sulfur dioxide, and hydrogen sulfide. Typical applications would include: enriched oxygen supplies for steel mills, smelters; re-oxygenation of downstream water from sewage plants, smelters, pulp and paper plants, fish ponds and tanks; removal of carbon dioxide, sulfur dioxide, and hydrogen sulfide from sour natural gas; removal of carbon dioxide, sulfur dioxide, and hydrogen sulfide from methane generators such as organic waste, sanitary landfills, municipal sewage systems, animal waste treatment facilities; the removal of sulfur dioxide from stack gases such as coal generating plants (to limit sulfur dioxide emissions to 100 ppm for EPA standards); coal gasification from underground sources for the removal of nitrogen and sulfur dioxide.

Building Applications

Typical building applications include: dimension stone, lightweight aggregate, and pozzolan.

Carriers

Clinoptilolite can be used as a carrier for insecticides, pesticides, and herbicides due to its large porosity. In animal feeds it is used as a carrier for antibiotics, enzymes, and other medicines.

Water Filtration

Zeolites are used as a filter media for particulate removal.

Additionally, they are used to remove nitrogen, certain organic hydrocarbons (chloramines), and toxic cations such as silver, mercury, nickel, chrome, cobalt, antimony, arsenic, etc. Typical applications would include: swimming pools, municipal water systems, and waste water treatment plants.

Aquaculture

Zeolites are used for the removal of ammonium from water fisheries, trucks to transport fish, and aquariums.

Desiccants

Clinoptilolite has been used as a desiccant for drying natural gas, carbon dioxide, Freon gas, and organic chemical streams such as transformer oil and xylene.

Pellet Binders

BRZ reduces the moisture in many animal feeds and helps produces a more resilient animal feed pellet.

Flow Agent

BRZ helps the flow of animal feed and other products from bins and is an anti-caking agent.

Advantages of BRZ:

- BRZ is almost pure clinoptiloite with a general formula of (Na, Ca)2-3AI3(AI, Si)2Si12O 12H2O and the balance is primarily opaline or non-crystalline silica.
- It contains approximately 3.5% potassium which is a plant nutrient.
- It contains approximately 1.6% calcium which is a pH buffer for soils.
- it contains less than 0.5% sodium, which is toxic to plants.
- When loaded with ammonium cations, it becomes highly favorable as a fertilizer.
- No significant concentrations of toxic trace elements exist.
- When dry, BRZ is light green. When wet the color is darker green.
- It holds up to 65% of its weight in water.
- It has a high cation exchange capacity (CEC) typically 160 to 180 meq/100 grams.
- The high CEC allows the BRZ to be loaded with 1.8 to 2.1% nitrogen ammonium.
- A low clay content makes BRZ non-clouding in water and low dust.
- It has a very large surface area that is approximately 24.9 square meters per gram.
- It is hard and resistant to attrition.
- BRZ has good oil absorption qualities.