

COSEVA ADVANCED TRS IN A COLLOIDAL SUSPENSION

WHAT IS ZEOLITE

ZEOLITES ARE CRYSTALLINE, HYDRATED ALUMINOSILICATES OF ALKALI AND ALKALINE EARTH METALS, HAVING INFINITE, THREE-DIMENSIONAL ATOMIC STRUCTURES. THEY ARE FURTHER CHARACTERIZED BY THE ABILITY TO LOSE AND GAIN WATER REVERSIBLY AND TO EXCHANGE CERTAIN CONSTITUENT ATOMS, ALSO WITHOUT MAJOR CHANGE OF ATOMIC STRUCTURE. ZEOLITES ARE THREE-DIMENSIONAL FRAMEWORKS OF SILICATE (SiO_4) TETRAHEDRA IN WHICH ALL FOUR-CORNER OXYGENS OF EACH TETRAHEDRON ARE SHARED WITH ADJACENT TETRAHEDRA. IN ZEOLITE STRUCTURES, SOME OF THE QUADRI-CHARGED SILICON IS REPLACED BY TRIPLY-CHARGED ALUMINUM, GIVING RISE TO A DEFICIENCY OF POSITIVE CHARGE IONS. THE CHARGE IS BALANCED BY THE PRESENCE OF SINGLY-AND DOUBLY-CHARGED ATOMS, SUCH AS SODIUM (Na^+), POTASSIUM (K^+), CALCIUM (Ca^{2+}), AND MAGNESIUM (Mg^{2+}), ELSEWHERE IN THE STRUCTURE. THE EMPIRICAL FORMULA OF A ZEOLITE IS OF THE TYPE: $\text{M}_2/\text{NO} \cdot \text{Al}_2\text{O}_3 \cdot \text{xSiO}_2 \cdot \text{yH}_2\text{O}$, WHERE M IS ANY ALKALI OR ALKALINE EARTH ATOM, N IS THE CHARGE ON THAT ATOM, X IS A NUMBER FROM 2 TO 10, AND Y IS A NUMBER FROM 2 TO 7. THE CHEMICAL FORMULA FOR COSEVA ADVANCED TRS, A COMMERCIAL ZEOLITE, IS $\text{AlMgNaO}_9\text{Si}_3$.

MECHANISM OF ACTION

FOR COSEVA ADVANCED TRS, CATIONS (CHARGED METAL ATOMS) ARE KNOWN AS STRUCTURAL ATOMS, BECAUSE WITH OXYGEN THEY MAKE UP THE RIGID FRAMEWORK OF THE STRUCTURE. THEREFORE, THE FORM OF ALUMINUM IN ZEOLITES IS COMPLETELY INERT AND DOES NOT REACT OR RELEASE IN THE BODY IN ANY WAY. SODIUM AND MAGNESIUM ARE KNOWN AS EXCHANGEABLE IONS, BECAUSE THEY CAN BE REPLACED (EXCHANGED) EASILY WITH OTHER CATIONS IN AQUEOUS SOLUTION, WITHOUT AFFECTING THE ALUMINOSILICATE FRAMEWORK. THIS PHENOMENON IS KNOWN AS ION EXCHANGE, OR MORE COMMONLY CATION EXCHANGE. THE EXCHANGE PROCESS INVOLVES REPLACING ONE SINGLY-CHARGED EXCHANGEABLE ATOM IN THE ZEOLITE BY ONE SINGLY-CHARGED ATOM IN A SOLUTION OR REPLACING TWO SINGLY-CHARGED EXCHANGEABLE ATOMS IN THE ZEOLITE BY ONE DOUBLY-CHARGED ATOM IN A SOLUTION. THE MAGNITUDE OF SUCH CATION EXCHANGE IN A GIVEN ZEOLITE IS KNOWN AS ITS CATION-EXCHANGE CAPACITY (CEC) AND IS COMMONLY MEASURED IN TERMS OF MOLES OF EXCHANGEABLE CATION PER GRAM (OR 100 GRAMS) OF ZEOLITE OR IN TERMS OF EQUIVALENTS OF EXCHANGEABLE CATIONS PER GRAM (OR 100 GRAMS) OF ZEOLITE. WHILE THE RATIO OF EXCHANGE FOR

IONS IS FIXED, THE EFFECTIVENESS OF CATION EXCHANGE IS DIRECTLY RELATED TO THE PARTICLE SIZE OF THE ZEOLITE. THE SMALLER THE ZEOLITE PARTICLE IS, THE GREATER THE AVAILABLE NEGATIVELY-CHARGED SURFACE AREA. A LARGE SURFACE AREA PROVIDES A GREATER ABILITY TO ATTRACT POSITIVELY-CHARGED IONS FOR CATION EXCHANGE.

THE ABILITY OF COSEVA ADVANCED TRS TO ATTRACT AND TRAP POSITIVELY-CHARGED TOXINS

COSEVA ADVANCED TRS HAS A CAGE-LIKE STRUCTURE, WITH PORES AND CHANNELS RUNNING THROUGH THE CRYSTAL. THE CAGE AND SURROUNDING MINERAL CARRY A NET NEGATIVE CHARGE, MAKING IT ONE OF THE FEW NEGATIVELY CHARGED MINERALS. BECAUSE OF ITS CAGE-LIKE STRUCTURE AND NEGATIVE CHARGE, COSEVA ADVANCED TRS CAN DRAW AND TRAP WITHIN AND ON ITSELF POSITIVELY CHARGED HEAVY METALS AND OTHER POSITIVELY CHARGED TOXIC SUBSTANCES. THE NEGATIVE CHARGES OF THE AlO_9 UNITS ARE BALANCED BY THE PRESENCE OF FOUR-EXCHANGEABLE, POSITIVELY CHARGED METALS KNOWN AS CATIONS. THESE CATIONS USUALLY CONSIST OF CALCIUM, MAGNESIUM, SODIUM AND POTASSIUM. THESE IONS ARE ONLY LOOSELY HELD AND CAN BE READILY DISPLACED BY OTHER SUBSTANCES, SUCH AS TOXIC HEAVY METALS OR OTHER ORGANICS. THIS PHENOMENON IS KNOWN AS CATIONIC EXCHANGE, AND IT IS THE VERY HIGH CATIONIC EXCHANGE CAPACITY OF ZEOLITES, WHICH PROVIDES FOR MANY OF THEIR USEFUL PROPERTIES. COSEVA ADVANCED TRS HAS BEEN SHOWN TO BE EFFECTIVE FOR THE REMOVAL OF HEAVY METALS. RESEARCH HAS SHOWN THAT THE SMALLER THE DIAMETER OF THE METAL AND THE HIGHER THE CHARGE OF THE METAL, THE GREATER THE AFFINITY IT HAS FOR THE ZEOLITE. HIGHER CHARGES SIMPLY INCREASE THE STRENGTH OF BINDING WITH HIGHER BINDING CHARACTERISTICS. THE SMALL SIZE ALLOWS FOR DEEPER ACCESS INTO THE ZEOLITE PORES WITH MORE POINTS OF COORDINATION. AS AN EXAMPLE OF THIS PHENOMENON, ARSENIC HAS A CHARGE OF +3 AND AN ATOMIC RADIUS OF APPROXIMATELY 1.8 ANGSTROMS, WHILE POTASSIUM HAS A CHARGE OF ONLY +1 AND AN ATOMIC RADIUS OF APPROXIMATELY 2.8 ANGSTROMS. THE ARSENIC BINDS WITH VERY HIGH AFFINITY FOR THE ZEOLITE WHILE THE POTASSIUM HAS NO AFFINITY WHATSOEVER. THE COSEVA ADVANCED TRS BINDS A VARIETY OF TOXINS. THIS INCLUDES HEAVY METALS (LEAD, CADMIUM, MERCURY, ETC.), NITROSAMINES, AND OTHERS. CATIONIC EXCHANGE IS AN ENTIRELY PASSIVE PROCESS—WHEN THE ZEOLITE IS IN CLOSE PROXIMITY TO THESE HIGH- AFFINITY COMPOUNDS, THEY WILL BE DRAWN TO THE ZEOLITE AND EITHER ABSORBED INTO THE CAGE OR ADSORBED ONTO THE SURFACE OF THE ZEOLITE. THERE IS NO CHEMICAL ACTIVITY IN THIS PROCESS. THE ZEOLITE WILL NOT BE DRAWN TO COMPOUNDS TO ‘RIP’ METALS AWAY FROM THEM. POSITIVELY CHARGED ORGANICS (NON-VOLATILE AND VOLATILE) ARE ALSO REMOVED BY COSEVA ADVANCED TRS. ORGANICS ARE NOT TRAPPED OR EXCHANGED IN OR ONTO THE SURFACE AS IN HEAVY METALS, BUT RATHER ARE ABSORBED INTO AND ONTO THE COSEVA ADVANCED TRS

USING A COMBINATION OF IONIC ATTRACTION RATHER THAN EXCHANGE. THIS ATTRACTION IS BASED ON THE OVERALL CHARGE OF THE ORGANIC COMPOUND WITH PREFERENCE GIVEN TO POSITIVE CHARGE POINTS ON THE MOLECULE ITSELF. THUS, A LARGE MOLECULE SUCH AS AMMONIUM CITRATE WILL STILL BE REMOVED EVEN THOUGH ITS SIZE IS MUCH LARGER THAN THE PARTICLE OF ZEOLITE. THERE ARE MANY STUDIES ONGOING TODAY TO TAKE ADVANTAGE OF THIS EFFECT. WHILE COSEVA ADVANCED TRS IS MOSTLY KNOWN FOR HEAVY METAL REMOVAL, THE ABILITY TO, POSITIVELY AFFECT THE REMOVAL OF POTENTIALLY TOXIC ORGANIC COMPOUNDS AT THE SAME TIME CANNOT BE IGNORED.

WHY A COLLOIDAL FORM OF ZEOLITE

ADVANCED TRS IS A LIQUID SUSPENSION OF ZEOLITE COSEVA ADVANCED TRS IN PURE WATER. A COLLOIDAL SUSPENSION ALLOWS FOR PARTICLES SIZED SO SMALL THEY CAN REMAIN SUSPENDED INSIDE WATER MOLECULES, PROVIDING A DELIVERY MECHANISM FOR COSEVA ADVANCED TRS ZEOLITE THROUGHOUT THE BODY WITH INCREASED SURFACE AREA.

WHAT IS A COLLOID

A SYSTEM IN WHICH FINELY DIVIDED PARTICLES, WHICH ARE APPROXIMATELY 10 TO 10,000 ANGSTROMS IN SIZE, ARE DISPERSED WITHIN A CONTINUOUS MEDIUM IN A MANNER THAT PREVENTS THEM FROM BEING FILTERED EASILY OR SETTLED RAPIDLY. COSEVA 'S ADVANCED TRS IS SIZED IN THE NANOMETER RANGE WHICH FORMS A VERY STABLE SUSPENSION AND IS A TRUE COLLOIDAL SOLUTION. IN EFFECT, THE ZEOLITE PARTICLES ARE SMALL ENOUGH TO FIT INSIDE THE WATER MOLECULES, CREATING A SUSPENSION THAT IS COLORLESS, ODORLESS AND TASTELESS. THIS OFFERS TWO DISTINCT ADVANTAGES: SMALLER SIZE AND INCREASED SURFACE AREA. WITH THE SMALLER PARTICLE SIZE, IT IS A LOGICAL ASSUMPTION THAT THE SMALLER THE PARTICLE THE MORE EFFICIENT IT IS IN GETTING IN THE MORE INACCESSIBLE PARTS OF THE CELLULAR STRUCTURE. A COLLOIDAL SUSPENSION WILL HAVE A GREATER IMPACT FOR DETOXIFICATION BY BEING ABLE TO GO WHERE THE FINEST CAPILLARIES FLOW AT A TRUE CELLULAR LEVEL.

SAFETY OF COLLOIDAL MINERALS

THE SAFETY OF COLLOIDAL MINERALS IS WELL STUDIED. NATURE SUPPLIES COLLOIDAL MINERALS TO US IN OUR WATER SUPPLY AND FOODS EVERY DAY. THE SAFETY OF COLLOIDAL ZEOLITE IN THE SIZE RANGE COSEVA IS PRODUCING HAS BEEN AS WELL STUDIED IN VITRO AND IN VIVO. THE COLLOIDAL ZEOLITE HAS BEEN SHOWN TO BE BIOLOGICALLY INERT EVEN AT THE SMALL SIZE IT TAKES TO FORM A COLLOIDAL SOLUTION. THE MAIN CHARACTERISTICS OF ZEOLITE ARE STILL IN PLACE.

THE ZEOLITE IN COSEVA ADVANCED TRS HAS BEEN RECOGNIZED AS SAFE, HAVING BEEN GRANTED GRAS STATUS BY THE FDA (GENERALLY RECOGNIZED AS SAFE). ADDITIONALLY, COSEVA ADVANCED TRS ZEOLITE HAS A DOCUMENTED AFFINITY (OR PREFERENCE) FOR POSITIVELY-CHARGED HEAVY METALS AND TOXINS AND WILL NOT REMOVE BENEFICIAL NUTRIENTS. THE PROPRIETARY PROCESSING FOR ADVANCED TRS REMOVES ANY EXISTING ENVIRONMENTAL POLLUTANTS FROM THE ZEOLITE CAGES AND FILLS THE CAGE-LIKE STRUCTURES WITH THE EXCHANGEABLE IONS CALCIUM, MAGNESIUM, POTASSIUM AND SODIUM, WHICH IN EFFECT, ADVANCED TRS WILL ALWAYS SWAP OUT ONE OF ITS BENEFICIAL IONS IN EXCHANGE FOR POSITIVELY-CHARGED HEAVY METALS AND TOXINS. THE COSEVA ADVANCED TRS ZEOLITE IS TOTALLY PRODUCED WITHIN THE UNITED STATES OF AMERICA. COSEVA ADVANCED TRS ZEOLITE IS NOT STORED IN THE BODY AND IS EXCRETED VIA THE KIDNEYS WITHIN 4-6 HOURS OF INGESTION. GIVEN THE NATURAL HYDROPHILIC NATURE OF ZEOLITES AND THE INCREASED SURFACE AREA OF ADVANCED TRS, INCREASING WATER INTAKE IS SUGGESTED TO FACILITATE THE BODY'S ABILITY TO REMOVE TOXINS. THE MANUFACTURING AND BOTTLING FACILITIES FOR ADVANCED TRS ALL FOLLOW GMP (GOOD MANUFACTURING PRACTICES) IN THE HANDLING OF BOTH THE RAW MATERIALS AND THE FINISHED PRODUCT.

THE EFFECTIVENESS OF COLLOIDAL ZEOLITE

IN ADDITION TO THE SAFETY OF COLLOIDAL ZEOLITE, ITS EFFECTIVENESS HAS ALSO BEEN WELL STUDIED. THIS DIRECTLY RELATES TO THE SMALL SIZE OF THE COLLOIDAL ZEOLITE PARTICLES. THE CATIONIC EXCHANGE EFFICIENCY (CEC) IS DIRECTLY RELATED TO THE NUMBER OF ALUMINUM INTERCHANGES AND CAGES EXPOSED. IN OTHER WORDS, THE SMALLER THE ZEOLITE PARTICLE IS, THE GREATER THE NUMBER OF CAGES AVAILABLE FOR HEAVY METAL AND TOXIN REMOVAL. WHILE IT IS LOGICAL TO ASSUME THE SMALLER PARTICLE IS MORE EFFECTIVE, THE RESEARCH SHOWS A MARKED INCREASE IN EFFICIENCY AND AMOUNT OF HEAVY METAL REMOVAL WITH THE REDUCTION IN PARTICLE SIZE. ADVANCED TRS UNDERGOES PROPRIETARY PROCESSING TO REDUCE THE ZEOLITE PARTICLE SIZE TO THE NANOMETER RANGE. THE SMALL PARTICLE SIZE CREATES A VAST SURFACE AREA IN EVERY SERVING, DELIVERING AN EFFECTIVE DETOXIFICATION WITH EVERY SPRAY.

SUMMARY

1. COSEVA ADVANCED TRS ZEOLITE IS SAFE AND EFFECTIVE, PROVEN IN NUMEROUS TRIALS INVOLVING BOTH PEOPLE AND ANIMALS, AND IS GRANTED GRAS (GENERALLY RECOGNIZED AS SAFE) STATUS WITH THE FDA (FOOD AND DRUG ADMINISTRATION).

2. THE ZEOLITE COSEVA ADVANCED TRS IS PROVEN SAFE THROUGH ITS YEARS OF SAFE USAGE AS A SUPPLEMENT FOR THE GENERAL POPULATION INCLUDING CHILDREN.
3. WITH ADVANCED TRS, COSEVA IS BRINGING TO THE MARKET THE VERY BEST THAT TECHNOLOGY AND NATURE CAN PRODUCE, WITH A ZEOLITE SIZED TO ACCESS THE BODY ON A CELLULAR LEVEL
4. SAFETY AND EFFECTIVENESS OF ADVANCED TRS IS INSTILLED THROUGH THE STRINGENT PROTOCOLS.
5. WITH AN AVERAGE SIZE OF <10 NANOMETERS AND AN ESTIMATED SURFACE AREA OF 5.2 MILLION SQUARE FEET PER OUNCE ADVANCED TRS HAS THE GREATEST SURFACE AREA FOR THE MOST EFFECTIVE METHOD OF ACTION OF ANY PRODUCT ON THE MARKET TODAY.

THESE STATEMENTS HAVE NOT BEEN EVALUATED BY THE FOOD AND DRUG ADMINISTRATION. OUR PRODUCTS ARE NOT INTENDED TO DIAGNOSE, TREAT, CURE OR PREVENT ANY DISEASE.