

Zeolites

The theme of this year's Denver Gem and Mineral Show will be "Colorado Zeolites" (esp. those from North Table Mountain in Jefferson County). There are two excellent articles and many photos of specimens in the July issue of Rocks & Minerals, and the following article will also be of interest:

Zeolites Have Many Uses

By James F. Hurlbut, RMFMS Mineral Technical Chair (from Rockhound Ramblings, June 2004)

Zeolites are members of the aluminosilicate family. Most mineral collectors have examples of them in their collections. They are found in most geologic type environments on most of the continents of the world. This vast variety of sources demonstrates that zeolites are much more than rare, prized collectable minerals. They are one of the more abundant mineralogical species on the earth. Zeolites have their beauty at the atomic level as well as in the crystalline forms. To date, more than 90 zeolite and zeotype structural frameworks have been fully characterized. These structures have many industrial uses.

The largest tonnage use each year of zeolites is because of their ability to act as highly selective cation exchangers. Foremost is the ability of the synthetic zeolite A to take up calcium, which accounts for over 500,000 tons per year being used in household detergents (liquid and powder) as a builder to soften wash water. Its use in this manner has significantly reduced the release of phosphates into the environment by replacing the more traditional sodium tripolyphosphates as washing agents. This has produced some clever manipulation of the crystal habit as zeolite A crystallizes as near perfect cubes, so synthesis design has produced powders of the same size but with chamfered edges. These are less likely to cling to fabric fibers. Do you know what crystal shape this is? A new product on the market contains synthetic Gismondine, which has a higher capacity per unit weight for calcium. The natural zeolites Clinoptilolite and Chabazite can be substituted in detergents but their natural off white color is less acceptable to our western world. Molecular sieving is one of the most well known used properties of zeolites. Another is the use of zeolites as catalysts in the petroleum industry. An adjunct to zeolite ion-exchange properties is in its addition to animal feeds to attain a balanced pH in the gut, improving weight gains and improved health.

In the future increased use of natural zeolites for environmental clean-up can be

expected. It has been proven to remove traces of pesticides and biological mutagens from drinking water. Clinoptilolite also has the desirable property of being able to selectively remove radioactive Cesium and Strontium from aqueous solutions. Planes dropped tons of Clinoptilolite on the Chernobyl reactor to prevent the spread of radioactive Cesium.

The theme mineral for the September 2004 Denver Gem and Mineral Show is Zeolite. In the current Fleisher's Glossary of Minerals there are listed 93 zeolite minerals. How many do you have in your collection? Have you ever displayed them? How about an educational case? Source: Rocky Mountain Federation News, May 2004