Gypsum

Alan Founie, the gypsum commodity specialist for the U.S. Geological Survey, has compiled the following information on gypsum, an abundant mineral that is one of the oldest building materials in the world.

The earliest known use of gypsum as a building material was in Anatolia (in what is now Turkey) around 6000 B.C. It has been found on the interiors of the great pyramids in Egypt, which were erected in about 3700 B.C. Now an average new American home contains more than 7 metric tons of gypsum in the form of more than 6,000 square feet of wallboard.

Gypsum makes an ideal building material because it is abundant, economical, fire-resistant, strong and helps to retard sound. As an integral component (3 to 5 percent by weight) of portland cement, gypsum is used in concrete for highways, bridges, buildings and many other structures that are part of our everyday life. Gypsum also is used extensively as a soil conditioner on large tracts of land in suburban areas and agricultural regions.

Gypsum is found on every continent in the world, with mines located all across North America, and some huge deposits of powdery gypsum rock occurring in the western United States (including White Sands National Monument in New Mexico).

Pure gypsum is a white-to-transparent mineral, but impurities can cause it to have a gray, brown or pink tint. Its chemical name is calcium sulfate dihydrate, but when gypsum is heated, it loses approximately three-quarters of its water and becomes hemihydrate gypsum, which is soft and can easily be ground to a powder. This powder is commonly called gypsum plaster or plaster of paris. If the powder is mixed with water to form a slurry or paste, it will dry and set rock hard. While the gypsum plaster is in slurry form, it can be poured between two paper and adhesive layers to make wallboard, poured into molds, or used to fill cracks and crevices. As the plaster-water mixture dries, water will chemically recombine with the hemihydrate gypsum and the material will revert back to the original composition.

A significant amount of synthetic gypsum is generated as a byproduct of flue-gas desulfurization (FGD) systems, which are required to reduce sulfur dioxide emissions from coal-fired electric power plants. Mixing limestone with the sulfur dioxide waste slurry of the power plant causes calcium to combine with sulfate to produce gypsum. These FGD systems not only keep the air clean, but also can provide a sustainable, ecologically sound source of very pure gypsum. Using FGD gypsum also reduces the amount of waste generated in power production that would require already limited landfill space. The use of byproduct synthetic gypsum from the desulfurization process is growing and currently makes up approximately 25 percent of domestic consumption.

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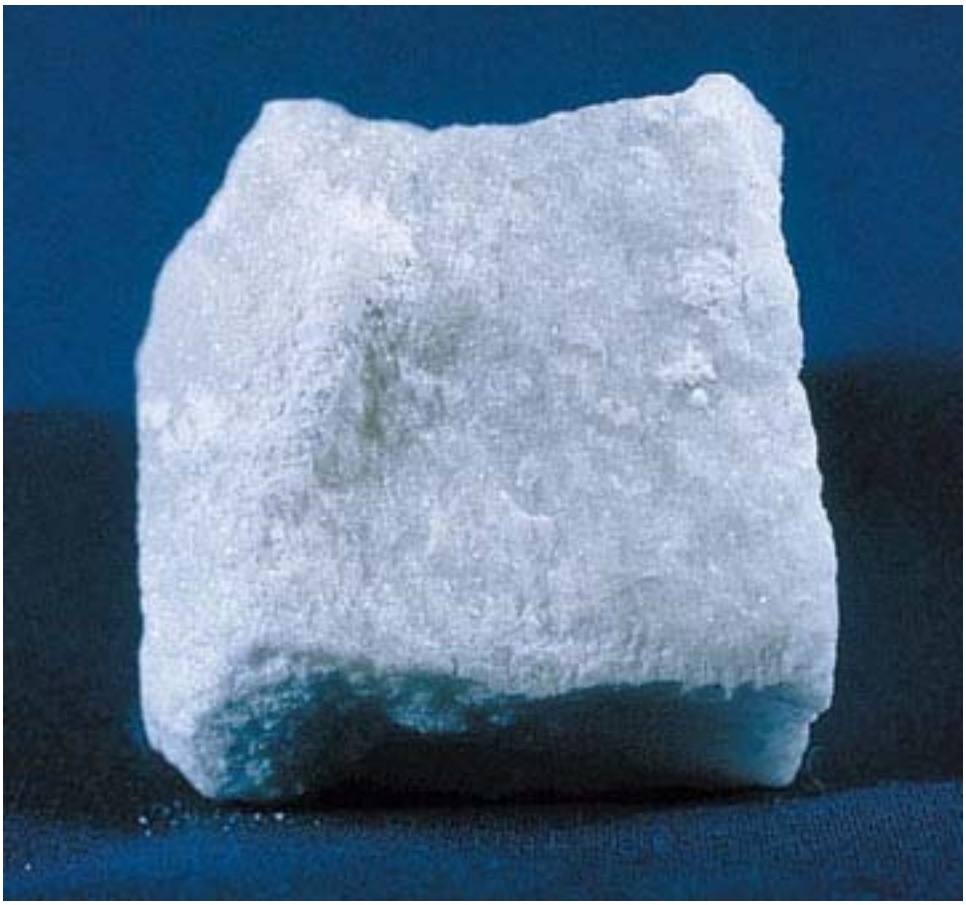

Sample of rock gypsum. Image from *Minerals in Your World*.