

MANY DEFINITION OF MINERALS

EARTH SCIENCE (GEOLOGY) DEFINITION

If you are confused about the use of the word **mineral**, or you're having a difficult time determining what a mineral is, you're not alone. The word has many definitions. The *Glossary of Geology* (Bates and Jackson, 1980, p. 401) defines a mineral as "**a naturally occurring inorganic element or compound having an orderly internal structure and characteristic chemical composition, crystal form, and physical properties.**" Minerals differ from rocks, which are naturally occurring solids composed of one or more minerals. Rocks do not have a distinctive chemical composition or crystal structure. The earth science definition, however, is not always used to define minerals.

LEGAL DEFINITION

The legal definition of mineral, according to *Black's Law Dictionary* (1968, p. 1146) is "**any valuable inert or lifeless substance formed or deposited in its present position through natural agencies alone, and which is found either in or upon the soil of the earth or in the rocks beneath the soil.**" This is a much broader definition of mineral than the earth science definition. When used this way, the word may include minerals as geologically defined, rocks as geologically defined, and sediment (gravel, sand, clay). In some contexts, it might even include water. Yet *Black's Law Dictionary* (1968, p. 1146) also notes that "**the word is not a definite term and is susceptible of limitations or extensions according to intention with which it is used.**" This means that even the legal definition is subject to different meanings for different uses.

U.S. GOVERNMENT DEFINITION

The federal government defines minerals in its section on national mining and minerals policy (U.S. Code: Title 30, Section 21a) as including "**all minerals and mineral fuels including some non-solid substances such as petroleum and natural gas.**" This definition is problematic, because it uses the word "minerals" in the definition. It also includes petroleum and natural gas, which are not considered minerals according to the earth science definition. As in the legal definition, water could be considered a mineral in some areas, depending on the statute and legal issue being considered.

The U.S. Geological Survey publishes an annual *Minerals Yearbook*, which contains mineral commodities summaries. Mineral commodities are minerals according to the earth science definition, but also manufactured products such as abrasives, cement, and lime. Still confused?

ECONOMIC DEFINITIONS

When economists, engineers, and scientists use mineral in an economic context, they generally use the terms **industrial minerals** or **mineral resources**. The term **mineral resources** refers to the occurrence of any mineral commodity (as defined above) that could be removed from the ground. There are three categories of mineral resources: fuels minerals, metallic minerals (also called ore minerals), and industrial or construction minerals. The term **fuels minerals** refers to natural gas and petroleum, and thus minerals as defined by the federal government, but not minerals according to the earth science definition. The term **metallic minerals** (for example, iron ore, copper) almost always also refers to minerals according to the earth science definition. The term **industrial minerals** may include minerals according to the earth science definition, but more often refers to rocks (for example, limestone) and sediments (for example, sand and clays) according to the earth science definition.

BIOLOGICAL-MEDICAL DEFINITION

The biological and health definition of minerals is in the context of "vitamins and minerals." Medical professionals use **mineral** to describe naturally occurring nutrients, which are inorganic elements and compounds such as iron, potassium, and calcium; rocks or fossil fuels are not included, although the minerals used in vitamins may be derived from rocks and fossil fuels. The health definition is still slightly different from the earth science definition, because it can include free elements such as calcium. In geology (and other sciences), calcium is considered an element that can be combined into a naturally occurring solid with a distinct crystal structure, such as calcite, which would be considered a mineral using the earth science definition.

REFERENCES

- Bates, R.L., and Jackson, J.A., 1980, Glossary of geology [2d ed.]: American Geological Institute, 751 p.
- Black, H.C., 1968, Black's law dictionary [rev. 4th ed.]: St. Paul, Minn., West Publishing Co., 1882 p.