

Properties Of Minerals

Mineral identification is done by checking for certain properties of minerals. Because each mineral has its own unique set of physical properties we can test a specimen and find out how it exhibits these properties. This list of characteristics along with a good field guide will improve your chances of identifying mineral specimens.

Some of the tests can be performed easily in the field, while others require laboratory equipment. For the beginning student of geology, there are a number of simple tests that can be used with a good degree of accuracy on common minerals. These tests are listed below. An explanation of each test follows.

The following physical properties of minerals can be easily used to help identify a mineral specimen:

Color
Streak
Hardness
Cleavage or Fracture
Crystalline Structure
Diaphaneity or Amount of Transparency
Magnetism
Luster
Specific Gravity

Color

Most minerals have a distinctive color that can be used for identification. In opaque minerals, the color tends to be more consistent, so learning the colors associated with these minerals can be very helpful in identification. Translucent to transparent minerals have a much more varied degree of color due to the presence of trace minerals. Therefore, color alone is not reliable as a single identifying characteristic.

Streak

Streak is the color of the mineral in powdered form. Streak shows the true color of the mineral. In large solid form, trace minerals can change the color appearance of a mineral by reflecting the light in a certain way. Trace minerals have little influence on the reflection of the small powdery particles of the streak.

Hardness

Hardness is one of the better properties of minerals to use for identifying a specimen. Hardness is a measure of the mineral's resistance to scratching. The Mohs scale is a set of 10 minerals whose hardness is known. The softest mineral, talc, has a Mohs scale rating of one. Diamond is the hardest mineral and has a rating of ten. Softer minerals can be scratched by harder minerals because the forces that hold the crystals together are weaker and can be broken by the harder mineral.

Cleavage & Fracture

Minerals tend to break along lines or smooth surfaces when hit sharply. Different minerals break in different ways showing different types of cleavage.

Cleavage is defined using two sets of criteria. The first set of criteria describes how easily the cleavage is obtained. Cleavage is considered perfect if it is easily obtained and the cleavage planes are easily distinguished. It is considered good if the cleavage is produced with some difficulty but has obvious cleavage planes. Finally it is considered imperfect if cleavage is obtained with difficulty and some of the planes are difficult to distinguish.

Fracture describes the quality of the cleavage surface. Most minerals display either uneven or grainy fracture, conchoidal (curved, shell-like lines) fracture, or hackly (rough, jagged) fracture.

Crystalline Structure

Mineral crystals occur in various shapes and sizes. The particular shape is determined by the arrangement of the atoms, molecules or ions that make up the crystal and how they are joined. This is called the crystal lattice. There are degrees of crystalline structure, in which the fibers of the crystal become increasingly difficult or impossible to see with the naked eye or the use of a hand lens. Microcrystalline and cryptocrystalline structures can only be viewed using high magnification. If there is no crystalline structure, it is called amorphous. However, there are very few amorphous crystals and these are only observed under extremely high magnification.

Transparency or Diaphaneity

Diaphaneity is a mineral's degree of transparency or ability to allow light to pass through it. The degree of transparency may also depend on the thickness of the mineral.

Magnetism

Magnetism is the property of minerals that allows a mineral to attract or repel other magnetic materials. It can be difficult to determine the differences between the various types of magnetism, but it is worth knowing that there are distinctions made.

Luster

Luster is the physical property of minerals that indicates how much the surface of a mineral reflects light. The luster of a mineral is affected by the brilliance of the light used to observe the mineral surface. Luster of a mineral is described in the following terms:

Specific Gravity

Specific Gravity of a mineral is a comparison or ratio of the weight of the mineral to the weight of an equal amount of water. The weight of the equal amount of water is found by finding the difference between the weight of the mineral in air and the weight of the mineral in water.

These are not foolproof tests. It pays to perform these tests more than once to improve accuracy. Even so mistaken identification is common even with the use of this list of physical properties of minerals. Many minerals are only slightly different in physical properties and can be easily confused. The same mineral may have several different forms leading to more confusion. Still these properties of minerals give us a starting place for identifying common mineral specimens.

About the Author

Learn more about [the properties of minerals](#) . You will also find Information, activities, and lesson plans on rocks, minerals, and crystals designed for students and teachers at <http://www.rocksandminerals4u.com> or buy [mineral specimens](#)

Source: www.isnare.com

Source: <http://articles.exospy.com>