

MINERAL IDENTIFICATION

Testing the Streak of a Mineral

The **streak** of a mineral is its colour when it is crushed into a fine powder. It is usually observed with the aid of a **streak plate**, which is a piece of hard white unglazed tile. The mineral is rubbed on the streak plate and the colour of the trace or streak made on the tile is observed. Its streak may be the same colour as the mineral itself or it may be quite different. Usually the streak is more dependable (shows less variation) than the actual colour of the mineral.



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Determining the Lustre of a Mineral

The **lustre** or “shine” of a mineral depends on the nature of its surface and the way it reflects light. The following terms are used to describe lustre:



Metallic

strong reflections; like metal surfaces

Adamantine

like diamond, cut gems

Resinous

like resin

Vitreous

bright and glassy

Pearly

whitish, like pearl

Silky

usually fibrous materials

Greasy

as if surface was covered by a film of oil

Earthy or Dull

like the surface of unglazed pottery



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Colour of a Mineral

The **colour** is the first thing we notice about a mineral and can be one of the most valuable properties of mineral identification. If a mineral has a composition which can vary, or tends to have impurities, then its colour may not be useful for identification.

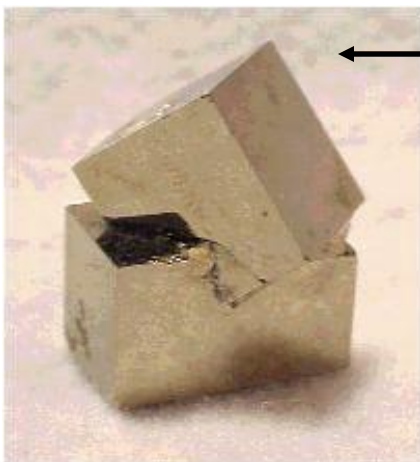


Quartz occurs naturally in several different colours.

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Describing Crystal Habit of Minerals

The usual **appearance** of the mineral and its crystal habit or shape can often be diagnostic of that mineral. Descriptive terms for general appearance of a specimen include:



Crystalline

made up of groups of crystals

Granular

made up of small rounded/shapeless crystals or grains

Earthy

the consistency of hard dried clay

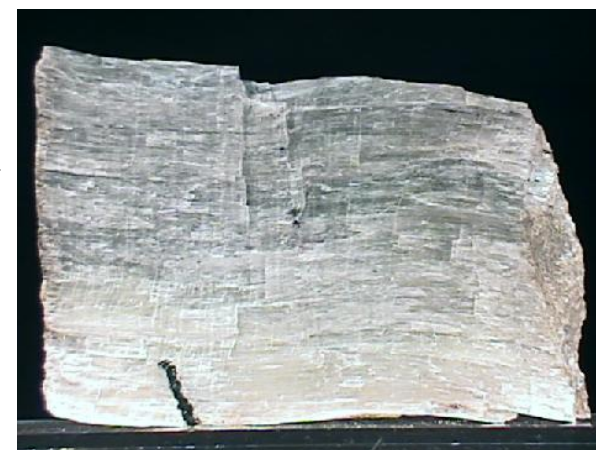
Massive

a mass without other particular characteristics

Powdery

Flaky

Fibrous



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Magnetic Properties of Minerals

A few iron-bearing minerals are **magnetic**, and may be distinguished from other similar minerals by holding a magnet near them.

Describing the Cleavage of Minerals

Some minerals have planes of weakness in their molecular structure along which they tend to break. These planes are called **cleavages**, and are visible as smooth, clean broken surfaces which reflect light. Minerals may have one or more cleavages, (i.e. more than one plane of weakness) or none at all. Some minerals have a characteristic angle between their cleavages, which allows us to distinguish them from minerals with otherwise similar properties. Amphiboles and pyroxenes, for example are similar types of minerals, but amphiboles have two cleavages at 60° and 120° ; while pyroxenes have two cleavages at 90° to one another.

Testing for Reaction to Acid

Some minerals will react with dilute acid and their response to the **acid test** will help to identify them. The test is done with 10% hydrochloric acid, and is commonly used to distinguish **carbonate** minerals.

Specific Gravity of Minerals

The **density** of a body is its mass per unit volume (g/cm^3). It is numerically equivalent to the **specific gravity**, which is measured as how much more the body weighs than an equal volume of water. For example, the weight of water is always indicated as 1, so a mineral with a specific gravity of 5 weighs 5 times more than an equal volume of water. Generally, we can compare the specific gravity of minerals by noting their relative weights (very heavy to very light).

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Mohs Hardness Scale		
S O F T	Talc	1
	Gypsum	2
	Calcite	3
	Fluorite	4
	Apatite	5
	Feldspar	6
	Quartz	7
H A R D	Topaz	8
	Corundum	9
	Diamond	10

← Fingernail (points to Calcite)

← Copper coin (points to Calcite)

← Knife blade (points to Apatite)

← Glass (points to Feldspar)

← Ceramic plate (points to Quartz)

Testing the Hardness of Minerals

Hardness is a measure of the mineral's resistance to scratching. It is measured by referring to **Moh's scale**, a hierarchy of minerals where a mineral can scratch all minerals below it and can be scratched by all above it.

For example, quartz has a hardness of 7. Therefore, it is able to scratch everything with a hardness of lower than 7 and be scratched by everything with a hardness of greater than 7.

The Moh's Hardness Scale also lists the hardness of a few objects that can be used as diagnostic tools to test for hardness. Say you want to determine the hardness of a mineral. You start at the low end of the scale by trying to scratch the mineral on a copper coin. The mineral scratches the coin, therefore it has a hardness of greater than 3.5. You next try to scratch the mineral with a knife blade or a steel nail. If the blade cannot scratch the mineral then the mineral has a hardness greater than 5.5. You continue to the next item, the glass plate. If the mineral cannot scratch the glass plate then it has a hardness of between 5.5 and 6.

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An Abbreviated Moh's Hardness Scale

The following is a simplified and abbreviated hardness scale that takes into account how one can test minerals for their hardness:



Moh's Hardness Scale

- 1 (softest)
- 2
- 3
- 4
- 5
- 6
- 7-10 (hardest)

Characteristics & Comparisons

- Feels soapy or greasy
- Scratched by fingernail
(Fingernail hardness = 2.5)
- Penny can scratch it
(Penny hardness = 3.5)
- Can scratch a penny
- Can be scratched by steel nail
(Steel nail hardness = 5.5)
- Can scratch steel
(Glass hardness = 6.0)
- Can scratch glass