



Mineral Cleavage & Fracture

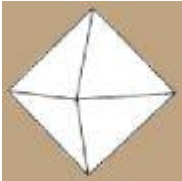
Cleavage and fracture are descriptions of how a mineral breaks into pieces. **Cleavage** describes how a mineral breaks into flat surfaces (usually one, two, three or four surfaces). Cleavage is determined by the crystal structure of the mineral.

Fracture describes how a mineral breaks into forms or shapes other than flat surfaces. Not all minerals have cleavage, however, all minerals will have some form of fracture.

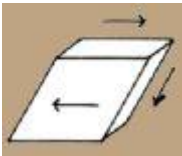
Common Cleavage Descriptions



Cubic – when a mineral breaks in three directions and the cleavage planes form right angles (90 degrees to each other). Results in pieces in the shape of a cube.



Octahedral – when a mineral breaks in the form of a diamond, resulting in 8 nearly equal faces.



Rhombohedral – when a mineral breaks in three directions and the cleavage planes form angles that are other than 90 degrees. The shape formed is called a rhombohedron.



Pinacoidal – when a mineral breaks in one direction, leaving a single flat surface (cleavage plane). When a mineral breaks into very thin sheets, like mica minerals, the pinacoidal cleavage is called micaceous.

Common Fracture Descriptions

- 1. Conchoidal:** describes a curved, nearly rounded, smooth fracture that looks like the inside of a shell. This is seen best in the igneous rock, obsidian, but also in massive pieces of the mineral quartz.
- 2. Fibrous:** describes minerals (like chrysotile asbestos) that break into fibers.
- 3. Splintery:** describes minerals that break into stiff, sharp, needle-like pieces.
- 4. Hackly:** describes fractures that have rough edges.
- 5. Uneven or irregular:** describes minerals that break into rough, uneven surfaces.

Sometimes one person might identify a fracture as hackly and another would describe the same specimen as irregular because they are fairly close to each other in appearance. With more experience, a mineralogist can easily tell the difference between these two fractures.

We Use a LOT of Minerals!

In a lifetime, the average American will use a LOT of stuff.
Much of this “stuff” comes from minerals.
In his lifetime, Corundum Carl will use . . .

1,600 pounds of Copper
(from azurite, malachite, cuprite)

1.7 Troy ounces of gold

32,300 pounds of salt
(halite)

5,700 pounds of aluminum
(from bauxite)

920 pounds of zinc
(from sphalerite)

1,000 pounds of lead
(from galena)

42,000 pounds of iron ore
(hematite and magnetite)

20,500 pounds of phosphate rock

68,000 pounds of cement
(cement is made from lime-
stone, sand and gravel.
Limestone contains the
same material as calcite—
calcium carbonate)

61,000 pounds of other minerals
(like gypsum, spodumene, sulfur, silver,
quartz, and fluorite)



You will use this much, too!!

*This information is from The Mineral Information Institute, Golden, Colorado.

Source: <http://www.kidsloverocks.com/pdf/MineralFacts1.pdf>