

## NONMETALLIC *DARK* MINERALS

Name	Formula	Color	Streak	Hard	Breakage	Mineral group	Mineral Structure	Specific Gravity	Uses & Special properties
<b>Apatite</b>	Ca <sub>5</sub> (PO <sub>4</sub> ) <sub>3</sub> F	<i>Glassy: varies</i> , greenish yellow, blue, brown, purple, white	White	5.0	Cleavage poor basal, fracture conchoidal	Sulfide	Hexagonal	3.1-3.2	Sometimes used as a gem source of phosphorus for fertilizers, phosphoric acid, detergents
<b>Bauxite</b>	Hydrous aluminum Oxide compound	<i>Dull:</i> gray, red, white, brown	Gray	1.0-3.0	Uneven Fracture	Oxide	None	2.0-2.5	Ore of Aluminum; used in paints, aluminum foil, and airplane parts; Smell of clay when wet
<b>Biotite (MICA)</b>	K (Mg, Fe) <sub>3</sub> Al Si <sub>3</sub> O <sub>10</sub> (OH) <sub>2</sub>	<i>Pearly:</i> black, brown, dark green	Colorless, white to gray.	2.5-3.0	Perfect Basal cleavage	Silicate	Monoclinic	2.7-3.4	Mica family peels in large Elastic thin sheets. Insulator and in electrical devices
<b>Copper (native)</b>	Cu	Copper red	Copper red	2.5-3.0	Hackly fracture	Native Element	Cubic (rare)	8.5-9	Used in coins, pipes, wire, cooking utensils, jewelry
<b>Corundum</b>	Al <sub>2</sub> O <sub>3</sub>	<i>Adamantine to Glassy:</i> colorless, brown, green, white, pink, blue, red, brilliant	Colorless, white	9	Fracture	Oxides	Hexagonal	4.0	Used in jewelry, industrial abrasives, lasers, mechanical watches, and other precision instruments: red gemstones: Rubies; Blue: Sapphires
<b>Garnet</b>	Fe Mg Ca Al	<i>Varies and dk red and reddish brown</i>	White or shade	7.0-7.5	Cleavage none	Silicate	Isometric	3.4-4.2	Gemstone (pyrope (red) and Andradite (green))
<b>Hematite</b>	Fe <sub>2</sub> O <sub>3</sub>	<i>Metallic (non): Black to reddish brown</i>	<i>Red to reddish brown</i>	1.0 6.5	<i>UNEVEN Irregular fracture</i>	<i>Oxide</i>	<i>Hexagonal</i>	5.26	<i>Source of iron used in making steel “pig iron” (red ochre) REDDISH STREAK</i>
<b>Hornblende</b>	Ca Na (Mg, Fe) <sub>4</sub> (Al, Fe, Ti) <sub>3</sub> Si <sub>6</sub> O <sub>22</sub> (O, OH) <sub>2</sub>	<i>Glassy:</i> green, black	White to gray	5.0-6.0	Cleavage in two directions @ 60 & 120 degree	Silicate	Monoclinic	3.0-3.5	Common material found in igneous rocks; Black strips like Long Prism
<b>Limonite</b>	Hydrous Iron Oxides	<i>Glassy: Dark Brown, to black</i>	Yellow Brown	5.0-5.5	Fracture (varies)	<i>Oxide</i>	None	3.5-4.0	Ore of Iron; also known as “yellow ochre” pigment
<b>Olivine</b>	(Mg, Fe) <sub>2</sub> SiO <sub>4</sub>	<i>Olive-green to yellowish (white rich in Ca)</i>	White or gray	6.5-7.0	Cleavage indistinct	Silicate	Orthorhombic	6.5-7.0	Refractory bricks
<b>Serpentine</b>	Mg, Al SiO <sub>3</sub>	<i>Dk green to black fibrous forms and platy</i>	White	2.0-3.0	Cleavage none	Silicate	Monoclinic	2.5-2.6	Asbestos: fire-resistant
<b>Smoky quartz</b>	SiO <sub>2</sub>	<i>Glassy:</i> white, colorless, gray, black	Colorless	7.0	Shell like fracture, conchoidal	Silicate	Hexagonal	2.6	Used in optical equipment, glass manufacture electronic equipment,