GUIA DE IDENTIFICACIÓN DE MINERALES

Lustre: metálico / submetálico / no metálico

Lustre Metálico Generalmente con raya de color, opacos

RAYA	DUREZA	COLOR	REMARKS	NOMBRE
Black	1	Steel gray	S.G. 2.0 Basal cleavage; Soft, marks on paper, greasy feel. Used in lubricants and pencils.	**GRAPHITE GRAFITO**
Iron-black	1-2	Black	S.G. 4.8 Radiating fibers, granular masses, or dendritic; sooty. An ore of manganese.	**PYROLUSITE PYROLUSITA**
Yellow brown	1 to 5	Yellow brown to black	S.G. 3.3 to 4.0 Your basic rust. Many forms and lusters. Occurs as flattened crystals, massive, reniform, or stalactitic. Common secondary mineral in rocks and soils. An ore of iron.	**LIMONITE LIMONITA**
Red brown to Indian red	1 to 6.5	Steel gray	S.G. 4.8 to 5.3 Many forms and lusters (can also occur in sub-metallic to non-metallic forms). Can be massive, radiating, botryoidal, and micaceous. The crystalline (metallic and sub-metallic) varieties are generally harder than the earthy (non-metallic) varieties. An ore of iron.	**HEMATITE HEMATITA**
Gray	2.5	Gray	S.G. 7.6 Perfect cubic cleavage (3 @ 90°); Occurs in cubes; may be massive or granular; heavy. The most common ore of lead.	**GALENA**
Light gray to silver	2.5	Silvery white, tarnishes to black	S.G. 10 to 12 Hackly fracture, easily distinguished from galena by lack of cleavage. Malleable and ductile. Used in coinage, fillings for teeth, jewelry, silverplate, photography, wires.	**SILVER PLATA**
Yellow	2.5 to 3.0	Pale to golden yellow	S.G. 19.3 Hackly fracture. Malleable and ductile. Used in coinage, fillings for teeth, jewelry, goldplate. Extensive use in computer industry as non-corrosive contact points for silicon chips.	**GOLD ORO**
Gray to black	3.0	Bronze, tarnishes to dark blue and purple	S.G. 4.9 to 5.4 Commonly called "peacock ore" because of the purple shine when it tarnishes. A common source of copper.	**BOURNITE BOURNITA**
Copper red	3.0	Copper red	S.G. 8.5 to 9.0 Malleable and ductile. Used in coins, pipes, wires, gutters, cooking utensils, pots and pans, jewelry, decorative items.	**KOPER COBRE**
Greenish-	4	Brass	S.G. 4.3	**CHALCOPYRITE**

black		yellow	The distinctive buttery yellow color is often tarnished purple or gray; yellower and softer than pyrite. An ore of copper.	**CALCOPIRITA**
Chocolate brown	5.5	Black to dark brown	S.G. 4.6 Distinctive chocolate brown streak. Commonly occurs as stratabound deposits in dunite segregations in ultramafic rocks, and as podiform masses in serpentinite. Used in stainless steel, high temperature alloys, and as refractory bricks. The ore of chromium.	**CHROMITE** **CROMITA**
Black	6	Black	S.G. 5.2 Conchoidal fracture. Strongly magnetic. Often called "lodestone." Common accessory mineral occurring as disseminated grains in mafic igneous rocks. An ore of iron.	**MAGNETITE** **MAGNETITA**
Black to greenish	6	Pale brass	S.G. 5.0 Often in cubic crystals. Can be massive, granular. Common name: "Fool's gold." Commonly alters to limonite. Sometimes mined as a source of sulfur.	**PYRITE** **PIRITA**

LUSTRE: Sub metálico

RAYA	DUREZA	COLOR	REMARKS	NOMBRE
Yellow-brown	1 to 5.5	Yellow to dark brown	S.G. 3.3 to 4.0. Your basic rust. Many forms and lusters. Occurs as flattened crystals, massive, reniform, or stalactitic. Common secondary mineral in rocks and soils. An ore of iron.	**LIMONITE** **LIMONITA**
Red brown to Indian red	1 to 6.5	Red, vermillion	S.G. 4.8 to 5.3 Many forms and lusters (can also occur in sub-metallic to non-metallic forms). Can be massive, radiating, botryoidal, and micaceous. The crystalline (metallic and sub-metallic) varieties are generally harder than the earthy (non-metallic) varieties. An ore of iron.	**HEMATITE** **HEMATITA**

LUSTRE: No-metálico. Raya incolora o de color muy claro

Dureza: < 2.5 / 2.5 a 3.5 / 3.5 a 5.5 / >5.5

Dureza: < 2.5 (se marca con la uña del pulgar)

DUREZA	PATRON D RUPTURA	COLOR	SP. GR.	REMARKS	NOMBRE
1	Good cleavage in 1 direction	White, green, pink	2.7	Easily scratched with fingernail. Flexible but not elastic; foliated; slick or soapy feeling. Typical luster: pearly to waxy. Used on baby's butts, and in paints, ceramics, rubber, insecticides, and paper. Variety SOAPSTONE can be carved into ornamental shapes and items.	**TALC TALCO**
1-2	Fracture	White, tan, gray	2-3	Earthy; clayey odor. Earthy to dull luster. A swelling clay, used to stop leaks in soils, rocks, dams, and basement walls. Due to its excellent water-retention properties, it is also used as a soil additive and kitty litter.	**MONTMOR-ILLONITE MONTMORILONITA**
1-3	Uneven fracture	Yellow brown to red	2-3	Not truly a mineral (lacks fixed chemical composition). Earthy to pisolitic (large round grains). Earthy, dull to waxy lusters. The most important ore of aluminum.	**BAUXITE BAUXITA**
1-5.5	Conchoidal fracture	Yellow, brown to black	2.7-4.3	Your basic rust. Many forms and lusters. Occurs as flattened crystals, massive, reniform, or stalactitic. Common secondary mineral in rocks and soils. An ore of iron.	**LIMONITE LIMONITA**
1-6	Irregular fracture	Brown, red, steel gray	4.8 to 5.3	Many forms and lusters (can also occur in metallic forms). Can be massive, radiating, botryoidal, and micaceous. The crystalline (metallic and sub-metallic) varieties are generally harder than the earthy (non-metallic) varieties. An ore of iron.	**HEMATITE HEMATITA**
1.5-2.5	Conchoidal to uneven fracture	Yellow	2.1	Characteristic bright yellow color; when small pieces are held in the hand close to the ear, crackling can be heard due to rapid, uneven thermal expansion. Pearly, waxy, resinous, to dull lusters. Used to make sulfuric acid, fertilizers, insecticides, explosives (kaBoom), and medicines.	**SULFUR AZUFRE**
2	No	White,	2.6	Earthy; clayey odor; absorbs	**KAOLINITE**

	macroscopic cleavage	often colored by impurities		moisture so rapidly that it will stick to the tongue. Earthy to dull lusters. Used in refractories, china, pottery and as a filler in paper. Also used in soft-serve ice cream to retard melting on hot summer days.	**KAOLINITA**
2	1 direction, perfect, 2 directions, good	Colorless, white, gray, gray-brown, pink reddish	2.3	As crystals and broad cleavage flakes with waxy to pearly to vitreous lusters (selenite variety); as compact fine-grained masses showing no visible cleavage, earthy to dull to waxy lusters (alabaster variety); as fibers with satiny luster (satin spar variety). Large crystals somewhat flexible, but not elastic. Used to make Plaster of Paris and sheetrock wallboard (drywall).	**GYPSUM YESO**
2-2.5	1 direction	Dark green to green-black	2.7	Thin sheets are flexible, but not elastic. Lusters typically resinous, waxy, vitreous or dull. A common alteration mineral found in mafic igneous rocks (alteration of the ferromagnesian minerals to chlorite results in the greenish tint common to altered basalt, and the re-naming of the rock "greenstone."	**CHLORITE** **CLORITA**
2-3	Wavy, uneven fracture	Green and white	2.5	Platy or fibrous; waxy luster when massive, satiny luster when fibrous (asbestos variety). Used as an insulating material against heat and electricity.	**SERPENTINE SERPENTINITA**
2.5	3 directions, perfect, cubic	White when pure; may be red, blue, pink	2.1 to 2.3	In granular cleavable masses or cubic crystals. Soluble in water; salty taste. Typical lusters: vitreous, waxy, dull. Common salt: used as a source of sodium compounds and hydrochloric acid; used to salt highways in winter; used as a seasoning and preservative in food.	**HALITE HALITA**
2.5	1 direction perfect	Pale brown, green, yellow	2.8	Common silicate mineral in felsic igneous rocks and low to medium grade metamorphic rocks. In foliated masses and scales. Transparent, flexible and elastic sheets. Vitreous to pearly luster. Used as insulating material in electrical appliances and as a fireproofing material. Also, Muscovite was used as windows before the invention of plate glass, was common as the rear window in early model convertible cars, and is still used as the front view-screen in many "fire-view" type wood stoves.	**MUSCOVITE MICA MUSCOVITA**

2.5 to 3.0	1 direction, perfect	Dark brown, green to black	3.0	Common ferromagnesian silicate mineral in felsic to intermediate igneous rocks and low to medium grade metamorphic rocks. In irregular foliated masses and scales. Translucent, somewhat flexible and elastic sheets. Pearly to vitreous luster. Forms hexagonal crystals.	**BIOTITE MICA** **BIOTITA**

LUSTRE: No-metálico Raya Incolora o de Color Claro

Dureza: 2.5 a 3.5 (no se puede marcar con uña ni con moneda de cobre)

DUREZA	PATRON D RUPTURA	COLOR	SP. GR.	REMARKS	NOMBRE
1-5.5	Conchoidal fracture	Yellow, brown to black	2.7-4.3	Your basic rust. Many forms and lusters. Occurs as flattened crystals, massive, reniform, or stalactitic. Common secondary mineral in rocks and soils. An ore of iron.	**LIMONITE LIMONITA**
1-6	Irregular fracture	Brown, red, steel gray	4.8 to 5.3	Many forms and lusters (can also occur in metallic forms). Can be massive, radiating, botryoidal, and micaceous. The crystalline (metallic and sub-metallic) varieties are generally harder than the earthy (non-metallic) varieties. An ore of iron.	**HEMATITE HEMATITA**
2-3	Wavy, uneven fracture	Green and white	2.5	Platy or fibrous; waxy luster when massive, satiny luster when fibrous (asbestos variety). Used as an insulating material against heat and electricity.	**SERPENTINE SERPENTINITA**
2.5	3 directions, perfect, cubic	White when pure; may be red, blue, pink	2.1 to 2.3	In granular cleavable masses or cubic crystals. Soluble in water; salty taste. Typical lusters: vitreous, waxy, dull. Common salt: used as a source of sodium compounds and hydrochloric acid; used to salt highways in winter; used as a seasoning and preservative in food.	**HALITE HALITA**
2.5	1 direction perfect	Pale brown, green, yellow	2.8	Common silicate mineral in felsic igneous rocks and low to medium grade metamorphic rocks. In foliated masses and scales. Transparent, flexible and elastic sheets. Vitreous to pearly luster. Used as insulating material in electrical appliances and as a fireproofing material. Also, Muscovite was used as windows before the invention of plate glass, was common as the rear window in early model convertible cars, and is still used as the front view-screen in many "fire-	**MUSCOVITE MICA MUSCOVITA**

				view" type wood stoves.	
2.5 to 3.0	1 direction, perfect	Dark brown, green to black	3.0	Common ferromagnesian silicate mineral in felsic to intermediate igneous rocks and low to medium grade metamorphic rocks. In irregular foliated masses and scales. Translucent, somewhat flexible and elastic sheets. Pearly to vitreous luster. Forms hexagonal crystals.	**BIOTITE MICA** **BIOTITA**
2.5 to 3.0	3 directions, perfect @75°	Clear, translucent, dark brown, green to black	2.7	Crystals in many forms. Occurs as large granular masses (limestone and marble) and fine granular or fibrous masses in which cleavage not prominent; also compact masses. Effervesces in cold, dilute HCl. Typical lusters: vitreous, pearly, waxy. Used in manufacture of cement, crushed stone, and as agricultural lime.	**CALCITE** **CALCITA**
3 to 3.5	1 direction, perfect, 2 directions, good	White or gray	4.5	Crystals usually tabular or bladed. Barite's distinctive characteristic is its specific gravity, which is very high for a nonmetallic mineral. Typical lusters: vitreous, pearly to dull. Used in powder form to give weight to drilling muds in order to prevent "blow-outs" of oil and gas wells, and to maintain the stability of the hole in diamond core and rotary drilling.	**BARITE** **BARITA**

LUSTRE: No-metálico Raya Incolora o de Color Claro

Dureza: 3.5 a 5.5 (se marca con moneda cobre pero no con vidrio/navaja)

DUREZA	PATRON D RUPTURA	COLOR	SP. GR.	REMARKS	NOMBRE
1-5.5	Conchoidal fracture	Yellow, brown to black	2.7-4.3	Your basic rust. Many forms and lusters. Occurs as flattened crystals, massive, reniform, or stalactitic. Common secondary mineral in rocks and soils. An ore of iron.	**LIMONITE LIMONITA**
1-6	Irregular fracture	Brown, red, steel gray	4.8 to 5.3	Many forms and lusters (can also occur in metallic forms). Can be massive, radiating, botryoidal, and micaceous. The crystalline (metallic and sub-metallic) varieties are generally harder than the earthy (non-metallic) varieties. An ore of iron.	**HEMATITE HEMATITA**

3.5 to 4.0	3 directions, perfect at 75°	White, pink, brown, gray, etc.	2.9	Usually harder than a penny. As crystals with curved faces (twisted rhombs), and as granular masses (dolostone, dolomitic marble). Effervesces in cold, dilute HCl only if powdered. Typical lusters: vitreous, pearly, waxy. Used as a building and decorative stone.	**DOLOMITE** **DOLOMITA**
3.5 to 4.0	Perfect cleavage in 6 directions	Yellow to brown, black, reddish brown	4	Usually massive. All six cleavages rarely seen on a single specimen. Luster typically resinous, but may be adamantine on well developed crystals. The most important ore of zinc.	**SPHALERITE** **ESFALERITA**
3.5 to 4.0	3 directions, perfect, rhombic	Light to dark brown; maroon	4	As crystals with curved faces; usually cleavable; sometimes in granular masses. Effervesces in dilute HCl only if powdered. Typical lusters: vitreous, pearly, waxy. A minor ore of iron.	**SIDERITE** **SIDERITA**
4.0	Good in 4 directions, octahedral	Purple, green to yellow, colorless	3.2	Well-formed cubic crystals, and also massive. Typical lusters: vitreous, pearly. Used in production of hydrofluoric acid, and as a flux in steel making. The fluorine used in fluoridation of public drinking water supplies and toothpastes comes from fluorite.	**FLUORITE** **FLUORITA**
5.0	Poor cleavage, 1 direction	Green to brown	3.2	Massive and granular. Vitreous luster when i large crystals; earthy luster when in fine-grained earthy masses. High quality crystals are used as semiprecious gemstones. Most important use is as source of phosphate for fertilizers.	**APATITE** **APATITO**
5.0 to 6.0	2 directions, good, at approx. 60° and 120°	Black to green	3.0 to 3.3	Crystals slender, fibrous. Often look like long, skinny rods. Commonly occur in cleavage fragments or granular masses. Typical lusters; vitreous to dull. **HORNBLENDE** is a common ferromagnesian mineral in intermediate silicate rocks (granitic to dioritic composition).	**AMPHIBOLE GROUP** **ANFIBOL**
5.0 to 7.0	Good in 1 direction	Blue to green	3.6	In bladed aggregates. Cleavage parallel to length of crystals. Hardness variable. Typical lusters: vitreous, pearly, dull. Used in manufacture of spark plugs and other high refractory porcelains.	**KYANITE**
5.5 to 6.0	2 directions, poor to fair, at approx. 90°	Green to black	3.1 to 3.5	Crystals "stubby" with nearly rectangular cross section. Commonly in granular or crystalline masses. Typical lusters: vitreous to dull. Common ferromagnesian mineral in mafic to ultramafic silicate rocks.	**PYROXENE GROUP** **PIROXENO**

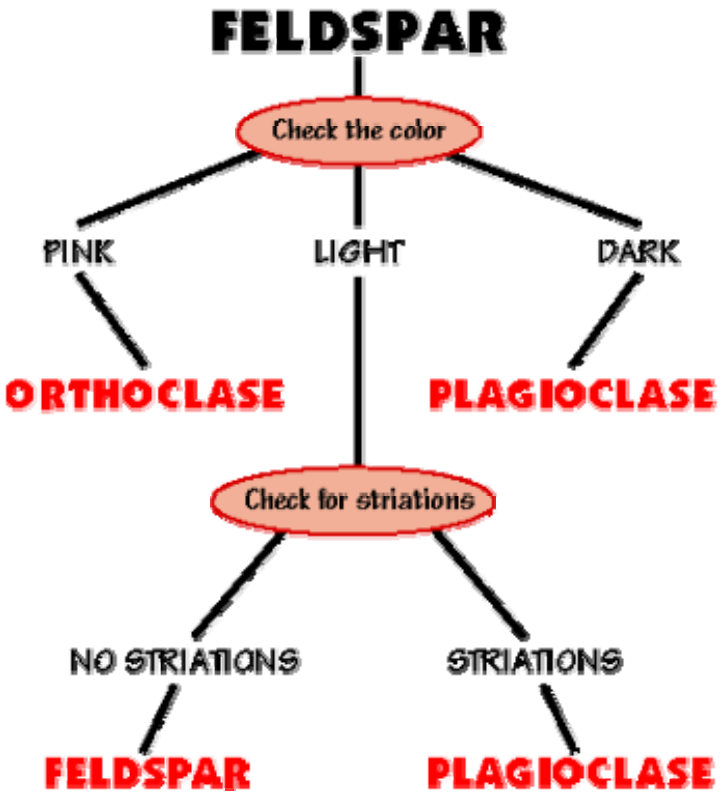
LUSTRE: No-metálico Raya Incolora o de Color Claro

Dureza: >5.5 (se marca con un vidrio/navaja)

HARD	BREAKAGE PATTERN	COLOR	SP. GR.	REMARKS	NAME
5.0 to 6.0	2 directions, good at approx. 60° and 120°	Black to green	3.0 to 3.3	Crystals slender, fibrous. Often look like long, skinny rods. Commonly occur in cleavage fragments or granular masses. Typical lusters; vitreous to dull. **HORNBLENDE** is a common ferromagnesian mineral in intermediate silicate rocks (granitic to dioritic composition).	**AMPHIBOLE GROUP ANFIBOL**
5.0 to 7.0	Good in 1 direction	Blue to green	3.6	In bladed aggregates. Cleavage parallel to length of crystals. Hardness variable. Typical lusters: vitreous, pearly, dull. Used in the manufacture of spark plugs and other high refractory porcelains.	**KYANITE** **CIANITA**
5.5 to 6.0	2 directions, poor to fair at approx. 90°	Green to black	3.1 to 3.5	Crystals "stubby" with nearly rectangular cross section. Commonly in granular or crystalline masses. Typical lusters: vitreous to dull. A common ferromagnesian mineral in mafic to ultramafic silicate rocks.	**PYROXENE GROUP** **PIROXENO**
6.0	2 directions, good at 90°	Colorless, white, pink, red, gray, green, blue	2.5 to 2.6	As cleavable masses or irregular grains in rocks; as crystals in pegmatites and some igneous bodies. Luster generally vitreous to pearly. Used in manufacture of some porcelains. Orthoclase is the common feldspar found in felsic silicate rocks. Common varieties include **MICROCLINE** (pink), and **AMAZONITE** (blue).	**ORTHOCLASE FELDSPAR GROUP** **ORTOCLASA Gpo FELDESPATO**
6.0	2 directions, good at 86°	Colorless, white, gray to black	2.6 to 2.8	In cleavable masses or irregular grains. Striations common on cleavage planes. Luster generally vitreous to pearly. Used in manufacture of some ceramics. Forms a continuous series from the calcium rich variety to the sodium-rich variety (refer to Bowen's Reaction Series). Plagioclase is the common feldspar found in intermediate to mafic silicate rocks.	**PLAGIOCLASE FELDSPAR GROUP** **PLAGIOCLASA Gpo.FELDESPATO**
6.5	Uneven fracture	Red to brown	4.3	Usually in 12 or 24 sided crystals (commonly as porphyroblasts in schists): also massive. No cleavage, but some samples may exhibit parting. Typical lusters: resinous, vitreous, dull. Used as an abrasive: well formed crystals may be used as gemstones.	**GARNET** **GRANATE**
6.5 to 7.0	Conchoidal fracture	Olive green to yellow green	3.3 to 3.4	Usually as disseminated grains in mafic igneous rocks; as granular masses having saccharoidal texture (looks like grains of sugar). Luster generally vitreous. Mined for refractory sand used in casting industry. A common ferromagnesian mineral in mafic to ultramafic silicate rocks.	**OLIVINE** **OLIVINO**

7.0	Conchoidal fracture	Colorless or white when pure, but may be any color	2.6	As crystals with hexagonal cross section, often with striations on prism faces. Also as crystalline masses, granular aggregates, irregular grains, etc. Luster generally vitreous to greasy. Varieties include **MILKY** (white to cloudy, usually due to included microscopic air bubbles); **SMOKEY** (gray to black); **ROSE** (pink); **AMETHYST** (violet). Used as a gemstone, to make glass, as a source of silicon for the computer industry, a flux, a filler, and an abrasive.	**QUARTZ** **CUARZO**
7.0	Conchoidal fracture	Various colors	2.6	Translucent to opaque. Varieties include **AGATE** (massive to banded, many colors); **FLINT** (dark gray to blue); **CHERT** (light-colored, white to gray); **JASPER** (commonly red but can include many hues); **OPAL** (milk-white, yellow, green, red, multi hued with "fire," waxy luster); **CHALCEDONY** (brown to gray, fibrous to botryoidal). Agate and opal are used as gemstones.	**MICRO-CRYSTALLINE QUARTZ** **CUARZO MICROCRISTALINO**
7.0 to 7.5	Cleavage not prominent	Varied; black common	3.2	Usually in trigonal prismatic crystals with prominent lengthwise-running striations. Typical lusters: vitreous to dull. Well-formed and colored crystals used as gemstones. Commonly occur in prgmatite dikes, and in higher grade metamorphic rocks.	**TOURMALINE** **TURMALINA**
7.0 to 7.5	Cleavage not prominent	Red-brown to brownish-black	3.7	Cruciform twin crystals common; also elongate bladed crystals with rhombic cross sections. Luster resinous to vitreous when unaltered; dull to earthy when altered or impure. Well-formed, cross-shaped twins used in jewelry ("Fairy Crosses").	**STAUROLITE** **ESTAUROLITA**
8.0	Imperfect cleavage	Green to yellow	2.7	Hexagonal, prismatic crystals. Luster generally vitreous. Used as a source of beryllium for metal alloys. High quality crystals used as gemstomes.	**BERYL** **BERILO**
8.0	1 direction, poor	Colorless, pink, yellow	3.5	Prismatic crystals, crystalline or granular masses. Luster generally vitreous. High quality crystals used as gemstone.	**TOPAZ** **TOPACIO**
9.0	Parting, no true cleavage	Brown, pink, ruby-red	4.0	Crystals generally hexagonal prisms, commonly barrel-shaped. Basal parting common. Typical lusters: vitreous to dull. Used as an abrasive; high quality, colored crystals used as gemstones: **RUBY** (red), **SAPPHIRE** (blue).	**CORUNDUM** **CORUNDO /CORINDON**
10	4 directions	Colorless, pale yellow	3.5	Uncut crystals have a characteristic greasy appearance; well-formed crystals are octahedral. Luster: adamantine. Industrial diamonds (borts) used as abrasives; high quality diamonds used as gemstones.	**DIAMOND** **DIAMANTE**

GRUPO DEL FELDESPATO



SERIE DE REACCIONES DE BOWEN