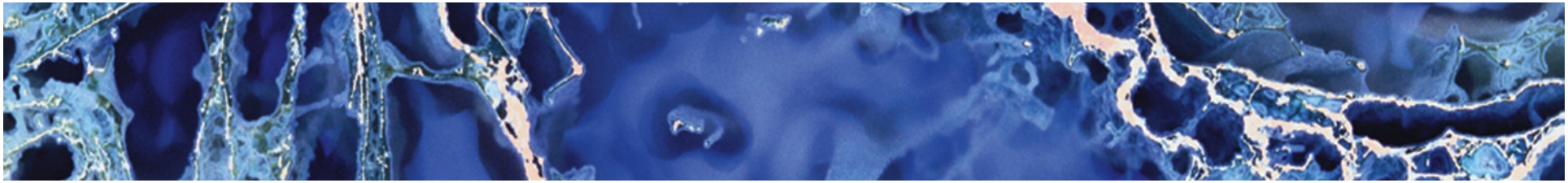


Chapter 2 Lab

Mineral Descriptions

Graphite

- Graphite has layers, therefore it has cleaned age in one direction, sometimes the layers are you regular, in other words, the clean page is not in totally flat plane's. On the punctuation. When you look at graphite, the greasy Luster is very apparent and is opaque and shiny gray. Graphite has a metallic luster, it is shiny dark gray, almost greasy looking in, is softer than paper. You can easily scratch it with your fingernail. In fact, it is so soft that it marks on paper, which is why it is the major component of pencil at 10 pencil that is not really lead it is graphite with a little bit of clay. Graphite can only be confused with molybdenum night. However molybdenum I has more of a bluish tinge to it and do them. Generally is in little hexagonal crystal flakes.

Galena

- The first thing you notice about Galena when you pick it up is the steel gray shiny metallic luster and how heavy it is. You notice the three cubic cleavage directions that is most characteristic of Galena, and this is the way you tell it apart from any other mineral. It's fairly soft, you can not scratch it with your fingernail, and galena will not scratch a penny. Galena in small pieces can be confused with sphalerite. However, sphalerite is light brown to yellowish brown color and has more cleavage directions than the three cubic directions than galena has. Galena can be distinguished from graphite, because Galena is harder and heavier

Sphalerite

- Sphalerite is a golden brown light brown or metallic brown. It is fairly heavy, and it has more than four directions of cleavage. It has a yellow brown streak. Even when it is very metallic looking, it still has a yellow brown streak. Sphalerite is also fairly heavy, though not as heavy as Galena. The characteristic luster of sphalerite is resinous. Resin is tree sap, or the resin is what violinists and other string players use on their bows.

Bornite

Bornite is also metallic in luster but its doesn't have cleavage. in other word it is irregular on all sides. There are no shiny flat planes or cleavage planes. Although bornite looks, bron on fresh surfaces, on weathered surfaces it has a purplish iridescent sheen. That's why it is called peacoc ore. Even though the color looks bronze or black, the streak is gray, black. Bornite has a hardness about the same as the hardness of a penny So sometimes it scratches a penny and sometimes the penny can scratc it. In particular, the tarnish rubs off easily. Because bornite is metallic. also is relatively heavy, although not as heavy as sphalerite or Galena. It can easily be distinguished from sphalerite or Galena, because it has no cleavage.

Copper

Copper is metallic and has no cleavage. It is about as hard as a penny, but generally will not scratch a penny. On a fresh surface, copper has the same color as a new copper penny. When it is tarnished, it may be black or dark brown or greenish colored. Copper is malleable, which means that it is easy to bend. This is why you see those machines that will turn a penny into a charm with names or other things on them. It's easy to roll the penny into a flat shape.

Chalcopyrite

Chalcopyrite is also metallic with no cleavage. It looks like brass. The color is a brassy yellow, and it can be confused with gold. However, chalcopyrite is harder than gold. Even though, chalcopyrite is a brassy yellow color, it's streak is greenish black. When chalcopyrite tarnishes, then it has an iridescent sheen. Chalcopyrite can be confused with pyrite, which is fools gold. However, pyrite will scratch glass, but chalcopyrite will scratch a penny, but will not scratch glass.

Chromite

Chromite is also metallic, although it is not often shiny. It is iron black in color, and sometimes is brownish black. It generally looks like cast iron. Chromite does not have cleave each, and is generally irregular in shape. It generally has conchoidal fracture, and is uneven, more brittle, and easy usually granular. Sometimes it may have very weak magnetism.

Hematite

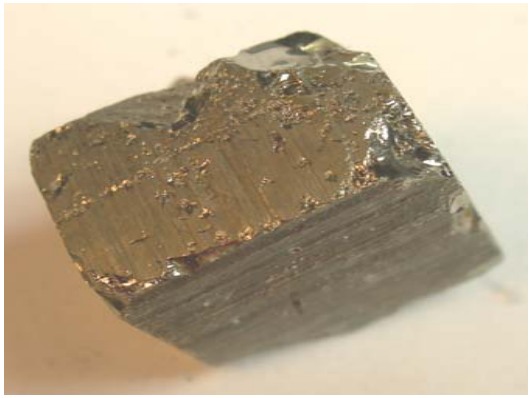
Hematite can be metallic in luster, or it can be earthy, and nonmetallic. But the metallic variety is a silvery gray color, and the earthy variety is the rusty red brown color. However, both types of hematite have a reddish-brown streak. You may have to rub your hand across the streak, to see the underlying color. Hematite does not have cleavage, as can easily be seen in the earthy variety. However, the shiny gray variety generally has sparkles of silvery gray plates. These are not cleavage planes, but they are crystal faces. The hardness of hematite is variable as the earthy variety is softer than glass. But the Metallic silvery gray variety may scratch glass. Hematite can be confused with magnetite as it sometimes is magnetic. This usually occurs because some magnetite is mixed in with the silvery hematite. However the streak of hematite will always be reddish brown.

Magnetite

Magnetite also has no cleavage and is metallic in luster. It is usually very black in color and will leave a black streak. Magnetite will scratch glass. The most characteristic feature of magnetite is that it will be attracted to a magnet. Magnetite and bornite look alike, although bornite always has a purple tarnish, where as magnetite is always a black. Also magnetite is harder than glass.

Pyrite

Pyrite also has metallic luster and looks like brass. The color is more silvery brass or pale brass, rather than the deep yellow brass of chalcopyrite. The streak of pyrite is greenish black or brownish black. Even though the color is a bright brass, pyrite will scratch glass. This is how you distinguish it from gold, which is soft enough to bite. Sometime pyrite looks like it has cleavage because it has cubic crystals or five sided crystal faces. However, if you look along the sharp edge between two crystal faces, you will see that the broken edge does not break in flat planes parallel to the crystal faces. Instead, it breaks in a curved pattern that we call conchoidal fracture.



Talc

Talc is nonmetallic. It has layers, which means it has cleavage in one direction, which is in flat planes. The layers of talc are not always perfectly flat planes. Because talc is a metamorphic mineral, its layers are slightly curved. Talc can be almost any color. It can be green, gray, white, pink, blue, or any other color. The streak is always white. The most characteristic thing about talc is that it is very soft. It is a much softer than your fingernail. In fact, it has a very greasy feel to it. It is so soft that it is used as talcum powder.

Gypsum

Gypsum is also nonmetallic and has good cleavage. The layers in gypsum are very flat planes in the variety selenite. The layers in gypsum are fibrous in the variety satin spar. The variety alabaster is very massive and does not appear to have cleavage. One of the most characteristic things about gypsum is the softness. It is much softer than your fingernail. Gypsum is usually clear or white, and the streak is also white.

Muscovite

Muscovite is clear or white mica. It is clear or white or sparkly silvery or bronze, but does not have metallic luster, because you can see through it, in other words, it is transparent to translucent. The most characteristic thing about Muscovite is the very thin, clear, flexible sheets. Sometimes you can scratch Muscovite with your fingernails, and sometimes it is harder than your fingernails, and you can scratch a penny with the Muscovite.

Halite

Halite is also nonmetallic in luster and has good cleavage in three directions, in a cubic shape. Halite is slightly harder than your fingernail, but will not scratch a penny. The most characteristic thing about halite is its salty taste and its cubic cleavage. It is usually colorless to white. Halite is common table salt and you can look at table salt with your hand lands or magnifying glass and see the cube shapes. Try crushing some of the coarser salt and see if they are still cubic shapes.

Biotite

Biotite is black mica. It is black to brown and is nonmetallic. Even though it is dark colored, you can see through the thin sheets. The hardness is variable, and sometimes you can scratch it with your fingernail and sometimes it will scratch a penny. Thin sheets are also flexible, and can bend.

Calcite

Calcite is also nonmetallic in luster and has good cleavage in three directions. However, these three directions are not at right angles to each other. The shape is more like a cube that has been pushed over on one side. This shape is called rhombohedral. Calcite can be any color. Clear to white is most common, but calcite can be pink or green or blue. Calcite is about the same hardness as a penny, and sometimes will scratch a penny. The most definitive characteristic of calcite, is the fact that it will fizz or effervesce in dilute hydrochloric acid. The reaction of hydrochloric acid with calcite releases the gas carbon dioxide. Carbon dioxide is the gas that is released in the bubbles in soda pop.

Barite

Barite is also nonmetallic and has a good cleavage in two directions and poor cleavage in the third direction. Barite is about the same hardness as a penny, and will usually scratch the penny. Barite is usually quite and sometimes has a slightly pinkish or flesh colored tinge to it. It can also be clear or blue or yellow or almost any other color, but it does have a white streak. The most characteristic thing about barite is that he is very heavy for a nonmetallic mineral. In other words, it is about twice as heavy as a similar sized piece of calcite would be. Another characteristic thing about barite is that it is usually tabular. In other words, it is longer and wider than it is thick. Sometimes barite can form roses.

Dolomite

Dolomite is also nonmetallic and has good cleavage. It has a very similar composition to calcite and has a similar cleavage. Dolomite has rhombohedral cleavage, in other words, cleavage in three directions like a pushed over cube. Dolomite will fizz in hydrochloric acid, only if you powder the mineral first. If the mineral has rhombohedral cleavage, and does not fizz in HCl, then use a knife or a nail to scratch a piece of the mineral to make a powder, then put a drop of hydrochloric acid on that powder to see if it fizzes. Dolomite can be many colors from white to pink to tan colored to gray, but the streak is generally white. Dolomite is about the same hardness as calcite and will most likely scratch a penny. Dolomite often forms small, bladed crystals that are curved.

Fluorite

Fluorite is also nonmetallic with good cleavage. However, the cleavage is in four directions. So there are more planes than a rhombohedral cleavage. Sometimes, these cleavage planes will form an octahedron in which there is a pyramid on the top and a reverse pyramid on the bottom. Fluoride has a hardness of four, which means that it will scratch a penny, but will not scratch glass. Fluorite can be any color from purple to white to clear to pink to green to blue to yellow to brown. Fluorite commonly occurs in cubic crystals. Although fluorite can look like calcite or barite or other minerals, it's hardness between a penny and glass is characteristic, as well as the good octahedron cleavage in four directions.

Sphalerite

Sphalerite can look nonmetallic when it has a resinous luster. It has cleavage in more than four directions, which is shown by the many flat planes of cleavage. It has a hardness between a penny and glass. Spell right can be yellow yellow brown to brown to black, but its streak is generally reddish-brown to yellowish brown. The resinous luster and many directions of cleavage are characteristic of sphalerite.

Hornblende (an amphibole)

Hornblende is also nonmetallic and has two directions of cleavage that aren't not at right angles. The two directions of cleavage are at angles of 120° and 60°, not at 90°. Hornblende is usually black or dark green to brown. Even though this mineral is very dark colored, it does not look like a metal, but looks more like black glass. Hornblende is harder than glass.

Orthoclase

Orthoclase is also nonmetallic and has two directions of cleavage that are at right angles. It is also harder than glass and is about the same hardness as the streak plate, which is porcelain, which is made from orthoclase. Orthoclase is generally white, pink or herb pinkish tan in color. However, the variety amazonite, is bright green. Another characteristic of orthoclase is the mottled nature.

Plagioclase

Plagioclase is also nonmetallic and has two directions of cleavage that are at right angles. Plagioclase is also a feldspar and is harder than glass and is about the same hardness as the streak plate. Plagioclase can be white, gray, blue-gray, gray, black, or iridescent blue. Some plagioclase has the characteristic of twinning, which results in striations on a cleavage face. These striations look like fine parallel grooves, similar to corduroy or grooves on a record.

Limonite

Limonite has a nonmetallic luster with no cleavage. It is an earthy, yellow brown to brown mineral that has a yellow brown streak. Limonite can be scratched with a fingernail.

Steatite

Steatite is the massive variety of talc. It is softer than your fingernail and has a greasy luster and is very slippery. The color of steatite can be green, gray, white, and other colors, but the streak is always white.

Bauxite

Bauxite is also nonmetallic with no cleavage. It is relatively soft and will not scratch a penny. It can be white, gray, yellow, red, brown, and dull, but its streak is white. The characteristic form of bauxite is pisolitic, which means there are small, round grains of different color is in an earthy, claylike, matrix.

Sulfur

Sulfur is also nonmetallic and has no cleavage. It is very soft and can be scratched by your fingernail. It has a distinctive bright yellow color, and has a yellow to white streak. It smells like sulfur. It is brittle, and it crackles with the heat of your hand.

Kaolinite

Kaolinite is nonmetallic, with no cleavage. It is very soft and is usually chalky clay. It is white, dull, an earthy, and is plastic when wet. It will stick to your tongue.

Hematite

Hematite is earthy, looks nonmetallic, and has no cleavage. It has a rusty to reddish brown color in its nonmetallic variety. The characteristic streak is reddish brown. The hardness is variable and can be scratched with a fingernail in its earth, the massive state or can scratch glass.

Malachite

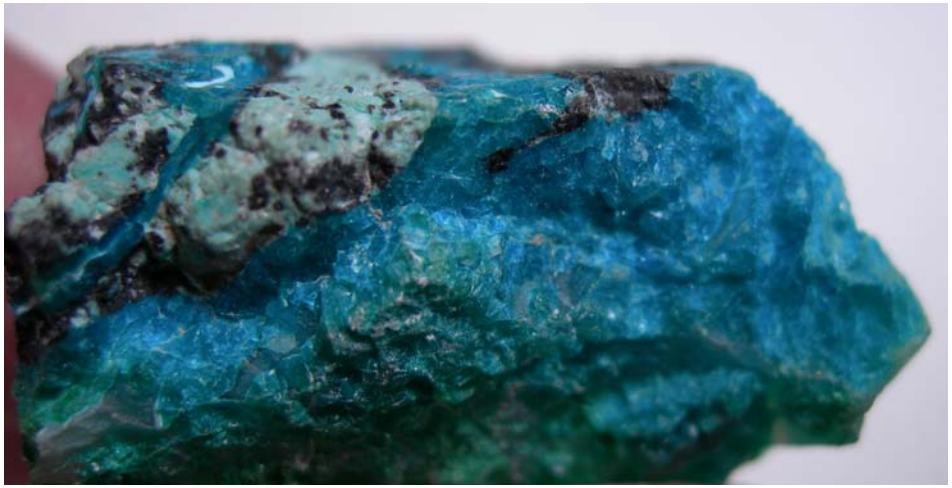
Malachite is nonmetallic and has no flat planes and no cleavage planes. Malachite is a bright green and can be a light green or dark green. Malachite will scratch a penny but will not scratch glass. The luster of malachite can be either earthy or glassy. The form can be botryoidal or stalactitic in shape. Botryoidal means rounded concentric layers and built one on top of the other. Malachite is copper carbonate, which has a similar chemistry as calcite and dolomite. Therefore, when you scratch malachite and make a powder, it will fizz in dilute hydrochloric acid.

Azurite

Azurite is also nonmetallic and has no flat planes or cleavage planes. Azurite is a bright blue and can be either light blue or dark blue. Azurite will scratch a penny but will not scratch glass. The luster of azurite can be either earthy or glassy. The form can also be botryoidal in shape. Azurite is also copper carbonate, and powdered azurite will also is in dilute hydrochloric acid.

Chrysocolla

Chrysocolla is also nonmetallic and has no flat planes were cleavage planes. Chrysocolla is a bright blue-green, similar in color to turquoise. The luster is earthy to glassy, and it is always massive and not crystalline. It has a characteristic conchoidal fracture. Chrysocolla has a hardness between two to four, which means you can not scratch it with your fingernail, and it may or may not scratch a penny.



Olivine

Olivine is also nonmetallic and has no cleavage. Olivine is a typical olive green to dark green color. It is characteristically in small, green, glassy grains. It will scratch glass, a making a deep groove. However, the grains are brittle, and will break off, making it seem like they are not as hard as glass. Looking at the grains with a magnifying glass, the conchoidal fracture can be seen. Olivine is the mineral name for the gemstone peridot.

Quartz

Quartz is also nonmetallic and has no cleavage. Quartz has a glassy to greasy luster. It will scratch glass leaving a sharp groove. Quartz can be almost any color. The purple variety is called amethyst. The pink variety is called Rose Quartz. The smoky yellow to brown and black variety is called smoky quartz. The light yellow variety is called citrine. The conchoidal fracture is characteristic of quartz. Quartz commonly occurs in hexagonal crystals with a point on one end. Looking at the sharp edges of the faces of these crystals indicates a conchoidal fracture where are the edges are broken or dinged.

Chert

Chert, Flint, and Jasper are forms of granular Quartz. These minerals are nonmetallic and have no cleavage, although they do have conchoidal fracture, which made them valuable to India in this for making arrow heads and spear points. These minerals can be any color, although they are usually colorless, white, red, gray, and other colors. They are very hard and will scratch glass.

Garnet

Garnet is also nonmetallic and has no cleavage. It is very hard and will scratch glass, making it a deep groove in the glass plate. Garnet has a very glassy to resinous guru and luster. Garnet frequently occurs in crystals in the shape of dodecahedrons, or 12-sided crystals. These have diamond shaped faces. These crystal faces may be confusing, and that they might look like cleavage faces. However, when you look at the place where two crystal faces join with a magnifying glass or hand lens, you will see that the broken edges have conchoidal fracture.

Topaz

Topaz is also nonmetallic and has only basal cleavage, which means that the base of the crystal may have a flat plane. Topaz is very hard and will scratch glass easily. Topaz commonly occurs in four-sided, prismatic crystals, which have a pyramid shape on the end. Topaz can be many colors, either colorless or white, or tan or brown or other colors.