

HUI PŌHAKU 'Ō HAWAII

Rock & Mineral Society of Hawai'i, Inc.



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COPPER MINERALS

BY DEAN SAKABE

Copper gets its name from the Greek word *kypros*, in reference to the Island of Cyprus, where copper deposits were mined by the ancient Greeks. The chemical symbol for copper is Cu which is derived from the Latin name for copper, *cuprium*.

Copper was the first metal used in significant quantity, when the Greeks found that it could easily be hammered into sheets, which in turn could be worked into shapes of increasing complexity. After the introduction of bronze, a wide range of castings also became possible, proved by legacy of Renaissance artwork. However copper and its principal alloys, bronze and brass, have been more than decorative embellishment. Although iron became the metal of choice in western civilization, it was copper metals which were used when a combination of strength and durability was required. The ability of copper to resist corrosion ensured that copper, bronze and brass remained as functional and decorative materials throughout history and on to the present day.

More than 5 million tons of copper are produced annually and copper metals are playing an increasingly vital part in many branches of modern technology. The ductility of copper, which led to its use for water piping in ancient Egypt, is illustrated by the countless thousands of miles of copper tube in contemporary plumbing and heating systems. Copper is resistant to corrosion, which induced the Romans to use it for sheathing the roof of the Pantheon. It is still in use today as sheathing on copper roofs. Additionally, the electrical conductivity of copper which was utilized by Michael Faraday in his epoch-making experiments, and it remains the key to modern power generation

Copper easily combines with a number of other elements and ions to form a wide variety of copper minerals and ores. The following is a few of the copper minerals.

Mixite (Hydrated Bismuth Copper Arsenate Hydroxide) is a fairly rare mineral. Mixite forms in the oxidation zone of metal ores that contained primary bismuth sulfides such as emplectite. Mixite forms nice radial clusters called spherules that are made up of fine acicular crystals. The color is typically a brilliant green with a silky luster. Mixite has been found in Inyou County (California), Gila and Pinal counties of Arizona, the El Carmen Mine in Durango (Mexico), France, and Czechoslovakia.



Barite
Serling mine, Stoneham, Weld Co. Colorado

MEETING

Wednesday

February 25

7:00—9:00 pm

Makiki District

Park

Administration

Building

NEXT MONTH

Lee Creek

Phosphate Mine

LAPIDARY

Every Thursday

7pm-9pm

Second-floor Arts

and Crafts Bldg

Makiki District

Park

MEMBERSHIP

COSTS

2008

Single: \$10.00

Family: \$15.00

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Cuprite (Copper Oxide) is a major ore of copper, and is mined in many places around the world. Cuprite gives the greatest yield of copper per molecule since there is only one oxygen atom to every two copper atoms. As a mineral specimen, Cuprite shows fine examples of well-developed cubic crystal forms. Cuprite's dark crystals show internal reflections of a deep red color inside the almost black crystal. Other varieties, such as chalcotrichite, show tufts of needle-like crystals that have a beautiful red color and a special sparkle that make them popular display cabinet specimens. Cuprite has been found in Arizona, Africa, Australia, and Chile.

Malachite (Copper Carbonate Hydroxide) is a famous and very popular semi-precious stone. Named for the Greek word for "mallow", which is a green herb. Malachite has banded light and dark green designs, which give it a unique ornamental quality unlike that of any other stone. The light and dark green bands are so distinctive that Malachite could be the most easily recognized mineral. Malachite forms when the banding from subtle changes in the oxidation states of the surrounding pore waters. Malachite forms in massive nodules, however, it can also form crystalline structures. Another one of its unique habits is its fine acicular crusts and tufts (appearing as a mat of thin hairs), other unusual form is found in stalactitic habits. Malachite has been found in many localities such as the Ural Mountains (Russia), Tsumeb (Namibia), Shaba (Congo), Australia, England, and Arizona.

Azurite (Copper Carbonate Hydroxide) has a deep blue color called "azure", hence its name. Azure is derived from the Arabic word for blue. The color is due to the presence of copper, and the way copper chemically combines with the carbonate groups (CO₃) and hydroxyls (OH). Azurite has been used as a dye for paints and fabrics for eons. Azurite is frequently associated with Malachite, as they often occur together, being that they have very similar formula. Malachite can replace azurite, making a pseudomorph, or an exact copy of an azurite

crystal (only now instead of being blue, it would be green). Azurite paints made centuries ago have undergone the oxidation transformation such that paintings of beautiful blue skies now have a most unusual green hue. Fine crystal clusters, nodular specimens, and interesting and beautiful combinations with malachite are important pieces in anyone's mineral collection. Azurite has been found in Bisbee (Arizona), Lasal (Utah), New Mexico, China, Toussit (Morocco), Tsumeb (Namibia), Mexico, Shaba (Congo), and Australia.

Dioptase (Hydrated copper silicate) is a very beautiful mineral, which can challenge emerald's deep green color. Unfortunately it is rather soft (for gemstone use) and has good cleavage, therefore is not usually cut as a gemstone. Dioptase is one of the few silicates to crystallize in the same symmetry class as dolomite and forms crystals that can have a typical carbonates' rhombohedral shape. Specimens of dioptase are often deeply colored and show well developed crystals. The faces of the rhombohedrons, and even the prism faces, are very reflective due to a fairly high luster. Crystals can be quite clear with very deep color. Dioptase has been found in California, Arizona, Tsumeb, Namibia, Zaire, Russia and Chile.

Chalcopyrite (Copper Iron Sulfide) sometimes called copper pyrite, appears similar and is easily confused with Pyrite. Chalcopyrite is one of the minerals referred to as "Fool's Gold" because of its bright golden color. As an ore of copper, the yield of chalcopyrite is rather low, only 25%, compared to other copper minerals, however the large quantities and widespread distribution of chalcopyrite make it the leading source of copper. Chalcopyrite is a common mineral and is found in almost all sulfide deposits. Fine crystals of chalcopyrite have a unique character and make fine additions to anyone's collection. Chalcopyrite has been found in Chile, Peru, Mexico, Europe, South Africa, and several states in the US.



Aquamarine
Mt. Antero, Colorado



Epidote
Calumet mine, Salida,
Colorado



(Rhodochrosite
Nate's Pocket, Mini King
Raise, Sweet Home Mine,
Alma, Co.

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Chrysocolla (Hydrated copper silicate) is an attractive blue-green mineral that provides a unique color to the mineral world. Chrysocolla is more appropriately a [mineraloid](#) (amorphous, inorganic substance lacking a crystal structure), they are mineral in nature but lack a crystal structure, than a true mineral. Chrysocolla forms in the oxidation zones of copper rich ore bodies. Pure chrysocolla is soft and fragile and therefore not appropriate for use in jewelry. However, chrysocolla often is "agatized" in chalcedony quartz and it is the quartz that provides the stone with its polish and durability. Druzy Chrysocolla is a rock composed of agatized chrysocolla with a crust of small sparkling quartz crystals in small cavities. Occasionally, chrysocolla can have a turquoise color and be used as a fraudulent substitute for turquoise. Chrysocolla has been found in Arizona, Utah, New Mexico, Pennsylvania, Israel, Zaire, and England



Zircon
St. Peter's Dome, Teller City, CO

Turquoise (Hydrated Copper Aluminum Phosphate), could possibly be the most valuable, non-transparent mineral in the jewelry trade. It has been mined since at least 6000 BC by early Egyptians and also is used in ornamental creations by Persians and Native Americans. Turquoise continues to be very popular with today's jewelry market. Although crystals of any size are rare, some small crystals have been found in Virginia and elsewhere. Most specimens are cryptocrystalline, meaning that the crystals could only be seen by a microscope. The finest turquoise comes from Iran but is challenged by some southwestern United States specimens. Turquoise is often imitated by "fakes", such as the mineral chrysocolla, and poorer turquoise specimens are often dyed or color stabilized with coatings of various resins. The name comes from a French word which means stone of Turkey, from where Persian material passed on its way to Europe. Turquoise is found in Arizona, New Mexico, Mexico, Australia, Iran, Afghanistan, and China



Gold
Farncomb Hill, Breckenridge, Colorado

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News and Notes, page 4

DOOR PRIZES

Please note that we have instituted door prize drawings at our monthly meetings. Because of Hawaii's gambling laws, these drawings cannot be conducted in the common "raffle" format where tickets are sold. Rather, each *paid* member attending the meeting will receive a drawing ticket upon request. A voluntary donation of \$1.00 is requested and encouraged. Drawings will be conducted at the end of the meeting with available prizes awarded in random order. You must be present to win. Please remember: if you win a prize, please bring one to the next meeting. This helps to keep our drawings going. Thank you.

WE HAVE A WEBSITE!

http://pohakugalore.net/Hui_pohaku/Hiu_pohaku_1.html

MAHALO TO MARKUS FOR HELPING US GET OUT OF THE ELECTRONIC STONE AGE!

THE METAPHYSICAL PROPERTIES OF COPPER BY JADE EMORY

When I lived in Taos, New Mexico, I became close to a Native American elder woman who was a respected potter. She wore a copper bracelet all the time. I asked how come she did so, because it turns your skin green, and so many other Indians just wore silver and turquoise. She explained that she had arthritis in her hands and the copper really helped her pain.

Turquoise, also a copper-based mineral, has the same effect, except that it is also respected by Indians as a link between the Blue Road of Spirit and the Red Road of Blood.

Astrologically, copper corresponds with the planet Venus, the planet ruling the capacity to love and be loved. Most people want to "have" love, but they are usually unaware that they already "are" love, and hence they are often not generous with their capacity to give love, apart from reinforcement of their own subjective values, or gratification of their emotional or physical needs. Copper strengthens the Venus energy in one's birth chart so that a person can give and receive love in a more enlightened manner.

ALAN ZEIGLER SINKHOLE DEDICATION!

What wonderful news concerning about the preservation of areas of scientific interest here in Hawai'i! Since the Hawaiian islands are so isolated, the presence of eagles, owls, ducks, and geese in these sinkholes by Kapolei boat harbor is especially noteworthy. Keith Krueger was pleased to share this news, and to tell that Bill and other members of our rock club presented testimony to the city council. Funds have been set aside of zoning and education.

Rock & Mineral Society of Hawai'i, Inc.

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The Rock & Mineral Society meets on the 4th Wednesday of each month (except for adjusted dates in November and December) at the Makiki District Park, 7:00 - 9:00 pm. Enter from Keeaumoku Street. Parking is free but limited.

The Newsletter is published monthly, some days prior to the meetings and is distributed in electronic format by email (Adobe Acrobat PDF file attachment). Printed copies are "snail" mailed to those who do not have email. The electronic format usually contains full-color images; the print version may be limited to B&W due to reproduction costs.

Any newsletter comments are appreciated, and can be sent to elise.thomasson@gmail.com

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