

# HUI PŌHAKU 'O HAWAI'I

## Rock & Mineral Society of Hawai'i, Inc.



VOLUME 44, NO. 1

OCTOBER 2008

### ORANGE AND BLACK MINERALS

BY DEAN SAKABE

Happy Halloween everyone! In order to celebrate the season, we will be highlighting Orange and Black minerals this month. We will be starting with the one mineral which spans both colors.

Diamonds, an addition to colorless, also occurs in both Orange and Black. Orange diamonds are one of the rarest of the fancy-colored diamonds. For a diamond to earn the classification of orange, there has to be absolutely no brown present in the diamond at all. Many diamonds look orange, but may not actually have the orange classification due to the brownish undertones.

Because this diamond is so infrequently found, no one actually knows how it is formed. Nor is it known what impurity in the stone causes the orange color, or if it is under any particular set of circumstances during the formation of the diamond which caused the orange hues to form.

Black Diamonds (2) were discovered in Brazil in the 1840's. These little pea-sized diamonds are made up of many tiny crystals that are all black in color, and are used as industrial diamonds. Called Carbonado's, they are not associated with any kimberlite pipe, nor do they have the some of the pyrope and forsterite inclusions found in other diamonds. Instead, they are found in younger sedimentary rocks with inclusions of minerals from the earth's crust compositions i.e. Silicon, silicon Carbide, Iron and Nickel. In short, how these Carbonado's formed or got to Brazil is a mystery. A notable black diamond found in Brazil was the Black Diamond of Bahia: its rough state weighed around 350 carats. This particular diamond was so hard that it could not be polished.



(Courtesy Harry Winston)

(1) (The Pumpkin diamond ring, the world's largest orange diamond ring.

The Harry Winston-designed ring was made for Best Actress winner Halle Berry, who wore the ring to the 2002 Academy Awards. It is the world's largest vivid orange diamond ring (5.54 carats), valued at just over 3 million dollars.)



(2) (Black Diamond, Bahia, Minas Geraes, Brazil )

#### ROOM CHANGE!

PLEASE BE AWARE THAT WE WILL NOT BE MEETING IN THE ARTS AND CRAFTS ROOM. WE WILL NOW BE MEETING IN THE ADMINISTRATION BUILDING. THERE WILL BE HELPFUL SIGNS, TOO!

#### MEETING

Wednesday

October 22

7:00—9:00 pm

Makiki District

Park

Administration

Building

#### NEXT MONTH

Tourmalines

#### LAPIDARY

Starts September

11

Every Thursday

7pm-9pm

Second-floor Arts

and Crafts Bldg

Makiki District

Park

#### MEMBERSHIP

COSTS

2008

Single: \$10.00

Family: \$15.00

# Rock and Mineral Society of Hawai'i INC.

## Orange and Black Minerals, page 2

Quartz is found in many different colors. The word 'citrine' comes from the same word as 'citrus' - like the oranges and tangerines you eat at lunch. Other minerals that can be orange include heulandite, zircon, and topaz.

The most valuable fancy sapphire is an orange-pink or pinkish-orange sapphire called "padparadscha" after the lotus blossom(3). Padparadscha sapphires are very rare and the exact definition has always been a matter of debate: different dealers and different laboratories around the world disagree on the exact color described by this term. Some dealers even argue that the term should not be limited to the pastel shades of Sri Lankan sapphires but should also include the more fiery shades of reddish-orange from the Umba Valley in Tanzania. Padparadscha sapphires sell at a premium, nearing the price for a fine blue sapphire. A similar color was recently achieved when light pink sapphires were heated in a beryllium rich environment. A padparadscha like color was achieved, and were selling at very high premiums until the beryllium was detected and the enhancement was defined.

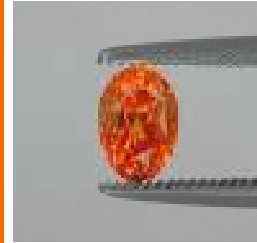
The "Sunkist" Orange Garnet is a newcomer to the Gem Markets. Discovered in 1992 in Namibia near the north border with Angola. The trade name is Mandarin Garnets, and they are mined in wasteland conditions with temperatures reaching 140° F in a desert area populated by Angolan soldiers who have fled their homeland. Mandarin Garnets are part of the Spessartite Garnet species and has a hardness of 6-6.5. Its uniform, vivid color of pure Orange sets it apart from other Orange stones. These garnets take a very good polish, and make a beautiful gemstone.

Crocoite (lead chromate), (4) is an unusual lead mineral that is a very beautiful and colorful specimen. Crocoite is well known for its distinctive orange-red color. Its main source of quality specimens comes from the Dundas District of Tasmania, Australia. The crystals there are usually long

thin prisms. However, large crystals from this locality have been scarce in the past thirty years. Most specimens now do not have any crystals over 5 cm long. Crocoite's high density and luster are the result of its lead content. Some Crocoite aggregates are composed of bars and splinters of differing sizes going in a dozen different directions, which produces a certain character to these specimens that is distinctive of crocoite. Crocoite is also one of the very few chromate minerals.

Imperial Topaz (5) is a golden-yellow gem variety of Topaz. Topaz is a common gemstone that has been used for centuries in jewelry. Its golden brown to yellow color is classic but is confused with the less valuable citrine, which is sold under the name topaz. The blue topaz that is often confused with aquamarine is rarely natural and is produced by irradiating and then heating clear crystals.

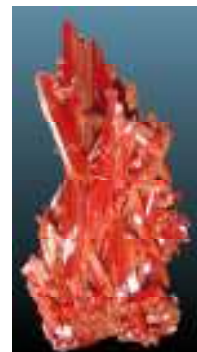
The structure of Topaz is controlled by a chain like structure of connected irregular octahedrons. These octahedrons have aluminum in the middle that is surrounded by four oxygens. Above and below the aluminum ion are the hydroxide or fluoride ions. The chains of octahedrons are held together by individual silicate tetrahedrons, but it is the octahedron chains that give topaz its crystalline shape. Topaz is the hardest silicate mineral and one of the hardest minerals in nature. It has a perfect cleavage which is perpendicular to the chains and is caused by planes that break the weaker Al-O, Al-OH and Al-F bonds. None of the stronger Si-O bonds cross these planes. Topaz crystals can reach the incredible size of several hundred pounds. Topaz can make very attractive mineral specimens due to their high luster, nice colors and well formed and multifaceted crystals.



(3) Orange Sapphire : Sri Lanka



Spessartine Garnet, Madagascar



(4) Crocoite : Adelaide Mine, Dundas, Tasmania



Imperial Topaz : [Ouro Preto, Minas Gerais, Southeast Region, Brazil](#)

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## Orange and Black Minerals, page 3

Fire Opals (6) are something unique in the splendid world of Opals. Even in ancient times, in India, and Persia, and in the empires of Central America, they were cherished as symbols of deepest love. Such gemstones sparkling with utmost vividness like Fire Opals were believed to have originated in the waters of paradise. Mayas and Aztecs loved it for jewelry and used it also for mosaics and religious cults. It was named "Quetzalitzlipyllitli", which means "Stone of the Bird of Paradise". But then came a time when the gemstone knowledge handed down from generation to generation in Mexico was almost completely forgotten until the year 1835 when the fiery treasures hidden in the Mexican highlands were remembered, and systematic mining was slowly beginning. Today Fire Opal is considered as the National Stone of the Mexico.

Mexico has the most important locations of Fire Opal in the world. The Mexican plateau with its many extinct volcanoes is threaded and veined with opaline rock. With only few exceptions, the gemstone is hidden in niches and caves and is mined above the surface, so that in the areas of occurrence, you will come across canyons with walls rising up to heights of up to 60 meters, and labyrinthine routes carved into the mountains. But the fire opal is not confined to Mexico, sometimes the orange red gemstone is also found in other countries in the world., like in Honduras or Guatemala, in the USA, Canada, Australia, Britain, or Turkey, but most of these occurrences are without considerable economic value. This is different for Brazil: in an agate mine near Campos Borges in the South Brazilian state of Rio Grande do Sul, there are yellow and orange colored Fire Opals that were discovered some years ago, and these stones are set apart by their beautiful color, which often appears slightly dimmed, but is not opalescent. Their vivid and warm orange varies in all shades and hues between yellow and red, and is sometimes set against a brownish underground. Especially remarkable is the size of the rough stones. Some achieve a size of a fist and thus allow for completely

new approaches of design. These Brazilian Fire Opals today provide afresh accent in the fascinating world of gemstones.

The orange variety of zircon (7) is called Jacinth (also spelled Hyacinth). The name Zircon is originated from Persian *Zargun* which means "gold color". Zircon is a silicate mineral, zirconium silicate. The high refractive index and dispersion of zircon actually cause it to approach the diamond in fire and brilliancy. Zircon is widespread as an accessory mineral in acid igneous rocks, it also occurs in metamorphic rocks and fairly often in detrital deposits. It occurs in beach sands in many parts of the world, particularly Australia, India, Brazil, and Florida. Gem varieties occur in stream gravel deposits, particularly in Indochina and Sri Lanka, but also in Burma, Australia, and New Zealand. Zircon forms an important part of the syenite of southern Norway and occurs in large crystals in Quebec. Zircon is also found in Cambodia, France, Myanmar, Thailand, Nigeria and Tanzania.

Carnelian or cornelian, from the Latin words *cornu*, "horn", and from *cornum*, "cherry," and from *carnis* "flesh or meat." The red color comes from iron inclusions. There is confusion both with the name, and the derivation. Since the color can vary from yellow to almost red, perhaps people invented some of the names. One of the most common, but to most people surprising, alterations is done to make carnelian. Agates which originally are white or slightly colored are made red by heating the stones in a muffled furnace to bring out the red of the iron trapped within the stone. A red presence is important. The ancient western Indian agate bead industry has been predominant for millennia because the stones were sitting in a layer of red silt, and over the eons, the local agate absorbed iron. The bead industry of Idar-Oberstein, Germany, relies on stones from Minas Gerais, Brazil, but they is no natural iron in them, so they must be soaked in an acid bath with dissolved iron before being heated to turn red. The carnelians from Pacitan, Indonesia are similarly heated to bring out the color.



(6) Fire Opal : Botallack Mine, Botallack – Pendeeo area, St. Just District, Cornwall, England, UK



SPEZZARTINE & ELBAITE ; SAN PIERO, ISOLA ELBA, ITALY



(7) Orange Zircon : Chanthaburi, Thailand



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## Orange and Black Minerals, page 4

We shall start the examples of black minerals with the other elemental carbon, Graphite. Graphite is the stable form of carbon. It has a sheet like structure where the atoms lie in a plane, with very weak bonds with the graphite sheet above and below. This makes graphite a very good lubricant. Oddly enough it is this two dimensional bonding has been developed into one of the highest strength composite used in automobiles, aircraft, and golf clubs. Graphite sheets are rolled up into fibers, and the fibers are twisted into threads, which are then held in place with resins result in "carbon fiber" materials, which have the highest strength to weight ratios of any material.

Bixbyite, (9) this Manganese Iron Oxide usually forms modified cubes of less than 1 centimeter wide. Bixbyite is associated with other minerals such as Imperial Topaz, and it makes very attractive arrangements with Bixbyite.

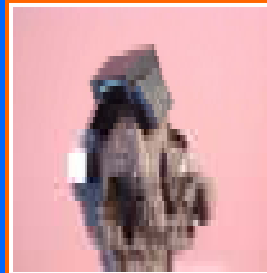
Sphalerite, (10) a Zinc Iron Sulfide, has excellent luster and is associated with many other minerals, which makes for very desirable specimens. Sphalerite is associated with Galena, Pyrite, Fluorite, Calcite, and Quartz. Sphalerite is also an important Zinc ore, for which it was mined.

Covellite (11) is a copper sulfide, which is not well known outside of the lapidary realm. It has a deep metallic indigo blue mixed in a black body. Butte Montana has the most prized samples of Covellite.

Franklinite (8) is a Zinc Iron Manganese Oxide, found in the Franklin from New Jersey, a world famous locality that has produced many exotic mineral species. It is found in large enough quantity to be mined for zinc and manganese that are two very important strategic and industrial metals. Specimens from Franklin often contain the rounded black grains of franklinite surrounded by white calcite and/or greenish Willemite with a sprinkling of red zincite. Note when viewing the specimen under long wave ultraviolet light, the Calcite will fluoresce red. The Willemite will fluoresce

Green. Franklinite does not fluoresce, it will just stay black.

Augite (12) is silicate whose name is derived from the greek word *Augites*, which means "brightness", an allusion to its relative high luster seen on some exceptional specimens. It is an important rock-forming mineral in many igneous rocks, especially gabbros and basalts, and is also found in some hydrothermal metamorphic rocks. Augite is a part of the solid solution series of the pyroxene group. Augite is the intermediate member of the series, which contains percentages of sodium and aluminum that are mostly lacking in diopside and hedenbergite. Mineral specimens of augite, while ordinarily unattractive and not very interesting, can have some specimens that are very striking in appearance and are of interest to many mineral collectors. Augite is included in this discussion, because as Reivan can be found on Haleakala at some of the lookouts. So on your next visit up there look for the little shiny crystals on the footpath!



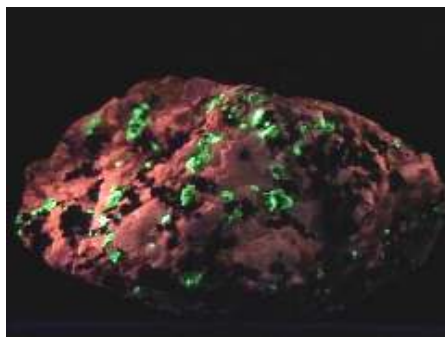
(9) Bixbyite, Thomas Range, Juab County, Utah



(10) Sphalerite and Calcite, San Antonio, Chihuahua, Mexico



(11) Covellite, Butte, Montana



(8) Franklinite in Calcite with Willemite Franklin, Sussex County, New Jersey

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## News and Notes, page 5

### 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](http://pohakugalore.net/Hui_pohaku/Hiu_pohaku_1.html)

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



(12) Augite

### 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.

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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](mailto:elise.thomasson@gmail.com)

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