

OPALS OF MEXICO INFORMATION



Composition Of Opal

Opal is made up of microscopic spheres of Silica quartz (without the quartz crystal structure), ranging in size from 200 to 300 nanometers in diameter at one time play of color was thought to be due to the interference of light as it passed through the microscopically thin layers of spheres.

Interference is the phenomenon that creates the iridescence. 'Play of Color' is caused by a combination of diffraction and interference; it works like this. Waves of light passing the edge of an object are bent slightly as they pass, a characteristic called diffraction. If two edges are close enough to form a narrow opening the waves fan out, bending around both edges, the waves of the fan begin to overlap like the waves of the ocean when they pass through the pilings of a pier. The overlapping causes interference-certain spectral colours are intensified and others are cancelled out.

The silica spheres in opal are close-packed, the spaces between them act like narrow openings through which light is diffracted, the diffracted light gives birth to the intense spectral colours of opal. The colours visible in an opal depends on the size of the spheres and the voids between them.

Occurrences

The opals occur in sedimentary rocks or where low temperature solutions bearing silica can percolate through rocks. Mexican opal occurs in siliceous volcanic lavas, in cavities and in many localities. Hyalite and precious opal that is completely transparent, colourless and rich in fire occurs at Queretaro (Tequisquiapan mines), Jalisco (Magdalena mines), San Luis Potosi, Chihuahua, Hidalgo. Fine Mexican opal is very rare in large sizes - over 50 carats.

Opal mines are usually in between the mountains of igneous rocks, where you can also find obsidian and volcanic glass, the ground in those places is very dry and the vegetation is mainly cactus. The color of the rocks vary from one region to another, going from a deep blood red to gray or pale white. The best opals in Mexico come from regions of mountains with volcanic lava.

Inclusions

The most common type of inclusion are black needle crystals (see arrow in photo). Many of these crystal inclusions had at least partially altered to goethite and many had almost botryoidal coating of hyalite opal, which was likely deposited at an earlier time than the precious opal. The dark needle like inclusions appear like distorted hexagons in cross section, many are brownish red in color, probably because they have altered to goethite, several of the inclusions have a coating of hyalite opal.

Occasionally the center of an opal is cloudy or even hollow, this inclusion is called 'huevo' meaning egg.



TYPES OF OPALS

SILICEOUS SINTER, GEYSERITE: that is a massive, glassy opal that forms around hot spring and geysers.

DIATOMACEOUS EARTH TRIPOLI: fine grained, powdery masses of opal of the siliceous remains of microscopic marine animals called diatoms.

PSEUDOMORPHOUS: opal may in percolating through the ground, replace wood, bone and shells.

HYALITE: transparent, colorless, or white to gray generally no gem significance.

COMMON OPAL: opaque or glassy opal, in a wide range of colours sometimes with a waxy luster, often fluorescent.

WATER OPAL: transparent, colourless opal that may have fire in it.

FIRE OPAL: transparent to translucent red or orange which, may not have fire in it, the term fire opal refers to a body color not to a play of color.

PRECIOUS OPAL: opal of any color with fire.

WHITE OPAL: white body-color opal usually with play of colour.

GRAY OPAL: light to dark body color with play of colour superimposed.

BLACK OPAL: black body color with fire. body colour also very dark, bluish, greenish, or brownish.

MILK OPAL: milk white translucent, also yellowish or greenish in color.



From the mines of La Trinidad in Tequisquiapan, Querétaro.

CRYSTAL OPAL: water opal or milk opal, generally rich in fire, transparent to translucent in transmitted light, colors seen by reflected light.

CONTRA-LUZ OPAL: very rare type usually from Mexico with color play in both transmitted and reflected light.

HYDROPHANE: light colored, opaque becomes iridescent and transparent when soaked in water.

JASPER OPAL: reddish-brown opal, opaque, resembles jasper.

CACHALONG: porcelain ferrous, often bluish-white very porous.

PRASE OPAL: translucent or opaque green opal a common opal resembling prase.

MOSS OPAL: white to brownish opaque opal that contains dendritic inclusions.

MENILITE: opaque gray to brown opal with a concetionary structure.

TABASHEER: opaline silica occurring in the joints of bamboo.

GIRASOL: opal that is almost transparent and has a billowy light-effect within it, resembling moonstone.

CRYSOCOLLA IN OPAL: blue material, with finely disseminated chrysocolla that gives the color.

LIVER OPAL: term used sometimes to describe brown opal.

RESIN OPAL: yellowish brown common opal with a waxy luster.

TERMS FOR COLOR IN OPAL

FIRE: the term fire refers to the magnificent play of color displayed by opal which is due to light diffraction from neatly stacked layers of the microscopic spheres of which opal is composed. Common opal is a jumble of spheres of random sizes, but in precious opal the spheres are the same size and they are layered in neat rows the particular color depends on the size of the spheres and the angle of viewing.



ONYX OPAL & AGATE OPAL: alternative layers of precious and common opal. In cats eye opal the color play is concentrated in the form of an eye or band. Matrix opal consist of specks of precious opal in a rock matrix usually sandstone, matrix opal may also be layers or stringers of opal in matrix.

FLAME OPAL: sweeping reddish streaks, bands move across the gem, resembling flickering flames.

FLASH OPAL: as the gem is moved back and forth flashes of color appear and disappear at various spots.

HARLEQUIN OPAL: the color display is in the form of angular patches, all in contact with each other like mosaic.

PINFIRE OPAL: the color is in the form of tiny dots, set close together.

PEACOCK OPAL: many colors appear in the same gem resembling the display of the tail of the male peacock.