

## QUARTZ; GEMS WITH CURIOUS INCLUSIONS

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Basic definition of inclusions may be given as trapped foreign materials or irregularities in a gemstone. They simply reflect the formation conditions regardless of the gemstone's origin, natural or lab-grown. While natural inorganic gems contain other mineral crystals and structural defects, organic gems such as amber may contain plant and insect remnants. Similarly, inclusions in synthetic or man-made gemstones reflect their growth conditions, for example, platinum platelets in a flux grown synthetic ruby crystal or free-standing air bubbles in glass. All these foreign structures would indicate the origin, almost as if a hidden message to the gemologist who can observe well and decipher the language. Gemologists love inclusions and in most cases, call them clarity characteristics rather than "imperfections" as they used to be called in the past. Observing a gemstone with magnification is fun detective work to the gemologist and hobbyist alike. Not only can we establish the nature of the gemstone in most cases, but also gain a plethora of information about its treatment status.

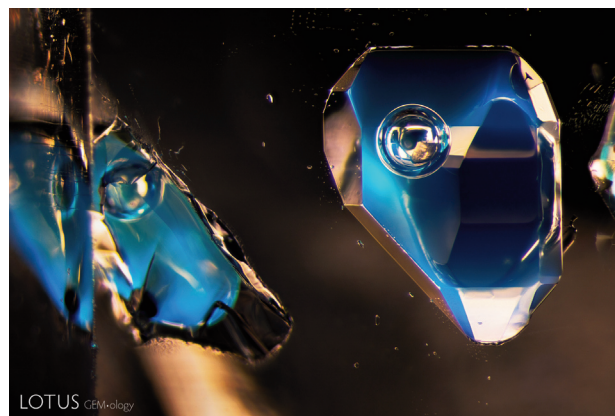
Inclusions are not appreciated for identification or grading purposes only. There are many gemstones containing eye visible inclusions that are rare and aesthetic, therefore desirable. Quartz group gemstones with different inclusions are a great example. Varieties such as tourmalinated or rutilated quartz have been known for their unusual patterns almost like artwork trapped in a transparent three-dimension-



*Rutilated quartz, black onyx, diamond, and gold necklace by Jean-François Albert. Courtesy of Heritage Auctions.*



*Tourmalinated quartz, diamond, platinum, and gold earrings.  
Courtesy of Heritage Auctions.*



*A cavity in quartz filled with petroleum. In dark field, the petroleum displays a yellow appearance. When illuminated with a longwave UV torch, the petroleum fluoresces and displays a blue appearance. Courtesy of Lotus Gemology, Hyperion. Photo by E. Billie Hughes.*

al sculpture. Black and rarely other colors of tourmaline needles and colorless quartz create a dramatic contrast without a particular pattern. On the other hand, metallic rutile needles tend to form in bundles and twinned structures so they create amazing star-like patterns. If the rutile needles are fine and golden colored, regardless of the pattern, they are known as "Venus' Hair" because it resembles shiny blonde hair attributed to the Greek Goddess Venus. There are other solid crystal inclusions in quartz that are cherished by the collectors and designers. For example, strawberry quartz is rock crystal, and sometimes pale amethyst, with small, bright red hematite platelets.

Although rare, blue dumortierite or violet fluorite crystals are also seen in clear quartz.

Another curious example is oil in quartz whereby large negative crystals containing not only gas bubbles but also two different liquids that do not mix. The darker liquid is mostly petroleum, and will fluoresce under an ultraviolet light source. If the negative crystals, basically the regular voids formed during growth, are big enough, the gas bubbles may be moving. These structures are known as enhydro and highly popular collector specimens. ♦

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