Figure 39. The molybdenite inclusions in the Chilean quartz display a characteristic lead-gray color and platy hexagonal form. Photomicrograph by John I. Koivula; magnified 10×.

from the Golconda mine, Minas Gerais, Brazil, which was provided by Luciana Barbosa of the Gemological Center in Belo Horizonte. Prominently displayed under the table facet was a most unusual rutile inclusion pattern.

The inclusion formation consisted of numerous densely packed parallel light yellowish brown needles of rutile that were swept back at an angle from a central opaque silvery black inclusion of hematite. The plane of this inclusion combination was oriented just slightly off-parallel to the plane of the table facet. As shown in figure 40, this orientation allowed the inclusion pattern to reflect light without interference from any reflection off the table facet. The precise epitaxial growth of rutile needles from the hematite, together with their dense, parallel formation and simultaneous reflectance, created the appearance of moth wings, while the contrasting black hematite formed the insect's "body" (figure 41). Through the years we have examined many fine examples of rutilated quartz. This is the first such hematite-rutile "moth" pattern we have encountered, so in our estimation this stone is not just unusual, it is unique.

John I. Koivula and Maha Tannous

Figure 40. Oriented rutile needles extending from the edges of a hematite plate form an unusual moth-shaped inclusion in this 13.97 ct rock crystal from Brazil. Courtesy of Luciana Barbosa; photo by Maha Tannous.

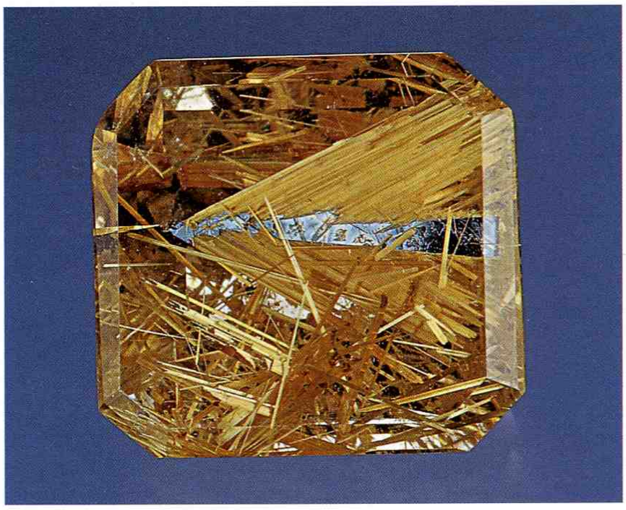


Figure 41. The orientation of the rutile inclusions, together with their dense, parallel formation and simultaneous reflectance create the appearance of moth wings, while the contrasting black hematite forms the "body." Photomicrograph by John I. Koivula; magnified 10×.

SYNTHETICS AND SIMULANTS

Synthetic Verneuil corundum with unusual color zoning. During a trip to Sri Lanka in mid-2004, one of our clients purchased, among other faceted corundums, a red 1.05 ct modified round brilliant with unusual color zoning. Refractive indices of 1.760–1.770 and a hydrostatic S.G. of 4.00 confirmed that it was corundum.

Viewed face-up, the sample appeared uniformly purplish red (figure 42, left). From the side, however, it appeared very light blue in the crown portion, while the culet area was purplish red (figure 42, right). Such color zoning has been observed in various colors of sapphire from Songea (Tanzania) and Sri Lanka, especially in blue and orange stones. A strong red fluorescence to long-wave UV radiation was observed in the culet area, and Raman spectroscopy confirmed that both parts were corundum.

With magnification, it became obvious that this was a Verneuil (flame fusion) synthetic sapphire, as numerous gas bubbles were visible in the very light blue portion (figure 43). When immersed in methylene iodide, the bound-

Figure 42. This 1.05 ct synthetic corundum appears uniformly purplish red when viewed face-up (left), while the color zoning is clearly visible from the side (right). Composite photo by H. A. Hänni, © SSEF.

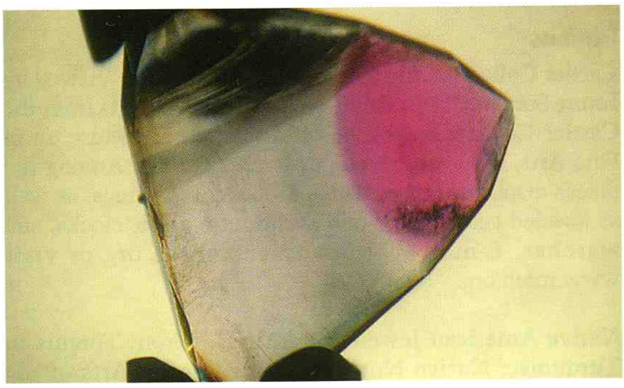
Figure 43. Gas bubbles appear to be radiating from the center of the color-zoned synthetic corundum (5.0–5.2 mm in diameter). Photomicrograph by H. A. Hänni, © SSEF.

ary between the purplish red and very light blue zones appeared curved (figure 44). However, no curved striae were observed in the purplish red portion. A qualitative chemical analysis of the table facet by EDXRF showed only Al; no Ga was detected, as expected for a flame-fusion synthetic corundum.

These observations indicated that the sample was cut from a color-zoned boule of Verneuil synthetic corundum, with the purplish red part representing the small center of the otherwise very light blue boule. This also explained the large fissures observed perpendicular to the growth direction (again, see figure 44). Verneuil boules usually have some tension along their growth axis along which they are split before being cut. Obviously this was not done in this case, and therefore the tension cracks developed.

Lore Kiefert (gemlab@ssef.ch)
SSEF Swiss Gemmological Institute, Basel
HAH
KS

Figure 44. With immersion, the curved growth boundary in this synthetic corundum (4.7 mm from table to culet) is clearly visible. The gray area at the top of the image is a tension crack. Such fractures are characteristically oriented perpendicular to the growth axis of the boule. Photomicrograph by H. A. Hänni, © SSEF.



Imitation clam "pearl." Throughout history, shell material has often been fashioned to resemble true pearls and non-nacreous "pearls," sometimes for the purpose of deceiving the consumer. The West Coast laboratory, for example, recently inspected several specimens of conch shell that were carefully and convincingly fashioned to mimic conch "pearls." Even more recently, this contributor examined an item that at first appeared like a natural pearl-like calcareous concretion (figure 45). It was donated to GIA by Bill Larson of Pala International, Fallbrook, California, who had obtained it at a jewelry store in La Paz, Baja California, Mexico. The store had about a dozen of these samples, which were represented to Mr. Larson as "genuine clam pearls" that had been polished. However,

Figure 45. This imitation clam "pearl" (17.5 × 10.8 × 10.2 mm) proved to be polished shell material from an unknown mollusk. Photo by Maha Tannous.