Figure 8. A partially tapered bipyramid sapphire inclusion within a sapphire. Photomicrograph by Britni LeCroy; field of view 2.90 mm.

surface also showed moderate-order birefringence colors; these represented the shared interface between the host's crystal lattice and the inclusion's crystal lattice (figure 8). External local fingerprints also terminated around the crystal's end point. Negative crystals within the inclusion showed tabular hexagonal habit (figure 9, left). When the host sapphire was exposed to temperatures below the freezing point of water, a CO_2 bubble was seen within the largest negative crystal (figure 9, right). A sapphire with this inclusion combination is rarely seen.

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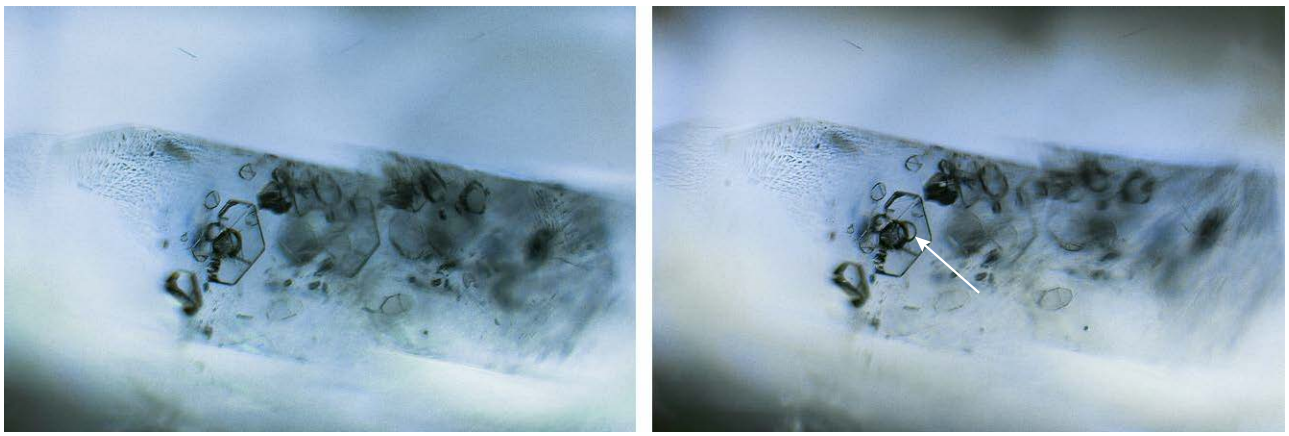
Curved Banding in Flame-Fusion Synthetic Sapphires

Most synthetic ruby and sapphire on the market is grown by Verneuil flame fusion. It can usually be separated from natural corundum by its distinctive curved banding, in contrast to the angular zoning seen in natural stones. Gemologists may see these features in the microscope when using darkfield or brightfield illumination. This zoning can also be seen with use of a short-wave fluorescent light, as noted in *Ruby & Sapphire: A Gemologist's Guide* (R.W. Hughes et al., Lotus Publishing, Bangkok, 2017).

Figure 9. Left: Negative crystals with tabular hexagonal habit within a euhedral sapphire inclusion. Right: A CO_2 bubble appears within the largest negative crystal (see arrow) after the stone was exposed to temperatures below the freezing point of water. Photomicrographs by Britni LeCroy; field of view 1.76 mm.



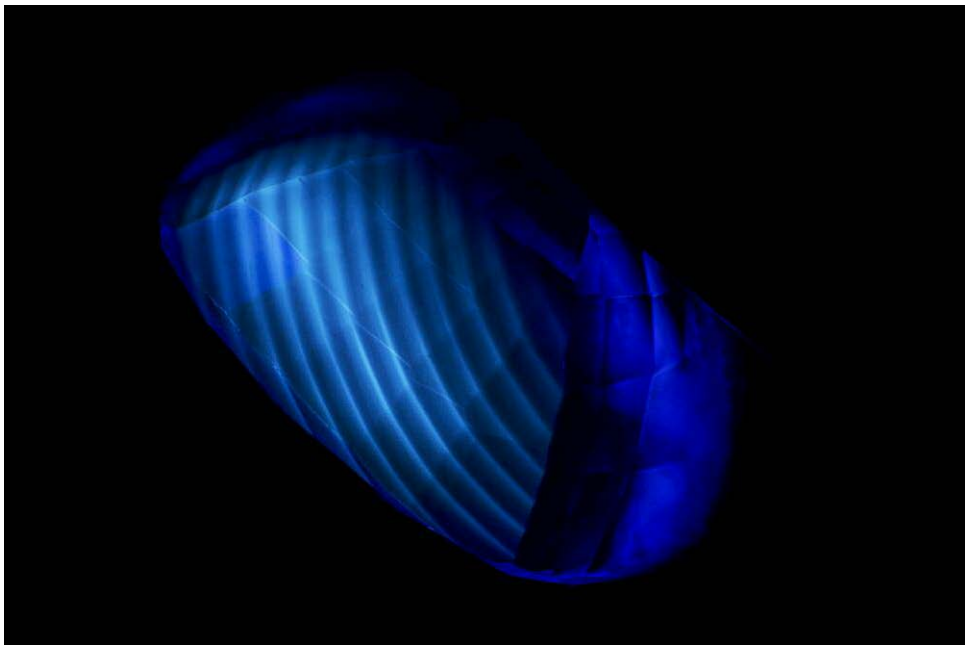


Figure 10. Curved banding is easily spotted in this flame-fusion blue synthetic sapphire when illuminated with the Magilabs deep-UV fluorescence system, a short-wave UV source. Photomicrograph by E. Billie Hughes; field of view ~13 mm.

Recently the author noticed two excellent examples. When viewed with the Magilabs deep-UV fluorescence system (a proprietary short-wave UV source), the curved banding in the synthetics was clear (figures 10 and 11), allowing them to be easily separated from natural corundum. Gemologists using a DiamondView may see the same reaction.

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Iridescent Tabasco Geode

Tabasco geodes are a small geode variety named for the area where they are mined in the Mexican state of Zacatecas, near the city of Tabasco. Typically, these geodes are lined with water-clear drusy quartz, but the author recently examined one that was filled with greenish blue botryoidal chalcedony that also showed iridescent colors (figure 12). The cause of the colors was not immediately

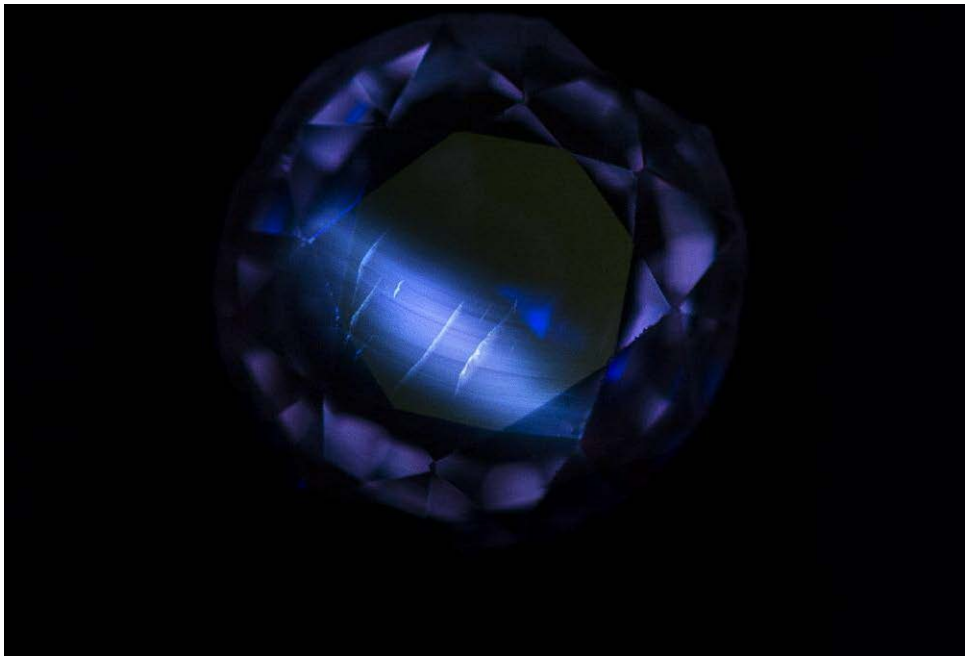

Figure 11. Observed with a short-wave UV light source, the sample displays curved banding, a telltale sign of a flame-fusion synthetic sapphire. Photomicrograph by E. Billie Hughes; field of view ~24.5 mm.