Gem Notes

COLOURED STONES

Red Beryl in Matrix, Cut as Cabochons

It is always interesting to see innovative uses of gemstone raw materials, particularly for high-value gem varieties. During the 2017 Tucson gem shows, this author saw one such example—for red beryl from the Wah Wah Mountains of southwest Utah, USA. The Ruby Violet mine was the only commercial source of gem-quality red beryl, but it closed several years ago, making this very rare beryl variety even rarer.

Figure 1: These cabochons (8 × 6 mm each) are cut from red beryl interspersed with its associated altered rhyolite matrix. Photo by Jeff Scovil.

At the booth of Robert and Patricia Van Wagoner (Beija-flor Wholesale, Haiku, Hawaii, USA), there were dozens of calibrated cabochons cut from red beryl in matrix (e.g. Figure 1). Various patterns were displayed by the light-coloured, altered rhyolite matrix against the deep red-to-pink beryl, ranging from random-appearing intergrowths to linear patterns that resulted from the crystallization of the red beryl along thin veinlets in the host rock (see, e.g., Figure 9 of Shigley et al., 2003). The cabochons were cut in various shapes (round, pear and oval), and ranged from 4 mm in diameter to 9 × 7 mm. Although it is common for red beryl to be clarity enhanced, these cabochons reportedly were untreated.

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Reference

Shigley J.E., Thompson T.J. and Keith J.D., 2003. Red beryl from Utah: A review and update. *Gems & Gemology*, **39**(4), 302–313, http://dx.doi.org/10.5741/gems.39.4.302.

Ceruleite from Chile

Ceruleite is a blue hydrous copper aluminium arsenate, $Cu_2Al_7(AsO_4)_4(OH)_{13} \cdot 12(H_2O)$, that is rarely encountered as a gemstone. Although originally described in 1900 from Chile, gem-quality ceruleite was first documented from Bolivia by Schmetzer et al. (1978). Subsequently, gem-quality material from Chile was mentioned by Schmetzer et al. (1983). Like turquoise, ceruleite is typically polished as cabochons. At the 2016 Tucson gem shows, we encountered ceruleite from Chile that was faceted and contained various impurities. The stones were offered by Mauro Pantò (The Beauty in the Rocks, Sassari, Italy), who had approximately 20 pieces weighing 1.0–2.5 ct. Pantò indicated the rough material came from Mina El Guanaco in the Taltal area of the Antofagasta Region, Chile. He kindly donated a 1.45 ct stone to Gem-A, and it was examined by authors CW and BW.

The gem was cut in a modified octagonal shape and measured 7.15 × 6.90 × 5.02 mm (Figure 2). It was opaque and showed an overall intense blue colour (World of Color 5B 7/8), with some dark brown, white and green areas corresponding to impurities. The RIs could not be obtained, probably due to the stone's poor polish. The hydrostatic SG was 2.69, which is lower than the value of 2.80

Figure 2: This 1.45 ct stone consists of intense blue ceruleite with dark brown, white and green impurities. Gift of Mauro Pantò; photo by B. Williams.

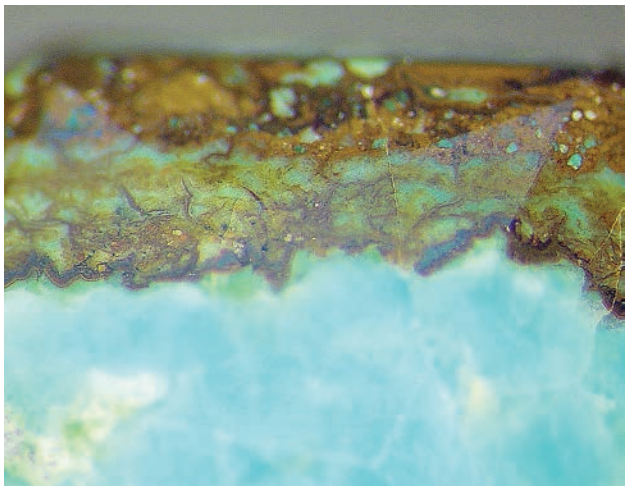

Figure 3: This closer view of the pavilion side of the stone in Figure 2 shows the veined appearance of the iron staining and associated matrix material, as well as the green and white impurities in the ceruleite. Photomicrograph by C. Williams; magnified 50×.

typically reported for ceruleite, but is similar to the SG of 2.70 determined by Schmetzer et al. (1978) on polycrystalline mater-ial. The blue areas of the sample were confirmed as ceruleite using an Enwave 785 Raman spectrometer, by comparing the spectra to the RRUFF database.

Microscopic observation of the blue areas revealed a polycrystalline texture, while the dark brown areas showed vein-like patterns (e.g. Figure 3) that resembled the iron-stained matrix commonly seen in turquoise and the white areas locally contained tiny open vugs. According to analytical work done by German mineralogist Gunnar Farber, the green inclusions consist of schlossmacherite, a sulphate mineral of the alunite group with the formula $(H_3O)Al_3(SO_4)_2(OH)_6$.

The reported hardness of 5–6 on the Mohs scale makes ceruleite sufficiently durable for cutting and use in jewellery. Like turquoise, however, it may be sufficiently porous to require stabilization. Schmetzer at al. (1983) documented plastic-impregnated ceruleite, which was easily identified because its SG was distinctly lower (2.58) than that of untreated material, and infrared spectroscopy showed a diagnostic absorption band at 1725 cm^{-1}, as seen in stabilized turquoise.

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References

Schmetzer K., Bank H., Berdesinski W. and Kroužek E., 1978. Ceruleite—A new gemstone. *Journal of Gemmology*, **16**(2), 86–90, http://dx.doi.org/10.15506/JoG.1978.16.2.86.

Schmetzer K., Lind T. and Bank H., 1983. Stabilized ceruleite. *Journal of Gemmology*, **18**(8), 734–735, http://dx.doi.org/10.15506/jog.1983.18.8.734.

Yellow Danburite from Namalulu, Tanzania: Gemmological Properties and Chemical Composition

Danburite is a calcium borosilicate [$CaB_2(SiO_4)_2$] that is an uncommon collector's stone. It typically ranges from colourless to light brown or light yellow, although less commonly it can exhibit intense yellow coloration. In early 2008, significant amounts of gem-quality yellow danburite entered the market, mined from granitic pegmatites in the Morogoro region of central Tanzania (Chadwick and Laurs, 2008). A few years later, another deposit of yellow danburite was discovered near