Gem Notes

COLOURED STONES

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

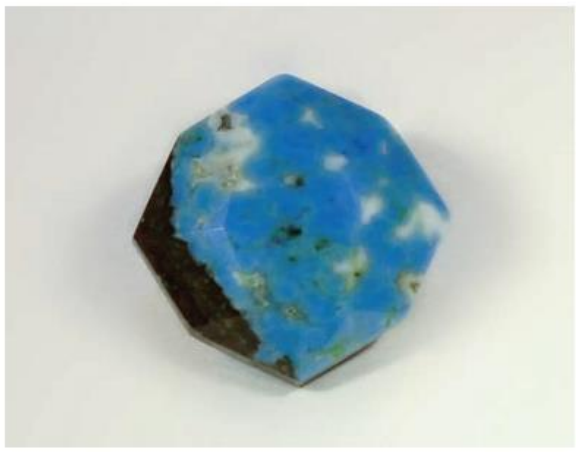

Figure 2: This 1.45 ct stone consists of intense blue ceruleite with dark brown, white and green impurities. Gift of Mauro Pantò; photo by B. Williams.

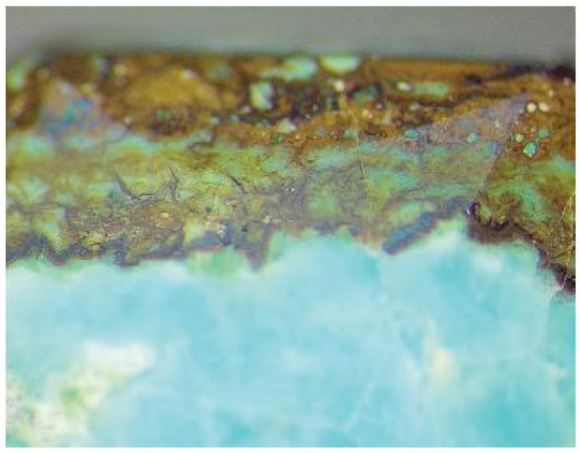

Figure 3: This closer view of the pavilion side of the stone in Figure 2 shows the veined appearance of the iron staining and associated matrix material, as well as the green and white impurities in the ceruleite. Photomicrograph by C. Williams; magnified 50×.

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

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