Gem Notes

COLOURED STONES

Almandine from Negev, Israel

In 2013, some dark red crystals were found in the southern mountains of the Negev Desert region near Eilat, Israel. This area is known to be rich in granite- and quartz-bearing rocks. Around 500 g of samples were collected during a two-month period, and a few were fashioned as cabochons, the biggest weighing 1.54 ct.

Gemmological testing was performed on seven rough samples and on one partially polished piece. They ranged from 0.38 to 0.67 g, averaging slightly over 0.4 g and measuring 4.3–7.8 mm in maximum dimension. All of the crystals exhibited a slightly flattened dodecahedral crystal form with shallow surface striations. They displayed a very dark, highly saturated, red colour with a distinct brownish tint, typical of some garnet (Figure 1). The samples were highly included, and microscopic examination revealed dark irregular-shaped crystals and an abundance of fluid inclusions with some fissures. The RI of the partially polished piece was above the limit of a standard gemmological refractometer (1.80). Most of the samples had hydrostatic SG values from 4.13 to 4.15, with a maximum value of 4.17 and the minimum of 4.10. These properties are consistent with almandine with some spessartine component.

Energy-dispersive X-ray fluorescence (EDXRF) chemical analysis with an Amptek X123-SDD spectrometer confirmed the anticipated high Fe content and a minor Mn component. A very minor amount of Ca also was detected. Absorption spectra recorded with a Unicam UV540 spectrophotometer revealed a classic almandine spectrum (peaks at 507 and 526 nm and a doublet at 573/578 nm) with weak spessartine features (409, 417, 421, 426 and 431 nm). Raman analysis with an Enwave 789 spectrometer yielded a consistent Raman shift of 915 cm^{-1}, and a comparison to the RRUFF database confirmed the garnet to be predominantly almandine.

Figure 1: These dark brownish red crystals and cabochons (0.60–1.54 ct) of almandine originate from the Negev Desert of Israel. Photo by G. Borenstein.

Due to their small size and the abundance of inclusions, these garnets are unlikely to be of commercial interest. However, based on their geographic origin, they may be related to the ancient Nofekh gem that is mentioned in the breastplate of the high priest of the Israelites. Commentaries by Philo Judaeus (Yonge, 1855) and Flavius Josephus (Court, 1770), and a passage in the *Targum Pseudo-Jonathan* (McNamara and Maher, 1994), have all pointed toward a precious stone resembling a burning coal in this breastplate, which might have been garnet.

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References

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