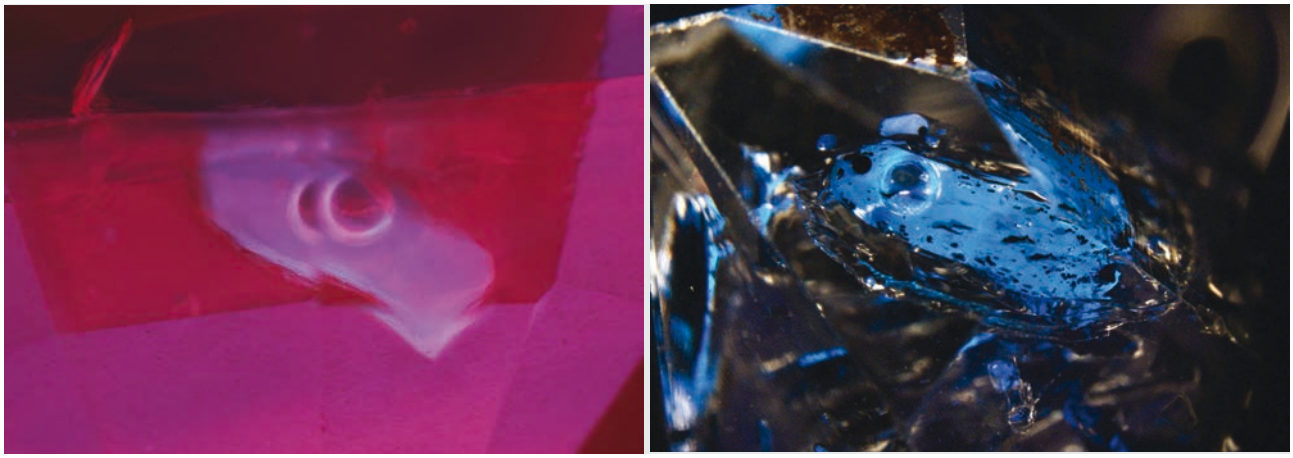

Figure 28: Left: Under long-wave UV radiation (365 nm), the petroleum exhibits a chalky blue-white reaction that was somewhat muted by the dominant red luminescence of the host spinel. Right: Such fluorescence also is displayed by petroleum inclusions in a Pakistani quartz. Photomicrographs by C. P. Smith; magnified 40×.

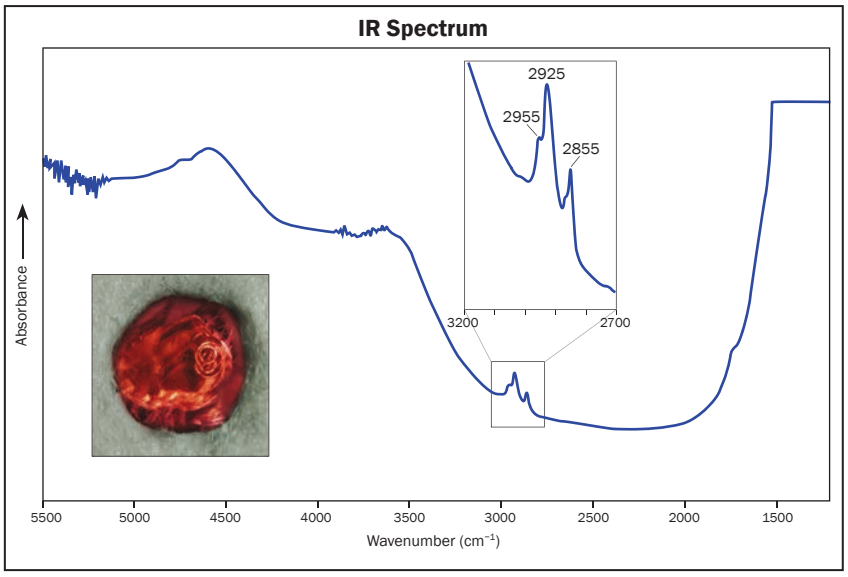

Figure 29: Focused infrared spectroscopy of the negative crystal in the spinel identified the viscous yellow fluid as petroleum, with lines at 2955, 2925 and 2855 cm^{-1}. The inclusion was isolated for the analysis by using a 1.5-mm-wide paper mask (inset photomicrograph by C. P. Smith).

Spurrite from New Mexico, USA

Spurrite is a calc-silicate mineral with the formula $Ca_5(SiO_4)_2(CO_3)$ and a Mohs hardness of 5. It typically forms in contact metamorphic rocks (in particular, skarn deposits) as granular masses ranging from colourless to greyish violet (Bernard and Hyršl, 2004). The mineral has only rarely been used for lapidary purposes (e.g. purple beads and polished slabs or freeform pieces from Mexico and south-western USA; Koivula and Misiorowski, 1986; Wentzell, 2004).

During the 2015 Tucson gem shows, Mauro Pantò (The Beauty in the Rocks, Laigueglia, Italy) had faceted spurrite from Tres Hermanas Mountains, Luna County, New Mexico, USA (cf. Homme and Rosenzweig, 1970). He had 15 pieces that averaged 3 ct each (e.g. Figure 30). Pantò kindly donated one of the spurrites to Gem-A, and the gem was characterized by authors CW and BW.

The following properties were recorded from the 1.86 ct stone: colour—greyish lilac purple; diaphaneity—translucent; RI—approximately 1.67 (indistinct, using the bright line technique); hydrostatic SG—3.00; fluorescence—inert to long- and short-wave UV radiation; polariscope—

aggregate reaction; Chelsea filter—light pinkish red; and no absorption features were visible with a desk-model spectroscope. These properties are consistent with those reported for spurrite in the literature, except that Wentzell (2004) documented faint 'cobalt'-blue long-wave UV luminescence in samples from Mexico. Microscopic examination revealed little other than minor surface-reaching fissures, grain boundaries typical of a polycrystalline material and a few tiny dark masses.

Raman analysis using an Enwave L-Series spectrometer with a 785 nm laser gave a very good match to spurrite in the RRUFF database and in our own reference spectra. EDXRF chemical analyses using an Amptek X123-SDD instrument with a DP5 preamplifier showed that Fe was the main impurity, along with minor-to-trace amounts of Mn, Cr, Zn and Pb. The presence of small amounts of mineral impurities (such as carbonates) was documented by Wentzell (2004) in spurrite from Mexico. Minute amounts of mineral impurities also were present in our sample from New Mexico, as indicated by the anomalous trace elements and the tiny black masses.

Figure 30: These translucent purple gemstones (3.14–5.73 ct) are spurrite from New Mexico, USA. Photo by Mauro Pantò.

Spurrite is dimorphous with paraspurrite, which has mostly overlapping gemmological properties but is known only from Inyo County, California, USA (Bernard and Hyršl, 2004).

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Update on Tsavorite Mining at the Scorpion Mine, Kenya

The history and mining of tsavorite at Kenya's Scorpion mine and surrounding claims was described by Bridges and Walker (2014), and since then many important developments have occurred. After a six-year hiatus, the operations were reopened in January 2015. This was accomplished after major investments in infrastructure and staffing, improved mining processes and newly implemented safety measures—all in an effort to ramp-up tsavorite production.

Among the infrastructural improvements, access roads to the Scorpion mine and outlying claim areas were upgraded for better access, and a new road to the Green Garnet 3 (GG3) operation was constructed after the old road was destroyed by past rainy seasons. The GG2 site has been renovated to repair most of the damage done by many years of illegal mining. The former 'CW' open pit (where very fine-colour tsavorite and some tourmaline were previously mined) has been reclaimed. Both the main camp and supervisor camp were restored after elephant attacks caused severe damage. The staff quarters also were upgraded to accommodate a labour force that expands to approximately 100 people during the height of the mining season. The main camp has been