Figure 25: These pale brownish yellow and greenish brown tourmalines (0.56–0.82 ct) were found to consist of dravite with a minor uvite component. Photo by Orasa Weldon.

Blauwet loaned four of the cut stones for examination (Figure 25), and authors AUF and WBS performed standard-based SEM-EDS chemical analysis using a Jeol JSM-6400 instrument with the Iridium Ultra software package by IXRF Systems Inc. The results showed that all four samples had a very similar composition that consisted of dravite with a minor uvite component (0.90–0.96 wt.% CaO). Consistent with the pale coloration, there were few minor and trace elements; MnO and FeO were present in very low amounts (0.01–0.02 wt.%), V_2O_3 was only slightly above the detection limit (0.01 wt.%) and TiO_2 and Cr_2O_3 were not detectable.

Most recently, in April 2017, Ulatowski reported obtained some matrix specimens of translucent Mwajanga tourmaline that were mostly colourless but with deep blue terminations. The future potential of the deposit is unknown, but clearly it has already produced a variety of colours of tourmaline as attractive crystals and also a limited amount of rough material suitable for faceting.

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Tourmaline (Dravite) from Simanjiro District, Tanzania

'Chrome tourmaline' is well known from East Africa (e.g. Sun et al., 2015), and in mid-2016 a significant new discovery occurred at the Commander mine in Simanjiro District, Manyara Region, north-eastern Tanzania. These tourmaline crystals first appeared on the market at the October 2016 Munich Show (Moore, 2017), and additional material was offered at the February 2017 Tucson gem shows. According to rough stone dealer Steve Ulatowski, the mine is located about 14 km from Nadonjukin village and was initially explored in 1997, but was soon abandoned. In late August 2016, a local miner referred to as 'Commander' reopened the deposit. He extended the previous workings by hand digging and blasting to ~12 m depth, where he found a large pocket that produced ~5 kg of mixed-grade crystals. A subsequent pocket was recovered that yielded an additional ~3 kg of tourmaline. The crystals were well formed with lustrous faces and ranged up to 10+ cm long. They typically were bicoloured with yellowish to orangey brown bases and green terminations (e.g. Figure 26). A few of the tourmalines were recovered on a matrix of blocky white crystals (probably calcite or dolomite), but most of them had been broken off the matrix by the miners.

Most of the tourmaline production has been sold as crystals, with only a limited amount of gem rough available. Ulatowski faceted four stones ranging from ~0.7 to 1.1 ct; two of them were bicoloured and two were pure green (again, see Figure 26). He donated a crystal fragment and loaned one of the green gems (1.09 ct) for examination. The faceted stone was characterized by authors CW and BW. It displayed an overall lively deep green colour and yellowish green/bluish dichroism. The RIs were 1.620–1.638 (birefringence 0.018) and the hydrostatic SG was 3.06. These data are very similar to those reported for 'chrome tourmaline' by Sun et al. (2015). The stone was inert to a standard long- and short-wave UV lamp, but emitted a red glow when exposed to 405 nm excitation from a hand-held laser. It ap-

Figure 26: These faceted stones (1.09 and 0.70 ct) and crystal (4.7 cm tall) consist of dravite that was recently produced from Simanjiro District in Tanzania. Photo by Jeff Scovil.

peared red under a Chelsea colour filter. Microscopic observation revealed two small fractures and also a long, needle-like growth mark (Figure 27). Raman analysis with a GemmoRaman-532SG instrument provided a good match to reference spectra for dravite.

Standard-based SEM-EDS chemical analysis of the crystal fragment was performed by author AUF using a Jeol JSM-6400 instrument with the Iridium Ultra software package by IXRF Systems Inc. In addition, Na was analysed by a direct-coupled plasma spectrometer to check the results. These data confirmed the tourmaline is dravite with a lesser uvite component. Analyses of green and brown portions of the crystal fragment yielded a fairly similar composition, with the following chromophoric elements: 0.71–1.12 wt.% TiO_2, 0.11–0.27 wt.% V_2O_3, 0.03–0.11 wt.% Cr_2O_3, 0.04–0.07 wt.% FeO and 0.04–0.07 wt.% MnO. These elements also were detected in the faceted stone by authors CW and BW using an

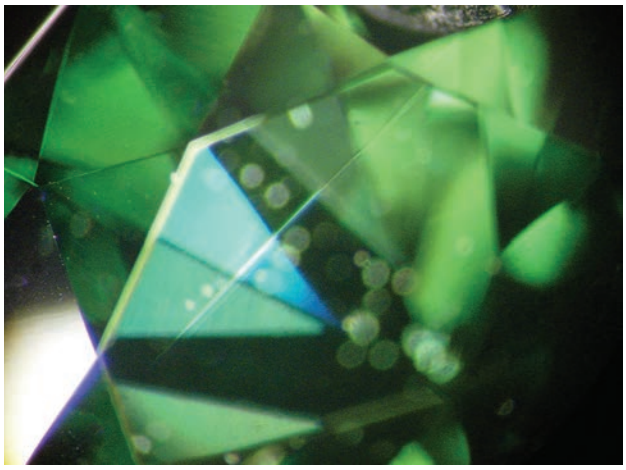

Figure 27: This microscopic view of the 1.09 ct dravite in Figure 26 shows a needle-like growth mark. Photomicrograph by C. Williams; magnified 40×.

Amptek X123-SDD EDXRF. A similar composition was reported for Cr- and V-bearing tourmaline from Kenya (Williams and Williams, 2015).

Due to the common presence of inclusions in this tourmaline and the fact that the well-formed crystals are sold as mineral specimens, it is unlikely that many gemstones will be cut from this dravite. In May 2017, gem dealer Dudley Blauwet received 34 faceted stones weighing 21.38 carats from his cutting factory; they were cut from a parcel of this dravite that he purchased at the 2017 Tucson gem shows that consisted of 31 pcs of rough weighing 17.8 g. The gems ranged from 0.10 to 1.62 ct, and from a fine light yellowish 'mint' green to brownish green to deep 'chrome' green.

A small amount of the Commander mine dravite contained abundant growth tubes oriented parallel to the c-axis that could produce chatoyancy if cut as cabochons.

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