Beryllonite from Pakistan

Beryllonite ($NaBePO_4$) is an uncommon mineral that is more typically seen as a mineral specimen than as a faceted gemstone. Nevertheless, its hardness of 5½–6 on the Mohs scale makes it suitable for faceting and use in gently worn jewellery. Both chatoyant cabochons and transparent faceted gems are sold as collector's stones, but they have seldom been documented in the gemmological literature (e.g. Koivula and Kammerling, 1991; Muyal and Sun, 2016).

Figure 4: Pakistan is the source of this beryllonite, which weighs 14.79 ct and is completely colourless. Photo by Dean Brennan.

During the February 2017 Tucson gem shows, Dudley Blauwet (Dudley Blauwet Gems, Louisville, Colorado, USA) showed one of the authors (BML) a faceted 14.79 ct beryllonite from northern Pakistan (Figure 4). He purchased the rough material 15–20 years ago in Chhappu village in Pakistan's Braldu Valley. The crystal was large (338.1 g), but Blauwet hesitated to send it to his cutting factory because he could not determine how much gem material was inside. In March 2016 he finally sent it for cutting, and the factory returned 102 pieces weighing 176.94 carats. The largest gem weighed ~28 ct, while the two largest clean stones were between approximately 9.7 and 8.6 ct, with the majority less than 3 ct including numerous melee-sized stones.

Blauwet loaned the 14.79 ct beryllonite to authors CW and BW for examination. It measured 17.81 × 14.56 × 10.28 mm and was so colourless that it appeared silver-white. The RIs were 1.551–1.560 (birefringence 0.009) and the hydrostatic SG was 2.81. It was inert to UV radiation. These properties are consistent with those reported for beryllonite, and the identification was confirmed by Raman analysis with a GemmoRaman-532SG instrument. Energy-dispersive X-ray fluorescence (EDXRF) chemical analysis with an Amptek X123-SDD instrument revealed only the expected major amount of P and no significant trace elements.

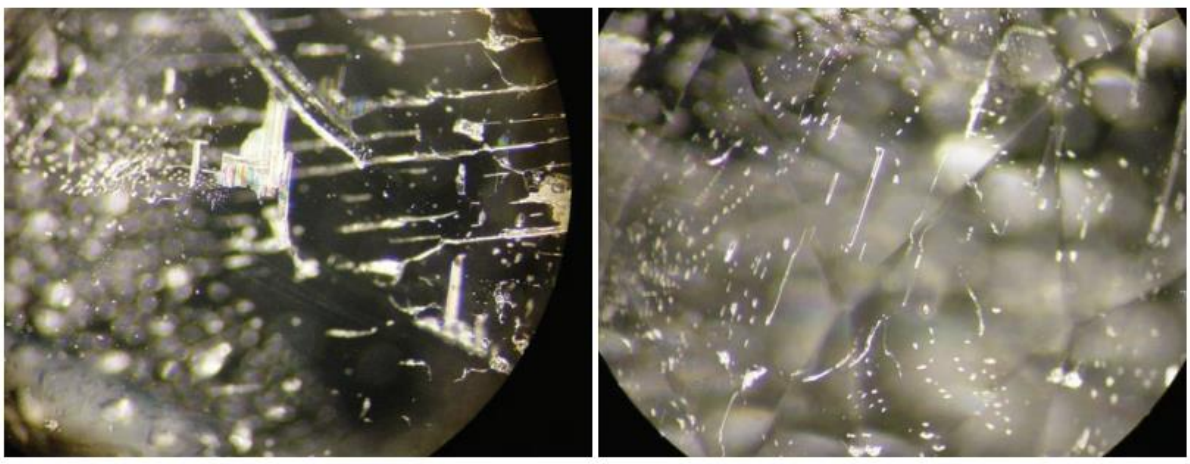

Figure 5: Internal features in the beryllonite consisted of iridescent planar fluid inclusions (left) and variably shaped two-phase inclusions (right). Photomicrographs by C. Williams; magnified 40×.

Numerous small inclusions were evident upon close examination of the stone without magnification. Microscopic observation with darkfield illumination revealed fluid-filled partially healed fissures, including one geometric-shaped iridescent inclusion that appeared to follow a cleavage plane (Figure 5, left). Also present were two-phase (fluid-gas) inclusions containing tiny bubbles (Figure 5, right).

Gem-quality beryllonite is known mainly from Afghanistan and Brazil, although Pakistan is also an occasional source of this rare gem material, as seen in this report.

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