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Pink Spinel from Mozambique

In November 2015, rough stone dealer Farooq Hashmi was on a buying trip to East Africa when he encountered a new find of pink spinel that was reportedly discovered near the town of Namapa in Cabo Delgado Province, northern Mozambique. Hashmi saw approximately 50 kg of rough material, mostly as pieces weighing less than 3 g each. He loaned two crystals of ~1 g each (5.73 and 5.24 ct) and one faceted stone weighing 1.91 ct to this author for examination (Figure 17).

The samples exhibited a strong pink colour with a hint of purple. The crystals showed typical octahedral morphology with distinct triangular growth hillocks on the octahedral faces (Figure 18). Both crystals appeared slightly waterworn, indicating that the material originated from an eluvial or alluvial deposit not far from where it formed.

The faceted oval had RI = 1.709 and SG = 3.67, while the two crystals had SG values of 3.58 and 3.61, all of which are consistent with those expected for spinel. (Rough material tends to show a slightly lower SG due to surface tension when weighed in water.) The faceted stone exhibited a hazy appearance due to the presence

Figure 17: These rough and cut spinels are from a new find in Mozambique. The faceted gem weighs 1.91 ct and was cut by Marvin M. Wambua (Safigemscutters Ltd., Nairobi, Kenya). Photo by D. Bakker.

Figure 18: This 5.24 ct spinel crystal from Mozambique shows octahedral morphology with triangular growth hillocks, and only slight evidence of erosional transport. Photo by E. Boehm.

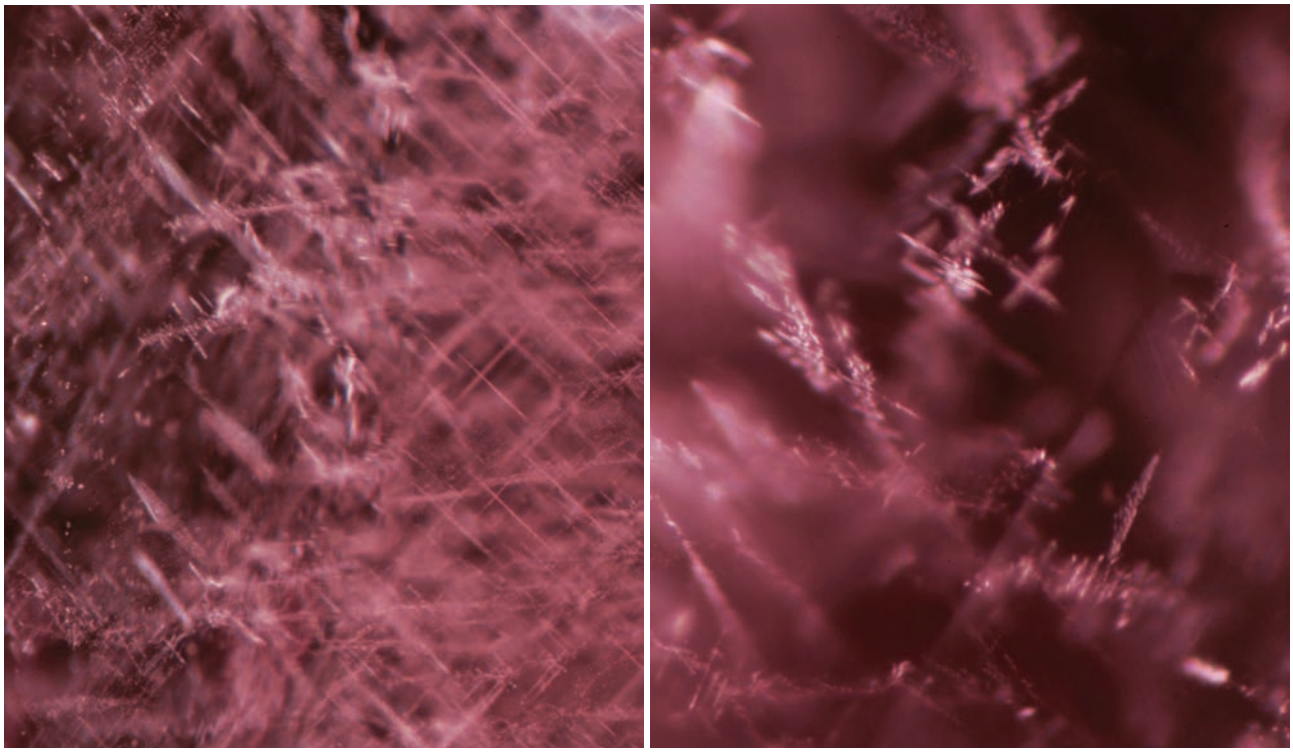
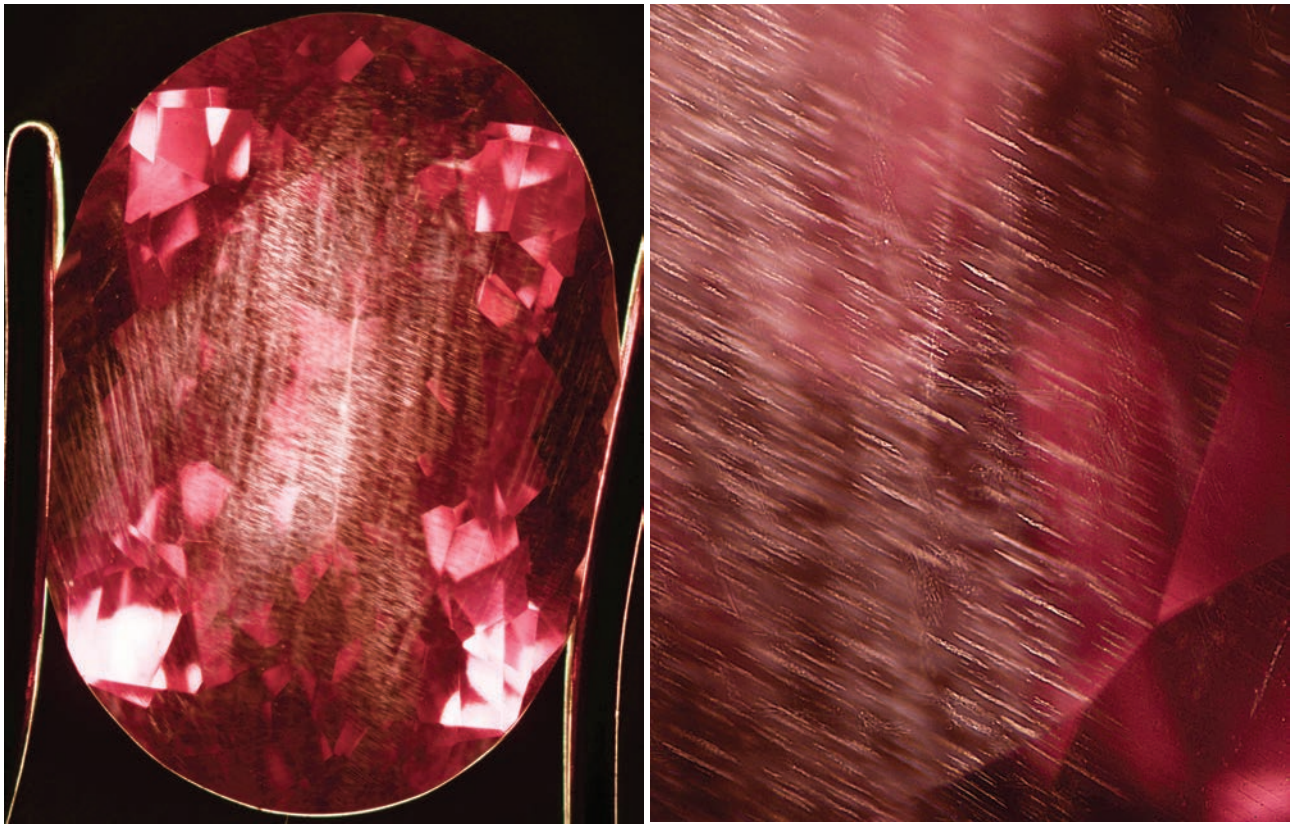


Figure 19: Inclusions in the 1.91 ct Mozambique spinel consisted of intersecting networks (left) and clusters (right) that resemble högbomite in pink spinel from Morogoro, Tanzania. Photomicrographs by E. Boehm; magnified 20× (left) and 40× (right).

Figure 20: Högbomite forms conspicuous parallel inclusions in this 3.34 ct pink spinel from Morogoro, Tanzania. Photomicrographs by E. Boehm; magnified 10× (left) and 40× (right).



of inclusion networks (Figure 19) that resembled högbomite often seen in pink spinel from the Morogoro region of Tanzania (Figure 20; see also Schmetzer and Berger, 1990, 1992). Högbomite, $(Mg,Fe)_2(Al,Ti)_5O_{10}$, is an Al-rich mineral that typically replaces Fe-Ti-oxide inclusions such as ilmenite and rutile in spinel (Gübelin and Koivula, 2005). The author has also seen such inclusions in pink-to-red spinels from Mahenge, Tanzania. Interestingly, the Tanzanian spinel deposits are located directly north of Namapa and within the same Mozambique Belt.

The samples of spinel from Mozambique exhibited moderate red fluorescence when exposed to long-wave UV radiation, but were inert to short-wave UV. This same reaction is seen in pink spinel from Morogoro. However, pink-to-red stones from Mahenge tend to exhibit strong red fluorescence to long-wave UV and are inert to short-wave UV radiation.

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Tantalite-(Mn) from Grangal, Nuristan, Afghanistan

Manganotantalite—renamed tantalite-(Mn) according to the conventions described by Burke (2008)—is an orthorhombic columbite-group mineral with the formula $MnTa_2O_6$ and a Mohs hardness of 6. Since 2011, one of the authors (DB) has occasionally obtained facetable 'manganotantalite' sourced from granitic pegmatites at Grangal and Watala in Kunar Province, Nuristan, Afghanistan. Although complete crystals are sometimes available, most of the production consists of broken fragments ranging from reddish brown to reddish black; the best is intense 'ruby' red in transmitted light. Most pieces contain only 10%–25% transparent areas that are cuttable; also, the tabular shape of the fragments limits the size of the faceted stones. Most recently, in January 2016, cutting of a parcel containing 29 pieces of rough totalling 86.4 g yielded 28 cut stones (~0.20–2.12 ct) with a total weight of 33.33 carats (7.7% yield). Most of them contained small inclusions visible with magnification. Due to the high specific gravity (see below), the stones had a relatively small size for their carat weight.

Two faceted samples of tantalite-(Mn) were characterized by one of the authors (JCZ): a round mixed cut weighing 1.10 ct (4.65 × 4.69 × 3.31 mm) and an oval mixed cut of 4.66 ct (8.82 × 6.98 × 4.10 mm). Both stones were transparent, and were very dark red with very high lustre (Figure 21). Pleochroism in dark red and dark reddish orange was observed using a calcite dichroscope. As expected for tantalite-(Mn), the RIs were above the limit of the refractometer, and the stones showed strong doubling of the pavilion facets when viewed face-up, consistent with the mineral's high birefringence (cf. RIs 2.19–2.34 and birefringence 0.15: Dedeyne and Quintens, 2007). Average hydrostatic SG values of 7.81 and 7.76 were obtained for the 1.10 and 4.66 ct samples, respectively. The gems were

Figure 21: These samples of tantalite-(Mn) from Afghanistan (4.66 and 1.10 ct) were studied for this report. Photo by Dirk van der Marel.