Two Large Rubies from the Pamir Mountains, Tajikistan

In 2016, a sizeable amount (about 600 g) of facet-grade ruby rough was offered on the New York market that had been collected over multiple mining seasons from the Pamir Mountains of Tajikistan. The material was examined by the author, and subsequent to manufacturing, several stones were submitted to the American Gemological Laboratories (AGL) for gemmological reports.

Rubies and pink sapphires from Tajikistan were first reported in the late 1990s (Smith, 1998). Since that time, little additional information has come forward, with the exception of an excursion to the region in 2006 (see, e.g., www.ruby-sapphire.com/tajikistan_ruby_and_spinel.htm). Since rubies of Tajik origin are not particularly well known or recognised in the gem and jewellery industry, this report provides a refresher of their key identifying features—as seen in the two largest, unheated rubies examined here, which weighed 12.08 and 17.14 ct (Figure 13).

The stones showed a highly saturated red colour. Consistent with rubies originating from marble-type deposits, they exhibited a strong red and moderate red reaction when exposed to long- and short-wave UV radiation, respectively. Microscopically, they contained

Figure 13: Weighing an impressive 12.08 ct (ring) and 17.14 ct (loose), these two unheated rubies were the best gems cut from a recent production of about 600 g of rough material from the Pamir Mountains of Tajikistan. Photo by Bilal Mahmood, AGL.

faint, very fine-grained planar clouds that had a whitish or slightly bluish appearance when illuminated with fibre-optic lighting (Figure 14). Concentrations of fine stringers were present, as well as colourless carbonate inclusions (calcite; identified by Raman spectroscopy) that commonly exhibited tiny black inclusions of their own (probably graphite). Partially healed fissures

Figure 14: Common inclusion features in the rubies from Tajikistan consist of very fine-grained planar clouds that can have a whitish or faint bluish appearance when viewed with fibre-optic lighting. Photomicrograph by C. P. Smith; magnified 30×.

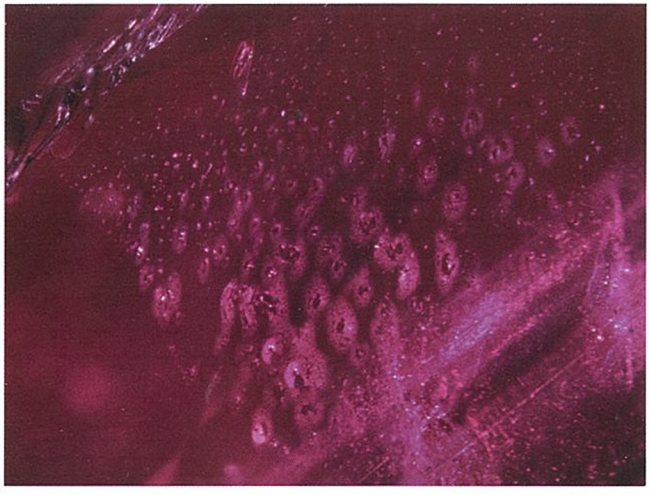

Figure 15: The most recognisable and diagnostic inclusion feature for rubies of Tajik origin consists of small negative crystals, each individually associated with basal-oriented thin films. These occur in groups along planar concentrations, as shown here, or as isolated features. Also present are fine, reflective stringers. Photomicrograph by C. P. Smith; magnified 38×.

showing various patterns were evident, as well as open fissures encrusted by epigenetic coatings of AlOOH, phyllosilicates and other minerals. However, the most distinctive inclusion feature in rubies from this source consists of negative crystals associated with tiny, basal-oriented thin films. These characteristic inclusions occurred in high numbers associated in planar concentrations (Figure 15) or as isolated features.

EDXRF spectroscopy of the two rubies revealed (in wt.%): 0.05 Ti, 0.01 V, 0.28 Cr, 0.04 Fe and 0.01 Ga for the 12.08 ct stone; and 0.03 Ti, 0.01 V, 0.14 Cr, 0.04 Fe and 0.01 Ga for the 17.14 ct ruby.

All of the features documented in this note are consistent with those reported previously for rubies and pink sapphires of Tajik origin. Beautiful, unheated stones such as these demonstrate the potential for Tajikistan to produce superior-quality rubies that can rival—and even be mistaken for—those of other, more well-known marble-type deposits of the region, including the historic Mogok Valley and, more recently, the Mong Hsu region of Myanmar (Burma), as well as the Jegdalek area of Afghanistan and Luc Yen region of northern Vietnam.

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Reference

Smith C.P., 1998. Rubies and pink sapphires from the Pamir mountain range in Tajikistan, former USSR. *Journal of Gemmology*, **26**(2), 103–109, http://doi.org/10.15506/JoG.1998.26.2.103.