

**Sapphires from Afghanistan and Pakistan.** Gem dealer Farooq Hashmi of Intimate Gems, Jamaica, New York, shared some information on the recent production of gem-quality sapphires from Afghanistan and Pakistan, and he loaned or donated several samples to GIA for examination. Mr. Hashmi obtained these samples during a buying trip to Peshawar, Pakistan, in early 2004.

*Blue sapphire from Maydan Shahr, Afghanistan.* The Summer 2002 Gem News International section (p. 181) documented dark blue sapphires from a new deposit in Afghanistan, which was represented as “Medan Khar” in Vardak Province, west of Kabul. Since that time, this province has been the source of additional sapphires, reportedly from the Maydan Shahr area. It is not clear if this new production is from the same locality (with phonetic allowances for the different spellings) or a different deposit. The sapphires are enclosed by a hard white matrix, which makes their recovery quite labor intensive. Mr. Hashmi saw several kilograms of rough in Peshawar, and most had a hazy or velvety appearance, as well as a slightly grayish tinge, which differed from the Afghan sapphire we reported on in 2002.

An examination of the 2.10 ct oval mixed-cut sapphire in figure 15 by one of us (EPQ) showed the following properties: color—dark grayish greenish blue, with medium bluish green and dark violetish blue dichroism; diaphaneity—transparent; R.I.—1.761–1.770; birefringence—0.009; S.G.—4.03; fluorescence—inert to both long- and short-wave UV radiation; and strong absorption bands at 450, 460, and 470 nm visible with the desk-model spectroscope. This stone displayed a medium to strong blue scattering effect when viewed with a fiber-optic light. This effect was caused by the reflection of light off clouds of very fine particles throughout the stone, resulting in a somewhat hazy appearance. Microscopic examination revealed a “fingerprint,” a twin plane, a transparent near-colorless birefringent crystal, stringers of pinpoints, and diffuse planar yellow and blue growth banding. No evidence of heat treatment was detected.

*Pink sapphire from Batakundi, Pakistan.* According to Mr. Hashmi, pink to purple (and rarely blue) corundum has been mined near the town of Batakundi in Pakistan’s North West Frontier Province since 1999. Several diggings in the area have produced mostly low-quality material, but some facetable stones were recovered recently. Although gemstones exceeding 5 ct have been faceted, most weigh less than 2 ct.

Five Batakundi sapphires (0.74–1.98 ct; see, e.g., figure 16) were examined by one of us (EPQ) and the following properties were recorded: color—purplish pink, pink, and slightly orangy pink, with moderate dichroism in purplish pink to purple-pink and pinkish orange to pink-orange; diaphaneity—transparent to semitransparent; R.I.— $n_e=1.759$ – $1.760$ ,  $n_o=1.767$ – $1.768$ ; birefringence—0.008; S.G.—4.00–4.03; fluorescence—moderate to strong red to



Figure 15. This 2.10 ct sapphire is reportedly from Maydan Shahr, Afghanistan. Courtesy of Intimate Gems; photo by Maha Tannous.

long-wave and very weak red to short-wave UV radiation. The desk-model spectroscope showed general absorption to 430 nm, a weak 450 nm band, weak 470 and 480 nm lines, a 550–590 nm band, and lines in the red end of the spectrum.

All but the smallest stone displayed a moderate violet-blue scattering effect when viewed with a fiber-optic light. As with the Afghan sapphire reported above, this effect was caused by reflection of light off clouds of very fine particles throughout the stones, which gave them a hazy appearance. Microscopic examination revealed that all five samples contained “fingerprints,” fractures, dark metallic inclusions, transparent near-colorless birefringent crystals (one of which was identified by Raman analysis as zircon), straight and/or angular growth banding (purplish pink to pink), and short needles resembling rutile. Also present were twin planes in four of the stones, needles (with the appearance of boehmite) and two-phase inclusions in three

Figure 16. Batakundi, northern Pakistan, is the source of these purplish pink to slightly orangy pink sapphires (0.96–1.98 ct, faceted). Courtesy of Intimate Gems; photo by Maha Tannous.



samples, and an angular blue color zone and large transparent crystals (one of which was identified by Raman analysis as apatite) in the smallest stone. No evidence of heat treatment was detected in any of the sapphires. However, one showed evidence of clarity enhancement (i.e., it “sweated” when tested with a thermal reaction tester).

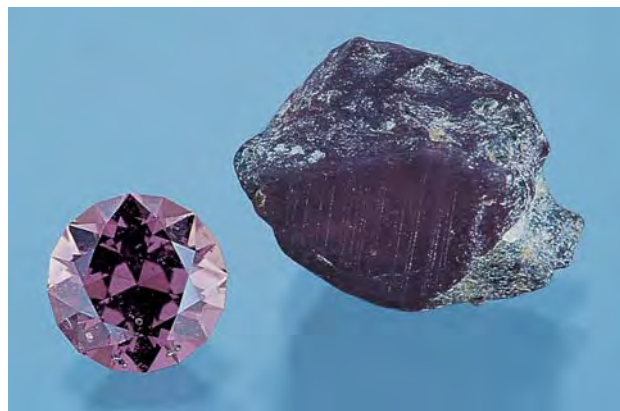
*Purple sapphire from northern Pakistan.* Another deposit in northern Pakistan is the source of purple sapphires. Mr. Hashmi was not able to learn the specific locality. He reported seeing less than 1 kg of rough in the Peshawar market.

A 1.20 ct modified round brilliant sapphire (figure 17) from this area was studied by one of us (EPQ): color—dark pink-purple, with weak to moderate dichroism in pink-purple and orange-pink; diaphaneity—transparent; R.I.—1.761–1.769; birefringence 0.008; S.G.—4.01; fluorescence—weak red to long-wave and inert to short-wave UV radiation; transmission luminescence—weak red. The desk-model spectroscope showed absorption bands at 450, 460, and 470 nm, together with lines in the red part of the spectrum. Microscopic examination revealed “fingerprints,” clusters of minute transparent near-colorless birefringent crystals, transparent light brown crystals (two of which were identified as monazite with Raman analysis), dark metallic crystals, and needles. No evidence of heat treatment was detected.

Elizabeth P. Quinn  
BML

**Sapphires from Baffin Island, Canada.** In 2002, local prospectors Seemeega and Nowdla Aqpiq discovered gem-quality sapphires in an outcrop southwest of the community of Kimmirut on the south coast of Baffin Island, Nunavut, northern Canada (figure 18). To date, six corundum occurrences have been discovered over a distance of 390 m.

*Figure 17. Northern Pakistan is also the source of this 1.20 ct purple sapphire and crystal fragment. Courtesy of Intimate Gems; photo by Maha Tannous.*



*Figure 18. Deep blue sapphires were discovered in southern Baffin Island, Canada, in 2002. One of the original prospectors, Seemeega Aqpiq, is shown with a matrix specimen containing a sapphire crystal that measures 7.7 cm long. Photo by William Rohtert.*

The original occurrence, called “Beluga,” contains deep blue sapphires with violet overtones (figure 19). Individual crystals up to  $7.7 \times 2.1$  cm have been recovered (again, see figure 18), although most are in the range of  $15 \times 4$  mm. Some of the sapphires are color-zoned (especially larger crystals), and may display concentric, irregular, or end-to-end variations in hue. The smaller crystals are generally free of inclusions, whereas the larger ones are often fractured and, in most cases, included with calcite and/or apatite. Needles of thomsonite, a zeolite mineral, coat grain boundaries and penetrate deeply into some of the crystals.

Most of the Beluga sapphire crystals exhibit spectacular zoning in cathodoluminescence which corresponds to the color zoning. Very faint compositional zoning was sometimes seen in backscattered-electron images obtained with a scanning electron microscope. Electron-microprobe analysis of 10 sapphire samples yielded maximum  $\text{TiO}_2$  and FeO values of 0.13 and 0.30 wt.%, respectively.

In August 2004, fragments of yellow, colorless, and light blue sapphires were discovered at another occurrence located 50 m from the Beluga lens, over an area about  $0.5 \times 0.5$  m. Called “Beluga South,” this locality also contains weathered fragments of a corundum-bearing plagioclase-muscovite-calcite rock. Microprobe analyses of the yellow