

Gem Notes

COLOURED STONES

Baryte from South Dakota, USA

Baryte (or barite) is an orthorhombic sulphate mineral that is sometimes found as well-formed crystals that are prized by collectors. One area in particular has yielded fine transparent baryte crystals that are colourless and yellow to yellowish brown (commonly referred to as 'golden'): Elk Creek in Meade County, South Dakota, USA (Campbell et al., 1987; see also <https://collectorsedge.com/pages/elk-creek-barite-meade-county-south-dakota>). Although these deposits have been known since at least 1891 and abundant mineral specimens have been mined there, it is rare to encounter gems faceted from this material. Therefore we were interested to examine three faceted South Dakota barytes (Figure 1) that were loaned by gem dealer Dudley Blauwet (Dudley Blauwet Gems, Louisville, Colorado, USA). The stones were cut from a 139 g parcel of rough that he obtained in January 2016, which contained pieces that were too broken to be sold as crystals. His cutting factory produced 25 stones weighing a total of 69.62 carats and ranging from ~1.2 to 8.30 ct; the yield was rather small due to fractures and cleavage issues.

The examined barytes weighed 2.27–7.90 ct and were very pale brownish yellow, medium brownish yellow and a cognac-like orangey brown. The RIs of all three stones were 1.634–

1.647, yielding a birefringence of 0.013 (comparable with the 0.012 stated in the literature). The hydrostatic SG value of each sample was 4.49. The stones fluoresced a moderate-to-strong yellowish white to long-wave UV radiation (Figure 2) and a very faint yellowish white to short-wave UV. Microscopic observation revealed only minor cleavage effects and twinning planes. Analysis with a GemmoRaman-532SG confirmed the identification as baryte, and energy-dispersive X-ray fluorescence (EDXRF) spectroscopy with an Amptek X123-SDD instrument revealed the expected major amounts of Ba and S; there were no significant chromophores detected, even when comparing these differently coloured stones. This is consistent with the fact that radiation-damage centres commonly cause colour in baryte (Bartoshinsky et al., 1991).

Baryte occurs as transparent material and in various colours, but its status as a collector's stone is due to its low hardness (3 on the Mohs scale) and perfect cleavage, making it generally unsuitable for use in jewellery.

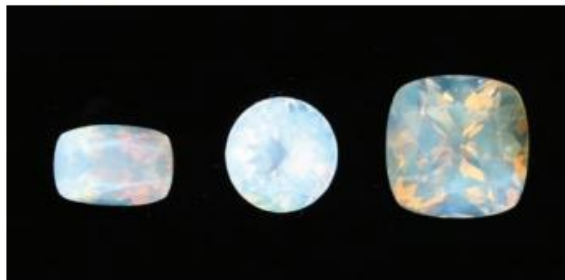
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Figure 1: These rare faceted barytes (2.27–7.90 ct) show the range of colour of material from South Dakota. Photo by Dean Brennan for Stone Group Labs.



Figure 2: All three of the barytes in Figure 1 fluoresce yellowish white to long-wave UV radiation. Photo by B. Williams.



References

Bartoshinsky V.Z., Shumsky A.A., Larikov A.L. and Dersky L.S., 1991. Paramagnetic and optically active centers in barites of the Ukraine. *Mineralogicheskii*

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Campbell T.J., Campbell D.R. and Roberts W.L., 1987. Famous mineral localities: Elk Creek, South Dakota. *Mineralogical Record*, **18**, 125–130.