A new kyanite

Cara Williams FGA reports on a fine quality, faceted, bluish-green kyanite.

Until a somewhat recent discovery in Nepal, facet-grade kyanite was rare. Fibrous, translucent kyanite from various sources was well-known in the mineral world but barely registered among gemmologists. The Nepalese kyanite, with its beautiful, rich sapphire appearance, was an instant hit when it was first found around 2001. Always requiring a double take, the colour is due to an iron-titanium charge transfer — the same charge that causes the blue colour of sapphire. In beads, blue and green kyanite colours are commonly seen, with the green being a softer mossy-to-celadon shade due to the presence of vanadium, but shades occasionally blend toward the teal tones.

Around 2011, orange kyanite was found in Tanzania, with a vibrant orange colour which is due primarily to manganese. So, why all the talk of chromophores? Many gem varieties are distinguished by their colour, their origin, phenomena or chromophores — the elements within a gem that cause its colour. For example, ruby's chromium is what makes it other than sapphire, and when copper is present in tourmaline, it becomes legendary. So we at Stone Group Laboratories were pleasantly surprised when a new kyanite came through the lab with a distinctly different chromophore. Neither blue nor green, the colour was right in between and reminiscent of the colour seen in many bluish-green alexandrites when viewed under daylight conditions.

Reportedly from Nepal, the samples we observed were nearly eye-clean and devoid of the colour zoning that is so pronounced in most blue kyanite. Small crystalline inclusions were visible in some samples, with small clusters of pinpoint inclusions seen in others. RI was 1.715–1.730. They all appeared a strong red under the Chelsea colour filter and fluoresced only moderately red under long wave ultraviolet. Pronounced dichroism was teal and grey. Whatever the chromophore was, it was possibly the cause of flooding (the equivalent of the machine being like a person having a bright light shone in their eyes at night) observed in our initial Raman analysis, which yielded negative results, but the FTIR spectroscopy revealed a match for kyanite in a critical region of the spectrum.

The X-ray fluorescence proved more helpful and revealed a high chromium content along with some vanadium and minor amounts of iron, which possibly explains why the fluorescence is a bit weak.

With so much chromium and vanadium present, we then looked for possible colour change effects, but the colour remained teal under all lighting conditions. Green kyanite with up to 1.8 wt% Cr_2O_3 was reported from Siberia as long ago as 1936, and Cr-bearing kyanite is also found in Australia and New Zealand, but, as far as we know, this is the only commercial source of gem-grade teal-coloured kyanite coloured by chromium and vanadium.

While still popular with lovers of unusual gems, the lower hardness of kyanite has made it more of a collector's item in spite of its attractive colours. Its resemblance to other gems has occasionally caused problems at the bench. Blue kyanite does not have sapphire's hardness; orange kyanite may look like spessartine garnet, but is certainly not as tough and teal kyanite may resemble alexandrite, but requires much gentler handling. While kyanite continues to masquerade as other gems, gemmologists and valuers will want to test carefully to distinguish these from spinel or chrysoberyl.