Module B. Colour from the Cosmos

Lesson 14: Beryl Mineralogy and Gemology

Beryl in the Rough

As described above, most beryl crystals show a hexagonal (six-sided) prismatic growth habit and basal termination. The images below show this habit and varying degrees of modification.

The Gachala Emerald from Colombia weighs a phenomenal 858 carats. This natural emerald crystal shows beryl's six-sided nature and flat basal termination at the top of the crystal. Photo courtesy of the Smithsonian Institute's [National Museum of Natural History](http://www.mnh.si.edu/).

This crystal is about 1 cm long by 6 mm wide and shows nice clarity and depth of colour at the top end of the stone. This specimen is from Colombia.

This is the same crystal as above but with the angle of the photograph showing the 'gemmy' section at the top of the crystal. The black bits are other opaque minerals (likely siderite or pyrite) on the surface and inside of the crystal that grew at the same time as the beryl. These are called inclusions when located "inside' the crystal.

This piece of rough emerald originates from the Tsa da Gliza emerald occurrence in Yukon Territory. Note the presence of non-gem and gemmy portions in one crystal – this is common in most gemstone localities. Photo courtesy of [True North Gems](http://www.truenorthgems.com/).

This dark blue beryl crystal shows good clarity in the deeper toned part of the stone and is intergrown with quartz (translucent white portions) and fluorite (creamy brown/white portions). The scale bar (above left) is divided into 1 cm blocks with 1 mm subdivisions. This specimen is from the True Blue locality, Yukon Territory, Canada. Photo courtesy of [True North Gems](http://www.truenorthgems.com/).

This faceted dark blue beryl crystal is the same crystal as that shown above in matrix. It was removed carefully as a fully formed crystal and then subsequently faceted so that the long axis of the rough stone is the same long axis of the cut stone. Photo courtesy of [True North Gems](http://www.truenorthgems.com/).

This pale to dark blue beryl crystal nicely shows the hexagonal prismatic nature of beryl. Here it is intergrown with quartz (translucent white) and covered with light green-yellow lichen. The scale bar (upper right) is divided in 1 cm blocks with 1 mm subdivisions. This specimen is from the True Blue locality, Yukon Territory, Canada.

This large aquamarine is free standing and originated from a pegmatite in northern Pakistan. It measures ~5 cm in length, shows perfect crystal form, and is associated with the minerals micas, quartz, and albite. Note the flat basal termination at the top end of the crystal. Photo by A. Borelli.

This phenomenal 15,256 carat (3.1 kg!) unheated aquamarine is from Minas Gerais in Brazil. Note the perfect hexagonal nature along the length of the crystal and modified basal termination at the top end of the crystal. Also of interest are the numerous fractures near the base of the crystal that are all oriented perpendicular to the c-axis – these are the result of beryl's basal cleavage. The crystal also shows some vertical striations along its length. Photo courtesy of the Smithsonian Institute's [National Museum of Natural History](http://www.mnh.si.edu/).

This red beryl crystal is from the Wah Wah range in Utah, USA. It measures only ~1.5 cm in length and shows perfect crystal form as well as some interesting intergrowths. Note the flat basal termination at the top end of the crystal and transparency in some portions of the crystal. Photo by R Lavinsky.

This very clearn goshenite crystal is hosted within a quartz-albite-mica matrix, and originates from the Gilgit pegmatite district of Pakistan. Again, note the flat topped termination of beryl and in this case a lack of striations. Photo by P. Gery.

This green beryl (not emerald!) is from Brazil and exhibits classic beryl morphology and measures ~12 cm in length. Note the flat basal termination at the top end of the crystal. Photo by R Lavinsky.

This morganite crystal from Afghanistan shows the common form of this variety of beryl - stout crystals with modified terminations as compared to other beryls. This is due primarily to the structural changes forced upon the crystals when significant amounts of Cs, Li and Mn are incorporated during growth. It measures ~4cm by 3 cm, and 2.75 cm depth and the matrix of this specimen is mostly muscovite with lesser quartz. Photo by R Lavinsky.

These heliodor cyrstals are from near Rangkul in Tajikistan (left, ~3 cm in length) and the Sarapulka District of Russia (righ, 2.5 cm in length). Note the modified termination at the top end of the crystals and how if the modifications on the right-hand crystal continued they would result in the final termination of the left-hand crystal. Photo by R Lavinsky.