What are those fibers in my rose quartz?

Most of us are curious about the variety of colors in quartz. Rose quartz is one of the loveliest types, and many of us have specimens or jewelry of rose quartz. What accounts for its delicate pink color? Recent work has shed some light on its origin - apparently it is due to the presence of a close relative of the mineral dumortierite.

The breakthrough discovery was work done in 1987 by 2 geologists at the University of Missouri at Columbia, Ken Appin and Brian Hicks. They were doing studies on the etching of various types of quartz. They discovered in one of their samples, a rose quartz from the Ruby Range of Montana, masses of pink fibers on the sample's surfaces after etching in hydrofluoric acid. The color of the fibers was spectrally the same as the pink color of the quartz specimen. Testing by X-Ray diffraction convinced them that the fibers were a mineral called dumortierite, and that they were responsible for the pink color of that particular quartz.

Dumortierite is a complex boron-bearing silicate. It was named for a French paleontologist, and has been known as a mineral since 1881. It is generally found in fibrous to columnar aggregates and is usually an attractive pink to blue to purple in color. The particular concentration of trace amounts of iron and titanium seems to control the color seen. Dumortierite often is found in granite pegmatites, high temperature hydrothermal veins, and in high-grade regional metamorphic rocks where boron was available during metamorphism. Sometimes interesting collector specimens occur from Maine, California, New Mexico and elsewhere. Lapidary quality dumortierite occurs in South Africa and other locations.

Appin and Hicks' work was followed by Julie Goreva, Chi Ma and George Rossman at Cal Tech. In a paper published in 2001, they looked for pink fibrous material in rose quartz from 29 localities from around the world. All of the samples they tested had such fibers. The fibers were very small, best described as "nano-fibers" 0.1 to 0.5 micro-meters wide (about 0.00002 inches). Their optical patterns again matched the pink color of rose quartz. X-Ray diffraction, Raman spectroscopy and other analytical tests showed that these fibers were from a mineral close to, but not exactly like, dumortierite. The scientists concluded the rose color of all massive rose quartz was due to this material.

Later work by this same team further characterized this material as a dumortierite relative. The only significant difference is the relatively large amount of iron replacing aluminum at a particular location in the mineral's structure. Whether or not this will constitute a new mineral remains to be

seen. At this point then it is hard to tell some one exactly what this material is. Yes, it is like dumortierite, but really isn't technically, and doesn't have an official name. I could suggest it be called "that pink fibrous dumortierite-like stuff in the rose quartz." A bit unwieldy, but, (to paraphrase the Bard), to a mineral collector, wouldn't the coloring agent of rose quartz by any other name, still look so sweet?

- Dr. Bill Cordua, University of Wisconsin-River Falls

References:

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