

## **Fibrous nano-inclusions in massive rose quartz: The origin of rose coloration**

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### **ABSTRACT**

Pink nanofibers were extracted from rose quartz from 29 different pegmatitic and massive vein localities throughout the world. Their width varied from 0.1 to 0.5  $\mu\text{m}$ . On the basis of optical absorption spectra of the fibers and the initial rose quartz, we conclude that these nanofibrous inclusions are the cause of coloration of massive rose quartz worldwide. These fibers do not occur in the rare, euhedral variety of pink quartz. Redox and heating experiments showed that the pink color of the fibers is due to Fe-Ti intervalence charge transfer that produces an optical absorption band at 500 nm. Based on the XRD patterns and characteristics of pleochroism, the best match for these inclusions is dumortierite. However, FTIR and Raman spectra consistently did not exactly match the standard dumortierite patterns, suggesting that this fibrous nano-phase may not be dumortierite itself, but rather a closely related material.