American Mineralogist, Volume 88, pages 37–46, 2003

An infrared spectroscopic study of the basic copper phosphate minerals: Cornetite, libethenite, and pseudomalachite

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ABSTRACT

The molecular structures of the basic copper phosphate minerals pseudomalachite, libethenite, and cornetite were studied using a combination of infrared emission spectroscopy, infrared absorption, and Raman spectroscopy. Infrared emission spectra of these minerals were obtained over the temperature range 100 to 1000 °C.

The infrared spectra of the three minerals are different, in line with differences in crystal structure and composition. The absorption spectra are similar, particularly in the OH stretching region, but characteristic differences in the bending regions are observed. Differences are also observed in the phosphate stretching and bending regions. The IR emission of the basic copper phosphates studied shows that the minerals are completely dehydroxylated by 550 °C.