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The hydrous component in andradite garnet

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ABSTRACT

Twenty-two andradite samples from a variety of geological environments and two synthetic hydroandradite samples were studied by Fourier transform IR spectroscopy. Their spectra show that H enters andradite in the form of OH^-. Amounts up to 6 wt% H_2O occur in these samples; those from low-temperature formations contain the most OH^-. Some features in the absorption spectra indicate the hydrogarnet substitution $(SiO_4)^{4-} \leftrightarrow (O_4H_4)^{4-}$ whereas others indicate additional types of OH^- incorporation. The complexity of the spectra due to multi-site distribution of OH^- increases with increasing complexity of the garnet composition.