

THE RAMAN STUDY OF SINGLE-CHAIN SILICATES

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Abstract

Some of the most common pyroxenes (bronzeite, hypersthene, diopside, hedenbergite, augite, omphacite, aegirine and spodumene) and pyroxenoids (wollastonite, rhodonite, fowlerite and charoite) have been investigated by non-contact Raman spectroscopy. In order to complete the information on the vibrational modes, the IR spectrum of augite was devised. In the Raman spectrum of aegirine, the bands appear at lower wavenumbers than in the rest of the pyroxenes. The bands assigned to the Si-O vibrational modes are split due to the deformation of the tetrahedra. In the rhodonite and zinc-rich variety (fowlerite) spectra, differences were noted; in fowlerite, some bands are shifted at higher frequencies, compared with rhodonite. The pyroxenoids presented the same typical bands of the single-chain structure. The spectrum of charoite shows two new lines at 2367 cm⁻¹ and 2403 cm⁻¹, which are due to the modes of the N-H bonds.

Key words: Raman spectra, IR, pyroxenes, pyroxenoids, single-chain silicates, aegirine, fowlerite, charoite

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