Infrared Reflectance Study of Thermally Treated Li- and Cs-Montmorillonites

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Abstract: The structure of Li- and Cs-montmorillonites was studied using infrared (IR) reflectance spectroscopy. The spectra of heat-treated clays between 80 and 220 ° C were analyzed by Kramers-Krönig inversion in order to obtain the optical and dielectric properties of the clays. The analysis revealed the transverse-optic (TO) and longitudinal-optic (LO) components of the asymmetric stretching vibration of Si-O-Si bridges. Major differences, in particular the systematic development of new bands, were found in the Li-montmorillonite LO and TO spectra with increasing temperature. These changes were attributed to the migration of the Li-cations into the layer structure.

Key Words: Cs-Montmorillonite • Li-Montmorillonite • Longitudinal-Optic (LO) Mode • Migration • Reflectivity • Transverse-Optic (TO) Mode

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