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Changes in structural and dielectric properties of nontronite caused by heating.

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Streszczenie

The study was focused on changes in the electrical and structural parameters of nontronite as a function of temperature in the range of 25 °C–325 °C. Nontronite during heating loses water from the interlayer space. Structural changes in the mineral were monitored by X–ray powder diffraction, thermal analysis, and dielectric spectroscopy. The experiments showed that between 35 °C–60 °C the mineral loses only a small part of water bound between the layers. This resulted in a significant change in the distance between the layers from 15.2 Å to 13.0 Å and a 100% increase in low–frequency electric permittivity. The main process of losing interlayer water molecules starts at 60 °C and finishes close to 160 °C. Interlayer water responds to the external electric field, causing an increase in electric permittivity. Analysis of dielectric relaxation gave valuable insight into the dynamics of weakly bound interlayer molecules–water in the case of natural nontronite.

Słowa kluczowe

Clay minerals, Smectites, Intercalations, Electric permittivity

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