Uniwersytet Wrocławski

Repozytorium

Plik pochodzi z repozytorium Wydziału Chemii Uniwersytetu Wrocławskiego

Interactions and dynamics of cations and interlayer quest molecules in nontronite and nontronite–formamide intercalation

Autorzy

Karol Kułacz

Kazimierz Orzechowski

Balázs Zsirka

János Kristóf

Rok wydania

2022

Czasopismo

Applied Clay Science

Numer woluminu

228

Strony

106637/1-106637/10

DOI

10.1016/j.clay.2022.106637

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Nontronite is a swelling clay mineral. Between the layers, it contains water and cations. Nontronite can be easily modified by intercalation. This work focuses on characterizing unmodified nontronite and nontronite intercalated with formamide. Thermal measurements, infrared spectroscopy, X–ray diffraction, and dielectric relaxation measurements were made to evaluate the interactions of the guest molecules with the host layers. A startling effect was observed in dielectric experiments: the low–frequency permittivity detected in nontronite was much larger than in the material intercalated with formamide, the molecule with a high dipole moment. To explain this effect, it was assumed that the low–frequency dielectric relaxation was associated with the movement of interlayer ions. Dehydration of nontronite, which is a stage of preparation for intercalation, can probably fix some ions in hexagonal cavities (privileged positions). Subsequent intercalation of nontronite by formamide does not bring back the mobility of ions, and the low–frequency electric permittivity remains relatively low. To achieve mobility of the cations, an expansion of the interlayer space is required, and ion–dipole interactions with guest molecules should be present.

Słowa kluczowe

Clay minerals, Smectites, Dielectric spectroscopy, Thermogravimetry, Infrared spectroscopy, Maxwell-Wagner effect

Adres publiczny

http://dx.doi.org/10.1016/j.clay.2022.106637

Strona internetowa wydawcy

http://www.elsevier.com

Plik został wygenerowany dnia 2026-11-11 05:52:00

Adres w repozytorium https://old.chem.uni.wroc.pl/pl/repozytorium/pvlHZ1B.