

INFLUENCE OF THERMO ACID EFFECTS ON THE STRUCTURE AND SORPTION FEATURES BENTONITES

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The results of the study on changes in the structure and surface properties of montmorillonite from different deposit from exposure to nitric acid of varying duration at an elevated temperature are presented in this work.

Treatment with HNO_3 solution causes partial leaching of octahedral and interlayer cations which leads to protonation of internal surfaces and to an increase in microporosity as a result of octahedral OH-groups protonation and change of octahedral Al coordination. The result of the exposure to acid solutions is a change of layer charge and interaction between the sheets and layers with each other which in turn leads to a significant increase of the specific surface area. Also, a reduction in the cation exchange capacity occurs due to the deposition of amorphous silica from disintegrated tetrahedral sheets on the particle surfaces as well as a reduction of the layer charge.

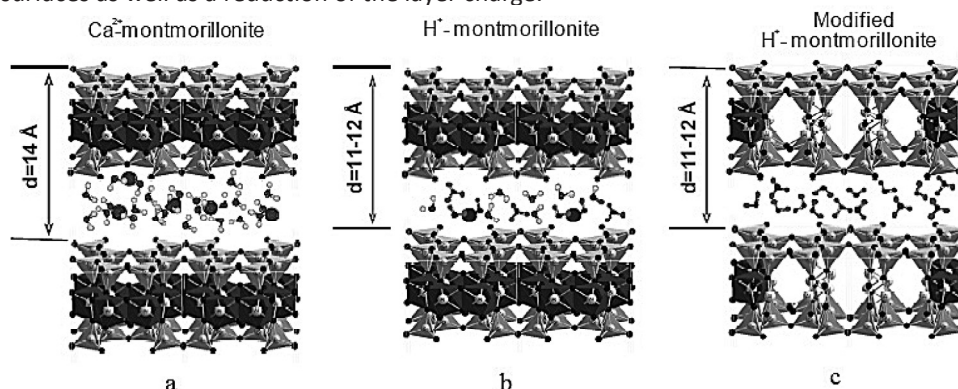


Figure 1. Schematic representation of structural changes in natural montmorillonite due to treatment with solutions of inorganic acids: a - natural Ca-montmorillonite, b - partial interlayer protonation, c - complete interlayer protonation (H-smectite), protonated OH-groups of the octahedral sheets and Al^{3+} coordination change