

## THERMAL TREATMENT OF ORGANOVERMICULITES USED IN SORPTION PROCESS

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### Abstract

Vermiculite is a well-known material from the group of the phyllosilicates nowadays used for nanostructured sorbent preparation. In their organically modified forms they are known to be very efficient sorbents of organic compounds, especially polycyclic aromatic compounds, from aqueous solutions. There is a large amount of research in the topic of organically modified vermiculites and their properties. One of our previous studies revealed almost 100% efficiency in column sorption of benzene, dichlorobenzene, toluene, naphthalene and others from highly polluted waste water. But there are only few studies about their treatment after utilization. Thus, the goal of this work is to propose ways of disposing them after their application.

The thermal treatment in high temperatures is one of the options. The goal of this study is to determine vermiculite structural changes after thermal process which can show if there is a possibility of its reuse or if the burned out material could be used in another application. In the thermal process various temperature influences were studied. Only a partial removal of organic compounds occurred in temperature of 300 °C. After exposing sample to the temperature 1100 °C a new ceramic material was made which showed different properties comparing original vermiculite. The prepared and tested samples were investigated using X-ray diffraction (XRD) method, Fourier transform infrared (FTIR) spectrometry, total organic carbon content (TOC), scanning electron microscopy (SEM).

**Keywords:** Vermiculite, modified vermiculite, sorption, thermal treatment

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