

# Accepted Manuscript

Research paper

Behavior of water and methane bound to hydrophilic and hydrophobic nanosilicas and their mixture

Vladimir M. Gun'ko, Vladimir V. Turov, Tetyana V. Krupska, Eugeny M. Pakhlov

PII: S0009-2614(17)30973-9

DOI: <https://doi.org/10.1016/j.cplett.2017.10.039>

Reference: CPLETT 35188

To appear in: *Chemical Physics Letters*

Received Date: 26 August 2017

Accepted Date: 19 October 2017

Please cite this article as: V.M. Gun'ko, V.V. Turov, T.V. Krupska, E.M. Pakhlov, Behavior of water and methane bound to hydrophilic and hydrophobic nanosilicas and their mixture, *Chemical Physics Letters* (2017), doi: <https://doi.org/10.1016/j.cplett.2017.10.039>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



## Behavior of water and methane bound to hydrophilic and hydrophobic nanosilicas and their mixture

Vladimir M. Gun'ko\*, Vladimir V. Turov, Tetyana V. Krupska, Eugeny M. Pakhlov

*Chuiko Institute of Surface Chemistry, General Naumov Street 17, 03164 Kyiv, Ukraine*

### ABSTRACT

Methane adsorption onto hydrated (0.1 g/g) initial and compacted nanosilica A-50 and compacted A-50/hydrophobic AM1 (based on nanosilica A-300) and water behavior vs. temperature were analyzed using  $^1\text{H}$  NMR and theoretical methods. Methane adsorption increases with temperature because of changes in structure of mobile water. Stronger compaction of A-50 than that of A-50/AM1 (due to negative effect of AM1 preventing formation of tight contacts between A-50 nanoparticles) leads to decrease in adsorption of methane onto dense A-50 alone. These effects cause the difference in temperature behavior of bound water.

*Keywords:* Hydrophilic nanosilica; Hydrophobic nanosilica; Structural organization; Bound water; Methane adsorption

\*Corresponding author. Tel.: +38044-4229627; fax: +38044-4243567.

*E-mail address:* [vlad\\_gunko@ukr.net](mailto:vlad_gunko@ukr.net) (V.M. Gun'ko)

Download English Version:

<https://daneshyari.com/en/article/7838617>

Download Persian Version:

<https://daneshyari.com/article/7838617>

[Daneshyari.com](https://daneshyari.com)