

20th International Colloquium on Scanning Probe Microscopy

** 20th anniversary in Okinawa! **



December 17-19, 2012.
Okinawa Kariyushi Urban Resort Naha, Japan.

organized by
Thin Film and Surface Physics Division
of Japan Society of Applied Physics

sponsored by
The Japan Society of Applied Physics

Important Dates

Abstract deadline: **Oct 31, 2012**

Registration deadline: **Nov 30, 2012**

Proceedings deadline: **Jan 15, 2013**

ICSPM20 Registration

Basics

Kuralay Korzhynbayeva <kuralay12@mail.ru>
Department of analytical, colloidal chemistry and technology of rare
elements, Al-Farabi Kazakh National University
050060, Almagul microdistrict, 48/16, Almaty, Kazakhstan
TEL:+7-775-971-76-10, +7-777-396-90-96 / FAX:

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Presentation #1

Electronic Microscopy of the Diatomite Surface

S. Tazhibayeva¹, [K. Korzhynbayeva](#)¹, A. Orazymbetova¹, K. Musabekov¹,
M. Burkitbayev¹, N. Guseynov¹ and M. Gabdullin¹ (¹Al-Farabi Kazakh
National University)

Preferred type:

Poster

Topic:

Others

Accepted as:

S3-62 (Poster)

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Send you abstracts devoted to the study of diatomite surface. Diatomite is the original highly porous sorbent. So we tried to study its sorption properties, as well as to prove the possibility of immobilization of cells of microorganisms. I hope that our materials will match the direction of your conference. Looking forward to further cooperation, Sagdat Tazhibayeva.

Presentation #2

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M. Burkitbayev¹, N. Guseynov¹ and M. Gabdullin¹ (¹Al-Farabi Kazakh
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Presentation #3

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Preferred type:

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Topic:

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New presentation

[[Submit a new presentation](#)]

Application for Poster Award

Poster presentation which is applied for the Poster Award will be reviewed at the poster session. At the reviewing, the presentation must be done in English.

Deadline:

December 9, 2012

Select your presentation to apply:

S3-62

Electronic Microscopy of the Diatomite Surface

**Self-recommendation of your paper for the Poster Award in English
(~ 100 words)**

Electronic Microscopy of the Diatomite Surface

S.M.Tazhibaveva, K.B.Korzhybnaveva, A.B.Orazymbetova, K.B.Musabekov,
M.M.Burkitbayev, N.Gusevnov, M.T.Gabdullin

Al-Farabi Kazakh National University
Almaty, 050040, Kazakhstan

It is widely known the use of clay minerals as sorbents of metal ions, surfactants and drugs, due to their high specific surface area. Interesting material with a developed surface are also diatomite, which formed from diatomic algae during long geological processes in Earth's crust.

The need to use diatomite as sorbents or carrier of polymers, enzymes and microorganism's cells require information about their structure.

In this context, we carried out electron microscopic study the surface of diatomite in presence of surfactants, polymers, Cu^{2+} and Pb^{2+} ions. On electron micrographs of individual diatomite clearly visible pores of 1,2-1.5 microns. Surface treatment of diatomite cationic polymer - polyethyleneimine (PEI) changes the structure of the mineral. At a concentration of PEI 10^{-5} base-mole/l were clearly visible pores on the surface of the mineral, while increasing the polymer concentration up to 10^{-2} base-mole/l pore size decreases and the outlines of them becoming less distinct, which is associated with the formation of a dense film structure.

Experiments on the immobilization of negatively charged microorganism's cells on the surface of diatomite showed that when the concentration of PEI to 0.03 base-mole/l adsorbed polymer layer on the surface of diatomite becomes so dense that prevents cell immobilization. This is due to the fact that the polymer film closes the pores of diatomite, which consequently leads to a decrease in the specific surface area of the adsorbent. These data agree well with electrophoresis. Negative values of ζ -potential of the surface decrease with increasing concentration of PEI up to 0.03 base-mole/l.

Interesting electron micrographs obtained for diatomite treated with Cu^{2+} and Pb^{2+} ions. If increasing the concentration of 10^{-5} mole/l to 10^{-2} mole/l a film adaptation has diatomite. In case of Pb^{2+} ions increase in concentration $\text{Pb}(\text{NO}_3)_2$ from 10^{-5} mole/l to 10^{-2} mole/l makes unclear the pores of diatomite, that is contribute to their manifestation. This, apparently, is associated with the formation of poorly soluble compound $\text{Pb}(\text{NO}_3)_2$ with SiO_2 groups of the surface.