



MONDOFIN
FINANCIAL ENGINEERING

Method of Targeted Selection of Microorganisms for Oil Industry

Description of MoTSoM Technology

❖ **METHOD OF TARGETED SELECTION OF MICROORGANISMS (MoTSoM)** steps from all areas of microbiology and is based on the molecular level of exposure to the cell (its genome), without the use of genetic modifications. The studies and tests were conducted on an extensive factual basis.

❖ **THE MoTSoM TECHNOLOGY** made it possible to bring the ability of microorganisms to adapt and respond to environmental influences to a new level, as well as to significantly increase their reproductive ability.



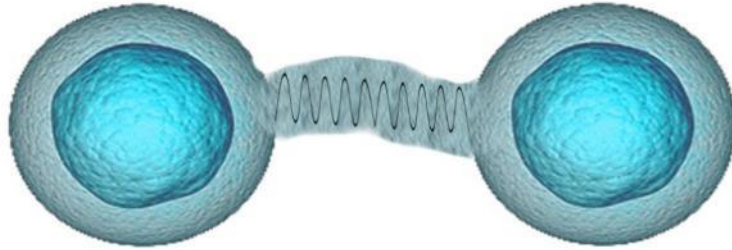
Description of the Information Molecule

- ❖ **THE INFORMATION MOLECULE** is a complex organic structure created with the application of MoTSoM, which acts as a generator, modulator and amplifier of bio-frequencies, when it enters the intercellular space.
- ❖ **THE INFORMATION MOLECULE** reduces the entropy in a cell and the surrounding intercellular space is reduced, which leads to changes in energy-consuming reactions and normalises the biologically active structures.

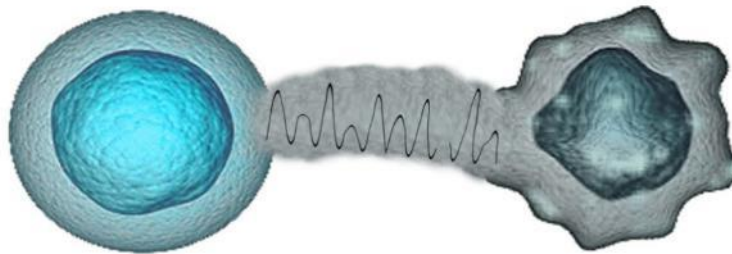


Description of MoTSoM Technology

INTERCELLULAR COMMUNICATION INVOLVING AN INFORMATION MOLECULE



Healthy cells



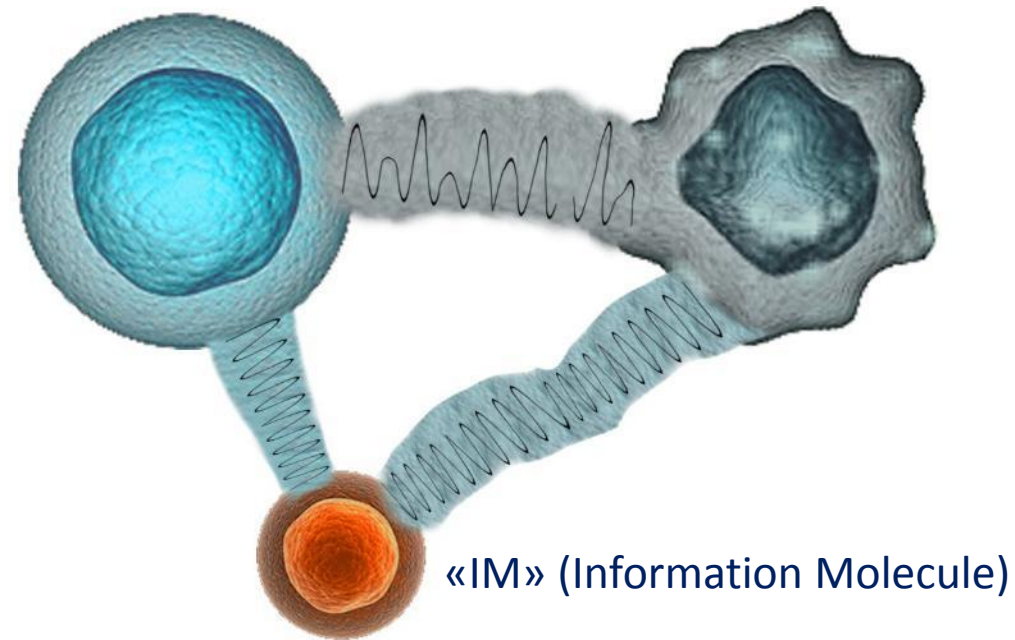
Healthy and damaged cells

One type of intercellular communication (there are plenty of them) occurs by means of electrical signals formed by the outer field of a cell with wavelengths from 200 to 1 000 nm. In the case of a damaged cell, the channel signal is disrupted, and with the assistance of an "information molecule," the distorted signal is aligned to "normal" or blocked.



Description of MoTSoM technology

INTERCELLULAR COMMUNICATION INVOLVING AN INFORMATION MOLECULE



The presence of rubrene in the complex of molecules allows stable generation of radiation within a given range. IM makes it possible to identify damaged cells with the altered DNA, as well as to produce healthy cells and include natural mechanisms to neutralise foreign cells.

Certificate of Compliance

СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
ФЕДЕРАЛЬНОЕ АГЕНТСТВО ПО ТЕХНИЧЕСКОМУ РЕГУЛИРОВАНИЮ И МЕТРОЛОГИИ

СЕРТИФИКАТ СООТВЕТСТВИЯ

№ РОСС RU.НВ61.Н02179
Срок действия с 10.03.2020 по 09.03.2025
№ 0429797

Орган по сертификации RA.RU.11НВ61
Орган по сертификации ООО "ЦЕТРИМ". Адрес: 153000, РОССИЯ, Ивановская область, город Иваново, улица Богдана Хмельницкого, дом 36В. Телефон +7 4932773165. Адрес электронной почты info@cetrim.ru

ПРОДУКЦИЯ Наиболее доступные технологии, продукция микробиологии, услуги, процессы производства, системы менеджмента качества, системы экологического менеджмента, интегрированные системы менеджмента, системы менеджмента качества пищевой промышленности, сельского хозяйства, переработки отходов, косметического производства, сертификация экспертов, персонала, промышленная безопасность и безопасность труда, экологическая безопасность, мониторинг и охрана окружающей среды. Торговая марка НПО Кинематика. Серийный выпуск.

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ НОРМАТИВНЫХ ДОКУМЕНТОВ
ТУ Восстановленные активные микроорганизмы. Технические условия № 21.10.60-001-67764787-2020

ИЗГОТОВИТЕЛЬ Общество с ограниченной ответственностью «НПО Кинематика». ОГРН: 1101690045280, ИНН: 1660143007. Адрес: 420061, РОССИЯ, Республика Татарстан, г.Казань, ул.Николая Ершова, 29а, а/я 126, телефон: +7(495) 681 – 27 - 11.

СЕРТИФИКАТ ВЫДАН Общество с ограниченной ответственностью «НПО Кинематика». ОГРН: 1101690045280, ИНН: 1660143007. Адрес: 420061, РОССИЯ, Республика Татарстан, г.Казань, ул.Николая Ершова, 29а, а/я 126, телефон: +7(495) 681 – 27 - 11.

НА ОСНОВАНИИ
Протокол испытаний № 09362-RPP/CM/2020 от 10.03.2020 г. выдан испытательной лабораторией Общество с Ограниченной Ответственностью "ЦСМК", свидетельство о подтверждении компетентности испытательной лаборатории № РОСС.RU.31801.RU.ИЦ012 от 12.03.2019

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ
Схема сертификации: 3с

Руководитель органа: П.Г. Рухлядев
Эксперт: В.П. Широков

Сертификат не применяется при обязательной сертификации

GOST R CERTIFICATION SYSTEM
FEDERAL AGENCY FOR TECHNICAL REGULATION AND METROLOGY

CERTIFICATE OF COMPLIANCE

No ROSS RU.HB61.H02179
Valid from 10.03.2020 To 09.03.2025
No. 0429797

CERTIFICATION AUTHORITY RA.RU.11HB61
Certification authority ООО "CETRIM". Address: 36V, Bogdan Khmelintsky Street, Ivanovo, Ivanovo Region, 153000, RUSSIA. Telephone: +7 4932773165. E-mail: info@cetrim.ru

THE PRODUCT The best available technologies, the products of microbiology, services, production processes, quality management systems, environmental management systems, integrated management systems, quality management systems for food industry, manufacture, agriculture, waste treatment, cosmetics production, certification of experts, personnel, industrial safety and labour safety, environmental safety, monitoring and protection of the environment. Trademark NPO Kinematika. Serial production.

MEETS THE REQUIREMENTS OF REGULATORY DOCUMENTS
of TS Reduced Active Microorganisms. Technical Specifications No. 21.10.60-001-67764787-2020

PRODUCER NPO Kinematika Limited Liability Company, PSRN: 1101690045280, TIN: 1660143007, Address: P.O. Box 126, 29a, Nikolai Yershov Street, Kazan, Republic of Tatarstan, 420061, RUSSIA, Telephone: +7 (495) 681-27-11

THE CERTIFICATE IS ISSUED TO NPO Kinematika Limited Liability Company, PSRN: 1101690045280, TIN: 1660143007, Address: P.O. Box 126, 29a, Nikolai Yershov Street, Kazan, Republic of Tatarstan, 420061, RUSSIA, Telephone: +7 (495) 681-27-11

ON THE BASIS OF
the Test Protocol No. 09362-RPP/CM/2020 of 10.03.2020 issued by the testing laboratory of CSMK Limited Liability Company, Certificate of Confirmation of Competence of Testing Laboratory No. ROSS.RU.31801.RU.IC012 of 12.03.2019

ADDITIONAL INFORMATION
Certification Scheme: 3c

Head of Authority: P.G. Rukhlyadev
Expert: V.P. Shirokov

Certificate does not apply in case of mandatory certification

MoTSoM technology has a certificate of conformity and is ready for industrial use.

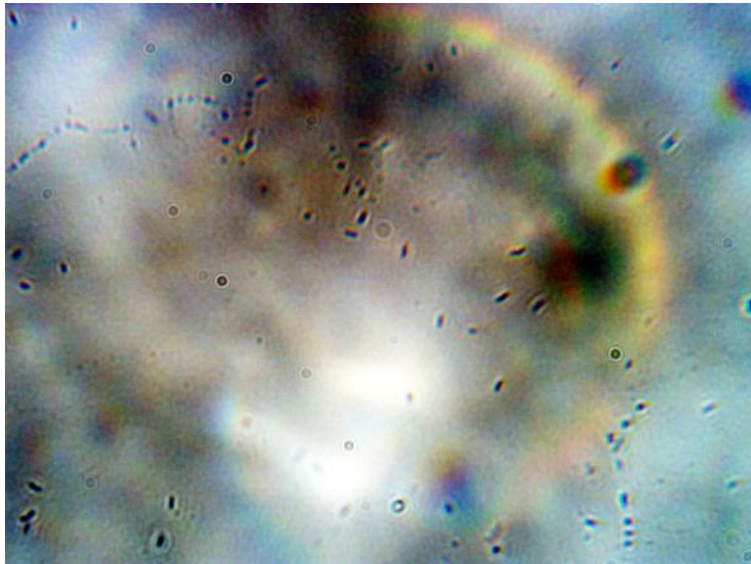
Research for Decontamination of Oil Spills under the Order of PJSC Gazprom Neft (Russian Oil Company)



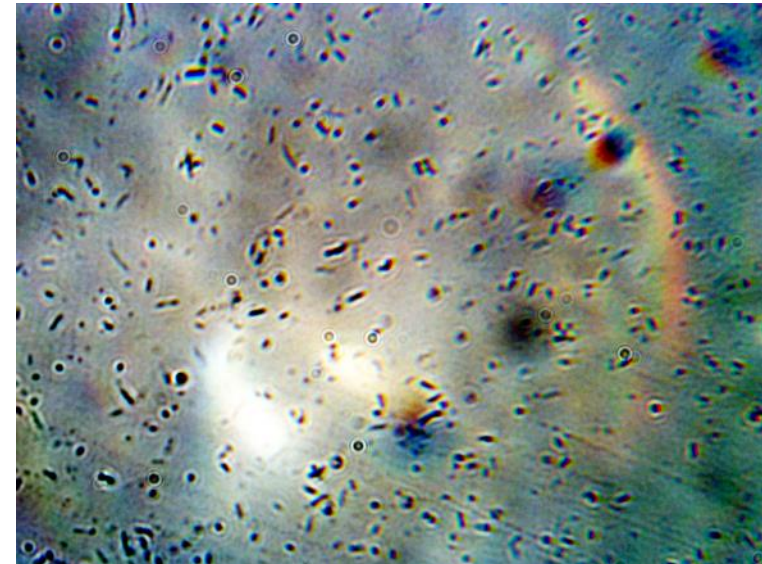
Research for decontamination of oil spills under order of PJSC Gazprom Neft

APPLICATION OF MoTSoM IN OIL SLUDGE PROCESSING TECHNOLOGY

BEFORE ACTIVATION



2 WEEKS LATER



The images show a significant growth of indigenous microorganisms after MoTSoM treatment.

Microorganisms produce their own surfactants, which contribute to the destruction of complex molecular compounds, as well as to the release of metal ions.



Research for decontamination of oil spills

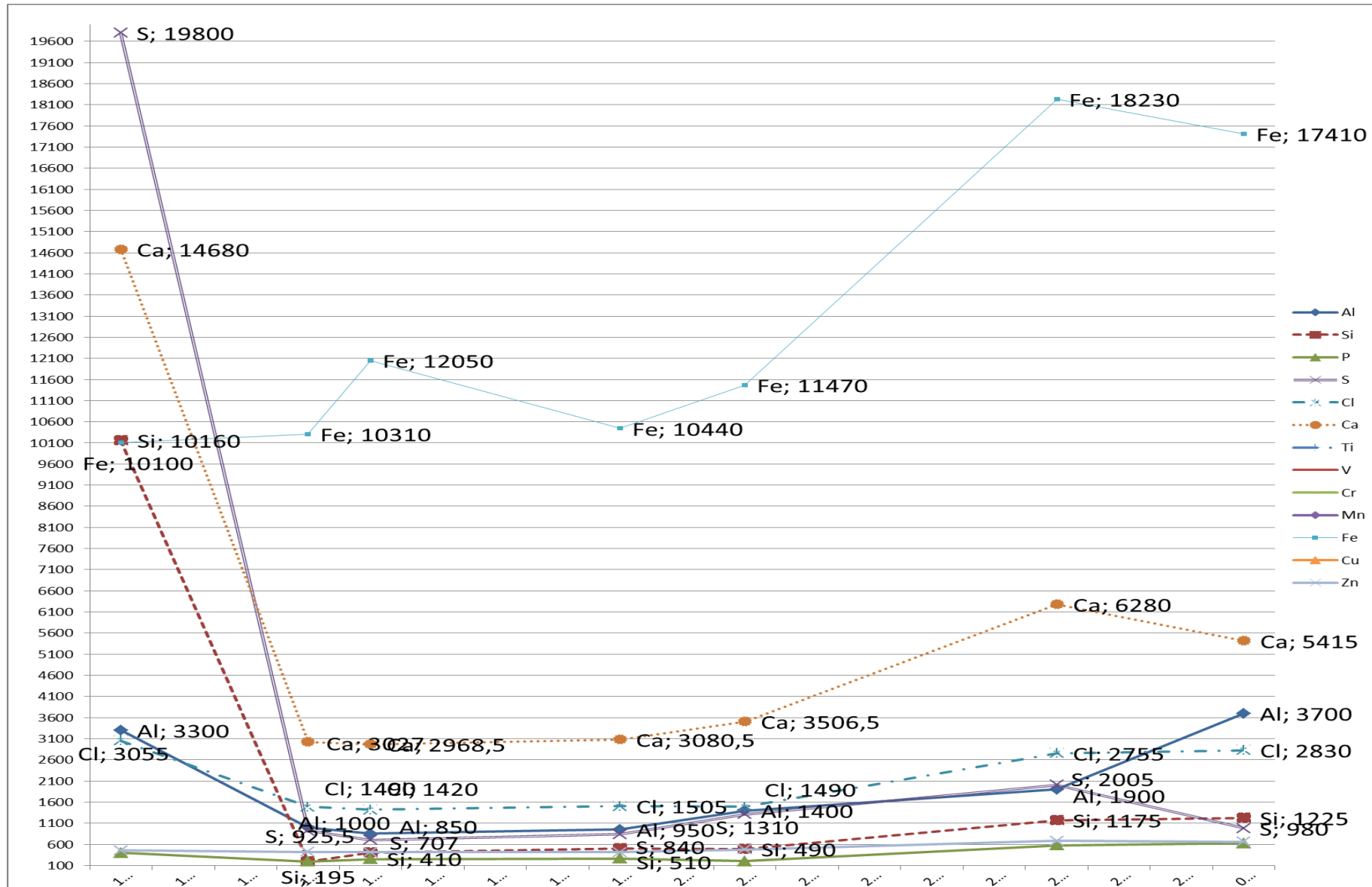
Chemical composition change (Pond III) *

Chemical element	geoChem-REE-Extra							GeoChem (2)						
	Pond III	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7	Pond III + gasoline+ IM+H ₂ O+ zeolite 7
	19.12.2018	14.02.2019	15.02.2019	19.02.2019	21.02.2019	26.02.2019	01.03.2019	19.12.2018	14.02.2019	15.02.2019	19.02.2019	21.02.2019	26.02.2019	01.03.2019
Al	3300	1800	1650	-	1400	-	3500	3300	1000	850	950	-	1900	3700
Si	1,016%	805	660	835	860	1840	2315	1,016%	195	410	510	490	1175	1225
P	400	375	360	455	395	1220	1400	400	195	250	265	205	580	625
S	1,98%	1890	1570	1870	2750	4810	2320	1,98%	925.5	707	840	1310	2005	980
Cl	3055	3385	3360	3620	3620	7240	7305	3055	1490	1420	1505	1490	2755	2830
Ca	1,468%	5825	5625	5900	6615	1,32%	1,15%	1,468%	3027	2968.5	3080,5	3506,5	6280	5415
Sc	286	1785	1730	1730	1795	3740	3925	286	-	-	-	-	-	-
Ti	-	-	-	-	-	-	-	-	140	270	100	300	1045	815
V	1600	-	-	-	-	-	-	1600	47	55.5	61	77	198	155,5
Cr	2150	2300	950	1150	2100	1300	-	2150	-	-	-	-	-	-
Mn	1170	1075	875	820	915	750	650	1170	70.5	79.5	69	98,5	167	162
Fe	1,01%	1.99%	2.32%	2,025%	2,19%	4,015%	3,845%	1,01%	1.031%	1.205%	1,044%	1,147%	1,823%	1,741%
Ni	-	-	-	165	160	-	370	-	27.5	23	22	25,5	69	53,5
Cu	-	645	260	310	325	1220	1225	-	52	48.5	48,5	59,5	95,5	103,5
Zn	455	1080	1020	1145	1295	2890	1825	455	420.5	414	416	481,5	683	662
As	-	-	-	-	-	-	-	-	-	-	-	-	4	5
Rb	-	-	7.5	-	-	-	-	-	6	6.5	5,5	7	7,5	8,5
Sr	26,5	173	184.5	166	160,5	213,5	228	26,5	92.5	95	88,5	95,5	102	103
Y	-	-	-	-	-	-	-	-	11.5	10.5	9,5	10,5	19	19
Zr	-	20	17	19	22,5	-	13	-	18.5	20.5	18	19,5	26	26,5
Nb	-	-	-	-	-	-	-	-	9	9	10,5	9	13,5	14,5
Mo	-	-	-	-	-	-	-	-	11.5	7.5	7,5	10,5	19,5	19
Rh	8,5	9	10	12,5	4,5	-	-	8,5	-	-	-	-	-	-
Pd	5,5	-	-	-	-	-	-	5,5	-	-	-	-	-	-
Cd	10	-	-	-	-	-	-	10	-	-	-	-	-	-
Ba	170	910	965	885	885	760	905	170	-	-	-	-	-	-
Pb	3	63	35.5	38	53,5	-	-	3	32.5	29.5	33,5	35	28,5	33
Th	-	-	-	-	-	-	-	-	46	38	38,5	44	65,5	66
U	-	-	-	-	-	-	-	-	10	9.5	10,5	9,5	18,5	20,5

* different modes of determination of chemical elements on the instrument Vanta C (geoChem-REE-Extra и GeoChem (2)).

Research for decontamination of oil spills

Results of MoTSoM application (abundances of chemical elements, Pond III)



Research for decontamination of oil spills

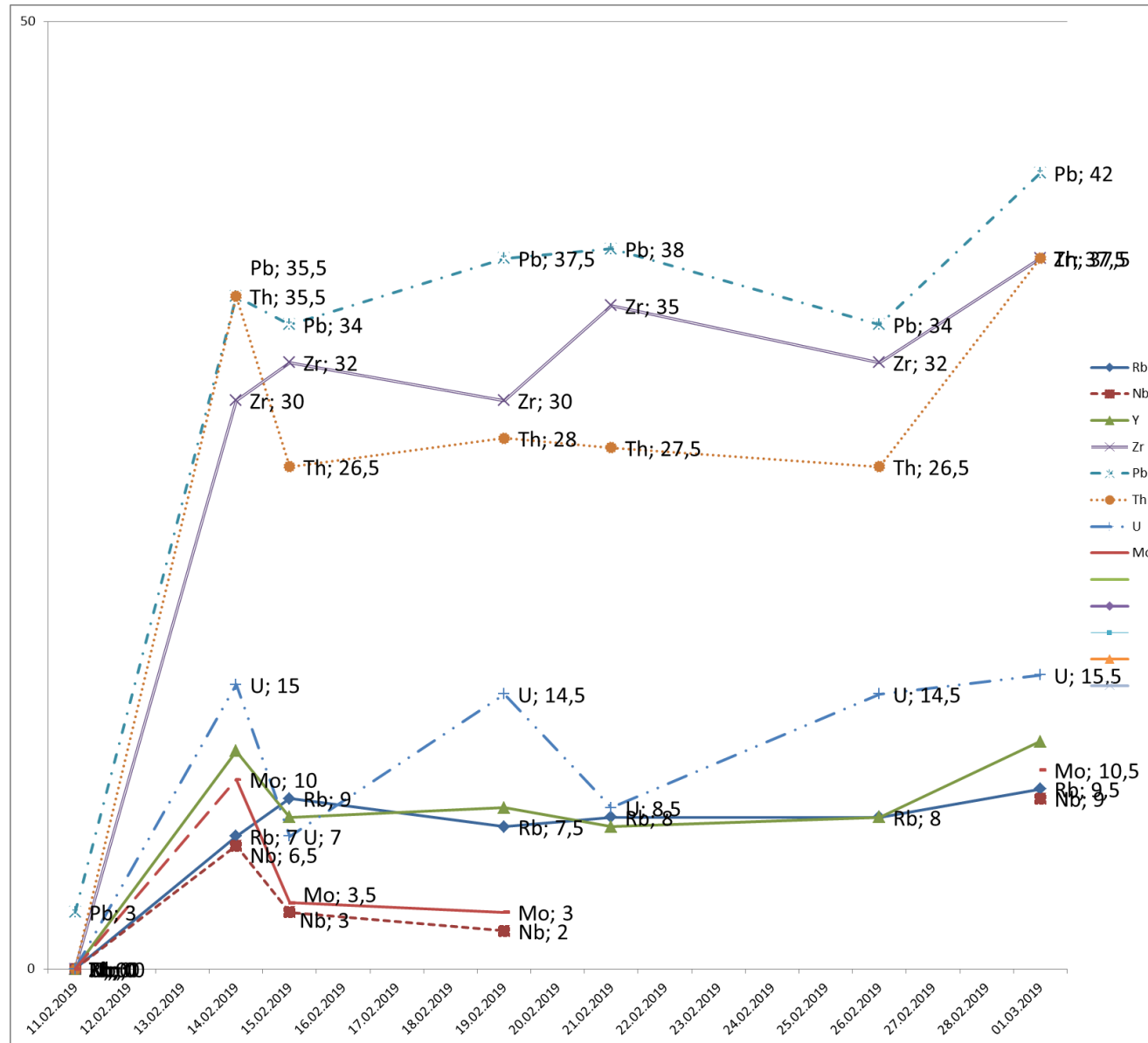
Changes in chemical composition (Pond IV)*

Chemical element	geoChem-REE-Extra							GeoChem (2)						
	Pond IV	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7	Pond IV + gasoline+ IM+H ₂ O+ zeolite 7
	19.12.2018	14.02.2019	15.02.2019	19.02.2019	21.02.2019	26.02.2019	01.03.2019	19.12.2018	14.02.2019	15.02.2019	19.02.2019	21.02.2019	26.02.2019	01.03.2019
Al	3300	3300	2050	1900	2600	2800	3900	3300	1350	-	2700	1000	2700	2400
Si	1,016%	720	690	790	655	855	1080	1,016%	405	485	555	570	625	790
P	400	420	550	465	280	555	685	400	240	335	290	220	445	460
S	1,98%	1471	2025	1065	1895	1680	1120	1,98%	1510	1122	684	1219	1088,5	630
Cl	3055	3550	3480	3060	2985	2980	4060	3055	1955	1725	1765	1770	1825	2000
Ca	1,468%	2.19%	2.05%	1,435%	1,67%	1,605%	1,84%	1,468%	1.399%	1.2245%	1,011%	1,2%	1,1905%	1,0835%
Sc	286	2185	2180	1915	1765	1800	2620	286	-	-	-	-	-	-
Ti	-	-	-	-	-	-	-	-	4940	4355	4190	4600	4920	4535
V	1600	-	-	-	-	-	-	1600	1095.5	1008.5	930,5	1017,5	1064,5	1032
Cr	2150	2300	2950	2600	3200	2550	1250	2150	-	-	-	-	-	-
Mn	1170	67	910	1140	850	920	1280	1170	437.5	413	392,5	449	449,5	479
Fe	1,01%	4.81%	4.69%	4,035%	3,975%	3,945%	4,985%	1,01%	2.801%	2.553%	2,597%	2,524%	2,7035%	2,8255%
Ni	-	-	-	-	-	-	-	-	30.5	20	24	29	36	31,5
Cu	-	390	380	-	275	790	595	-	87	87.5	81,5	81	106	97,5
Zn	455	915	835	725	715	670	1100	455	392	339.5	347	347,5	382,5	384
As	-	-	-	-	-	-	-	-	-	3.5	-	-	-	-
Rb	-	-	-	-	-	-	-	-	7	9	7,5	8	8	9,5
Sr	26,5	1065	1090	1000	1000	930	1200	26,5	606.5	614.5	629,5	647	647	663
Y	-	-	-	-	-	-	-	-	11.5	8	8,5	7,5	8	12
Zr	-	42.5	52	22,5	38,5	34,5	59,5	-	30	32	30	35	32	37,5
Nb	-	-	-	-	-	-	-	-	6.5	3	2	-	-	9
Mo	-	-	-	-	-	-	-	-	10	3.5	3	-	-	10,5
Rh	8,5	-	-	-	-	-	-	8,5	-	-	-	-	-	-
Pd	5,5	-	-	-	-	-	-	5,5	-	-	-	-	-	-
Cd	10	-	-	-	-	-	-	10	-	-	-	-	-	-
Ba	170	6420	6335	6635	6950	7035	6310	170	-	-	-	-	-	-
Pb	3	-	42.5	-	-	-	-	3	35.5	34	37,5	38	34	42
Th	-	-	-	-	-	-	-	-	35	26.5	28	27,5	26,5	37,5
U	-	-	-	-	-	-	-	-	15	7	14,5	8,5	14,5	15,5

* different modes of determination of chemical elements on the instrument Vanta C (geoChem-REE-Extra и GeoChem (2)).

Research for decontamination of oil spills

Results of MoTSoM application (abundances of chemical elements, Pond IV)



Research for decontamination of oil spills

Report on activation of indigenous strains of microorganisms in oil emulsion (cleanup of BND Thailand facilities)

Objectives:

1. To obtain a consortium of microorganisms from an emulsion.
2. To isolate indigenous microorganisms from emulsion samples.
3. To choose optional IM-agents.

Results:

1. Isolated indigenous microorganisms.
2. Selected three most active consortia of microorganisms:
 - No. 4 (photo 1);
 - No. 6 (photo 2);
 - No. 7 (photo 3).



Research for decontamination of oil spills

Report on activation of indigenous strains of microorganisms in oil emulsion (cleanup of BND Thailand facilities)

Photo on the third day of the strain No. 4

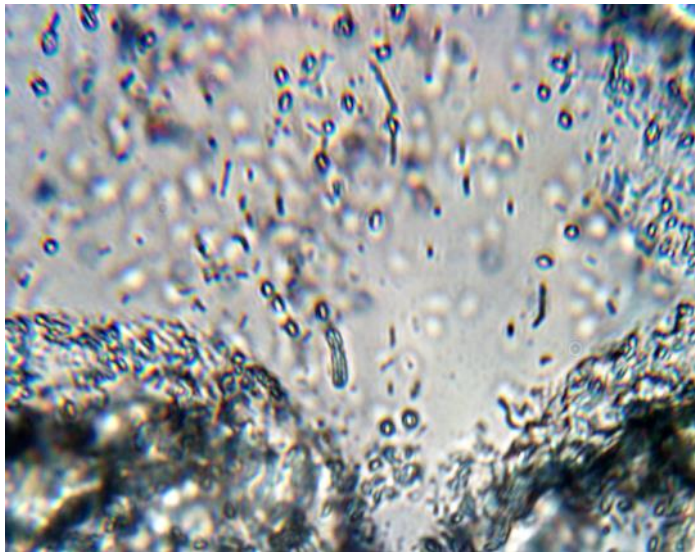


Photo No. 1

Photo on the third day of the strain No. 6

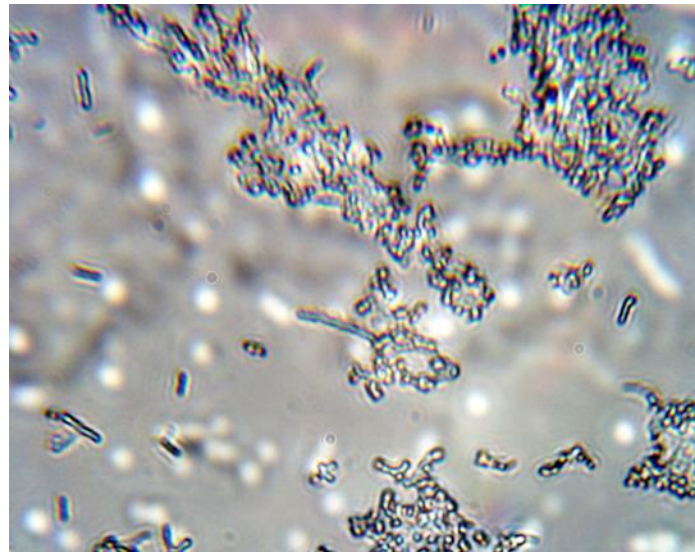


Photo No. 2

Photo on the third day of the strain No. 7

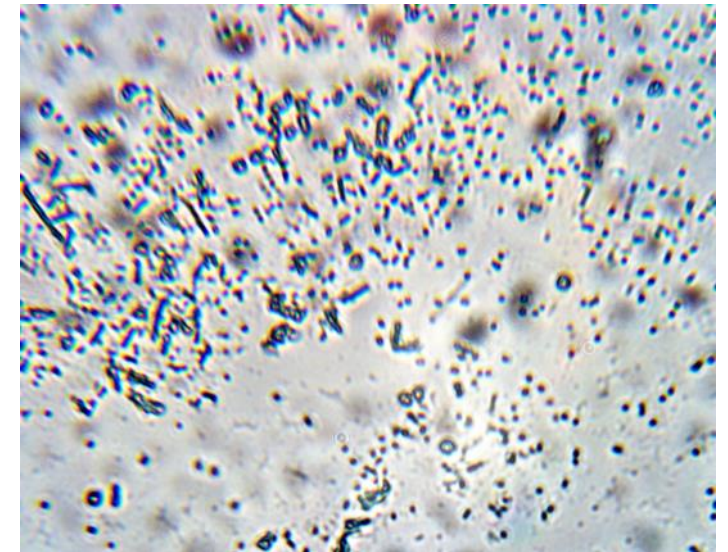


Photo No. 3

Research for decontamination of oil spills

Report on activation of indigenous strains of microorganisms in oil emulsion (cleanup of BND Thailand facilities)

The results of activity of microorganisms in oil emulsion were obtained, and the optimal strain No. 6 was chosen (photos No. 4 and 5).



Photo No. 4

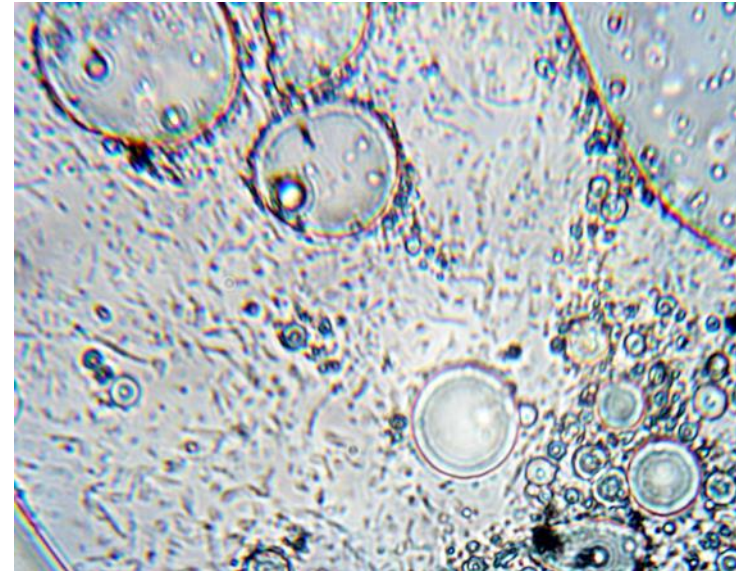


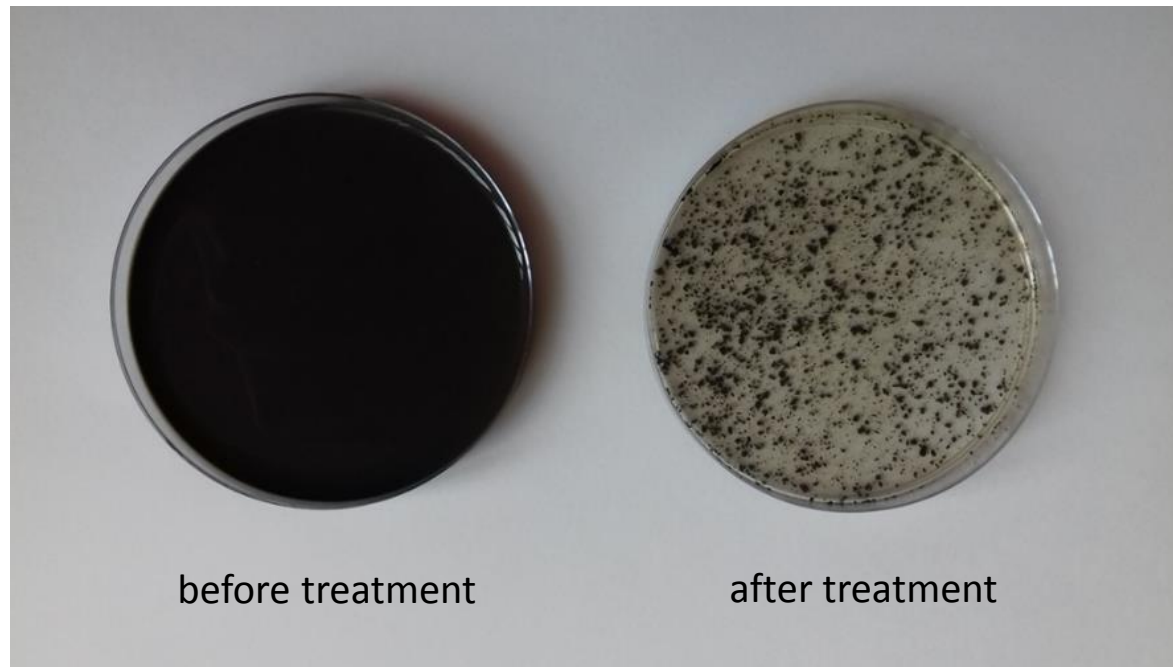
Photo No. 5

The result: an active strain No. 6 for the cleaning of oil emulsion from hydrocarbons.



Research for decontamination of oil spills

MoTSoM Emulsion Treatment + Preparation 6 (BND Thailand)



Residue after treatment: ultra-dispersed carbon and water.

The obtained carbon, after washing with a solvent, is suitable for the production of rubber products.

Research for decontamination of oil spills

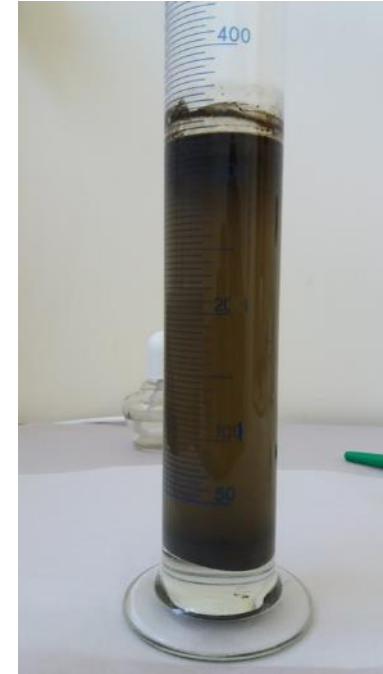
Application of MoTSoM for breaking of water-oil and oil-in-water emulsions (BND Thailand)



Start of observations at 13:00



16:00



In 24 hours

The results of experiments show high efficiency of the created strains of microorganism cultures. The strains showed exceptional activity in decomposition and breakdown of oil-in-water emulsion. It can be used effectively for treatment of circulating reservoir waters at oil fields.

Potential for Application of the Technology

Purification of water after separation of the oil fluid from oil residues by biological method

The application of our technology gives the following advantages:

- Possibility to re-use purified water and switch to recycling water supply;
- Removal from water of even the dissolved hydrocarbons;
- Purified water is saturated with enzymes that dissolve hydrocarbons and, when re-injected into the well, it restores permeability of rocks of the oil reservoir. With time it will help restore the well yield and, at the same time, reduce water content in the oil fluid, thus extending the service life of the oil wells;
- The technology can be applied to restore the idle wells, which will have a sizeable economic effect;
- The application of our technology will reduce significantly the ecological load on the environment.



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Thank you for your attention!