

*Справочник  
№ 11*

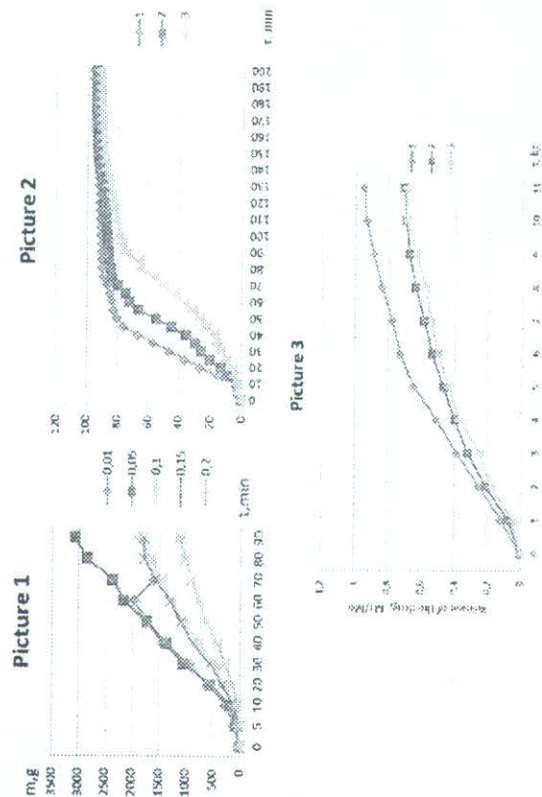
Russian Academy of Sciences  
Department of Chemistry and Materials Science  
Lomonosov Moscow State University  
Topchiev Institute of Petrochemical Synthesis  
of the Russian Academy of Sciences

**IV International Conference  
ON COLLOID CHEMISTRY  
AND PHYSICOCHEMICAL  
MECHANICS**

**BOOK of ABSTRACTS**



30 June – 05 July 2013  
Moscow, Russia



## BP05

### The current state of the soil covers of Kazakhstan.

#### Ways of solution

N. Ye. BEKTURGANOVA<sup>1</sup>; S. B. AIDAROVA<sup>1</sup>; K. B. MUSABEKOV<sup>2</sup>; M. KERIMKULOVA<sup>2</sup>; A. A. SHARIPOVA<sup>1</sup>

1. Satpayev Kazakh National Technical University, Almaty, Kazakhstan  
2. Al-Farabi Kazakh National University, Almaty, Kazakhstan

bektur\_n@mail.ru

Current condition of the soil surface is determined primarily by the activities of human society. A particularly dangerous consequences of human impact on the soil have to be soil erosion, pollution by chemical substances, salinization, dehumification up to a complete loss of fertility, as well as the direct destruction and occupation of the soils for constructions, buildings, water reservoirs and etc.

At present, technogenic industrial enterprises and plants of energy engineering located in the city (Almaty, Karaganda, Dzhezkazgan, etc.) constitute a particular danger. In these cities soils are intensively contaminated with elements of class I and II hazard: lead, zinc, copper, nickel, mercury, cadmium, and chromium. In some areas, there are small concentrations of copper, manganese and nickel. It is unnecessary to talk about dangers of heavy metal accumulation in the soil cover for the human body and human life. But it is worth noting that many years of industrial pollution of soil turn the cities a biogeochemical province, threatening the world around serious negative consequences.

It is not solved the problem of the consequences of the Aral Sea drying which led to the formation of the desert Aralkum, the danger of which is that it is itself a continuous saline consisting of fine marine sediments and residual mineral deposits, washed off the irrigated fields. One of the major environmental problems facing the Aral Sea region is wind erosion of

the dried bottom of the Aral Sea. Each year, about 75 million tons of sand, dust and salt from the bottom of the dry Sea is blown with the wind as a result of deflation processes. Millions of tons of toxic chemicals and sand are spread over hundreds of kilometers from the adjacent agricultural lands as well as have a serious impact on public health.

Another example of aweless human impact on the pedosphere is soil cover of the territory of the former ranges. There is not a secret for everyone that in the years of Soviet era in the territory of Kazakhstan there were dozens of research testing and nuclear test sites: the Semipalatinsk nuclear test site, The test site Baikunur (Kyzylorda region), the Sary-Shagan (Karaganda and Zhambyl Oblast), Emba (Aktobe) and Kapustin Yar (Atyrau and West Kazakhstan region) and Azgir sites. The presence of such a large number of test sites in the territory of one state is more than enough. Since the damage done not only to the soil, but also all the environmental situation of the republic is not comparable. Total area affected is estimated at 304,000 square km. According to scientists' research the activity of radiation plutonium (which is now in excess on the Semipalatinsk test site) is uniformly reduced by half every 24,000 years (half-life). This means that only in a million year the background radiation lands of the former Semipalatinsk nuclear test site will be equal to the natural.

In this study, the problem of fixation of soil carrying radionuclides and heavy metals in order to prevent their further movement is raised. Wind and water are of particular importance in the migration of soil. As it is known, heavy metals and radioactive isotopes are well adsorbed by soil and moved along with it, resulting in their redistribution at deflation and soil erosion. Erosion of soil in the contaminated area can cause the formation of new centers of radioactivity in the accumulation area of the washed off or blown away soil with a high content of pollutants, which further exacerbates the problem of environmental protection. Therefore, the development of the efficient structure formers - soil fixers is an urgent problem in the field of environmental protection.

In this study, a comprehensive study of complex forming, absorption, rheological and structure forming properties of water soluble polymers of anionic and cationic nature, surface-active substances and complexes polymer/surfactant on the soil of Azgir landfill, dried bottom of the Aral Sea is carried out.

It is found that anti erosion soil resistance depends on the nature, concentration and time of exposure of reagents to the soil.

## BP06

### The impact of microalga *Spirulina platensis* on the rheological properties of the dough from wheat flour

L. G. BELYAVSKAYA<sup>1</sup>, A. G. UVAROVA<sup>2</sup>

1: Department of Technology of Bread, Macaroni and Confectionery, Moscow State University of Food Production, Moscow, Russia

2: Department of Standardization and Equipment of Processing Production, Kursk State Agricultural Academy, Kursk, Russia

belyavskaya@list.ru

Creation of modern technologies for healthy bakery products used for preventive purposes is one of the aims of Russian Federation State policy and healthy nutrition program up to 2020. The part of this program is use of new types of raw materials in baking industry.

One of perspective and biologically active additives in this field is the introduction of microalga *spirulina* in traditional bakery products. Rich composition of this microalga, its biological efficiency, the pharmacological properties and its safety are showing positive effect