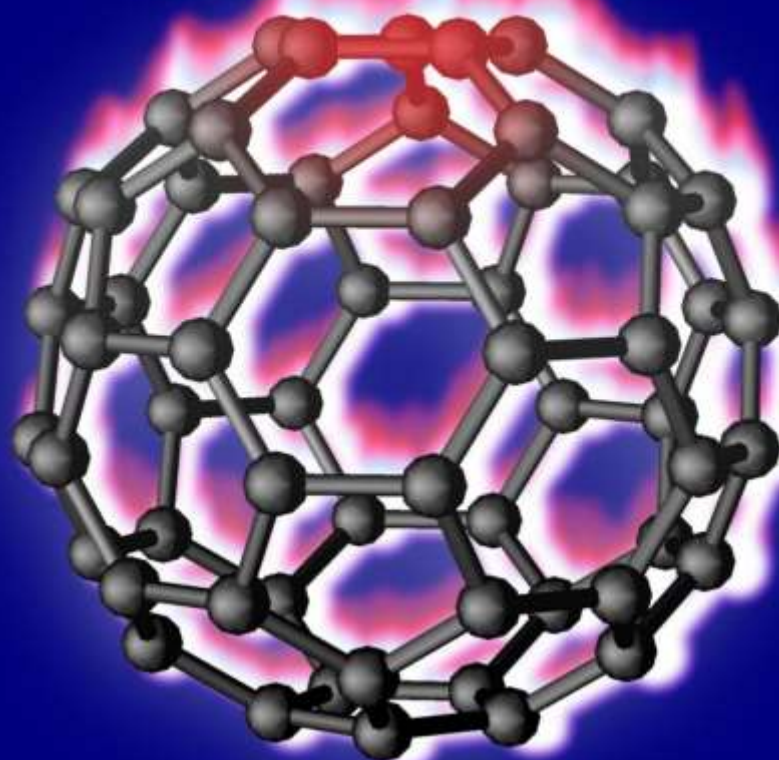


The Ministry of Education & Science of the Republic of Kazakhstan Scientific Committee

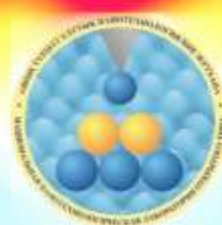
Al-Farabi Kazakh National University
International Science and Technology Center
The Institute of Combustion Problems
National Nanotechnology Laboratory of Open Type

X International Symposium

The Physics and Chemistry of Carbon and Nanoenergetic Materials



September 12-14, 2018
ALMATY, KAZAKHSTAN



The Ministry of Education & Science of the Republic of Kazakhstan
Қазақстан Республикасы Білім және Ғылым Министрлігі
Министерство Образования и Науки Республики Казахстан

al-Farabi Kazakh National University
әл-Фараби атындағы Қазақ Ұлттық Университеті
Казахский Национальный Университет им. аль-Фараби

International Science and Technology Center
Халықаралық Ғылыми-Технологиялық Орталық
Международный Научный и Технологический Центр

The Institute of Combustion Problems
Жану Проблемаларының Институты
Институт Проблем Горения

National Nanotechnology Laboratory of Open Type
Национальная Лаборатория Открытого Типа
Ұлттық Ашық Лаборатория



X International Symposium
«THE PHYSICS AND CHEMISTRY OF CARBON AND NANOENERGETIC MATERIALS»

12-14 september 2018

X халықаралық симпозиумы
«ФИЗИКА ЖӘНЕ ХИМИЯ КӨМІРТЕКТІ ЖӘНЕ НАНОЭНЕРГЕТИКАЛЫҚ МАТЕРИАЛДАР»

12-14 қыркүйек 2018

X Международный Симпозиум
«ФИЗИКА И ХИМИЯ УГЛЕРОДНЫХ И НАНОЭНЕРГЕТИЧЕСКИХ МАТЕРИАЛОВ»

12-14 сентября 2018

Алматы, 2018

X Международный Симпозиум «Физика и химия углеродных и наноэнергетических материалов» – Алматы: Институт проблем горения, 2018. - 312 с.

ISBN 978601-04-3554-7

Компьютерный набор и верстка О.Ю.Головченко

Адрес оргкомитета:
Республика Казахстан, 050012,
г. Алматы, ул. Богенбай батыра 172,
тел. 8 727 2675111, 2924346,
факс: 8 727 2925811,
e-mail: zmansurov@kaznu.kz

ISBN 978601-04-3554-7

© Институт проблем горения, 2018

Chapter 7

POSTER PRESENTATIONS

TABLE of CONTENTS

1. Coal tar processing into nanomaterials <u>Imangazy A., Smagulova G.T., Kerimkulova A.R., Zakhidov A.A.</u>	4
2. Al-based mixtures for flameless ration heaters <u>Kaliyeva A.M., Tileuberdi Ye., Galfetti L., Ongarbayev Ye.K., Mansurov Z.A.</u>	6
3. The study of the morphological structure of nanocarbon materials after chemical activation <u>Nyissanbayeva G.R., Kudaibergenov K.K., Ongarbayev Ye.K., Mansurov Z.A., Capua R., Alfe M., Gargulio V.</u>	9
4. Возможно ли управлять химическими реакциями на углеродных и родственных цепях с помощью солитонов? <u>Оксенгендлер Б.Л., Никифорова Н.Н., Тураева Н.Н., Карпова О.В., Нечипоренко Ю.Д.</u>	15
5. Investigation of the effect of activated carbon (from plant raw material) based on metal oxides for pyrotechnical purposes <u>Yelemessova Zh.K., Lesbayev B.T., Ruiqi Shen</u>	17
6. Electrical conductivity study of porous carbon composite derived from rice husk <u>Supiyeva Zh., Pavlenko V., Biisenbayev M., Béguin F., Mansurov Z.</u>	20
7. Synthesis of SiC nanostructures on the surface of copper films <u>Kenzhegulov A.K., Suyundykova G.S., Mansurov B.Z., Medyanova B.S., Partizan G., Aliev B.A.</u>	23
8. High Mass-Loading Sulfur-Composite Cathode for High Performance Lithium-Sulfur Batteries <u>Baikalov N., Almagul M., Kurmanbayeva I., Bakenov Z.</u>	27
9. Металлическая углеродная сажа. <u>Жаксылыкова А.Н., Курманбаева Г.Г., Нургаин А., Жапарова А.А., Нажипкызы М., Лесбаев Б.Т., Приходько Н.Г.</u>	28
10. Synthesis of solid high-energy compounds <u>Seisenova A.B., Aknazarov S.KH., Juan Maria Gonzalez-Leal, Golovchenko O.YU., Bairakova O.S., Kapizov O.S.</u>	30
11. Functionalization of carbon based wound dressings with antimicrobial phytoextracts for bioactive treatment of septic wound <u>Akimbekov N.Sh., Abdieva G.Zh., Ualieva P.S., Zhusipova D.A., Digel I., Tastambek K.T., Zhubanova A.A.</u>	33
12. Silica based anode from local agricultural waste for LiB <u>Sadykova A., Mentbayeva A., Adi A., Kurmanbayeva I., Bakenov Z.</u>	36
13. Особенности формирования структуры пленок a-C<Pd _x > и ее влияние на величину запрещенной зоны в зависимости от мощности плазменного разряда <u>Рягузов А.П., Немкаева Р.Р., Гусейнов Н.Р.</u>	40
14. Исследование агрегативной устойчивости водонефтянных эмульсий при добыче высоковязких нефтей <u>Салахов Р.Х., Хамидуллин Р.Ф.2, Бодыков Д.У.1, Сейтжанова М.А.</u>	44
15. Парамагнитные характеристики рисовой шелухи при ее термодеструкции <u>Рябикин Ю.А., Байтимбетова Б.А., Лебедев И.А., Серикканов А.С., Дмитриева Е. А.</u>	47
16. Зависимость сигнала эпр углеродной пленки от температуры на некоторых подложках <u>Рябикин Ю.А., Байтимбетова Б.А., Лебедев И.А., Серикканов А.С., Дмитриева Е. А.</u>	50
17. Изучение воздействия электрогидравлического эффекта на высоковязкую нефть <u>Бодыков Д.У., Сейтжанова М.А., Салахов Р.Х., Мансуров З.А.</u>	53
18. Применение композиционного материала, упрочненного углеродными нанотрубками в пиротехнических замедлителях	

COAL TAR PROCESSING INTO NANOMATERIALS

^{1,2}A.M. Imangazy, ^{1,2}G.T. Smagulova, ^{1,2}A.R. Kerimkulova, ³A.A. Zakhidov

¹Institute of combustion problems, Almaty, Kazakhstan

²Al-Farabi Kazakh National University, Almaty, Kazakhstan

³University of Texas at Dallas, Richardson, USA

kazpetrochem@gmail.com

Abstract. Experiments on the extraction of technogenic nanofibers from coal carbonization products, namely, coal tar are under development. In particular, the technology for producing nanofibers from coal tar using electrospinning method under research.

In 2017, according to the BP Statistical Review of World Energy, the coal production in Kazakhstan was 47,9 million tonnes of oil equivalent whereas coal consumption was only 36,2 million tonnes of oil equivalent. Theoretically remained 11,7 million tonnes of oil equivalent may be processed into nanomaterials [1].

The main importer of Kazakh coal remains Russia, but the development of the energy sector of the Russian Federation assumes a gradual transfer of consumption by the Ural power plants from Ekibastuz coal to Kuznetsk coal. The increase in export volumes of Ekibastuz coals in the Russian direction is not forecasted, due to the adoption of a program for the development of the Russian coal industry for the period up to 2030, by order of the Russian government. According to this program, it is planned to replace the consumption of Kazakh (Ekibastuz) coals by Russian power stations with Kuznetsk coal and the transition of individual Russian power plants to gas [2].

At a joint seminar of the Institute of Combustion Problems and the Kazakhstan Highway Research Institute, Professor Mansurov Z.A. and Teltayev B.B. proposed the idea of processing local coals into the products with high added value, such as nanofibers, which are widely used in medicine, biotechnology, power engineering, filtration systems, composite materials, etc.

The interest in nanofibers production caused by the fact that the mechanical properties of these materials, such as tensile strength, bending and compression, the elastic moduli increase with decreasing fiber diameter and accomplish a theoretical limit when reaching the nanoscale level.

Coal tar pitch is a solid product of coal tar processing with the yield of 50-60 wt%. Pitch is a homogeneous and thermoplastic substance of black color with a brilliant wrinkled fracture [3].

The advantages of the electrospinning method is that, unlike normal, mechanical extrusion of fibers from a solution, it does not show high requirements for the chemistry of the process, does not require high temperatures for fiber solidification, and therefore, allows the creation of fibers from long and complex molecules. Electrospinning is a complex, profitable and simple method for manufacturing nanofibers.

Currently, at Institute of Combustion Problems, a new technology for producing nanofibers from coal tar using electrospinning method under development. In connection with the release of a huge amount of non-sold coals, it opens the possibility of developing new deep processing of local coal technologies in Kazakhstan and construction of new enterprises near the coalfields, which in

X International Symposium
«THE PHYSICS AND CHEMISTRY OF CARBON AND NANOENERGETIC MATERIALS»
X халықаралық симпозиумы
«ФИЗИКА ЖӘНЕ ХИМИЯ КӨМІРТЕКТІ ЖӘНЕ НАНОЭНЕРГЕТИКАЛЫҚ МАТЕРИАЛДАР»
X Международный Симпозиум
«ФИЗИКА И ХИМИЯ УГЛЕРОДНЫХ И НАНОЭНЕРГЕТИЧЕСКИХ МАТЕРИАЛОВ»

turn will smooth out export restrictions, reduce social tension, and bring new branch of nanotechnology to our country.

References:

- [1] The BP Statistical Review of World Energy, June 2018, P. 38-39
- [2] «Samruk-Energo» JSC, <https://www.samruk-energy.kz/ru/>
- [3] Coal tar // The Big Soviet Encyclopedia (in 30 tons) / Ch. Ed. A. M. Prokhorov. - 3rd Ed. - Moscow: «Soviet Encyclopedia», 1973. – Vol. XI. - P. 258. - 608 p.