



Livited Nations



International Competence Centre fur Mining Engineering Education under the auspices of UNESCO

Saint-Petersburg Mining University

XV INTERNATIONAL FORUM-CONTEST OF STUDENTS AND YOUNG RESEARCHERS "TOPICAL ISSUES OF RATIONAL USE OF NATURAL RESOURCES"

UNDER THE AUSPICES OF UNESCO

13-17 May 2019

SCIENTIFIC CONFERENCE ABSTRACTS

SAINT-PETERSBURG 2019

ELIMINATION OF OIL POLLUTION USING SORBENTS

The rate of accumulation of petroleum products as a result of anthropogenic pollution in water and soil ecosystems is far ahead of their rate of biodegradation in a natural way, and existing technologies do not allow to cope with such contamination quickly and efficiently. Sorbent materials can provide a useful resource in a response to a spill of oil, allowing oil to be recovered in situations that are unsuitable for other techniques [1,2]. The hit of oil and its products into the environment, either in air, water or soil, causes a change in their physical, chemical and biological characteristics, disrupting the natural course of biochemical processes. Elimination of oil pollution is not without the use of various types of sorption materials. Oil sorbents are materials that can absorb oil products in large quantities, however preventing their migration in the surrounding environment [3]. A special interest is the research and study of materials that have high sorption characteristics and have an organic basis. This fact is very important, since by solving problems of recycling and (or) regeneration of sorbents, in the case of their organic basis, their rational use, for example, for obtaining thermal energy, without secondary pollution of the environment, is possible.

In recent years, a search has been actively carried out in the field of obtaining nonexpensive oil sorbents for the collection of hydrocarbon spills. Despite the development in this direction, the issues of research of the collection of oil and oil products from various surfaces and the estimate effectiveness of the usage of sorbents on the basis of the agroindustrial complex's residual are not given enough attention, which determined the purpose of this research. For the research, the following residual samples of agroindustrial complex are considered: Buckwheat husk Fagopyrum esculentum, Buckwheat husk Fagopyrum esculentum, Peanut pericarp Arachis hypogaea and Pericarp of radis Raphanus.

These sorbents are not inferior in oil sorption known industrial sorbents. The offered sorbents can be dissipated during cleaning of various polluted surfaces of water, concrete, asphalt, metals, soil (clay, sand) from the pollutant by hand, by mechanical or pneumatic devices, further assembled conglomerate of hydrocarbon impregnated sorbent can be subjected to extraction of oil (oil product) by compression methods. The residue can be used as fuel briquettes with an increased calorific value. Petroleum sorbents from agroindustrial residual have the ability to biodegrade under the influence of aboriginal soil or artificially introduced microorganisms. It should be noted that it is advisable to obtain data sorbents in environmental and economic terms, due to the low cost of materials, easy manufacturing, high sorption properties, the possibility of recycling of secondary raw materials.

REFERENCES:

1. Zhu K, Shang Y, Sun P, Zhu H 2013 J. Frontiers of Materials Science 7(2) pp 170-176

2. Teli M, Valia S. 2013 J. Fibers and Polymers 14(6) pp 915–919

3. Yakubouski S, Bulauka Y, Mayorava K, 2017 J. Bulletin of the Polotsk State University 11 pp 9–11.