



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

VIKTORYIA LIAKHOVICH

Polotsk State University

YULIYA A. BULAUKA

Polotsk State University

METHOD TO REDUCE FREEZING AND IMPROVE DUST SUPPRESSION WHEN RECEIVING AND TRANSPORTING PETCOKE

Petcoke may be combusted as fuel in industrial and power generating plants[1].Coke fines may be easier to burn as a fuel. The creation of coke dust, associated with the presence of coke fines, is a major cause of environmental problems. It results also in loss of productivity [2].An emission control technique that is commonly used at petcoke storage locations is the application of water to storage piles, but freezing temperatures may require additional practices to mitigate fugitive dust. Treating piles with anti-dust chemical agents prior to the arrival of subfreezing conditions is the following practices are mitigation strategies for wintertime conditions [3, 4].

The input analysis of raw materials was performed in the laboratory of the Department of Technology and Equipment of Oil and Gas Processing. Compounding of light vacuum gas oil with high-molecular oil residues was performed on a laboratory setup. For the obtained prophylactic agents assumed viscosity at 50°C (GOST 6258), pour point (GOST 20287), flash point (GOST 6356), determination of water content (GOST 2477), determination mechanical admixtures (GOST 6370) and copper strip test (GOST 6321) were determined.

A prophylactic agent for dust suppression and reducing losses from blowing petcoke upon receipt, as well as against the freezing of coke, sticking during transportation at negative temperatures has been developed on the basis of residual refined products. The process of freezing and sticking to the surface of the gondola cars when watering coal and applying anti-freezing agent is simulated at a temperature of minus 25°C. The sequence of modeling the process of freezing and sticking of coal to the walls of gondola cars.

It is established that the proposed prophylactic agents do not exhibit corrosion aggressiveness with respect to metal surfaces, do not contain mechanical impurities and water. Samples have sufficiently high flash points that meet fire safety requirements. Also samples are characterized by low pour points allowing them to be used at ambient temperatures below minus 40°C. The proposed samples are not inferior in performance properties to the analogue "Niogrin-PS 35S" and cheaper than it more than three times. Prophylactic agents can be effectively used as prophylactic agents against freezing, sticking, for dust suppression and reducing losses from blowing petroleum coke and coal.

REFERENCES:

1. Anthony Andrews, Richard K. Lattanzio. Petroleum Coke: Industry and Environmental Issues / Congressional Research Service / October 29, 2013.
2. Hassan Al-Haj Ibrahim, Ali Abdullah. Upgrading Delayed Petroleum Coke Fines by the Use of Pitch Binders / Chemical Engineering and Science, 2014, Vol. 2, No. 2, 15-17.
3. Guidance Document for the Storage and Handling of Petroleum Coke / Energy API / first edition / December 2014.
4. Liakhovich V., Yemelyanova V., Bulauka Y. Receiving an antifreezing agent for transporting coke by rail // European and national dimension in research. technology : Electronic collected materials of X Junior Researchers' Conference, Novopolotsk, May 10-11, 2018 / Polotsk State University , Novopolotsk, 2018, P.153-155.