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REDUCED DUST POLLUTION IN THE PROCESSES OF PRODUCTION AND TRANSPORTATION
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A preventive agent based on residual products of Naftan Open Joint Stock Company has been developed. This agent is effective for dust suppression and reducing losses from blowing loose carbon-containing materials, in particular petroleum coke, as well as against freezing and sticking during their transportation at low temperatures. The resulting agent is not inferior in operational properties and more than three times lower in cost of industrial analogues.

Keywords: Oil refining, petroleum coke, dust, dust factor, dust suppression-antifreezing agent.

Introduction. Actual problem for refiners is to reduce the exposure of workers to dust factor in obtaining and transporting the petroleum coke and coke decrease freezing at low air temperatures [1, 2]. Air pollution can cause accidents and incidents. Working in a dusty environment for a long time causes occupational lung disease. The dust of petroleum coke smolders, spontaneously ignites and spontaneously ignites.

Task formulation – reducing the impact of the dust factor on workers in the process of obtaining and transporting petroleum coke by treating it with a specially developed dust suppression agent [3-8].

Methods of research. 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.

Results, their discussion and perspectives. To simulate the process of pulverization of petroleum coke, a sample was obtained from Visbreaking diesel fuel with 5% wt. fuel oil from the AVT-6 installation, manufactured by OJSC Naftan. The task was to determine the ability of the sample to prevent dust extraction and blowing during transportation of petroleum coke. A dry and processed sample of petroleum coke dust was placed in a wind tunnel for 30 minutes at a wind speed of about 30 km / h. The test simulation process is presented in figure 1. Coke pyleunos without treatment is 58% wt., and after treatment with agents - less than 12% wt., blowing losses are reduced by 4.8 times.



Figure 1. - Modeling the dust extraction process during transportation of petroleum coke

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The efficiency of dust suppression of coke dust was determined by the mass method. The concentration of dust in the air was determined by subtracting the mass of the filter before and after drawing air through it with coke dust, related to its volume. The dust chamber is made of profile aluminum and has transparent walls (figure 2). It was found that dust suppressants with the addition of 5% wt. fuel oil reduces air pollution by 7.4 times.



Figure 2. - Dust chamber

Technical and economic indicators of the proposed sample were compared with industrial analogues and are shown in table 1.

Table 1. – Technical and economic indicators of prophylactic agents

Indicators	Niogrin PS-35S	Universin-S	Severin-2	Sample
Assumed viscosity at 50°C, GOST 6258, °AV	1,0 – 3,0	1,1 - 3,5	1,1 - 1,5	1,12
Pour point, GOST 20287, °C	- 35	- 40	- 50	< -65
Flash point, GOST 6356, °C	40	80	80	70
Determination of water content, GOST 2477, % of the mass	2,0	0,5	0,5	0,01
Copper strip test, GOST 6321	stands	-	-	stands
Cost \$ / ton	180-200	180-200	210-1100	55

Conclusion. The proposed dust-suppressing and anti-freezing agent for preventing air dust does not cause corrosiveness of the cars surfaces made of metal, has a high flash point that meets fire safety requirements, a negative pour point that allows the tool to be used at an air temperature below 40 ° C, so it shows high dust suppression ability.

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