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Status and of the development of oil and gas complex of Russia: Developing new cost reduction methods

Keywords: cost management, cost structure, earnings, decision management, cost reduction, oil production, Direct-costing, cost price, pumps, cost control.

Abstract. The cost of production and sales are one of the most important financial indicators of a company and in a competitive environment cost reduction leads to reduced prices and generates higher profits. Cost formation in oil production depends on the processes of exploration, mining, well operation and trade economy. The cost structure of crude oil is fully dependent on the natural and geographical features of the oil-producing region. Further on, cost amount is largely determined by the recovery technique and the overall efficiency of field development. Cost of oil recovery depends on the distance between the wells, development time, the current level of oil production and oil recovery from the depths.

Reducing the cost of commercial products is closely related to the improvement of labor organization, production management, changes in the structure of production, changes in natural geological conditions and other factors.

Thus, essential for improving production efficiency is the cost minimization on all production levels. Operational expenditures occupy a large proportion of the cost structure and even a small saving in raw materials, fuel and energy in the production of each unit work can provide a financial benefit for the company. This paper will elaborate:

- ✓ cost structure of oil companies;
- ✓ the cost structure of crude oil;
- ✓ possible ways to reduce production costs of oil companies.

(Gubkin Russian State University of oil and gas, Moscow)

**PETROLEUM PRODUCTS:
TECHNOLOGY, INNOVATION, MARKET**

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Optimization of process parameters for the fractionation of FCC products within GK3 unit of Angarsk Petrochemical Company refinery

Keywords: optimization of process, GK3 unit, FCC products, computer program for refinery process simulation, C₄-hydrocarbons, gas fractionation part.

Abstract. The article represented some results of the work realized in JSC "APCC" for optimization in the operation of FCC fractionation part within GK3 unit. The main goal of the optimization was maximization of C₄ hydrocarbon percentage in product for the next processing in gas fractionation plant and discovering factors which determined yield and flexibility of C₄ hydrocarbon recovery into the product streams. During the work some calculation and estimates were carried out with a computer program for refinery process simulation and the experimental test was put into the operating unit (GK3). Some ways for optimization of the process parameters were improved using potentialities of the operating units.

(Angarsk Petrochemical Company)

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Production of portland cement clinker in straight-through arrangement

Keywords: clinker, Portland cement, calcining cement, technology, fuel, direct flow, counter-flow, petroleum coke, flue gases, sulphur oxide, alkali metals, chlorides.

Abstract. The production of Portland cement clinker in rotating calcining furnace according to direct-flow scheme is considered in the article. It is noted that many cement plants in our country produce clinker from calcium-carbonate feed, they use natural gas as a fuel for bypass (counter-flow) scheme; the article contains the description of counter-flow scheme and the disadvantages of this scheme are analyzed. The article shows the ways of development of cement production nowadays. The possibility of use of direct-flow scheme of clinker burning is considered. There are four possible options. It is noted that industrial realization of acidic and

alkaline feed and fuel treatment during production of cement clinker in direct-flow scheme is a lot simpler than in counter-flow scheme.

(SUE «Institute of petroleum refining and petrochemistry» RB;
Branch of FSBEI HPE «Ufa State Petroleum Technological University»; LLC «Blagoveshenskiy plastic»)

Vysotskaya M.A., Shekhovtsova S.Yu.

The influence of morphology on high-quality properties of polymer-bitumen binder

Keywords: polymer-bitumen binders, morphology, aging, stratification.

Abstract. Currently, the main material used in road construction, asphalt is, the durability and reliability depend on the quality of raw materials and, primarily, binders. Every year the number of vehicles on the roads of the country methodically increases, which entails an increase in the load on the coating. Therefore, the use of conventional road bitumen in the asphalt composition, no longer able to provide the necessary durability of the coating of the road. The introduction of polymer modifiers in asphalt opens up the possibility of radically new high-quality polymer-bitumen binders (PBB).

Russian scientists have performed many scientific papers devoted to the study of the PBB, but unfortunately, the work aimed at the study of the structural features and morphology of the modified binder, not so much.

However, this aspect has a significant impact on the performance properties of both binders and asphalt concrete based on them. Therefore, the study of the structure and morphology of WSPs may allow early to predict and control the properties of the final product is asphalt.

The aim of the study was to investigate the quality characteristics of the PBB, available on the Russian market, and in the first place, such as resistance to delamination and aging, morphology, and identifying the relationships between them.

The research identified a direct relationship – PBB samples having issues with uniformity and morphology is astringent with low quality. The presence of undissolved particles of the polymer in the structure of the WSP, which are defined in the study of morphology, is highly undesirable and negative point, as at the stage of storage and transportation of these particles to act as a "parasite" which is pulling light from bitumen fractions, nothing gives him in return, except destruction.

The results of this study revealed a pattern: the less uniform morphology of the binder, characterized, by the presence of a significant number of undissolved polymer particles, the absence of the polymer network, the greater the propensity to aging and delamination were observed in this sample. This leads to the instability of the final product, as it is impossible to obtain a PBB with high consumer properties and resistance to delamination, when there are unused in the system of the polymer and in the absence of the polymer network.

(Belgorod Shukhov State Technological University)

Khabibova A.G, Kurbanova R.V., Kurbanova A.K., Bayramova S.T., Aleskerova E.A.

Synthesis of the propargyl esters 1,1-diorganyl-3- butine-1

Keywords: Synthesis, propargyl bromide, dipropargyl ester, heterocycle compound.

Abstract. Synthesis of the propargyl esters 1,1-diorganyl-3- butine-1 have been realized. The initial compounds are alkynols, received by known method. As a catalyst triethylbenzylammonium chloride has been used (TEBAC). The structure of received product was confirmed by method of IR- and NMR-spectroscopy. The dipropargyl esters is of the utmost interest from scientific point of view.

(Azerbaijan State University of Oil and Industry)

ANALYTIC METHODS FOR OIL and PETROLEUM PRODUCTS

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Undissolved water content control method in jet aircraft fuel

Keywords: dielectric sensor, undissolved water, control facilities, fuel cleanliness, capacitive sensor, dielectric constant, jet fuel, moisture meter, moisturemetry.

Abstract. The article reviews both method and apparatus for determining undissolved water in jet fuel under dynamic conditions using capacitive sensors. The device is based on the differential measurement method, in which two capacitive sensors can determine the dielectric constant of dry and water-cut fuels under the same conditions, with dry fuel is produced directly in the flow of the pumped fuel by freezing out the undissolved water and then filtering it.

(FAE «The 25th State Research Institute of Chemistry of Ministry of Defence of the Russian Federation»)

Salmanova Ch.Q., Mamedov A.P., Jafarova R.A., Najafova M.A., Akhmedbekova S.F., Yolchuyeva U.J.

Termoluminescence oil products in reactions of liquid-phase initiated of oxidation

Keywords: hightemperature TChL, hydrocarbons oil residues, peroxide radicals, reactions oxidation.

Abstract. Investigated thermochemiluminescence (TChL) the low (100–200°C) and highboiling (400–450°C) distillate fractions different oil containing additives hydrocarbons evolving from heavy oil residues > 500°C. These are considered issues related to the latest which including components with weakly-bound C-H and C-C bond. Discussed mechanisms leading to reduce temperature TChL in the presence of oil initiators of liquid-phase oxidation and generation of peroxide radicals.

(Institute Petroleum Chemical Processes named Yu.G.Mamedaliyev, Azerbaijan NAS)

CHEMMOTOLOGOS

Lashkhi V.L., Chudinovskikh A.L., Efanova O.Yu., Zagryadskaya A.D.

Description of working motor oils behaviour from non-equilibrium thermodynamics positions

Keywords: colloidal system, non-equilibrium chemical thermodynamics, motor oil.

Abstract. Description of condition change of the working motor oils as open disperse systems is being offered to obtain from positions of non-equilibrium chemical thermodynamics. With use of its basic principles it is possible to allocate the main informative indicators of oil condition (acid number and viscosity), those being suitable for most objective characteristic of the product working.

MATERIALS of the PETROCHEMICAL and REFINERS ASSOCIATION

Extracts of the protocol #124 of ANN board meeting of 06.08.2015