

IN SIGHT

Galkin V.V., Makhiyanov V.A., Levinbuk M.I. **Complex efficiency analysis of oil refining PFDs depending on refinery power in conditions of legislation changes in Russia. Part 1 (deep processing excepted)**

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Yanovskiy L.S., Shabalina T.N., Ezhov V.M., Molokanov A.A., Kolybelsky D.S. **Aircraft aviation hydraulic fluids: problems and perspectives**

Keywords: organophosphorus hydraulic fluids, synthetic hydraulic fluids, hydraulic oils.

The article describes the evolution of synthetic aviation hydraulic fluids. For new domestic synthetic hydraulic fluids were identified key strengths and weaknesses, was carried comparison with existing domestic and foreign counterparts, and was defined the vector of further strategy to improve performance properties for the near future.

Halafova I.A., Ismailov E.G., Mirzoeva L.M., Poladov F.M., Martynova G.S. **Magnetic field influence on state of vacuum gas oil, atmospheric flash residue and their blends**

Keywords: black oil, vacuum gas oil, influence of the magnetic field, dispersion, UV-spectroscopy, dynamic dispersion of light, electron spin resonance, hydrodynamic, fluidization.

In spite of the fact that researches in this field are carried out today the main theory which explains a mechanism of influence of the magnetic field on the dispersions of hydrocarbons is absent. In connection with this the research of mechanism of influence of the magnetic field on dispersion of oil with the aim of preparation of the hydrocarbon crude to further processing is very important. And the research of the abovementioned impact on indicators of conditions of the technological processes and on quality of the obtained oil products is also important.

Chudinovskikh A.L., Lashkhi V.L. **Some features of detergents effect on motor oils**

Keywords: motor oil, detergents, import substitution.

Replacement of functional additives of foreign countries to more available components at production of domestic fuels and lubricants, motor oils in particular, becomes urgent now. On the one hand, this allows to reduce the price of the final product, and on the other, to enhance the production rhythm, gradually excluding its dependence upon import. In case of motor oil such statement first of all concerns the detergents as a basis of any oil.

MATHEMATICAL SIMULATION

Ivashkina E.N., Ivanchina E.D., Kravtsov A.V., Kirgina M.V., Dolganov I.M., Semakin S.V., Afanasyev Yu.I. **Optimization of thermal operating modes of the reactor block of dehydrogenation of highest paraffins by a method of mathematical modeling**

Keywords: dehydrogenation of highest paraffins, linear alkylbenzene, reactor block, plate-type heat exchanger, tubular furnace, method of mathematical modelling, reconstruction, optimization.

A way to increase overall performance of the reactor block of highest paraffins dehydrogenation as the main stage of linear alkylbenzene production process, is described. The method of mathematical modeling is offered, regarding physical and chemical process mechanisms to forecast the unit behaviour in various modes of its productivity increase.

Veliyeva F.M., Akhundov A.A., Alimardanov H.M., Rustamov M.I. **Mathematical modeling dynamics of the process of dehydroalkylation methylcyclohexane by methanol in the adiabatic reactor with sectional oxygen delivery containing gas carrier**

On the basis of a mathematical model of statics of process of an oxidizing dehydroalkylation of methylcyclohexane by methanol, developed a mathematical model of dynamics of the process, provided in the form of system of non-linear differential equations in private derivatives with the float factors, allowed to calculate transfer functions on all dynamic channels.

CONFERENCES. SEMINARS. EXHIBITIONS

Danilov A.M., Fialko V.M. **The import substitution problem in the field of additives to fuels and oils / Based on the materials of academic council meeting of All-Russian Scientific-Research Institute for Petroleum Processing (VNII NP JSC)**

Lobanov A.E., Finelonova M.V., Kovalyov V.A., Andryukhova N.P., Maslov L.L., Oleynik Zh.Ya., Ermolayev M.V. **Fuel and oil additives offered by Plastneftehim LLC**

IN SIGHT

Gareev T., Fedorov M. **Tacit knowledge management in Russian companies**

Keywords: knowledge management, communities of practice, information, data, explicit knowledge, tacit knowledge.

The article presents Molten consultants experience in knowledge management projects implementation, as well as practical cases of building knowledge management systems by TNK-BP and Rosatom.

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Samedova F.I., Gasanova R.Z., Aliyeva R. V., Azizbeyli G.R., Kadymaliyeva N.Z. **The increasing of efficiency of the selective cleaning of the viscous distillate from balakhny oils with different solvent by using of SC-CO₂**

The possibility of the increasing of efficiency the selective cleaning of the viscous oil distillate using the solvents' mixture – N-methylpyrrolidone (NMP), N-formilmorpholine (NFM) with water and waterless and SC-CO₂ is explored. The efficiency of using the NFM in mixture with SC-CO₂, relieving the extraction of the resins and heavy aromatics is shown.

Krivtcova N.I., Ivanchina E.D., Afanasyeva Y.I., Zanin I.K. **Thermodynamic analysis of process hydrotreating of fuel**

Keywords: hydrotreating, sulfur compounds, reactivity.

Thermodynamic analysis of hydrogenation of sulfur compounds present in the raw fuel hydrotreating process plant LH-24/7, LLC «KINEF». Based on thermodynamic analysis established reactivity of sulfur compounds, which decreases in the series: mercaptans > sulfides > disulfides > thiophenes > benzothiophene > dibenztiofeny.

Khavkin V.A., Gulyaeva L.A., Vinogradova N.Ya., Shmel'kova O.I., Aliev R.R. **Modern technologies of diesel fuels production**

Keywords: requirements of modern standards, Technical Regulations, hydrotreating of diesel fuel, mild hydrocracking of vacuum distillate, catalytic dewaxing, reconstruction hydrotreating.

The most important problems of oil refining industry development now are increase of processing depth and development of high-quality products. Production of the fuels which are meeting the requirements of modern environmental standards is a condition of presence in the international market. Hydrogenation processes solve at the same time problems of oil refining deepening and improvement of quality of motor fuels. JSC VNII NP developed production technologies of the diesel fuels which are meeting the requirements of Technical regulations. Experience of industrial realization of JSC VNII NP technologies at the oil processing enterprises is presented.

ECOLOGY and INDUSTRIAL SAFETY

Skobelev V.N., Serdiuk V.V., Serdiuk D.V., Aszkinazi L.A. **Influence catalyst combustion fuel on ecological and operation factors of motors**

Keywords: application area, additive, catalyst, fuels.

Size of annual ecological damage caused by Russian motor transport complex (atmosphere pollution, noise, impact on climate) exceeds 2% of gross national product of Russia and equals to about 5 billion dollars a year (www.bibliofond.ru). According to the Committee on environmental management, environmental protection and ecological safety, a 93 percent of harmful substances emissions into the atmosphere of St. Petersburg is shared by transport.

Adding catalysts of burning to automotive fuel is a way to decrease toxicity of the exhaust gases of internal combustion engines. Development of catalysts of burning for fuel was begun in the eighties after request of the USSR military industry complex, and efficiency of their action in new fuels is confirmed by laboratory, bench-scale and operational researches in leading research centres.

Syrojedov N.E., Petuhov V.G., Sharykin F.E. **Petroleum fuel facilities as the fire and explosion risk objects**

Keywords: process safety, electrostatic charge, facility, electrization of petroleum fuel.

Petroleum fuel facilities were studied as a fire and explosion risk objects. The survey of the most significant factors increasing the level of electrostatic charge of the petroleum fuels and those conditioning the risk of electrostatic discharge was carried out.

EQUIPMENT and DEVICES

Kovalsky B.I., Bezborodov Yu. N., Derezin A.N., Grigorenko M.V. **Device for magnetic processing liquids**

Keywords: stator, thin-walled cylinder, a hollow cylinder with external trapezoidal threaded, flanged, the rotating magnetic field and magnetic manufacturing liquid.

The design of magnetic devices for liquid handling, providing more efficient processing of liquid in a magnetic field by increasing the exposure time pulse of alternating magnetic field, the path length and the residence time of the liquid in a magnetic field, and the possibility of rotation of the magnetic field and the flow of fluid in one or different direction.

CONFERENCES. SEMINARS. EXHIBITIONS

Medzhibovskiy A.S., Fialko V.M., Levitina I.S. **Range and features of application of dialkyldithiophosphate-based additives of various structure in production of oils**

MATERIALS of the PETROCHEMICAL and REFINERS ASSOCIATION

Extracts of the protocol # 112 of ANN board meeting of 07.02.2013. Subject: Development of production of competitive additives to modern lubricant oils

The VNIINP BULLETIN

Gulyaeva L.A. **Development and deployment of modern techniques of production and application of high-energy thermostable fuels for rocket and aircraft engineering**

№ 5_2013

IN SIGHT

Makaryan I.A., Rudakova M.I., Savchenko V.I. **Creative evolution in production methods of isobutylene and its application fields**

Keywords: isobutylene, isobutene, mixture of C₄ hydrocarbons, catalytic dehydrogenation, membrane-catalytic dehydrogenation, industrial technology, markets development forecast.

A comparative analysis of traditional and developing methods of isobutylene industrial production has been carried out. The existing methods of isobutylene separation from the C₄ hydrocarbons mixture, the well-known industrial processes of catalytic dehydrogenation of isobutene, and a developing method of isobutylene production on the basis of biological feedstock, are reviewed. The trends of the international and regional isobutylene markets and the forecast of their development are observed.

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Emelyanov V.E. **Using of methyl tert-amyl ether in gasoline**

Keywords: gasoline, oxygenates, production of methyl tert-amyl ether (MTAE), application MTAE.

Improving the quality of gasoline by the use of oxygenates in their composition is possible with increased production of methyl tert-amyl ether (MTAE). The high cost is a barrier for general use MTAE.

Aksyonov V.I. **Influence of some oxygen-containing anti-detonators on automotive gasoline RVP**

Keywords: Reid vapour pressure, automotive gasoline, oxygen-containing compounds, Raul's law, ideal solutions, associates, acidity of alcohols, azeotropic solutions.

A positive deviation of the RVP from Raul's law for gasoline containing ethyl alcohol, and absence of such a deviation for gasoline containing MTBE and TAME is experimentally confirmed.

Kutin Y.A., Telyashev E.G., Khares Mushref. **Character and properties of various bitumen binders and role of petroleum refining in production of polymer-bitumen binders**

Keywords: road bitumen, road building, colloid systems, non-blown bitumens, road tar, viscosity, structure, modification, polymer-bitumen binder, property, quality, efficiency.

The introduction to the article states that the use of even high-quality road bitumens does not always permit to solve the problems, facing the modern road building industry. Different types and structures of road bitumens are studied. It is shown that non-blown residual and compound bitumens can be referred to the colloid systems with "sol" structure. The bitumen colloid systems with "sol" structures are more plastic than the "sol-gel" structures and besides high adhesion characteristics this

quality favors the increased hydrophobic properties of the asphalt concretes, produced on the basis of these structures, and the inter-repair term of asphalt concrete surfaces operation.

The advantages of the use of petroleum products, produced according to various technologies excluding the stage of oxidation, as a petroleum basis for production of polymer-bitumen binders are stated. It is shown that the up-to-date petroleum refining has a broad range of petroleum products, which can provide a basis for production of high-quality polymer-bitumen binders.

The development of insights in the mechanism of directed control of the composition and properties of bitumen and bitumen-polymer colloid systems as well as the features of such systems interaction with polymer materials made it possible to obtain a material with new level of quality – the polymer-asphalt concrete.

Nazarova T.I., Bartko R.V., Veselov V.G., Madaliev R.S., Kotova A.A., Zibrova S.N. **All-season aviation oil KA-7.5 for turbo-prop and turbo-fan engines of aircraft**

Keywords: viscosity-temperature characteristics, gas turbine engines, diisooctyl ether of sebacic acid (DESA), poly-alpha olefin hydrocarbons (PAO), starting properties, gearbox, lubricating properties, thermal oxidation stability, turbo-prop, turbo-fan engines, all-season improved oil.

The authors conducted the research work to make a thermally stable all-season universal aviation oil with a high level of starting properties for modern and perspective turbo-prop engines. As a result, the authors worked out a recipe for the lubricating oil based on the mixture of poly-alpha olefin hydrocarbons with di-isooctyl ether of sebacic acid (DESA) thickened with a highly-effective thickener of poly-methacrylate type and a complex of anti-oxidizing, anti-wear and corrosion-preventive additives. New lubricating oil KA-7.5 shows improved engine-starting properties as compared with existing lubricating oils and is considerably better in respect of thermal oxidation stability, volatility and resistance to mechanical destruction.

Abbasov V.M., Amirov F.A., Mamedkhanova S.A. **Liquid preservative based on oil – T-30 and corrosion inhibitors**

Keywords: conservation, oil, table, phenol-formaldehyde

Prepared preservative liquid oil-based T-30, alkyl phenol-formaldehyde and phenol-formaldehyde resins and also amidoamines based on natural oil resins. Examined the protective properties of the compositions prepared in different environments (humidity, sea water, 0.001 solution of H₂SO₄).

Zverev O.V., Rozanova N.L., Tsvetkov O.N. **New technologies of gas-turbine oils**

Keywords: organic-silicon liquid, metal-containing organic-silicon additive, time of gel formation, thermal and oxidation stability.

The article is devoted to the creation by VNII NP new lubricating oil on the basis of liquid with a new additive on the basis of metals of variable valence.

ECOLOGY and INDUSTRIAL SAFETY

Amiraslanova M.N., Seyidov N.M., Aliyeva N.M., Rustamov R.A., Mustafayev A.M., Rzayev A.H.

Investigation of petroleum-collecting properties of nitrogen-containing oxypropylates of monoalkyl(C₈-C₁₂)phenols

Keywords: nitrogen-containing oxypropylates, benzoguanamine, petroleum-collecting coefficient, monoalkyl(C₈-C₁₂), petroleum-collecting properties, propylene oxide.

The petroleum-collecting properties of nitrogen-containing oxypropylates of monoalkyl(C₈-C₁₂) phenols have been investigated. The dependence of these properties on the component composition and structure of the oligomers has been shown. The importance of the research has been based on the authors' arguments on facts.

Abbasov V.M., Aliyeva L.I., Nadjafova G.A., Aliyev B.M., Movsumova P.A. **Dearomatization of fr. 260-340°C of medical Naphtalan oil with N-methyl-2-pyrrolidone**

Keywords: naphtalan oil, dearomatization, selective purification, extract, raffinate.

The article demonstrates the use of N-methyl-2-pyrrolidone on the selective purification of medical naphtalan oil (fr.260-340°C). On the basis of the results revealed of regularity extraction dearomatization of Naphtalan oil with N-methyl-2-pyrrolidone at different volume ratios raw: extractant and temperatures. Defined the physical and chemical properties and structural singularities of raffinate.

REVIEW of FOREIGN PUBLICATIONS

A. Duker. **Optimisation of integrated complexes** (Source: Catalysis ptq, 2012. Translated by Bubnova A.G.)

MATERIALS of the PETROCHEMICAL and REFINERS ASSOCIATION

Extracts of the protocol #112 of ANN board meeting of 07.02.2013. Subject: Development of production of competitive additives to modern lubricant oils

CONFERENCES. SEMINARS. EXHIBITIONS

№ 6_2013

Chudinovskikh A.L.

Life devoted to applied chemistry of fuels and oils

Chudinovskikh A.L., Sokolov V.V., Pervushin A.N.

The NAMI-HIM CJSC as a versatile organisation

Chudinovskikh A.L., Pervushin A.N., Katul'skiy P.V., Babushkin M.O.

Development of the automotive D3 (CF-4/SG) motor oil

Keywords: motor oils, detergents, motor check.

Questions of imported detergents replacement for additives of domestic production, making on their basis a package of additives for motor oils of operational D3 group being considered.

Chudinovskikh A.L. Pervushin A.N., Yakubyak V.M., Nikolin D.S.

Efficiency estimation of succinimide-based additives to motor oils

Keywords: succinimide additives, stabilizing action of succinimides, dynamics of motor oil condition change.

Practically all modern motor oils produced both by domestic and foreign industry contain succinimide additives in their structure. They impart high dispersing and stabilizing ability to motor oil, and the general level of operational properties of the final product substantially depends on their action efficiency. Therefore, much attention is always paid in the world practice to the efficiency and features of succinimides action. It can be seen at the stage of new additives creation or optimisation of an oil composition structure.

Chudinovskikh A.L., Pervushin A.N., Yakubyak V.M., Zvontsov A.A., Protiven' S.V.

Efficiency estimation of detergent additives to motor oils

Keywords: detergent additives to motor oils, import substitution, quality of motor oils.

In the recent years a special relevance is gained by the need of import components substitution for fuels and lubricants production, motor oils in particular, for the domestic ones. It generally applies to the products made in foreign countries. Such statement allows to reduce dependence of the domestic industry upon foreign deliveries, and as a result of some work done, to fully exclude import from a production cycle.

Chudinovskikh A.L., Pervushin A.N., Yakubyak V.M., Zvontsov A.A.

Development of automotive motor oils of the highest operational groups D4 and D5

Keywords: detergent additives to motor oils, import substitution, quality of motor oils.

Recently the question is often raised of the need to replace in compositions of the domestic motor oils the additives of foreign countries by more available additives. It allows to dispose of the domestic industry dependence on import or to lower it to a reasonable minimum.

Buyanosky I.A., Bolshakov A.N., Levchenko A.V., Pervushin A.N.

Application of diamond-like coatings-orienters for to increase the lubricity of lube oils

Keywords: carbon coating orienter, oriented boundary layer, tribological tests, lube oil.

Highly ordered monocristalin hard carbon coating-orienters provides formation of strong boundary layers, which increases the lubricity of the lube oils or reducing the content of triboactive additives in these oils for heavy loaded units of vehicles.

Sokolov V.V., Izvekov D.V.

Requirements of automotive engineering producers for motor fuels and order of their sales

Keywords: ecological car class, quality of motor fuels.

Enactment of Resolutions of the Government of the Russian Federation concerning the approval of Special technical regulations about requirements to emissions of the automotive engineering, being released for the territory of the Russian Federation, harmful (polluting) substances, and the approval of technical regulations about requirements to automotive and aviation gasoline and ship fuel, fuel for jet engines and to fuel oil, has promoted formation of automotive and oil-processing industry development directions, change of fleet of vehicles structure of the country and motor fuels applied.

Sokolov V.V., Mai I.V., Izvekov D.V.

Measures for providing modern automotive engineering with motor fuels of requisite technological level

Keywords: emissions of harmful substances, fuels consumption level, fuels production output, ecological class of fuel, ecological class of the vehicle.

Now the production of motor fuels in Russia is allowed to be not below the 3rd ecological class. Some oil companies in initiative order produce class 4 fuels and higher. However, lack of proper coordination in production and delivery of automotive engineering and oil products results in some cases in lack of motor fuels of technological level required for modern automotive engineering in certain regions of the country.

For the solution of this problem it is offered to carry out a complex work on ecological and economic justification and stimulation of modern automotive engineering and motor fuels of a necessary technological level use in country regions, including definition of influence of fuel class on ecological indicators of cars, definition of detergent additives influence on ecological indicators of cars, development of the gasoline production and consumption balance, and also data acquisition concerning influence of automotive engineering operated and motor fuels applied upon the ecology and population health.

Chudinovskikh A.L., Lashkhi V.L., Boykov D.V.

Some features of disperse phase interaction with detergent-dispersing additives of motor oils

Keywords: disperse phase, dispersion, motor oil, detergent-dispersing additives, deposits, efficiency of additives.

Sufficient attention is paid in special literature to questions of formation of deposits in engines at high and low temperatures, both in practical and theoretical aspect. Considering their importance, in article the emphasis is only placed on those moments which in last statement either weren't considered at all for various reasons, or this consideration had a superficial character. Specifics of deposits formation depends on features of interaction of the disperse phase (DP) accumulating in working motor oils, with detergent-dispersing additives. The last make a basis of any motor oil and therefore should studying their behavior always be of special interest.

Chudinovskikh A.L., Lashkhi V.L., Fialko V.M.

A universal approach to efficiency estimation of motor oil detergent additives effect

Keywords: detergent, alkaline number, free and screened alkaline centres of detergent.

Detergent additives for motor oils are characterised by the existence of micelles of free and screened alkaline centres in their structure. The free centres are available for active interaction with acids in working oil. Screened ones interact only with strong acids. With the ratio of the specified centres in the additive structure its efficiency at the neutralization process can be determined.

Chudinovskikh A.L., Lashkhi V.L., Ivankovskiy V.L.

Alkaline stock and acidity of a motor oil as indicators of its working capacity

Keywords: detergents, acid number, motor oil, motor oil condition, alkaline number.

To describe the condition change of motor oil at its operation in the engine various indicators are used, among which alkaline and acid numbers are of special significance. With their help it is possible to estimate the behaviour of each ingredient of the oil, and the product as a whole. At the same time, considering their importance as single indicators of oil condition, we will try to define their importance in the general system of quality estimation.

Chudinovskikh A.L., Lashkhi V.L., Bartko R.V.

Role of the motor oils chemmotology theory in their practical application

Keywords: motor oil, internal combustion engine, theory, chemmotology.

Development of theoretical provisions of a chemmotology theory of motor oils should not have an abstract character, but must be steadily directed to the solution of the main chemmotology theory task of determining a relation between the quality of motor oil to be considered as a design element, and reliability of the engine. For this purpose the theory has to accompany constantly any current work and have impact upon methodology improvement.

Chudinovskikh A.L., Tonkonogov B.P., Spirkin V.G.

Features of protective lube layers formation on a metal surface

Keywords: electrochemical corrosion, wear, high-alkaline metal sulphonates, corrosion inhibitors.

When the internal combustion engine works, wear of its various units and details occurs. Cylinders, piston rings, crankshaft bearings, valves wear out most intensively. By this, corrosion and mechanical wear of details can dominate in some cases. The optimum solution of engine corrosion and mechanical wear problem is use of motor oils with high protective properties.

Medzhibovskiy A.S., Guschin A.I., Dement'yev A.V., Moykin A.A., Pervushin A.N.

Features of additives packages components interaction at lubricants use

Keywords: composition of additives.

Development and production of new oils demands deep understanding of physical and chemical processes occurring in their action zone. For this purpose the knowledge in both physics and various branches of chemistry (physical, colloidal, organic and inorganic) is necessary. Many consider lubricant as a simple solution of additives in oil. Actually it is a complex multicomponent heterophase colloidal system. Scientific approach to the development of different purpose motor oils compositions was formed throughout a long time period (since the end of the 40th years of XX century). The main regularities of oil properties change at the engine operation were revealed by works of a large number of scientists and summarised in a division of science having the name HIMMOTOLOGIYA.

Mitin I.V.

The NAMI-HIM CJSC as an outpost of national Himmotology

№ 7_2013

Proud of the success, believe in the prospects

Interview of the editor of the newspaper «SYNTHESIS» V.V. Krivorotova with the General Director of LUKOIL-Nizhegorodnefteorgsintez LLC A.N. Kovalenko

Ovsyannikov V.A., Krivorotova V.V.

LUKOIL-Nizhegorodnefteorgsintez LLC: legs of a big route

Karpov N.V., Vasilyev G.G., Reshetov M.S.

LUKOIL-Nizhegorodnefteorgsintez LLC: strategy of Renovation

Karpov N.V., Vasilyev G.G., Gavrilov N.V., Rykov R.V., Zheleznov M.V.

Demercaptanisation of kerosene fractions at the primary distillation units

Keywords: jet fuel, mercaptan sulphur, counterflow scheme of kerosene demercaptanisation.

Feature of the industrial scheme of kerosene demercaptanisation implemented now in the AVT-6 unit at the LUKOIL-Nizhegorodnefteorgsintez LLC is use of fractioning column stripper as a reactor. Due to mercaptan content decrease in the fuel with almost invariable general sulphur content at the same time, fuel is characterized by high thermooxidizing stability and lubricating properties without additives blending.

Vasilev G.G., Zheleznov M.V., Rassadin O.V. **Absorption-gas fractionation plant**

Keywords: absorption, gas fractionation, demercaptanization, metildietanolaminovaya cleaning.

A review of existing plants fractionation justify the choice of the technological system design fractionation LLC "Nizhegorodnefteorgsintez", the main characteristics of AGFU, operating experience is a block absorption and fractionation.

Nikolaev S.I., Zheleznov M.V.

Production of solid oil paraffin of high purity complying with the RAL-GZ 041 specification

Keywords: paraffin production, RAL-GZ 041 specification, hydrotreatment.

Distinction of paraffin production at the LUKOIL-Nizhegorodnefteorgsintez JSC is absence of a stage of gatch vacuum distillation, this was possible after reconstruction of vacuum blocks of primary distillation units. As a result those units produce narrow cuts of medium-viscosity and viscous vacuum fractions of 380-430°C and 430-480°C respectively.

Belova O.A.

Rapidity and reliability of test results: a key to ensuring process management efficiency

Keywords: laboratory information management system (LIMS), quality control.

With the startup of new units and increasing products range, a need appeared to introduce into laboratory practice new international and Russian standards, develop new control methods, carry out modernization of laboratory. Laboratory equipment of Central Refinery Lab is now modern accessories providing high level and efficiency of control: automatic analyzers of sulphur and metals, Chromatography complexes, automatic titration devices, atomic, absorption, emission spectrometers, automatic devices for atmospheric and vacuum distillation, automatic low-temperature analysers, BIK-Fourier spectrometers of MRA and other hi-tech equipment.

Logunov P.L., Shamanin M.V.

Use of information technologies and mathematical models in production management

Keywords: mathematical models, planning, advanced management, information technologies.

In recent years Russian oil processing has begun active implementation of projects directed on the elimination of technological lag from foreign competitors. In other articles of this number it is narrated in detail about the construction of new deep processing units at the LUKOIL-Nizhegorodnefteorgsintez JSC. But here other aspect of development is to be discussed – introduction of modern information and administrative approaches and use of mathematical models.

Russkikh S.B. **Energy saving: from task to decision**

Today the LUKOIL-Nizhegorodnefteorgsintez LLC is the largest oil refinery within the Lukoil group. The most large-scale investment program in the oil processing block is exercised at the enterprise. To ensure a dynamic development and satisfy the requirements of newly constructed units and reconstructed objects a significant amount of energy resources is necessary. Therefore in the Company and at the enterprise the work on energy efficiency increase and energy saving is referred to as strategic. Technical policy of the Lukoil JSC in the field of power efficiency and a number of standards of the Company in energy saving direction are now active. Energy saving measures at the LUKOIL-Nizhegorodnefteorgsintez LLC are taken according to the Program of energy saving of 2011–2013. Thanks to this a 1,282 million kWh of electric energy, a 31485,5 Gcal of thermal energy, and a 2912 standard coal tons of fuel oil have been saved in the last two years.

Epifanov S.V.

System of risks and equipment reliability control at the Lukoil company enterprises.

RBI-analysis

Keywords: Risk control, equipment reliability, RBI-analysis.

In 2012 at oil refineries of the Lukoil company a project is being completed for introduction of a system of risks and equipment reliability control (SURNO). The project began at the end of 2009 at the LUKOIL-Nizhegorodnefteorgsintez LLC and was later duplicated onto remaining LUKOIL refineries by specialists of the Branch center of competence. For increase of static equipment reliability the LUKOIL company decided to introduce at its facilities a methodology of risks calculation based on the API 581 standard of American Petroleum Institute.

Shuvalov V.V.

Environmental care as a priority

Keywords: environmental protection, safety, rational use of natural resources, reducing development pressure, self-monitoring.

Any nature protection work has besides its economic basis moral aspects, too. The LUKOIL-Nizhegorodnefteorgsintez JSC team understands it and realises that Nature is our home, and its maintenance in a condition suitable for vital activity is a duty of all the people together and each taken separately.

Alekseev A.V.

The results of the implementation and certification of management systems in LUKOIL-Nizhegorodnefteorgsintez JSC

Keywords: system of enterprise management, implementation and certification of management systems.

To keep in line with existing standards means only to try to catch up with those who got far forward. Modern effective Quality Management Systems developed on a basis of not only formal requirements of the ISO standards of a 9000 series, but also of the world and domestic experience being outside the present versions of these standards.

Terentiev V.V., Bubnov V.A., Malyshev N.E.

From process management – to production management. Metrological providing and automation of technology processes in LUKOIL-Nizhegorodnefteorgsintez LLC

Nakonechnyy N.I.

The TOPO module (maintenance and equipment repair) SAP R/3 in the course of preparation to repair and repair of units of the LUKOIL-Nizhegorodnefteorgsintez LLC

Keywords: maintenance and equipment repair, SAP R/3 TOPO module.

One of the aspects required for development of a modern oil processing enterprise is introduction of the latest methods of revamp. Progress doesn't stand still: with the inactment of new rules and rigid competitive market of oil processing there is a need for use of the latest technologies of processing that involves use of new complicated equipment which needs to be served and repaired, and its revamping costs planned. A modern control system of equipment maintenance and repair TOPO can help with it. The R/3 product produced by the SAP company is developed in its best way and supported in relation to requirements of Russian users. All these preconditions cause inclusion of the R/3 product into complex solutions of modern enterprise control systems creation, including the TOPO module.

Kuvykin V.

Refinery busyness process models application in plan and accounting systems

Keywords: refining, industrial automation, integrated management systems, knowledge transfer.

The design conception for optimal plan and accounting mathematical refinery models is proposal. The methods to integrate ERP, APS и MES levels information for economic and refinery products reports are considered.

№ 8_2013

IN SIGHT

Tsvetkov O.N., Toporischeva R.I.

Russian motor oils: current state, problems and prospects

Keywords: tests, lube oil theory, motor oils, additives.

Motor oils play a key role in the lube oil theory development, including creation of base oils and additives technology. The today's condition of motor oils production in Russia is far from the potentially possible one. Achievement of world level requires a radical change of the country leaders' attitude towards oil refining science, intensification of base oils quality improvement, building plants of modern additives production, foundation and public financing of a fuel and lubricant testing cluster.

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Zolotaryov A.S., Kuznetsov S.E., Levinbuk M.I.

High-octane gasoline additives: MTBE, TAME and alkylation gasoline

Keywords: gasoline, oxygenate additives, octane number, saturated vapor pressure, TAME.

A study was made of the physical and chemical properties of the main oxygenate gasoline additives (MTBE, TAME) with compound main components of the gasoline. An aggregate of the key performance factors for such additives (octane number and saturated vapor pressure) was used to assess preferences for the type of additives from the point of view of the prospects for their use in the technological processes of automobile gasoline production.

Kovalsky B.I., Shram V.G., Yudin A.V., Runda M.M.

The test results of mineral gear oil 80w-85GL4 TNKtrans on the temperature resistance

Keyword: absorption coefficients of luminous flux, the relative viscosity, volatility, the criterion of anti-wear properties.

The results of the test mineral gear oil TNK Trans 80W-85 GL-4 on the temperature resistance, determined the critical temperature, changes in anti-wear properties of the test temperature, the criterion of anti-wear properties.

Pervushin A.N., Chudinovskikh A.L., Bunto I.V., Levitina I.S., Medvedeva I.V.

Dependence of anti-oxidizing efficiency of zinc dithiophosphates on their structure

Keywords: zinc dithiophosphates, anti-oxidizing efficiency, detergent-dispersing properties.

Object of the research which results are presented in this article is synthesis and estimation of anti-oxidizing and detergent-dispersing properties of zinc dithiophosphates on the basis of individual alcohols or their mixes produced by the domestic industry.

Abbasov V.M., Jafarov R.P., Abdullayev E.Sh., Agazadeh E.J., Hasanov E.K.

Optimization of process forming conservative liquids on the bases of amido-amines and nitroproducts

Keywords: conservative liquids, amido-amines, nitroproducts, technical petroleum acid (TPA), polyethylene polyamine (PEPA), optimization, active experiment, statistical treatment, sufficiently, dispersion, regression mathematical model.

On the bases of experimental data has been developed the regression mathematical model reflecting the ratio of the major factors (technical petroleum acid and polyethylene polyamine, as well as their concentrations) for the indications of the process. Statistical analysis of the obtained models was held, proved the adequacy of the developed equations to the experimental data. Optimal importance of relations of components and their concentrations leading to the best protective properties from corrosion was found.

Amirov F.A. Creation the modified epoxy Novolac Composite

Keywords: composite material, epoxy oligomers, adhesion, phenol-formaldehyde, thiocarbamide.

The article describes research on the development of composite materials based on modified oligomer and ED-16. The studied physic-mechanical properties of epoxy-novolac.

ANALYTIC METHODS FOR OIL and PETROLEUM PRODUCTS

Mitusova T.N., Kalinina M.V., Nedayborshch A.S., Kapitonov I.V.

Features of testing diesel fuels EURO

For production of diesel fuels EURO according to GOST R 52368, Russian refineries use both domestic and foreign cetane improvers and lubricity improver additives. Often, one package contains additives, produced by different companies. Therefore, in the first place raises question of their compatibility in fuel. Methods of qualification evaluation of diesel fuels developed in the 70–80 years of XX century according to GOST 305 are obsolete and do not meet modern requirements. This article provides an assessment of the foreign and domestic test methods of modern diesel fuels.

Kovalsky B.I., Runda M.M., Berko A.V., Yudin A.V. Technique of identification of lubricant oils

Keywords: optical properties, viscosity, fugacity, factor of thermooxidizing stability, antiwear properties and criterion of their assessment.

Results of research of partially synthetic CJ-4/S1 G-Energy 10W-40 engine oil of two parties are given, distinction in indicators of thermooxidizing stability and antiwear properties is established.

STUDYNG TOGETHER

Okhlopkov A.S., Zarubin O.P., Zorin A.D., Zanozina V.F.

Features of existing systems of oil classification in Russian Federation and in the World

Keywords: oil, oil classification, density, light oil, middle oil, heavy oil.

The review of various types and kinds of modern and existing earlier oil classifications is presented. Short descriptions by each kind of classification are represented, basis parameters are marked, the comparative analysis of classification types is carried out.

CONFERENCES. SEMINARS. EXHIBITIONS

The photo report from the 2nd International Forum «Big Chemistry» / Ufa, May 23–25, 2013

The Krasnodar Spring Forum «Power Efficiency and Innovations» / May 23–25, 2012

The «Petrochemistry of Russia and CIS» / Moscow conference, June 18–19, 2013

The 12th International exhibition «Oil and Gas» / Moscow, June 25–28, 2013

MATERIALS of the PETROCHEMICAL and REFINERS ASSOCIATION

Extracts of the protocol #113 of ANN board meeting of 28.03.2013

NEWS. FACTS. DOCUMENTS

Ethics of scientific publications in Russia and abroad

№ 9_2013

IN SIGHT

Levinbuk M.I., Kotov V.N.

Changes in the structure of consumption of the primary energy resources in the United States – one of the challenges of energy security for Russia

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Shmelkova O.I., Gulyaeva L.A., Khavkin V.A., Vinogradova N.Y., Gorlov E.G.

Development of destructive processes for oil residues treatment in Russia and abroad

Keywords: oil residues, masout, goudron, destructive processes, visbreaking, coking, fluid catalytic cracking, hydrofining, hydrocracking, gasification.

The features of today and future destructive processes for petroleum residues treatment are described. The role of thermal processes in crude oil deepening and ways of intensification of commercial technologies are shown.

Tomin V.P., Mikishev V.A., Tsvetkov D.A., Novichikhin D.N., Tomin A.V.

Operating conditions analysis of the block of benzene cut extraction from the reformer product by rectification

Keywords: reformate, benzene fraction, benzene-containing fraction, rectification, heavy reformate, light reformate, de-alkylation.

Operation experience is presented of the benzene cut extraction block from stable reformate at the L-35/11-1000 reformer at the ANHK JSC after start-up. By means of a computation programs package operation of stable reformate division block is simulated, and dependence of benzene content in products on feed quality and technology parameters forecasted. Several operation mode alternatives of the stable reformate division block being considered, with quality and products yields estimation.

Ibragimov A.A., Shiryazdanov R.R., Davletshin A.R., Rakhimov M.N., Telyashev E.G.

Low-temperature isomerization of pentane-hexane fraction of chloraluminat ionic liquid

Keywords: isomerization, ionic liquid, super-acid, octane number, naphthenes, pentan-hexane fraction.

The process of low-temperature isomerization of pentane-hexane fractions using the ionic liquid as a catalyst was studied. It was found that when aromatic hydrocarbon additives are removed,

the chloraluminat ionic liquids with super-acid properties catalyze the process of isomerization of light alkanes industrial fractions. The influence of naphthenes in the studied fractions on catalytic properties of the ionic liquid and the value of octane number of isomerizate are shown.

Mukhtorov N.Sh., Kolokolnikov A.S., Chugunov M.A.

Influence of the composition and structure of the alkyl methacrylate copolymers on their depressor properties in diesel fuels

On the basis of alkyl methacrylates having alkyl radicals of C₁₂₋₁₈, C₁₆₋₁₈ and C₂₀₋₂₂ a number of copolymers with different substituent's alkyl methacrylate fractional composition and the composition and quantity of polar comonomers were synthesized. The impact of the samples at low-temperature properties (cloud point, cold filter plugging point and pour point) of diesel fuel were tested. It is established that the depressors efficiency can be influenced in two ways: the fractional change of base monomers – methacrylates of depressor and controlled thermodynamic affinity of the polymer to hydrocarbons of diesel fuel by introducing polar comonomers.

Abbaszade S. M., Abbasov V. M., Abullaev E. Sh., Ismailov T. A., Badalova C. B.

Water soluble demulsifier with anti-corrosion property in order to oil desalting and dehydration of oil

Keywords: demulsifier, inhibitor, desalting, dehydration, corrosion.

Results of laboratory tests of a new Khazar-24 reagent are given. Article represents that assigned composition is not only good demulsifier and it is effective corrosion inhibitor as well.

Gureev A.A., Bystrov N.V., Kleimenov A.V., Orlov D.V.

About life and elasticity road bituminous materials

Keywords: road bitumen, bituminous materials, thin films, durability, elasticity, reversible deformation, compounding, rheological properties, Super Pave.

Made a analysis of modern methods of testing petroleum bitumen road and shows the need for the development of research on testing of bitumen in thin films, simulating the conditions of their use in asphalt concrete mixtures and coatings. The efficiency of estimation of durability of bituminous binders of materials in terms of their flexibility, i.e. propensity to reversible deformation. Logical conclusion is made about the need for the construction of road categories 1 and 2 only in the RF bitumens with a certain degree of elasticity, i.e. compounded bitumen. Suggested by one of the first steps in this direction to implement and adapt the practice of the American system of road construction design of asphalt mixes «Super Pave – Superior Performing Asphalt Pavement System».

CHEMMOTOLOGY

Bakaleynik A.M., Skvortsov V.N., Fialko L.M.

Fuel soiling and cleaning

Keywords: Intake valve deposits, motor gasoline, detergent additives, IVD test Russian Oil Products Association (ANN).

Deposit grow on intake valves changes over a wide range depending on features of a design of engines, their condition and quality of fuel. . Operation of the «bad» car on considered quality on fuel high tendency to formation of deposits can lead to decrease in reliability of operation of the engine. Due to the lack of laboratory methods and norms and standards for control of this characteristic of motor gasolines Scientific-Research Institute for Petroleum Processing (VNIINP) carries out an assessment of it by a bench technique (test ANN) at a stage of working off of composition of gasoline with new components and additives. If necessary for reduction of tendency of fuel to formation of deposits VNIINP involve in composition structure domestic and foreign detergent additives. Application of fuels with detergent additives equalizes chances of cars of the park significantly differing on tendencies to formation of deposits, to keep the indicators of fuel profitability and level of harmful emissions for the mileage according to established frequency of maintenance.

Chudinovskikh A.L., Lashkhi V.L.

Recommendations for the /Read-Across/ principle development for domestic motor oils

Keywords: motor oil, tests, acid number.

A /Read-Across/ principle is widely used abroad by testing motor oils insignificantly differing in base structure. In practice this principle is used for reasonable reduction of tests number of analysed systems similar in structure, and simultaneous maintenance of resultant estimate reliability. For the analysis of domestic oils the approach offered should be considered as a possible way of samples scrapping and the subsequent motor tests number regulation. By this, after elaborate laboratory research the less quality oil samples are either excluded from further consideration, or on the contrary exposed to more detailed motor check.

EQUIPMENT and DEVICES

Fedotov A.A.

Analytical research of detection and prevention problem of stealing products from main pipelines

Keywords: insets in pipelines, control systems, violation detection, steal prevention.

Briefly covered the issue of stealing products from pipelines in the country and abroad. Discussed proposed methods of detecting and preventing stealing with the evaluation of their capabilities. Indicated tasks to be solved, which would reduce the loss-pumped product from the «inset-terrorism» to an acceptable level. Justified a comprehensive approach based on using of active and passive vibroacoustic control methods.

№ 10_2013

IN SIGHT

Freiman L.L., Korba O.I.

The Russian market of hydrotreating catalysts and the law of unintended consequence

Keywords: catalysts, hydrotreating, state regulation.

The analysis of the Russian market of catalysts of hydrotreating of diesel fuel and the tendency of its development is carried out. The main features of the successful player of this market are described and the question of competitiveness of domestic producers is concerned.

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Tsvetkov D.A., Tomin V.P., Pleshakova N.A., Tomin A.V.

Research of benzene content change in reformer product of the L-35/11-1000 unit

Keywords: dehydrogenation, dealkylation, catalysate.

Research results of benzene formation conditions within the reforming process are shown. The analysis is carried out of the data collected in industrial conditions at the L-35/11-1000 reformer of ANHK OJSC with the RB-33U and RB-44U catalytic systems of the reforming block during the whole period of its operation. The comparative analysis is also made of modern reformer catalysts operation with a different kind of feed than that used at the ANHK OJSC.

Gulyaeva L.A., Khavkin V.A., Vinogradova N.Y., Shmelkova O.I., Gorlov E.G.

Thermal treatment of Petroleum Residiums at presence of the active catalytic additive

Keywords: oil residues, masout, goudron, active catalytic additive, zeolite, thermal treatment, thermolysis, gasification.

Experimental investigation thermocracking of petroleum residium in suspension phase are performed. The natural as a catalytic additive is used. The optimal parametres of the process are choosen. The yield and quality of final products and ways of their use are estimated.

Kovalsky B.I., Shram V.G., Yudin A.V., Runda M.M.

Effect of thermo-oxidative degradation products on the antiwear properties of transmission oil MT-8p

Keywords: thermal stability, absorption coefficient of light output, the volatility, the spot diameter of wear, the criterion of anti-wear properties.

The results of the investigation of the oxidation products and the effect of oxidative degradation on the anti-wear properties when tested mineral gear oil MT-8p.

Abbasov V.M., Mamedkhanova S.A., Nuriyev L.G., Abdullayeva N.R., Ismailov T.A.

An influence of oxy-ethers of synthetic petroleum acids on the electrical conductivity of hydrocarbon liquids

Keywords: oxidation, synthetic naphthenic acids, antistatic agents, oxy-ethers, statistical electricity, oxypropylene, conductance.

Results of investigations on the increase of electrical conductivity in fuels, such as kerosene and diesel fuel are given. To this end oxy-ethers on the basis of synthetic naphthenic acids and oxypropylene were synthesized. From the oxy-ethers obtained, the solutions in kerosene and diesel fuel were prepared at different molar ratios and their electrical conductivities were determined. It has been established that the electrical conductivity of hydrocarbon solutions of kerosene and diesel fuel is increased with increasing of the concentration of oxy-ethers.

Axenov V.I., Emelyanov V.E.

On antioxidant activity of N-methylaniline

Keywords: N-methylaniline, automotive gasolines, autooxidation, antioxidants, induction period, Hammett equation.

N-methylaniline exhibits the antiknock activity together with antioxidant one. The automotive gasolines containing N-methylaniline are resistant to autooxidation without addition of special antioxidants, in particular Aguidol-1.

EQUIPMENT and DEVICES

Kovalsky B.I., Artemov M.N., Virkov D.V., Pavlov A.V.

Closed drainage system-loading operations with oil

Keywords: closed drainage system-loading operations with oil, condensation unit air-steam mixture, refrigerant, instrumentation and automation.

A universal scheme and the device closed process drain and loading operations with oil products, providing an exception getting outside air pollution and moisture, as well as emissions of oil vapor.

Monakhov A.N., Monakhova M.A., Lovyannikova E.S.

Evaluation of corrosive wear refining equipment in real time. Perspectives and expectations

Keywords: corrosivity, primary processing of oil, corrosion monitoring in real time.

Corrosivity entering the refinery has been steadily growing. The factors that determine the trend in the long term growth of aggressive media. The urgency of the need for advanced corrosion protection measures that minimize the human impact on decision-making such as automated corrosion monitoring in real time (CMRT). For practical implementation of the results CMRT several refineries of Russia, showing the efficiency of the system. Analyzed the reasons for failure of anticorrosive measures used today in Russia.

MATERIALS of the PETROCHEMICAL and REFINERS ASSOCIATION

Extracts of the protocols #114, 115 of ANN board meeting of 16.05. and 03.07.2013

NEWS. FACTS. DOCUMENTS

How to count the impact factor and h-index, what these parameters are for, and what in general the scientometrics is dealing with ...

IN SIGHT

Savchenko V.I., Makaryan I.A., Arutyunov V.S.

Analysis of foreign commercial technologies of hydrocarbon gases processing and prospects of their realization in Russian oil and gas industry

Keywords: hydrocarbon gases processing, natural gas, associated petroleum gas, GTL-process, syngas, Fischer-Tropsch synthesis, synthetic liquid fuels, Sasol Oryx GTL, Shell Pearl GTL.

An overview of foreign commercial GTL-technologies based on Fischer-Tropsch synthesis to convert natural and associated petroleum gases into valuable chemical and petrochemical products including synthetic fuels has been done. A comparative analysis of current projects developed by the leading world companies for the full-scale GTL-productions was carried out. The prospects of practical realization of conventional GTL-processes in the oil and gas industry of Russia are analysed.

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

Kutin Yu.A., Telyashev E.G., Victorova G.N., Khares Mushref

Production and usage of road bitumens and polymer-bitumen binders. Reality and prospects

Keywords: bitumen, bitumen-polymer binder, BPB, solution, modification, quality, stability, achievement, heavy oils, natural bitumens, bituminous rocks, processing.

The first part of the article deals with the features of bitumen modification by polymers, obtained according to different technologies. The proposition about preferable usage of non-blown bitumens and other stable residual petroleum products as hydrocarbon bases of polymer-bitumen binders is substantiated. The necessity to follow the main points of the polymer solutions theory in the processes of modification is stated.

The second part studies the problems of further increase of road bitumen quality. It is shown that simple increase of numerical values of different quality standards does not guarantee the real high quality of bitumens as binders for fixing mineral bases of asphalt concrete. At concrete examples it is shown that real increase of bitumen quality can be achieved by using the new non-traditional feed sources: heavy oils, natural bitumens, bituminous rocks, etc.

Khavkin V.A., Gulyaeva L.A., Kalimullin A.K.

About selective hydrotreatment technologies of catalytic cracking gasolines

Keywords: gasoline of catalytic cracking, selective hydrodesulfurisation process, catalyst, octane number of gasoline, commercial implementation of the process.

Technological schemes of sulfur containing gasolines treatment are considered. Different methods, permitting sulfur content to decrease in catalytic gasoline without sufficient octane number reduction are described. The results of commercial implementation series processes for hydrodesulfurisation of catalytic crackiny gasolines are presented.

Mukhtorov N.Sh., Goryachev U.V., Kolokolnikov A.S., Chugunov M.A.

Modifiers of wax crystallization and their role in the dewaxing processes

The existing dewaxing methods studied. Crystallization and separation of diesel fuel waxes (n-alkanes) in the presence and the absence of SAS carried out. The most common and well-known depressors for diesel fuel based on vinyl acetate (VA) and alkyl methacrylate (AMA) have been used as SAS. Identification and determination of character of the distribution of SAS between the solid and liquid phases were carried out by IR spectroscopy. It was revealed that the sample of diesel fuel cooled in the presence of AMA based modifier filtered faster than the sample without additives (20 times) and the sample cooled in the presence of VA based modifier (4 times). Thus, the SAS based on alkyl methacrylates exhibit properties of wax crystallization modifiers more than depressor one, while SAS based on copolymers of ethylene with vinyl acetate exhibit depressor properties more than wax crystallization modifiers one. The observed phenomenon can be explained by the fact that the polyalkyl methacrylates, unlike ethylene vinyl acetate copolymers are not incorporated into the crystal lattice of n-alkane to form a crystal surface layer, loosely associated due probably dipole-dipole interaction.

Akhmedov A.I., Talishova N.A.

Sulfur- and phosphorcontaining oligomers of hexene-1 as additives to lubricating oils

Keywords: oligomer, hexene-1, oligomerization, sulfuration, phosphosulfuration, additive.

The article is devoted to functionalization of oligomers of hexene-1, which is obtained by oligomerization in the presence of aqua complex of aluminium chloride. It was investigated the influence of temperature, consumption of catalyst and toluene on the results of the process of oligomerization and were found the conditions, providing the preparation of oligomers with high yield. By sulfonation and phosphosulfurization of synthesized oligomer and further neutralization of the obtained products were prepared additives which besides the viscous-temperature properties of oils have detergent-dispersing, antioxidative, anticorrosive and antiwear properties, that is the they have action of additive of multifunctional character in the composition of petroleum oils.

EQUIPMENT and DEVICES

Churakova S.K., Sidorov G.M., Rezyapov R.N., Bogatykh K.F.

Modernization of the distillation equipment using cross-flow packed contact device

Keywords: modernization, intensification of work, mass-transfer equipment, rectification column, contact devices, plates, cross-flow packing, low pressure drop, high efficiency, decrease of energy, simplified scheme of fractionation, sectioning, resource and energy saving technologies, construction and technological approach.

In the article on various examples show the advantages of upgrading equipment using a column packed Cross-flow devices. Cross-flow phase contact (countercurrent apparatus as a whole and cross-current to each contact level) solves one of the most important problems : the possibility of independent control section for the passage of vapor and liquid in order to select the specific vapor and liquid loads , that is the ability to control performance pressure drop and performance simultaneously. The use of cross-flow nozzle can significantly increase the separation capacity of vehicles at lower specific energy consumption at the expense of: sectioning, use of constructive-technological approach in the design process and allows to optimize the constructive design of all sections of the column , especially the sections with disproportionate vapor and liquid loads and thus provide an effective work at both low and high vapor and liquid loads.

ANALYTIC METHODS FOR OIL and PETROLEUM PRODUCTS

Tomin A.V.

A complex efficiency estimation technique for modern automotive gasolines

Keywords: automotive gasolines, test methods of operational properties, knock characteristic, exhaust gases composition.

Presented results of development of a technique for complex efficiency estimation of modern gasoline compositions by the example of research of influence of nature and content of some oxygenates and monomethylaniline.

Luk'yanchenko Ye.M., Dorogochinskaya V.A., Tonkonogov B.P., Anan'yev S.S.

The analysis of trace elements in used turbine oils

Keywords: X-ray fluorescence analysis, the wear indicators, turbine oil, the method of analysis

The analysis of existing methods for the determination of trace elements in oils and show that the most accurate and current is a method of X-ray fluorescence analysis. The technique of determining the elements of deterioration in lubricating oils for example oils, turbine units of thermal power stations. The dependence of the intensity of the analytical signal on the concentration of the substance and nature of the matrix of the analyzed sample. The equations of the signal intensity due to concentration of the element. The high accuracy of the analysis and lower detection limits for trace elements.

PETROLEUM PRODUCTS: TECHNOLOGY, INNOVATION, MARKET

*Grudanova A. I., Khavkin V.A., Gulyaeva L.A., Sergienko S.A.,
Krasilnikova L.A., Misko O.M.*

Perspective process of diesel fuel production for cold and arctic climate with good ecological and exploitation properties

Keywords: diesel fuel, catalytic and isomerization dewaxing, hydrodearomatization, catalyst, zeolite, cetane number, cloud/pour point.

Different methods of diesel fuels for cold and arctic climate are described. Diesel fuels for cold climate conditions are produced by catalytic dewaxing process. But most profitable process is isodewaxing process, for it provide as best yields and high cetane number. This process is expensive enough because of high price of Pt (Pd) catalyst. The main results of isodewaxing catalyst development are presented.

Kovalsky B.I., Vereschagin V.I., Runda M.M., Yanovich V.S., Shram V.G.

Influence of climatic conditions of operation of engines on processes of aging of oil

Keywords: the absorption coefficients of light and the relative viscosity, the concentration of soluble and insoluble products of aging, anti-wear, anti-wear criterion.

Results of research of process of aging of synthetic Mobil 1 New Life 0W-40 SN/SM/SL/SJ in the winter and summer seasons of the engine car.

Mamedyarov M.A., Abbasov V.M., Aliyeva F.K., Mamedova G.F., Hasanov E.K., Ahmadbayova S.F.

Nitrogen derivatives of alkenylamber acids as components of conservation liquids

Keywords: nitrogen derivatives, anhydrides of alkenylamber acids, corrosion, inhibitor, conservation liquids.

Based on anhydrides of alkenylamber acids (AAA) and amines (monoethanolamine, and diethylamine), nitrogen-containing derivatives were synthesized and investigated their physico-chemical properties. Conservation liquids prepared using nitrogen derivatives of AAA and mineral oils T-30, which are tested under different conditions.

Gojayeva A.R., Asfandiyarova L.R.

Synthesis of water-soluble cationic polyelectrolyte based epichlorohydrin dimethylamine

Keywords: polymer, structure, flocculants, properties, synthesis conditions, viscosity, temperature.

The synthesis of water-soluble cationic polyelectrolyte based on epichlorohydrin and dimethylamine, the possibility of changing its properties as conditions change and process parameters, in particular, the following sequence of input raw materials providing reception polyelectrolyte ECH-DMA optimum viscosity for a given temperature.

CHEMMOTOLOGY

Aksyonov V.I.

A question of automotive gasolines chemical stability with N-methylaniline in blend

Keywords: automotive gasolines, auto-oxidation, breakdown time, antioxidants, N-methylaniline.

With a fixed amount of N-methylaniline used as inhibitor of automotive gasolines auto-oxidation, growth of olefins content in gasoline cannot result in breakdown time increase.

Chugunov V.M., Ermilov S.N., Mitin I.V. Samoshin E.V.

Temporary loss of thickened oils viscosity at high shear rates. Methods for estimation of temporary viscosity loss

Definition of shear rate is given, and examples of temporary loss of viscosity of thickened oils at high shear rates in lubrication units of an engine with oil film thickness indication are shown. Results of SAE 5W40 SL/CF oil tests with different types of thickening additives are presented at high shear rates using the Tapered Bearing Simulator (TBS) device. Level of these additives destruction in oils is specified at test with a Bosch pump nozzle. Determination of limit viscosity values at high shear rates is an important indicator when developing low-viscous energy saving oils and at work on oil waste lowering in an engine.

EQUIPMENT and DEVICES

Korneev S.V., Demin M.A., Demin A.M., Reutova O.A., Pilyaeva Y.A.

Testing of raw heat exchangers installations гидроочисток diesel fuels with the help of simulation programs

Keywords: efficiency systems, modeling of the process, heat exchangers, technological process, pollution.

In this article it is considered the actual for today the problem of pollution of heat exchangers installations for hydrotreatment of diesel fuel. The main content is the development of methods of calculation algorithm using the simulator HYSYS.

Dumbolov D.U., Elkin A.V., Galko S.A., Sharykin F.E.

Method, device and mathematical model for determination of consumption rate of fuel containing undissolved water

Keywords: undissolved water, flowmeter, measuring devices, fuel purity, mathematical model.

The article describes the method, device and mathematical model for measuring the consumption rate of fuel and undissolved water contained in the latter in dynamic conditions with use of an axial-turbine flowmeter coupled with a capacitive pick-up for determination of undissolved water on the base of an insulated electrode provided with equipotential screening

CONFERENCES. SEMINARS. EXHIBITIONS

NEWS. FACTS. DOCUMENTS

A world level scientific edition: preparation and inclusion into citation indexes and abstract databases

**MATERIALS of the PETROCHEMICAL and REFINERS ASSOCIATION
Extracts of the protocol #116 of ANN board meeting of 07.11.2013**

List of articles published in the Journal in 2013