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IMPORT SUBSTITUTION IN OIL AND GAS PROCESSING

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Replacement of imported detergent additives to gasoline domestic equivalents obtained on the basis of phenolic Mannich bases

Keywords: mannich bases, amines, paraformaldehyde, detergents, efficiency detergent action.

*Abstracts.*Studied the synthesis of Mannich bases based on alkyl(C_{16}-C_{18}) phenols, amine number of components and paraformaldehyde. The influence of the structure reacting the reaction rate amines obtain Mannich bases based on alkyl(C_{16}-C_{18})phenols. Experimentally investigated these phenolic Mannich bases as active ingredients for the detergent inlet valve engines. It is shown that the washing effectiveness of the additive is higher, the greater the number of amino groups and alkyl radicals contained in the structure of its active substance - a Mannich base. On the basis of comparative studies matched high-performance solvent component – diesel fuel, increases the effectiveness of the action functional additives. Since the industrial production of alkyl(C_{16}-C_{18})phenols currently operates in OOO "Novokuibyshev plant oils and additives," the organization of the proposed technology can be relatively easily organized in the enterprise.

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Research in the fi eld of oils development for two-stroke gasoline engines

Keywords: two-stroke engines, oils, detergents, dispersants, antioxidants, anti-wear additives, fuel-oil mix, cylinder, spark plugs, carbon deposits.

*Abstracts.*The influence of various chemical compounds and the base oils of the amount of deposits on the details of the two-stroke engine. Engine oil samples with the compositions of additives were subjected to the tests. As additives used detergents, dispersants, anti-oxidants and anti-wear additives in various combinations and contents in the oil.

The results of motor tests showed that the best washing activity showed samples of oils having a part of an additive package succinic acid imides, alkylated PIB with the highest molecular weight. Thus, in all cases studied, the use of dispersants, leveling action is not exerted on the antiwear additive.

The advantage for the use in thermal oxidation stability of oil composition for two-stroke engines diphenylamines compared with phenolic antioxidants, due to reduced effect of the latter with increasing temperature in the contact zone. Partial substitution phenolic additives to diphenylamines not provide reduction of deposits.

It was confirmed that the use of synthetic esters as the base oils results in a substantial reduction of deposits on engine parts. It is found that the sample of oil based on synthetic ester TOTM provides maximum efficiency and performance characteristics superior to the imported sample of synthetic oil. It is shown that the content of heavy aromatics and resins in the base oil leads primarily to deposits on the piston crown and the exhaust manifold and the introduction of burning booster avoids the formation of deposits in the combustion chamber and provides a reduction in carbon deposits formation on the spark plug and the piston head, respectively, in 2 and 6 times.

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Manufacture and application of russian origin esters

Keywords: esters, hydraulic fluid, synthetic oil.

*Abstracts.*The specialists of JSC "Sovchemtech" developed and produced group of esters Syntolux L with a kinematic viscosity at 100°C in the range of 1 to 20 mm2/s and developed lubricants for various purposes on their bases. These lubricants are similar to foreign analogues by their characteristics.

Esters Syntolux L 0*** can be used as components of hydraulic fluids. Syntolux L 0290 usage allowed to develope synthetic aviation hydraulic oil AMG-10SL which significantly exceeds AMG-10 and FH-51 characteristics such as flash point and resistance to mechanical degradation. Special formulated ester Syntolux L 140 is mainly developed as synthetic main component of universal lubricant applicable in aircraft gas-turbine engines and gearboxes of helicopters. Esters Syntolux L 2**, 3** or 7** are used as base components of high thermal stability lubricants with a kinematic viscosity 4-5 mm2/s at 100°C.

The specialists of JSC «Sovchemtech» continue to improve the special ester manufacture technology and develope lubricants on their basis.

Shkilevich N.N, Usanov A.A., Malysheva E.V., Karpov A.V., Karpova E.A. (Sovchemtech JSC)

Vinyl ethers based polymers application instead of non russian origin viscosity additives and group V base oils

Keywords: polymerization, oligomerization, base oils, thickening additives, diesel oils, gear oils, motor oils.

Abstracts. The specialists of JSC «Sovchemtech» developed and produced group of viscosity additives Syntolux V with low destruction. Additionally, Syntolux V can be used as group V base oils. Syntolux V are polar, so they have a good dissolving ability of functional additives. In addition, Syntolux V have good lubricating properties.

Unlike other viscosity additives Syntolux V have an unique characteristic – glass transition temperature is below minus 70ºC. Lubricants compaunded with Syntolux V can be used in equipment for Northern and Arctic regions.

Currently Syntolux V are applied for use in diesel motor oils, extreme preassure gear oil, universal low-temperature motor oil, etc.

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To the issue import substitution in technology of regeneration waste oils

Keywords: utilization and regeneration of used oils, import substitution of technologies.

Abstracts. The problem of utilization and regeneration of waste oils and their associated wastes is acute worldwide because waste oils represent a significant environmental problem. Currently, the complexity of processing of waste oils with additives, difficulty of disposal of production wastes, the growing scale of the processing leads to the fact that outdated technologies are replaced on more modern processes.

Modern regeneration processes are used mainly abroad and they are based on imported technologies. Therefore for address this issue of import substitution in Russian Federation is necessary to develop wasteless technologies for regeneration of waste oils. In the operation oils are working at high loads and exposed to significant difference temperature and oxidation, resulting in the irreversible degradation of hydrocarbonic base of lubricants. As a result for obtaining of fuel products is necessary of destructive processing of waste oils, that raises the question of the need to develop technologies of regeneration what allow recycled waste oils involve in recycling processes heavy distillate fractions and petroleum residues using destructive processes of catalytic cracking and delayed coking.

At the Angarsk petrochemical company JSC a universal method of regeneration of waste oils was developed, which provides an opportunity to of import substitution of technology to obtain high quality raw materials and high yield. The presented method allows professionally to recycle waste oils and to realize wasteless production with simultaneous solution of environmental problems.

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Development and production domestic standard liquids for testing rubbers

Keywords: standard liquids for testing rubbers СЖР, new specifications, standards ASTM D 471 and ISO 1817.

Abstracts. The article presents the results of work to restore the production of standard liquids for testing rubbers СЖР-1, СЖР-2 and СЖР-3. Developed new specifications for quality standard liquids СЖР-1, -2, -3 to meet the requirements of international standards ASTM D 471 and ISO 1817. The new technology of liquid applied to the changed resource base.

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Solving the problem of import greases

Keywords: import substitution, greases, heavy duty friction units, extreme pressure properties, corrosivity.

Abstracts. One of the priorities within the framework of a comprehensive program of Rosneft OJSC-Moscow plant «Nefteprodukt» in addition to the preservation and modernization of unique special purpose products is to organize the production of modern lubricants (and first of all - greases) that will lead to the replacement of currently used imported products. Research units of the plant carry out activities to develop formulations of import substitution greases primarily on domestic raw materials with further scaling technology in laboratory, on pilot equipment and in industrial production.
Rosneft EP Greases are made on the basis of domestic mineral base oils and an effective package of functional additives. These greases have a high extreme pressure and anti-wear properties, excellent oxidation stability and corrosion protection.

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Polietilengudronovye binders – innovative material for road construction

Keywords: compaunded bitumens, polymer-bitumen binders, polietilengudronovye binders, elemental sulfur, rubber crumb, SBS – styrene-butadiene-styrene block copolymer.

Abstracts. Developed the technology compounding and formulation of cost-effective to use compounded polyethylene tar binders that allow to expand the range and improve the ecological purity of Russian production of road binders by inoculation through the sulfur bridges of the polymer molecules to the asphaltene structures of tar. The resulting binding can significantly expand the range of Russian road binders (in the coordinates of price and quality). When this is achieved, and a number of environmental problems - reducing emissions from oxidation tars in bitumen, used tires recycling and elemental sulfur.

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Import substitution of fuels and lubricants applied in arms and military equipment as atopic issue

Keywords: import substitution, fuels and lubricants, military equipment.

Abstracts. Part of the fuels and lubricants main brands included into GOST PB 50920-2005 "Fuels, oils, greases and special liquids for arms and military equipment. The restrictive list and an order of appointment", either is not being produced, or developed by domestic industry with use of import components.
This situation formed partly in connection with economic disinterest of oil companies in production of low-tonnage production and technologically difficult components and additives, but was acceptable only according to the main priority of the last century nineties – ensuring reliable operation of domestic machine park, and it has been done so. But today, with positive development of economy and branch, the question of replacement of import components as a part of fuels and lubricants, and first of all those intended for arms and military equipment is raised to the forefront.
However to the large oil companies having oil resources, to buy necessary components abroad being more economically than to make investments into development and organization of low-tonnage production of price-quality competitive additives and synthetic oil components. Apparently, it is expedient to invite for this problem solution hi-tech scientific and production enterprises of small and medium business, specializing in areaof development, synthesis and production of chemical and petrochemical products and fuels and lubricants. The solution of this problem is one of priority activities of the Coordination scientific council for rational and effective use of fuels and lubricants in arms and military equipment, created according to the order of the Government of the Russian Federation of March 20, 2008. No. 353-r at the federal autonomous institution "25 State research institute of a chemmotologos of the Ministry of Defence of the Russian Federation".

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Import substitution in oil products control

Keywords: import substitution, products testing, quality control, standards.

Abstracts. Laboratories of domestic oil processing are now sated with devices of foreign producers. This certainly increased efficiency of refinery laboratories and improved the quality departments work. However this instrument park needs service and upgrading. At this a complete dependence emerged from the will of governments of those countries where manufacturing companies are located. Due to latest events and sanctions concerning Russia the import substitution problem became actual in this direction.

Lashkhi V.L., Leymeter T., Chudinovskikh A.L.

General analysis of domestic motor oils composition structure and possible import substitution mechanism

Abstracts. Owing to present aggravation of political situation to the forefront of domestic practice moved forward questions of replacement of import accessories by domestic ones at industrial production (within a production cycle). It is so for production of fuels and lubricants, too, and to motor oils production in particular. The urgent need of works on import substitution is dictated not only by organizing reasons connected with political situation aggravation, but also by technical reasons. So, some foreign companies concerning undesirable losing Russian sales market and getting a "coming true" party, try to rapidly modify their production quality. It can be connected with a need to eliminate certain defects known to the supplier, and to avoid wide publicity in sight of large-scale works on import substitution of additives in motor oils.

As practice showed, small and medium-size domestic enterprises specializing in this area can successfully be a base in the work on import substitution of additives. Unlike large ones, they are more dynamic: if necessary, they can be easier reconstructed structurally and adjusted to suit the industry. These enterprises show not only economic interest, but also a significant share of patriotism that allows them to actively get rid of import additives of any functional purpose in the domestic market.

Besides this, for ensuring the domestic motor oils production rhythm it is necessary to take into account additives or components of those foreign companies who don't participate in sanctions against Russia.