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The 50th anniversary of chimmotologiya...

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Anniversary: the Science of chimmotologiya is 50

Keywords: himmotology, petroleum, oil and lubricants (POL) application, POL performance characteristics, the methodology of Himmotology, scientific schools.

The article is devoted to the results of Himmotology development. The totals include the own methodology, main scientific schools, research lines, theoretical basics and practical results. The role of Himmotology has been marked both in reliability and resources enhancement of machinery and vehicles under operating conditions and in the economy effectiveness of the country. The problems of Himmotology have been described. The principal objective of Himmotology has been stated – to develop its own theoretical basis.

Bulatnikov V.V.

Normative-legal support in chimmotologiya

The chimmotologiya goal is improvement of operational properties of fuels and lubricants defining operability of the machinery in its operation conditions. The most important component of a question of quality improvement is estimation of quality level of petroleum products. The major factors defining this level along with hi-tech production are: presence of modern requirements to the quality indexes stated in standards, validation tests and confirmation of products compliance to the established requirements being harmonized with similar foreign systems.

Emelyanov V.E., Danilov A.M.

Chimmotologiya role in production and use of automotive gasolines

Keywords: Chemmotology, test methods, motor gasoline, technical regulations, advanced fuels.

The present article focuses on the role Chemmotology in production and use of motor gasoline. Scientific substantiation of optimum quality requirements of automotive gasoline contributes to solving the problems of energy saving, ecology and security of transport fuel. At the moment it is very important to determine the optimal level of quality of gasoline for cars of various environmental class, which is one of the tasks Chemmotology.

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

Production and application of diesel and boiler fuels

Keywords: diesel fuels, boiler fuels, environmental requirements, standards, mixing of fuels, influence of water, storage of fuels, fuel oil, hydrogen sulfide absorbers.

Increase of the requirements concerning ecology properties of both diesel fuels and products of their combustion set new tasks of fuel quality improvement for chimmotologists. Tough requirements of the Customs union Technical regulations and the differentiated system of taxation have led to a dramatic increase in production of Euro class 4 and 5 diesel fuels. For production of the Euro diesel fuel at a refinery quite often in one package both domestic and foreign additives can be used. Caused by this are problems of compatibility of additives in fuel, terms and storage conditions, fuels from various refineries blending in the same tank. Modern chimmotologiya has to deal with this. Ecological requirements affect fuel oils as well. Decrease of the hydrogen sulphide content to 20 ppm and later to 10 ppm is one of the most actual tasks of an oil refinery.

Chudinovskikh A.L.

Development of chimmotologiya of automotive motor oils

In June, 2014 passed 50 years of publication of an article by K . Papok ("Chemistry and Technology of Fuels and Oils" magazine, 1964. – No. 6), in which for the first time it is offered to classify the sum of knowledge in the field of effective and rational application of fuels and lubricants in the machinery as a science by the name chimmotologiya. From this point begins the history of chimmotologiya and its own "family tree". In the 50 years period of chimmotologiya there were different periods of active development and certain recession. At the same time, despite all twists and turns the chimmotologiya as an applied discipline undoubtedly achieved success.

Tsvetkov O.N.

Technology and chemmotology of motor oils of VNII NP

Keywords: Maslovedenie, chemmotology, motor oils, additives.

In connection with the anniversary it is appropriate to emphasize that the appearance of chemmotology is associated with motor oils, study and establishment of empirical and possibly formalized patterms of influence of oils on the reliability of the individual parts and engines in general. VNII NP, for its more that 80 years of activity in the area of maslovedenie and being the main developer of technology of motor oils, has been actively using and, if necessary, independently developing chemmotology test methods for motor oils. At present, chemmotology needs updating and approaching to foreign systems of testing for motor oils.

Parenago O.P.

Additives chemistry development in the Institute of petrochemical synthesis of the Russian Academy of Sciences

The development of lubricants and fuels additives chemistry in the IPCS RAS (from 1934 to 1947 – Institute of combustible minerals of the Academy of Sciences of the USSR) was started by one of the founders of this institute, academician S.S.Namyotkin. In his profound work by the name Oil Chemistry (the 1st edition, 1932) he gave an important place to chemistry of synthetic additives which, as author believed, have to come to forefront in future, when obtaining various fuels, lubricants and petrochemistry products. After the war, in 1946, S.S.Namyotkin together with his pupil, subsequently professor P.I.Sanin publishes About the Classifi cation of Additives article, where besides main properties of these compounds and their types research works were planned upon synthesis and study of the acting echanism of special substances, i.e. additives to fuels and oils.

Danilov A.M., Bezgina A.M., Oknina N.G.

Development of works in the field of additives to fuels in Russia

In the last several years keen interest of developers in additives for motor fuels has showed up. It is due to, on one hand, a big need for additives for production of fuels of high ecological classes, on the other to the need to overcome the import-dependence in this strategic branch. In the first decade of this century it was normal to speak about some domestic traditional additives developed several decades ago, for example anti-oxidizing, but now we deal with a whole branch capable to compete with foreign producers.

Rozhdestvina O.V., Ivankovskiy V.L., Pashkova L.V.

Cleaning efficiency and colloidal stability of sulphonate additives to lubricating oils

Keywords: ulphonate additives, efficiency of separation, colloidal stability, coefficient of optical transmission.

By an example of the sulphonate additives for motor oils a need to control the efficiency of stage of cleaning the products of neutralization and carbonatation in the centrifugal machinery is shown. Techniques of colloidal stability estimation of commodity additives by means of turbidimetry are critically considered. It is proven that they estimate completeness of cleaning the additives from organic compounds insoluble in light hydrocarbons (in Nefras petroleum solvents). The technique is offered of turbidimetry separation efficiency control by assessment of proximity of optical transmission coefficient of an additive solution to its value for a "reference" sample.

Tomin V.P., Mozilina O.Yu.

Degradation of physical and chemical properties of motor oils during their operation. Possibilities of used motor oils solvent regeneration

Keywords: monitoring of motor oil quality, utilization and regeneration of used oils.

One of the main functions of motor oil is ensuring stable work of internal combustion engine (ICE). Long operation of the engine with low-quality oil leads to a premature operation breakdown. In this regard a question of optimal determination of oil replacement terms is subject of numerous researches. In their turn, used oils are one of significant sources of environmental pollution, thus complete or partial recovery of their quality for re-use for intended or other purposes to be of great importance.

At the Angarsk Petrochemical Company JSC on the basis of its Test Centre - Quality Control Department a work is carried out upon oils quality monitoring at their use in automotive transport and upon the optimum technology of used oils regeneration.

Lyubinin I.A.

Plastic greases for heavily loaded friction units: features of application, tribology assessment and mechanism of lubricant action

Keywords: plastic greases, heavily loaded friction units, mechanism of lubricant action.

Specifi c usage conditions of plastic greases for heavily loaded friction units are considered, e.g. in bit bearings and threaded joints of drill and pump and compressor pipes. Results of the tribology tests and research of friction surfaces are given, allowing to estimate the mechanism of lubricant action and to carry out development of greases for specifi c operation conditions.

Krahmalev S.I.

Development of efficient application methodology and operability guaranteeing of viscous lubrications and pastes

Keywords: application of lubricating greases, friction unit, types of equipment, viscous lubrication, lubrication property, operating conditions, friction regime, friction area, reserve area, active life, exploitability.

The contribution of scientists from JSC VNII NP in the creation of a domestic range of lubricating greases and pastes and the development of their application as well as operability guaranteeing in rolling bearings, plain bearings, and gearings is noted. The achievements in the creation of simulators, tribometers, and methods for studying the composition and dynamics of changes in the properties of lubrications when operated and kept are described. Necessity to assess the impact of multi-properties (volumetric-mechanical and physics-chemical) of lubricants and their mutual influence on the functional and performance characteristics is shown.

Boychenko S.V., Aksyonov A.F. **Key role of chimmotologiya**