INNOVATIVE TECHNOLOGICA
METHODICAL RESEARCH JOURNAL
ISSN: 2776-0987 Volume 2, Issue 11, Nov., 2021

TECHNOLOGY PREPARATION OF OILS FOR MODERN ENGINES ON THE BASIS OF RAW MATERIAL AND HIGH SULFUR CONTENT

Ergashev Mahmudjon Mamadjanovich
PhD, Fergana Polytechnic Institute,
Fergana city, Uzbekistan
0000-0003-4962-3017

Annotation
The technology of production of engine oil for high-powered engines M-14 DM on the basis of local oils.

Keywords: oil, isoparaffin, reliability of equipment, alumocalcium, aromatic hydrocarbon.

Introduction

The functions of oils are extremely diverse and are determined by the specific operating conditions of specific machines and mechanisms [1,2] and, therefore, there is a need for a wide range of lubricating oils. For a number of years, we have been carrying out a complex of works of scientific and applied nature, aimed at the fullest possible use of the potential of local oil raw materials and the organization of motor oils with high performance characteristics. One of the necessary conditions for achieving high reliability of technology is the mutual correspondence of the properties of the used motor oils, the conditions of their operation and the design of specific engines. To ensure reliable lubrication of high-powered engines of imported equipment, oils are needed that can long maintain the performance of turbocharged diesels in extremely difficult conditions: the use of fuels with a high content of sulfur compounds in hot climates. [3,4]

INNOVATIVE TECHNOLOGICA
METHODICAL RESEARCH JOURNAL
ISSN: 2776-0987 Volume 2, Issue 11, Nov., 2021

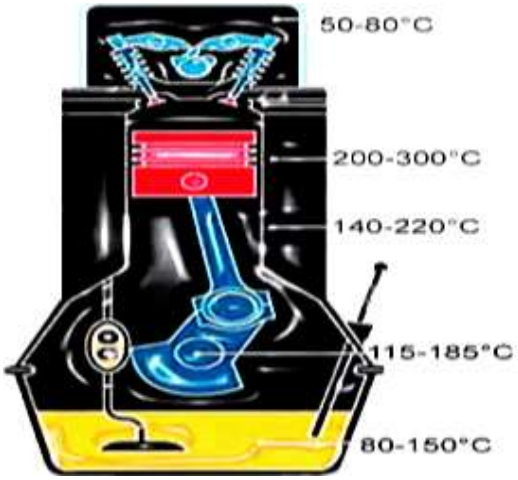

Figure 1 shows the oxidation of oil in the engine at operating temperatures. Analysis of the hydrocarbon composition [3] of heavy fractions of oils processed at the refinery revealed the presence of a significant number of useful isoparaffin, naphthenic-paraffin, mono and bicyclic aromatic hydrocarbons with long side chains of desirable components for the production of oils. This indicates the prospects of organizing the production of high-quality base oils and expanding the range of commercial oils, in particular group D. [5]

RELATED WORK

To increase the relative content of desirable components in oil fractions, providing an optimal combination of performance characteristics with long-term, stable operation in difficult conditions, the Fergana refinery adopted the following scheme of the process of obtaining and purification of oil distillates. The most viscous products of atmospheric-vacuum distillation, III fraction and deasphaltic tar, are successively subjected to selective purification with phenol, dewaxing with solvents and, finally, Hydrotreating with an aluminocobalt-molybdenum catalyst. The main characteristics of the obtained components for base oils, recorded during the year, are presented in the table. [6] Obvious fluctuations of the main indicators: viscosity, pour point and color indicate the instability of the hydrocarbon composition of the processed raw materials, as well as insufficient depth of removal, undesirable for high-quality oils, unbranched paraffins, polycyclic hydrocarbons and resinous substances. Therefore, for compounding in order to prepare base oils for high-powered engines, only batches of oil distillates that meet the requirements of the technical SPECIFICATIONS were used. The required viscosity of the base oil in the

ISSN: 2776-0987 Volume 2, Issue 11, Nov., 2021

range of 13.5-14.5 °C at 100°C achieved by varying the ratio of fraction III and residual oil. It is experimentally shown that an increase in the content of the residual fraction over 70-75 %, causes a high color of the product and an increase in the tendency to carbon and varnish formation. While the growth of the fraction III fraction of more than 30 %, the viscosity of the base oil is reduced below the permissible limit [7]. The study of the main indicators of a number of samples of base oils of optimal composition, in addition to good solvent ability in relation to additives and compatibility with common materials of engine seals, revealed unsatisfactory low-temperature and color characteristics, compared with imported analogues.

TEXT INPAINING

Improvement of a complex of the operational characteristics corresponding to commodity oil M-14DM, technical and economic indicators and stability of quality of a finished product, is reached by introduction of a multifunctional package of additives K-471 according to the recipe of NPP "Kvalitet" made by JV "Farmoy". The boron-modified zinc dialkyldithiophosphate, which is part of this package, in combination with an amine antioxidant, provides correction of viscosity properties, along with high antioxidant, anti-wear, anti-corrosion and anti-friction activity. Specially selected in the package complex sulfonate additives, with varying degrees of alkalinity, effectively prevents the formation of varnishes and deposits on the parts and long neutralizes acidic oxidation products of the oil in the process. This is evidenced by the stability of the hydrogen index during the test run, since the pH value is a rejection parameter of the presence in the tested oil of strong acids that activate the corrosion wear of internal combustion engines. However, the viscosity isotherms of the prototype oil, involving only the additive package K-471, are characterized by a clear depression in the region of negative temperatures, indicating an increase in the processes of Association and structure formation of the most viscous components of the mixture. Therefore, to regulate the viscosity-temperature properties, an additional introduction of a depressor additive based on K-110 was required [8].

INNOVATIVE TECHNOLOGICA
METHODICAL RESEARCH JOURNAL
ISSN: 2776-0987 Volume 2, Issue 11, Nov., 2021

EXPERIMENTAL RESULTS

In the process of optimizing the composition of the lubricant composition, the compatibility of reagents of different chemical composition and structure was evaluated. A slight discrepancy between the experimental and calculated values of the alkaline number obtained by changing the concentration of the additive K-471 in the experimental samples indicates the compatibility of the detergent-dispersing substances included in the additive package with the components of the base oil, depressor and anti-foam additives. The high performance properties of the obtained oil of the m-14 DM brand are confirmed by the results of tests in the volume of kmco oils for automobile gasoline engines and for automobile, tractor and combine diesels. The Technical conclusion of the state standard of Russia about the admission to production and application of oil M-14 DM on the basis of the Fergana oil distillates is received. It should be noted that during the entire period of testing at NPO "Quality" power and economic indicators of bench engines were within acceptable limits, and the physical and chemical parameters of the prototype oil corresponded to TU 0253-046-40065452-03 for commercial oil brand M-14 DM. figure-2.

Figure-2.Pump compartment technology.

CONCLUSION

The organization of production of competitive domestic oil at the refinery allowed to expand the range of import replacement products and reduce the shortage of lubricants in the market of the Republic of Uzbekistan. The described perspective oil

INNOVATIVE TECHNOLOGICA
METHODICAL RESEARCH JOURNAL
ISSN: 2776-0987 Volume 2, Issue 11, Nov., 2021

for the highly accelerated engines quite withstands a competition with foreign samples, considerably winning ' in the price. Our current research work [4], on the organization of two-stage Hydrotreating technology and the development of Aluminum-Nickel-molybdenum catalyst with high hydrogenating capacity, aimed at further improving the color and other parameters of domestic oils. Figure-3.

Figure-3. Tanks of oil.

REFERENCES

1. Рязанцев Н.К , Бородин Ю.С., Бычков В.З. и др. (2002). Моторное масло для форсированных транспортных дизелей. Химия и технология топлив и масел. № 5, С. 21-22.
2. Старкова Н.Н, Шуверов В.М, Рябов В.Г., Юнусов Ш.М. (2001). Характеристика сырья для получения высокоиндексных базовых масел. Химия и технология топлив и масел. № 3, С. 36-37.
3. Сайдахмедов Ш.М. (2005). Научно-технологические основы производства смазочных масел из местного углеводородного сырья. Дисс. Д.т.н. Ташкент.
4. Эргашев М.М, Алиев Х.М, Молодоженюк Т.Б., Сайдуллаев Б. Т. и др. (2006). Влияние типа форконтакта защитного слоя на качество гидрогенизата. Узбекский журнал нефти и газа. № 1, С.28-30.
5. Эргашев, М. М. (2020). Утилизация строительных отходов-мировой опыт. Теория и практика современной науки, (10), 90-93.

ISSN: 2776-0987 Volume 2, Issue 11, Nov., 2021

6. Эргашев, М. М., Мамажонов, А. У., Умирзаков, З. А., & Насирдинов, Х. Ш. (2019). Влияние наполнителя и добавки АЦФ-3М на реологические свойства цементного теста. Проблемы современной науки и образования, (12-2 (145)).
7. Эргашев, М. М. (2020). Применение нанотехнологий в производстве цемента. Экономика и социум, (1), 952-955.
8. Эргашев, М. М. (2020). Строительная индустрия узбекистана: перспективы развития. Экономика и социум, (1), 947-951.
9. Мамажонов, А., & Косимов, Л. (2021). Особенности свойств цементных систем в присутствии минеральных наполнителей и добавки ацетоноформальдегидной смолы. Грааль науки, (5), 102-108.
10.Qobulov, M., Jaloldinov, G., & Masodiqov, Q. (2021). Existing systems of exploitation of motor vehicles. Экономика и социум, (4-1), 303-308.