

# MECHANO-CHEMICAL ACTIVATION OF LIQUID HYDROCARBON FUELS BY USING THE ACTIVATOR ACCORDING TO THE PATENT OF RUSSIAN FEDERATION NO. 2411074

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The improvement of engines of research in the motor industry and in the service is overdue. But improving fuel efficiency and environmental friendliness is a costly upgrade of their fuel systems. And thanks to the study of fuels, this can be solved more simply, the modification of fuels that change their composition and properties by applying magnetic and electromagnetic, cavitation, tribotechnical processing, homogenization, additives. But outside, the magnetic fields of fuel changes are reversible, mechano-chemistry and more are tested: mechanochemistry changes in the composition, physical and chemical properties of substances under the influence of mechanical forces. Even strong chemical bonds breakage by electromagnetic fields and mechanical stresses are possible. At the beginning, the bonds with the lowest energy are torn, and strong bonds require 502.4 kJ/mol. The consequence, for example in heptane, is a violation of covalent bonds with energy yield of ~419 kJ/mol, free valence and free radicals, for example, R-CH<sub>2</sub>·, but the changes can be reversible. Mechanical activation is simple in equipment, not energy-consuming. It can be subjected to mixtures and individual fractions of oils. Their destruction occurs with the formation of low-molecular homologues, the most stable products are formed: hexane, heptane with the deposition of sulfur. The peculiarity of the mechanochemistry of hydrocarbons-irreversible reactions are outside the equipment. From here, it is promising. Thus, the activator of motor fuels under the RF patent No. 2411074 facilitates fractional composition of gasoline, aviation and diesel fuel. Activator tested three bench engine tests in Russia, environmental testing engines in Rochester (USA), chemmotology of eight grades of gasoline, three grades of diesel fuel, tens of chromatogram fuels, temperature control of freezing them and smoke of diesel engines. Chromatograms of mineral and biofuels showed an irreversible decrease in heavy hydrocarbons and the formation of lungs: hexane, heptane, 3-methyl pentane to 37%, decrease in sulfur content from 0.032 to 0.015%, resins from 7.4 to 0.8 mg/100 ml., in gasoline, the proportion of octane determining toluene increased to 16%, in aviation kerosene, nonane and decan to 21%. Activation continues behind the activator. Activation provides a reduction in fuel consumption by 20-27% without reducing the power of the engine, reduces smoke and toxicity of engines, reduces the freezing temperature of diesel fuel, it is cleaned of resins and sulfur compounds. Stable, effective and versatile action on fuel was introduced only in the activator according to the patent of Russian Federation № 2411074. Its irreversibility is suitable for automotive, transport, aviation and liquid-jet engine fuels. Activation is useful in the production and distribution of fuels, different fuels are brought to the same properties.