

PREPARATION OF HYDROCARBON SOLVENTS FROM SPENT HEXANE

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Annotation *In this work, the production of waste hexane hydrocarbon solvents was studied. The chemical composition of the resulting solvent was studied. It was also used in practice in the production of automotive paints.*

Key words: *paraffins, JV LLC " Uz-Kor Gas Chemical ", suspension polymerization, Micosol – 1723, oxypolymerization of varnish, organocolloid solutions, LLC " Multy Business Company ", auto primer, auto putty, auto enamel, auto varnish, auto dyes, auto protective agents, auto sealants for car bodies[1].*

The automobile industry is part of an industry that is of great importance in the development of the country's economy and also contributes greatly to the development of other industrial sectors.

industry have been built from scratch in Uzbekistan . It's safe to say that starting from 2022, Uzbek car factories are actively increasing the production of cars on their assembly lines.

It is noted that UzAuto Motors is pursuing the correct investment policy. The company invested \$620 million in its production facilities to build vehicles on the GM GEM platform. Since July 2022 (it must be taken into account that this crisis is at its peak), mass production of the newest Chevrolet Tracker crossover has been launched at the facilities of the Uzbek company in Asaka. At the beginning of 2023, it was joined by the Chevrolet Onix sedan.

The development of the automotive industry depends on many factors. One of the main ones is the localization of parts necessary for the production of cars. Various autochemical products are used in the manufacture of automobiles. For example, auto primer, auto putty, auto enamel, auto varnish and various auto dyes, auto protective agents, auto sealants, chemical pre-treatment agents for the car body, etc. The composition of the products listed above consists of several ingredients, many of which are imported from near and far abroad.

Hydrocarbon solvents are widely used in the paint and varnish industry due to their low cost and availability. This group of solvents includes saturated hydrocarbons of the aliphatic series (paraffins, or alkanes) $C_n H_{2n+2}$, alicyclic





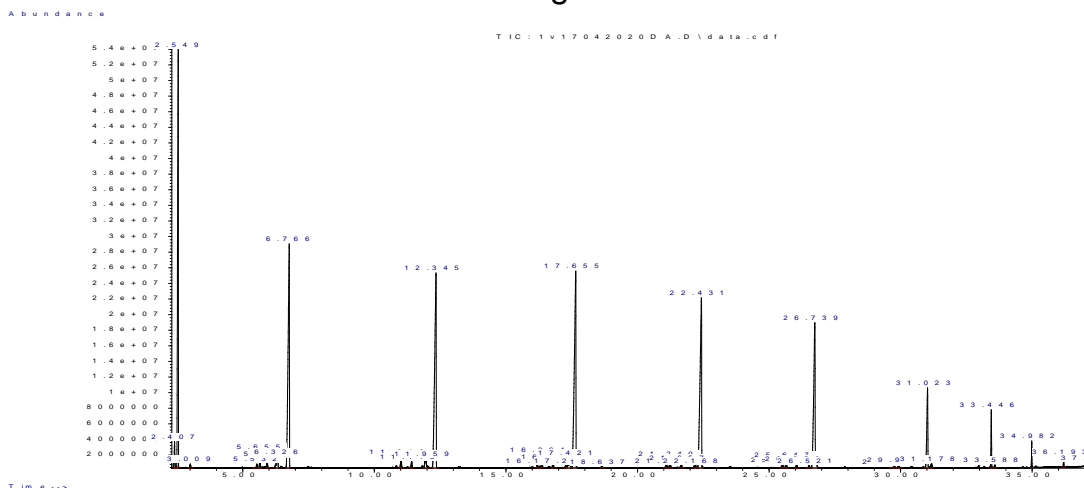
hydrocarbons of general composition $C_n H_{2n}$ and aromatic hydrocarbons. Hydrocarbon solvents are obtained by dry distillation of wood and coal, from shale gasoline, from oil and from petroleum gas. Currently, the main natural source of most hydrocarbon solvents is oil, which contains mainly paraffin, naphthenic and aromatic hydrocarbons.

Depending on the type of oil, one or another class of hydrocarbons predominates in it. Oil fractions distilled over a wide temperature range consist of a mixture of hydrocarbons of different chemical structures.

In many oils, 100-150 alkanes of various structures have been identified, containing from one to 35 carbon atoms per molecule. In the paint and varnish industry, C_6 - C_{12} paraffins are mainly used. Due to the difficulty of their isolation, individual saturated hydrocarbons are used to a limited extent, mainly for dissolving low-polar polymers and oligomers (some fatty alkyds and rubbers).

Of undoubted interest are isoparaffins with a number of carbon atoms of 9-12 (for example, 2,2,5-trimethylhexane), since they are practically odorless [2].

Treated hexane is a colorless, cloudy liquid with an oily odor. It is a secondary product of the polyethylene production process in the Uz-Kor Gas Chemical LLC JV, the results are shown in Table 1 and Figure 1.



Picture 1. Chromatogram of processed hexane

Table 1. Chemical composition of the secondary product of hexane processing of the suspension polymerization process of JV LLC " Uz-Kor Gas Chemical "

No.	Substance name	Formula	Mass on, %	Similarity, %
1.	Octane	C_8H_{18}	16,38	91
2.	Dean	$C_{10}H_{22}$	14,59	95
3.	T ridecan	$C_{13}H_{28}$	14,88	94



4.	Te tradecane	C ₁₄ N ₃₀	15 , 29	97
5.	Hexadecane	C ₁₆ N ₃₄	13 , 29	97
6.	Geneikozan	C ₂₁ N ₄₄	10 , 35	91
7.	Heptadecane	S ₁₇ N ₃₆	4 , 03	91

The special solvent Micosol - 1723 is a transparent, colorless liquid with an oily odor, the main composition of which consists of saturated hydrocarbons, the results of which are presented in Table 2 and Figure 2 .

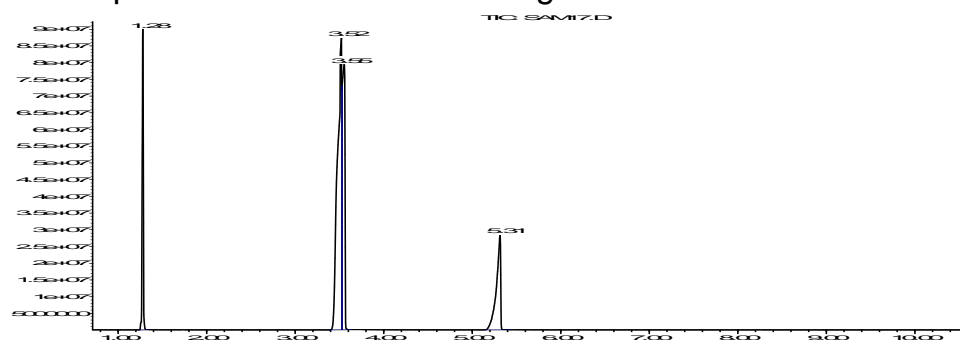


Figure 2 . Chromatogram of the special solvent Micosol -1723

Table 2 . Chemical composition of the special solvent Micosol -1723

No	Substance name	Formula	Mass on, %	Similarity, %
1.	Tridecan	C ₁₃ N ₂₈	13 , 28	90
2.	Te tradecane	C ₁₄ N ₃₀	45 , 37	95
3.	Hexadecane	C ₁₆ N ₃₄	26 , 65	96
4.	Heptadecane	S ₁₇ N ₃₆	14 , 69	86

And testing of specific solvents for the production of auto chemical products, such as Micosol -1723 based on feedstock. The physicochemical and operational properties of the obtained solvents were studied in comparison with the properties of similar imported solvents. Based on the obtained solvents, various car varnishes, car dyes and car sealants were manufactured, and the resulting paintwork materials were tested in accordance with the requirements of the scientific and technical documentation [3] .

The colloidal chemical properties of organocolloid solutions prepared in various concentrations using the Micosol – 1723 solvent obtained during the oxypolymerization of varnish were studied, and the results obtained are shown in Figure 3 .



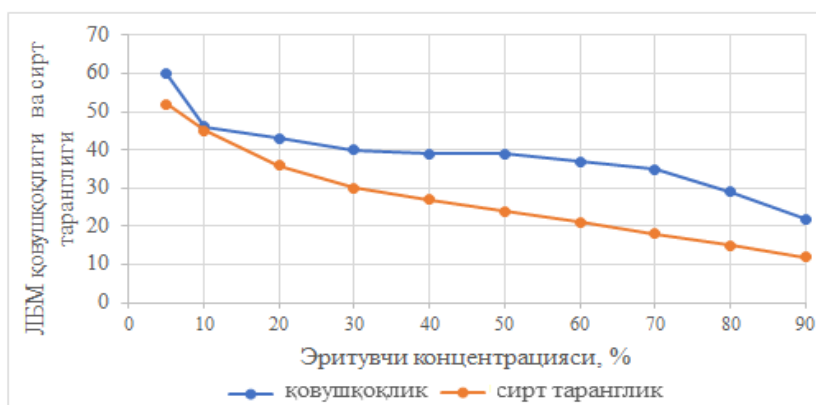


Figure 3 . Dependence of paintwork viscosity (1) and surface tension (2) on solvent concentration

The paintwork obtained on the basis of the proposed solvents was tested in the laboratory of Multy Business Company LLC on the basis of the relevant regulatory and technical documentation.

LITERATURES USED

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