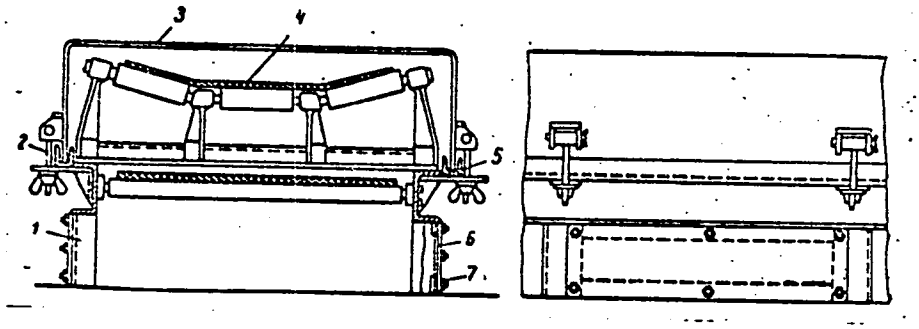


Figure 1. Sealing of a belt conveyor.

1— Conveyor base; 2—swing bolt with wing nut; 3—hermetic housing; 4—conveyor belt; 5—channel iron maze; 6—hermetic cover for conveyor base; 7—resin packing.

As a further example of the technique, Figure 5 shows the design of a rotary valve.

ACC NR: AP6019042

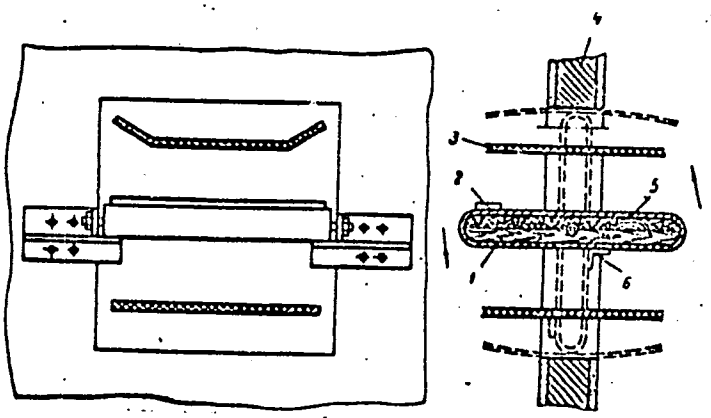


Figure 5. Design of rotary valve

1—Rotary valve made of two plates; 2—counterweight made of bar steel; 3—conveyor belt; 4—fire-resistant partition; 5—galvanized steel casing; 6—carbon steel support.

The article also gives designs for a screw conveyor, a scraper-type conveyor, and for two belt conveyors, joined by a gravity flow tube. Orig. art. has: 5 figures.

SUB CODE: 13/ SUBM DATE: none.

Card 3/3

ACC NR: AT6037050 SOURCE CODE: UR/0000/66/000/000/0134/0141

AUTHOR: Kharybin, A. Ye. (Candidate of technical sciences, Docent); Dzhavadov, G. G. (Candidate of technical sciences); Chertkov, N. I. (Engineer)

ORG: none

TITLE: The spectrum of an amplitude modulated sequence of video pulse packets

SOURCE: Moscow. Aviatsionnyy institut. Teoriya i tekhnika radiolokatsii (Radar theory and techniques); sbornik statey, no. 1. Moscow, Izd-vo Mashinostroyeniye, 1966, 134-141

TOPIC TAGS: radar, spectrum analysis, signal detection

ABSTRACT: The spectrum of an amplitude modulated sequence of video pulse packets is investigated for the case when the ratio of pulse repetition rate to packet repetition rate is a whole number or a fraction. Expressions are obtained for the amplitude of the modulation function's first harmonic. Relationships are established between the packet repetition rate and the pulse repetition rate inside a packet. When the ratio of pulse repetition rate to the switching frequency is even and also when this ratio is a fraction with an even numerator, the combination components of the spectrum do not fall on the useful signal frequency. When this ratio is odd and also when the ratio is a fraction with odd numerator values, the combination components of the spectrum fall on the signal frequency and may either increase the signal amplitude if the initial

Card 1/2 UDC: 621.396.963.001(04)

ACC NR: AT6037050

phases of the pulses and of the switching function coincide, or they may decrease the signal amplitude if the initial phases do not coincide. In order to avoid the superposition of combination components on the useful signal, it is necessary to provide for rigid synchronization between the pulse repetition rate and the switching rate. If this condition is not satisfied, a parasitic modulation of the signal will be produced by the superposition of the combination components. Orig. art. has: 2 figures, 12 formulas.

SUB CODE: 17,09/ SUBM DATE: 15Jul66/ ORIG REF: 003

Card 2/2

CHERTKOV, N.K., inzh.

Study of a weighing process on belt conveyors. Teploenergetika 9 no.12:31-37 D '62. (MIRA 16:1)

1. Vostochnyy filial Vsesoyuznogo nauchno-issledovatel'skogo teplotekhnicheskogo instituta.
(Conveying machinery) (Scales)

L 22718-66 EWT(d)/EWP(1) IJP(c) BB/GG

ACC NR: AP6002938 (A) SOURCE CODE: UR/0286/65/000/024/0104/0104

AUTHOR: Chertkov, N. K.

ORG: none

TITLE: A shift register using thyratrons with a cold cathode. Class 42, No. 177166

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 104

TOPIC TAGS: thyratron, electronic circuit

ABSTRACT: This Author Certificate presents a shift register using thyratrons with a cold cathode. The anodes of all the thyratrons are joined together and are connected to the common anode load. The cathodes of the thyratrons of each discharge are connected with a resistance and with a capacitor which are connected in parallel. To produce a reverse, each discharge of the register includes two parallelly connected thyratrons (see Fig. 1).

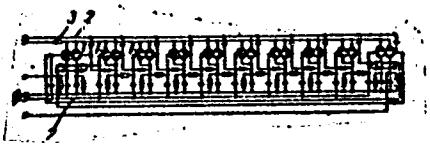


Fig. 1. 1 - thyratrons; 2 - shift busbars; 3 - common anode load.

The controlled electrodes of these thyratrons are connected (through resistances) respectively with the cathodes of the subsequent discharge or with the previous

Card 1/2 UDC: 681.142

L 22718-66

ACC NR: AP6002938

discharge. These control electrodes of the thyratrons are also connected, through capacitors, respectively with the shift busbars in the forward direction or the reverse direction. Orig. art. has: 1 figure.

SUB CODE: 09/ SUBM DATE: 30Oct64

Card 2/2 ULR

CHERTKOV, N.N.

Vegetative distrubances in lumbosacral radiculitis. Sbor. trud. Kursk. gos. med. inst. no.13:287-290 '58. (MIRA 14:3)

1. Iz kliniki nervnykh bolezney (zav. - prof. N.I.Golik) Kurskogo gosudarstvennogo meditsinskogo instituta.
(NERVES, SPINAL--DISEASES)

LASKOV, B.I., CHERTKOV, N.N.

Use of oxyhemography in objectifying the pain syndrome in lumbosacral radiculitis. Zhur.nevr. i psikh. 63 no.12:1789-1791 '63.
(MIRA 18:1)

1. Kurskiy meditsinskiy institut.

CHERTKOV, P.

Without relying on the activist group. Sov. profsoiuzy 6 no. 9:60-62 Ag '58. (MIRA 11:8)

1. Predsedatel' uchastkovogo komiteta profsoyuza, brigadir Kerchevskogo splavnogo reyda.
(Ural Mountain region--Lumber--Transportation)
(Trade unions)

CHERTKOV, R. I.

"Theory of Gyrovertical Deviation," Trudy Len. Politekh inst., no.3, 1947

CHERTKOV, R. I.

Chertkov, R. I. "On the theory of rolling of ships in a wave of varying frequency," Trudy NII (M-vo sudo-stroit. promsti SSSR, Gos, soyuz. nauch.-issled. in-t), Issue 2, 1948, p. 3-59

SO: U-3264, 10 April 1953, (Letopis 'Zhurnal 'nykh Statey, No. 3, 1949)

CHERTKOV, R.I. (Leningrad)

Oscillation of a system under the influence of a perturbation force of variable frequency [with summary in English]. Prikl. mekh. 4 no. 2:139-159 '58. (MIRA 11:8)

1. Leningrads'kiy naukovo-doslidniy institut Ministerstva sudnobudivnoi promislovosti.
(Oscillations)

PHASE I BOOK EXPLOITATION SOV/4785

Chertkov, Rafail Isaakovich

Metod Yakobi v dinamike tverdogo tela (Jacobi's Method in the Dynamics of Rigid Bodies) Leningrad, Sudpromgiz, 1960. 323 p. Errata slip inserted. 3,250 copies printed.

Scientific Ed.: D. R. Merkin; Ed.: Ye. N. Shaurak; Tech. Ed.: N. V. Erastova.

PURPOSE: This book is intended for scientific workers, research engineers, and for teachers of theoretical mechanics, astronomy, and physics in institutions of higher education.

COVERAGE: The book presents material related to application of the Jacobi-Ostrogradskiy method for the integration of canonical equations to some problems of the rigid body. The authors discuss the application of the small parameter method to the approximate formation of the full Hamilton-Ostrogradskiy integral and the application of Jacobi's method to systems containing gyroscopes. The general theorems and methods are illustrated with

Card 1/11

numerous examples from the general and applied theory of gyroscopes, theoretical mechanics, and astronomy. No personalities are mentioned. There are 45 references: 42 Soviet (3 translations), 2 German, and 1 French.

TABLE OF CONTENTS:

SAYDOV, Pavel Ivanovich, doktor tekhn.nauk, prof.; SLIV, Elya Izrailevich; CHERTKOV, Rafail Isaakovich; GOLUBEVA, N.P., red.; KOROVENKO, Yu.N., tekhn.red.

[Applied theory of gyroscopes] Voprosy prikladnoi teorii giroskopov. Pod red. P.I.Saidova. Leningrad, Gos. soiuznoe izdvo sudostroit. promyshl., 1961. 426 p. (MIRA 15:3)
(Gyroscope)

SHMYREV, Aleksandr Nestorovich; MORENSHIL'DT, Vera Aleksandrovna; IL'INA, Sof'ya Glebovna; FATEYEV, A.V., doktor tekhn. nauk, prof., retsenzent; KHOLODILIN, A.N., kand. tekhn. nauk, retsenzent; LEVITIN, S.G., inzh., retsenzent; GERASIMOV, A.V., kand. tekhn. nauk, nauch. red.; CHERTKOV, R.I., kand. fiz.-mat. nauk, nauch. red.; KAZAROV, Yu.S., red.; ERASTOVA, N.V., tekhn. red.

[Ship stabilizers] Uspokoiteli kachki sudov. Leningrad, Gos. soiuznoe izd-vo sudostroit. promyshl., 1961. 515 p. (MIRA 14:12)
(Stability of ships)

RIVKIN, Samuil Simonovich; OSTROMUKHOV, Ya.G., inzh., retsenzent; SLIV, E.I., doktor tekhn. nauk, retsenzent; CHERTKOV, R.I., doktor fiz-mat. nauk, nauchn. red.; KLIMINA, Ye.V., red.

[Theory of gyroscopic devices] Teoriia giroskopicheskikh ustroistv. Leningrad, "Sudostroenie." Pt.2. 1964. 547 p. (MIRA 17:7)

Chertkov, S.N.

LOMTATIDZE, N.F.; CHERTKOV, S.N.

Intratracheal administration of drugs. Khirurgiia Supplement:65 '57. (MIRA 11:4)

1. Iz 2-y khirurgicheskoy kliniki Tbilisskogo instituta usovershenstvovaniya vrachey
(DRUGS--ADMINISTRATION AND DOSAGE)

Chertkov, S.N.

CHERTKOV, S.N. (Tbilisi, okruzhnoy voyennyy gospital')

Prevention of hemorrhage in fulguration of pleural adhesions. Vest.khir. 79 no.9:132-133 S '57. (MIRA 10:11)

(PLEURA, dis.
adhesions in artif. pneumothorax, prev. of hemorrh. in fulguration)
(PNEUMOTHORAX, ARTIFICIAL, compl.
pleural adhesions, prev. of hemorrh. in fulguration)

CHERTKOV, S.N., podpolkovnik meditsinskoy sluzhby; VASIL'YEV, B.N., podpolkovnik meditsinskoy sluzhby

Use of aminopeptide in surgery. Voen.-med.zhur. no.12:48-49 '59. (MIRA 14:1)

(OPERATIONS, SURGERY) (PEPTIDE)

L 27381-65 EPA/EWT(m)/EPF(c)/EWG(s)-2/EWP(f)/T Pr-4/Pw-4/Paa-4 TT/Ea/WE

ACCESSION NR AM4042766 BOOK EXPLOITATION S/

Chertkov, TAkov Borisovich; Bol'shakov, Gennadiy Fedorovich; Gulin, YEvgeniy Il'ich

Jet engine fuels (Topliva dlya reaktivnykh dvigateley), Leningrad, Izd-vo "Nedra", 1964, 225 p. illus., biblio. Errata slip inserted. 2,700 copies printed.

TOPIC TAGS: jet engine fuel, fuel combustion, fuel storage

PURPOSE AND COVERAGE: The book presents information on the chemical composition and service properties of jet fuels. Data are included on the composition and properties of jet fuels, the changes occurring in long-time storage of fuels, and transportation and use in flying vehicles. Experience in improving the service properties of jet fuels through the use of additives is described. The book is intended for engineers and researchers in the field of the chemistry and the use of jet fuels and can be used by students of special higher and secondary educational institutions.

TABLE OF CONTENTS [abridged]:

Card 1/2

L 27381-65

ACCESSION NR AM4042766

SUBMITTED: 23Jan64

SUB CODE: FR, FP

NO REF SOV: 175

OTHER: 093

Card 2/2

BEDA, E., inzh.; PETERSON, A., inzh.; BEGUNOV, I.; KALENT'YEV, V., inzh.; PRIKHOD'KO, V., inzh.; CHERTKOV, V., inzh.; KOLOMYYCHENKO, V., inzh.; BIKEYEV, V., inzh.; KOGUYENKO, B.

Exchange of experience. Avt. transp. 43 no.1:49-54 Ja '65. (MIRA 18:3)

CHERTKOV, Yeniamin Kus'mich; VOROSHILIN, I.R., redaktor; KEL'NIK, V.P., redaktor izdatel'stva; ZEF, Ye.M. tekhnicheskiy redaktor

[Balancing of excavators] Balansirovka ekskavatora. Sverdlovsk, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1957. 34 p. (MLRA 10:5)
(Excavating machinery)

CHERTKOV, V. K.: Master Tech Sci (diss) -- "Investigation of the effectiveness of the replacement-center method of repairing the UZTM SE-3 excavator at the open-pit coal mines of the Urals". Moscow, 1959. (Min Higher Educ USSR, Moscow Mining Inst im I. V. Stalin), 150 copies (KL, No 7, 1959, 126)

DEMIN, A.M., kand. tekhn. nauk; CHERTKOV, V.K.; VASIL'YEV, M.V., kand. tekhn. nauk; YEFIMOV, I.P.; KOKH, P.I.; KMITOVENKO, A.T., dots.; PRISEDSKIY, G.V., inzh.; DUNAYEVSKIY, Yu.M.; VOLOTKOVSKIY, S.A., prof., doktor tekhn. nauk; KUR'YAN, A.I., kand. tekhn. nauk; MAYMIN, S.R., kand. tekhn. nauk; MIROSHNIK, A.M., kand. tekhn. nauk; PETROV, I.P., kand. tekhn. nauk; TURYSHEV, B.F., kand. tekhn. nauk; SHISHKOV, A.I., kand. tekhn. nauk; AVERBUKH, I.D., inzh.; VARSHAVSKIY, A.V.; KRYUKOV, D.K.; LUKAS, V.A.; MINEYEV, V.A.; SMIRNOV, A.A., otv. red.; LYUBIMOV, N.G., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Handbook for the operator and mechanic of open-pit mine equipment] Spravochnik mekhanika ugol'nogo kar'era. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1961. 639 p. (MIRA 15:3)

(Strip mining—Equipment and supplies)
(Coal mining machinery) (Electricity in mining)

DEMIN, A.M., kand. tekhn. nauk; KOKH, P.I.; CHERTKOV, V.K.; VASIL'YEV, M.V., kand. tekhn. nauk; YEFIMOV, I.P.; KMITOVENKO, A.T., dots.; PRISEDSKIY, G.V., inzh.; DUNAYEVSKIY, Yu.N.; VOLOTKOVSKIY, S.A., doktor tekhn. nauk; KUR'YAN, A.I., kand. tekhn. nauk; MAYMIN, A.I.; MIROSHNIK, A.M.; PETROV, I.P.; TURYSHEV, B.F.; SHISHKOV, A.I.; AVERBUKH, I.D., inzh.; VARSHAVSKIY, A.V.; KRYUKOV, D.K.; LUKAS, V.A.; MINEYEV, V.A.; SMIRNOV, A.A., otv. red.; LYUBIMOV, N.G., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Handbook for the mechanic in a coal pit]Spravochnik mekhanika ugol'nogo kar'era. Moskva, Gosgortekhizdat, 1961. 639 p. (MIRA 15:12)

(Coal mining machinery—Handbooks, manuals, etc.)

DEMIN, A.M., kand. tekhn. nauk; CHERTKOV, V.K.; VASIL'YEV, M.V., kand. tekhn. nauk; YEFIMOV, I.P.; KOKH, P.I.; KMITOVENKO, A.I., dots.; PRISEDSKIY, G.V., inzh.; DUNAYEVSKIY, Yu.N.; VOLOTKOVSKIY, S.A., prof., doktor tekhn. nauk; KUR'YAN, A.I., kand. tekhn. nauk; MAYMIN, S.R., kand. tekhn. nauk; MIROSHNIK, A.M., kand. tekhn. nauk; PETROV, I.P., kand. tekhn. nauk; TURYSHEV, B.F., kand. tekhn.nauk; SHISHKOV, A.I., kand. tekhn. nauk; AVERBUKH, I.D., inzh.; VARSHAVSKIY, A.V.; KRYUKOV, D.K.; LUKAS, V.A.; MINEYEV, V.A.; SMIRNOV, A.A., otv. red.; LYUBIMOV, N.G., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Handbook for the operator and mechanic of open-pit mine equipment] Spravochnik mekhanika ugol'nogo kar'era. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1961. 639 p. (MIRA 15:3)

(Strip mining—Equipment and supplies)
(Coal mining machinery) (Electricity in mining)

CHERTKOV, Viktor Petrovich.

Academic degree of Doctor of Philosophical Sciences, based on his defense, 5 July 55, in the Council of Inst of Philosophy Acad Sci USSR, of his dissertation entitled: "On the struggle between the new and the old in the development of a socialist society."

Academic degree and/or title: Doctor of Sciences

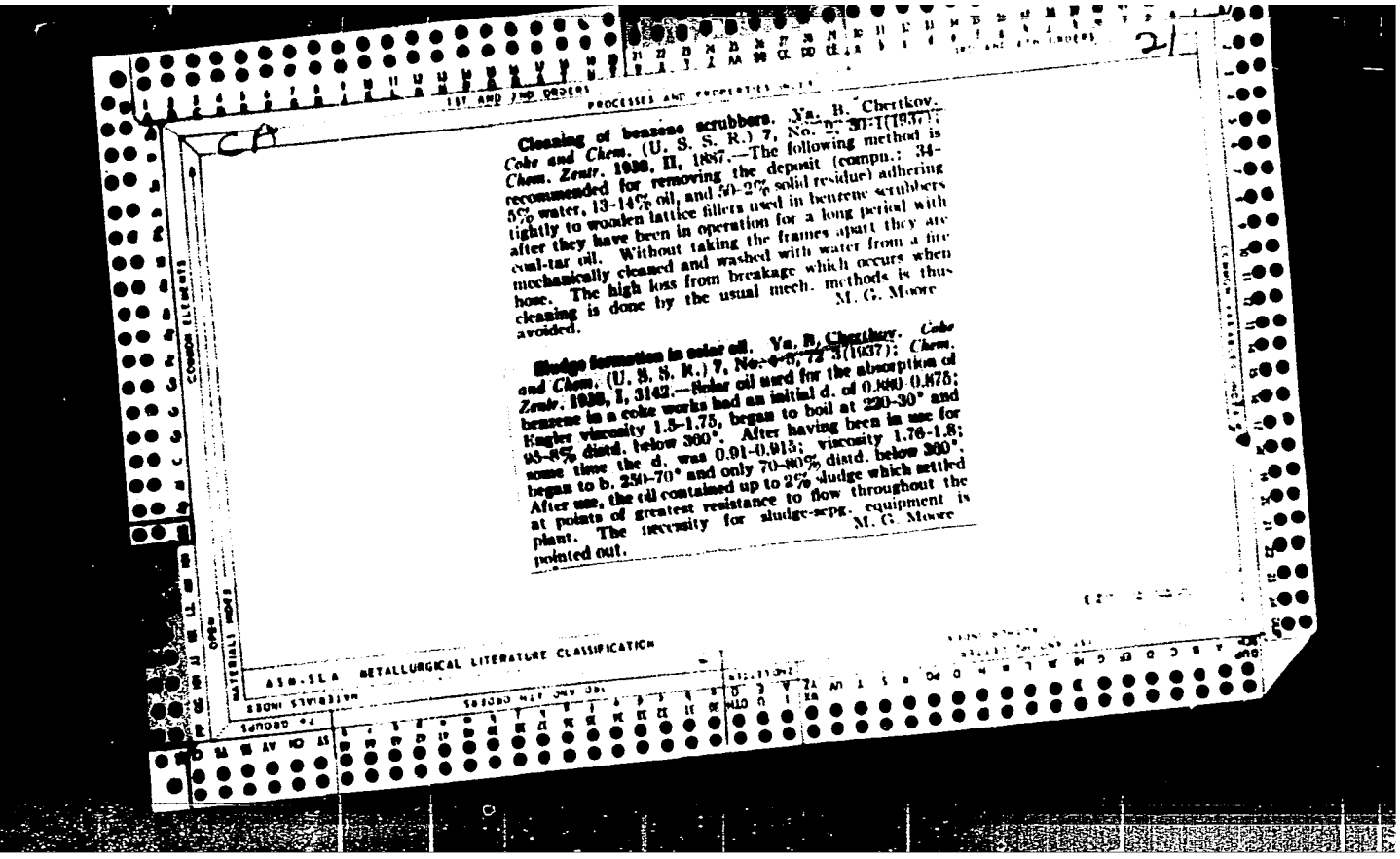
SO: Decisions of VAK, List no. 5, 3 Mar 56, Byulleten' MVO SSSR, No. 2, Jan 57, Moscow, pp 17-20, Uncl. JPRS/NY-466

CHERTKOV, VASILIY V.

VOLKOV, Aleksandr Pavlovich; CHERTKOV, Vasiliy Vasil'yevich; MAZUR, M.V., inzhener, redaktor; FEDOROVA, T.N., redaktor; GLADKIKH, N.N., tekhnicheskiy redaktor

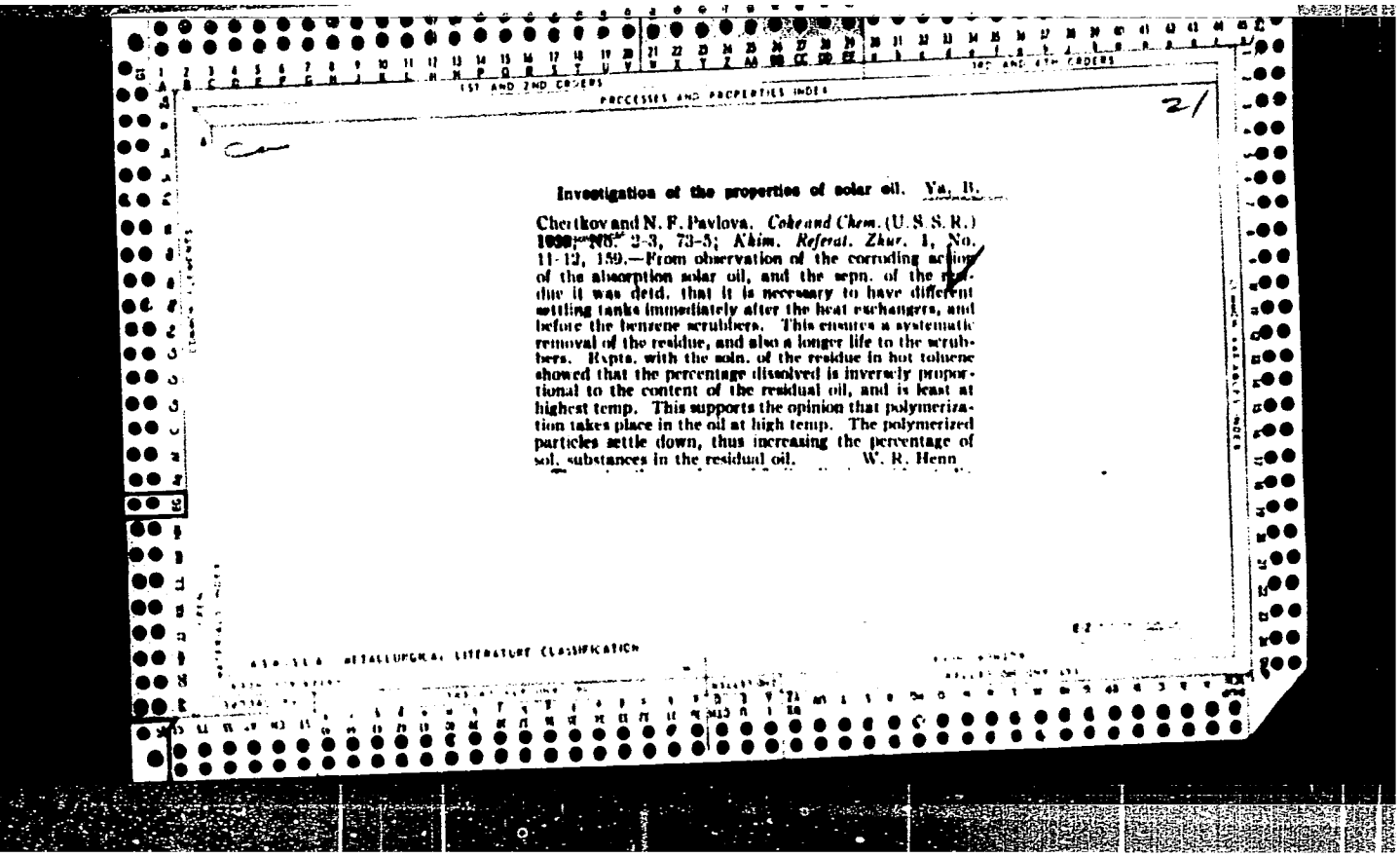
[Multilayer gluing of wooden construction elements; the practices of the Kostopol Housing Combine] Mnogosloinaia sklеika dereviannykh stroitel'nykh detalei; iz opyta Kostopol'skogo deomostroitel'nogo kombinata. Pod red. M.V. Mazura. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1956. 109 p. (MLRA 10:5)

(Building, Wooden) (Gluing)



Cleaning of benzene scrubbers. Ya. B. Chertkov. *Coke and Chem.* (U. S. S. R.) 7, No. [illegible] 30-1(1937); *Chem. Zentr.* 1938, II, 1887.—The following method is recommended for removing the deposit (compn.: 34-5% water, 13-14% oil, and 50-2% solid residue) adhering tightly to wooden lattice fillers used in benzene scrubbers after they have been in operation for a long period with coal-tar oil. Without taking the frames apart they are mechanically cleaned and washed with water from a fire hose. The high loss from breakage which occurs when cleaning is done by the usual mech. methods is thus avoided. M. G. Moore

Sludge formation in solar oil. Ya. B. Chertkov. *Coke and Chem.* (U. S. S. R.) 7, No. 6-8, 72-3(1937); *Chem. Zentr.* 1938, I, 3142.—Solar oil used for the absorption of benzene in a coke works had an initial d. of 0.880-0.875; Engler viscosity 1.5-1.75, began to boil at 220-30° and 95-8% distd. below 300°. After having been in use for some time the d. was 0.91-0.913; viscosity 1.76-1.8; began to b. 230-70° and only 70-80% distd. below 300°. After use, the oil contained up to 2% sludge which settled at points of greatest resistance to flow throughout the plant. The necessity for sludge-scpg. equipment is pointed out. M. G. Moore



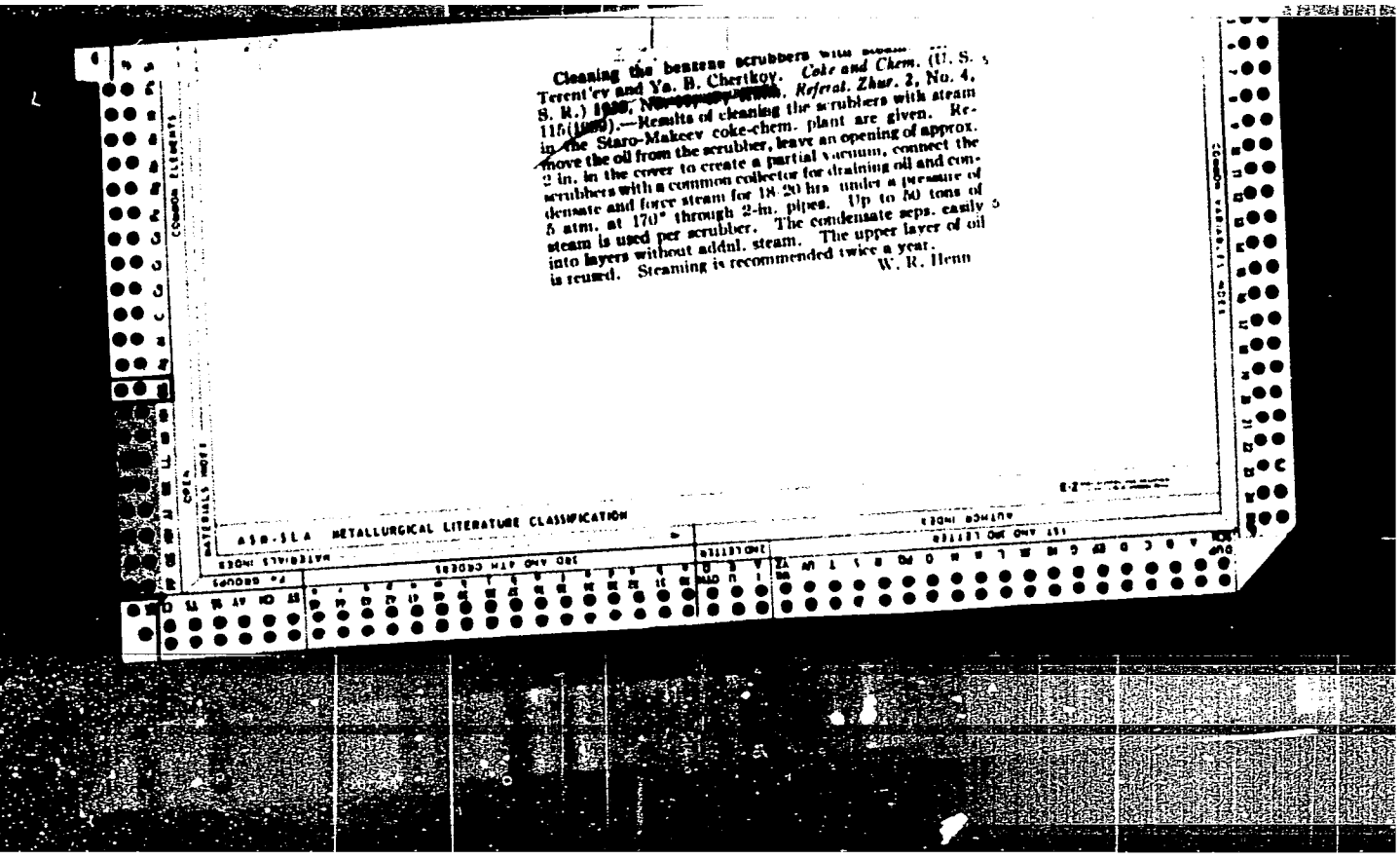
1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

21

Investigation of the properties of solar oil. Ya. B. Chertkov and N. F. Pavlova. *Coke and Chem.* (U. S. S. R.) 1938, No. 2-3, 73-5; *Khim. Referat. Zhur.* 1, No. 11-12, 159.—From observation of the corroding action of the absorption solar oil, and the sepn. of the residue it was detd. that it is necessary to have different settling tanks immediately after the heat exchangers, and before the benzene scrubbers. This ensures a systematic removal of the residue, and also a longer life to the scrubbers. Expts. with the soln. of the residue in hot toluene showed that the percentage dissolved is inversely proportional to the content of the residual oil, and is least at highest temp. This supports the opinion that polymerization takes place in the oil at high temp. The polymerized particles settle down, thus increasing the percentage of sol. substances in the residual oil. W. R. Henn

METALLURGICAL LITERATURE CLASSIFICATION



Cleaning the benzene scrubbers with steam. Terent'ev and Ya. B. Cherikov. *Coke and Chem.* (U. S. S. R.) 1939, No. [illegible]. *Referat. Zhur.* 3, No. 4, 115(1940).—Results of cleaning the scrubbers with steam in the Staro-Makeev coke-chem. plant are given. Remove the oil from the scrubber, leave an opening of approx. 2 in. in the cover to create a partial vacuum, connect the scrubbers with a common collector for draining oil and condensate and force steam for 18–20 hrs. under a pressure of 5 atm. at 170° through 2-in. pipes. Up to 50 tons of steam is used per scrubber. The condensate seps. easily into layers without addnl. steam. The upper layer of oil is reused. Steaming is recommended twice a year.

W. R. Henn

C.A.

Oxidation of paraffinic hydrocarbons. A. N. Bashkirov and Ya. B. Chertkov. *Doklady Akad. Nauk S.S.S.R.* 78, 473-6(1951).—Oxidation of paraffins follows the scheme: peroxides → alcs. → aldehydes → acids, with concurrent change of peroxides directly to aldehydes; the acids may be oxidized to more complex O compds. Liquid-phase oxidation of *n*-octadecane was examd. with addn. of catalysts or inhibitors. About 0.2% $KMnO_4$ served as the former, while about 2.7% tars produced by neutral oxidation, served as the inhibitor. The process was followed by analyses for the above mentioned compd. classes, which showed a considerably increased formation of acids and their derivs. in the presence of the catalyst. From *n*-tridecane it was possible to isolate dodecanol and lauraldehyde, showing that oxidation proceeds by gradual cleavage of terminal atoms. Hydrocarbons give mixts. of all intermediates, while alcs. and aldehydes give acids and esters.

G. M. Kosolapoff

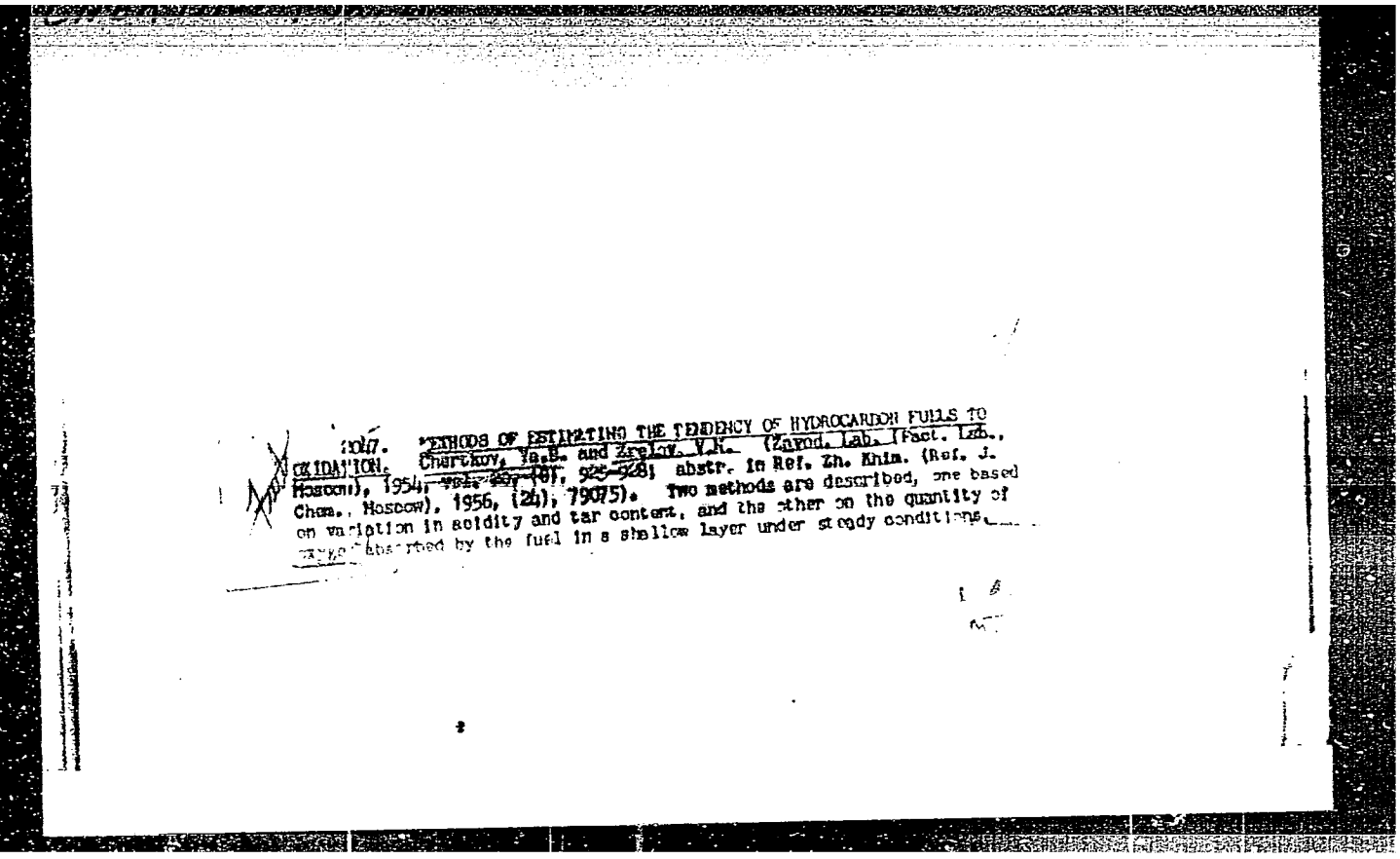
CHERTKOV, Ya. B.

Chemical Abst.
Vol. 48 No. 3
Feb. 10, 1954
Petroleum, Lubricants, and Asphalt

Autoxidation of hydrocarbon fuels. Ya. B. Chertkov and V. N. Zreloy. *Zhur. Prikład. Khim.* 26, 1031-41 (1953).—When ligroine-kerosine fractions of straight-run and cracked petroleum were kept for several months in contact with air definite evidence of oxidation was obtained in that O-compds. were formed from the more complex components of the fuel. The hydrocarbons which underwent such oxidation contain an aromatic ring which was connected to side chains of unsatd. nature and (or) with naphthene units. The rate of oxidation was essentially proportional to the concn. in the fuel of compds. that are susceptible to such an attack. Regardless of the source of the petroleum fractions, the general nature of the oxidizable substances was the same. The oxidation products are largely ales. and carbonyl compds. Only traces of acids and other higher oxidation products were detected. By means of fractionation it was possible to isolate fractions of 90% ales. and 55% aldehyde-ketone group, in which the ketones are the predominant form. No phenols were detected.

G. M. Kosolapoff

8-30-54



:1047. METHODS OF ESTIMATING THE TENDENCY OF HYDROCARBON FUELS TO OXIDATION. Chertkov, Ya.B. and Zrelov, V.N. (Zavod. Lab., [Fact. Lab., Moscow]), 1954, [28], 925-928; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1956, (24), 79075). Two methods are described, one based on variation in acidity and tar content, and the other on the quantity of [illegible] absorbed by the fuel in a shallow layer under steady conditions.

CHERTKOV, Ya. B.

AID P - 831

Subject : USSR/Chemistry

Card 1/1 Pub. 78 - 16/26

Authors : Chertkov, Ya. B. and Zrelov, V. N.

Title : Wood resin as an anti-oxidizer additive for hydrocarbon fuels

Periodical : Neft. khoz., v. 32, #9, 70-74, S 1954

Abstract : The effectiveness of various anti-oxidizers for fuels is discussed. Anti-oxidizers of wood resin types are found less effective than the aminol-phenol type. 5 charts and 5 Russian references (1936-1951).

Institution: None

Submitted : No date

AID P - 1353

Subject : USSR/Chemistry

Card 1/1 Pub. 78 - 16/30

Authors : Chertkov, Ya. B., Zrelov, V. N. and Rudakov, V. V.

Title : Heat of combustion of hydrocarbons

Periodical : Neft. khoz., v.32, #12, 53-57, D 1954

Abstract : Variations in the heat of combustion of hydrocarbons of paraffin, naphthene and aromatic types are discussed from the point of view of obtaining maximum heat value. Heats of combustion per unit of weight and per unit of volume are related to density and molecular structure (ring and chain types). 5 charts and 3 Russian references (1948-53)

Institution: None

Submitted : No date

Chertkov Ya. B.

V Effect of tarry compounds on the rate of autoxidation of cracked kerosines. Ya. B. Chertkov and V. N. Zrelov. *Zhur. Prikład. Khim.* 28, 1332-8(1955).—Tarry acidic substances and hydroxy acids formed during autoxidation of cracked kerosine appear to be active promoters of autoxidation. Neutral tars in the concn. usually found in kerosine are inhibitors for autoxidation. Phenolic substances found in Baku kerosine have little effect on the rate of autoxidation.

G. M. Kosolapoff

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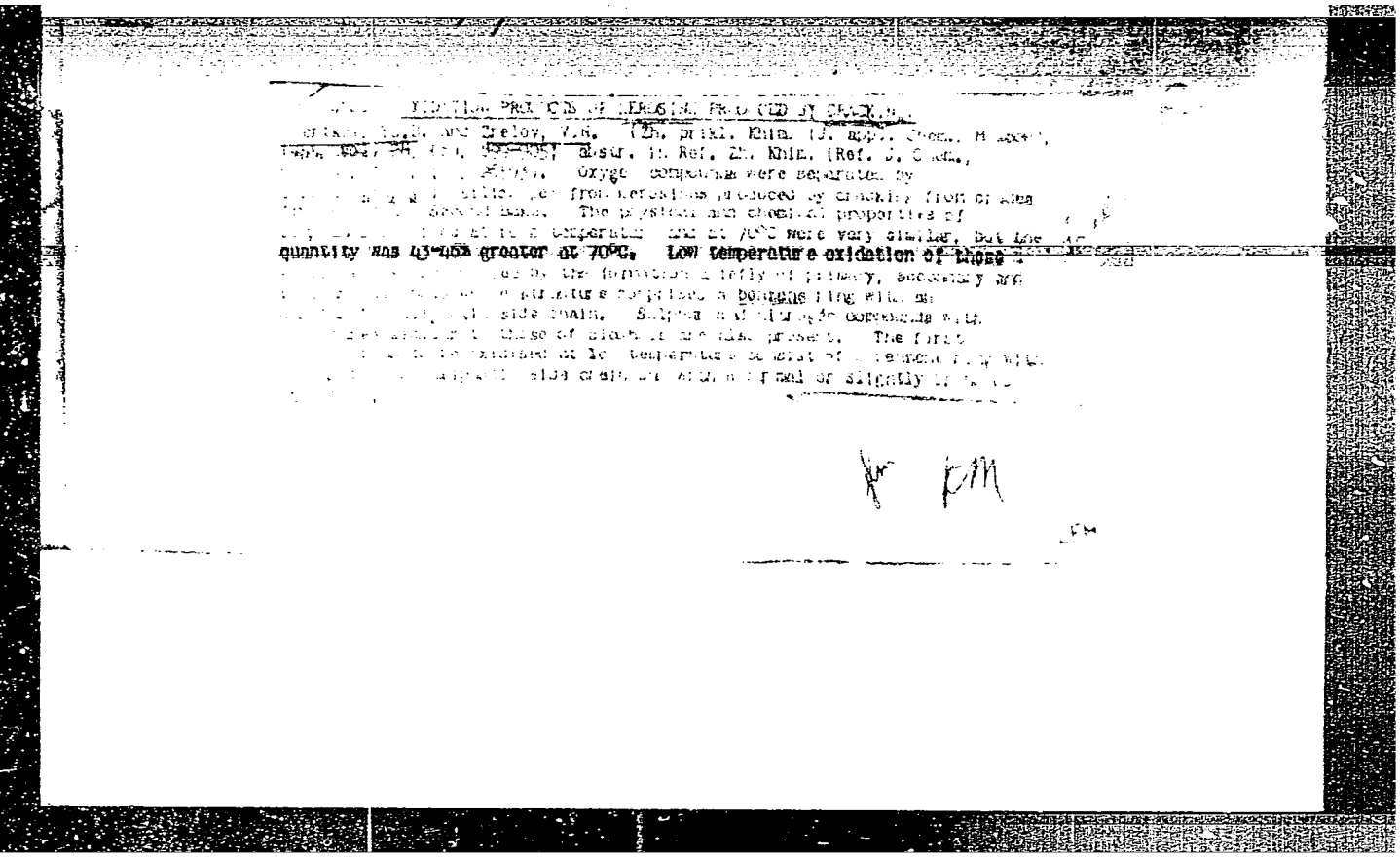
(1)

CHERTKOV, YA.B.

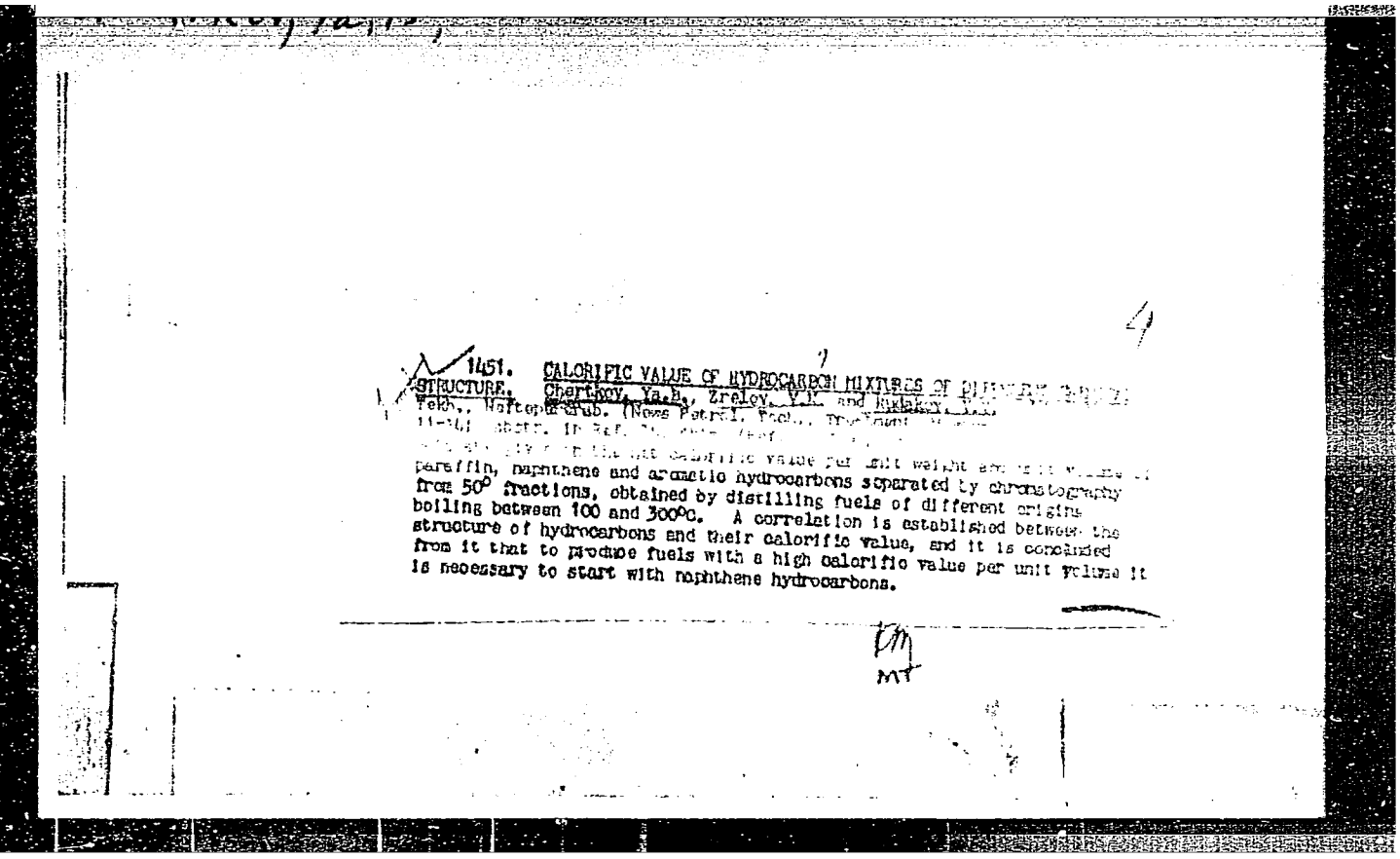
2043. OXIDATION METHOD OF DETERMINING SULPHUR IN PETROLEUM PRODUCTS. Chertkov, Ya.B., Marinchenko, N.I. and Afanas'eva, N.A. (Nov. Neft. Tekh., [illegible] (News Petrol. Tech., Treatment. Moscow), 1956, (7), 8, 9; [illegible] in Ref. Zh., Khim. (Ref. J. Chem., Moscow), 1956, [illegible]
[illegible] method of determining total sulphur [illegible]
[illegible] and subsequent oxidation [illegible]
[illegible]



quantity was 43-60% greater at 70°C. Low temperature oxidation of these

3

1452. FREEZING OF HYDROCARBON MIXTURES. Chertkov, Ya.B. and Zrelov, V.N. (Nov. Neft. Tekh., Neftepererab. (News Petrol. Tech., Treatment, Moscow), 1956, (2), 14-16; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1956, (22), 72662). Determinations were made of temperatures at which the first crystals were precipitated and the liquid [illegible] for about 100 fractions of hydrocarbon mixtures of different compositions boiling between 100 and 300°C, which had been separated by [illegible] into groups of hydrocarbons of uniform structure. It is shown that a high freezing temperature in a fuel is caused by bicyclic aromatic and paraffin hydrocarbons of normal structure boiling at over 200°C. In addition to supercooling, a most characteristic feature of bicyclic aromatics is the effect of solution, when the crystals in the fuel disappear at a lower temperature than the temperature at which crystallization begins. This effect of solution occurred for some paraffin-naphthene and naphthene fractions and amounted to 3 to 19°C.

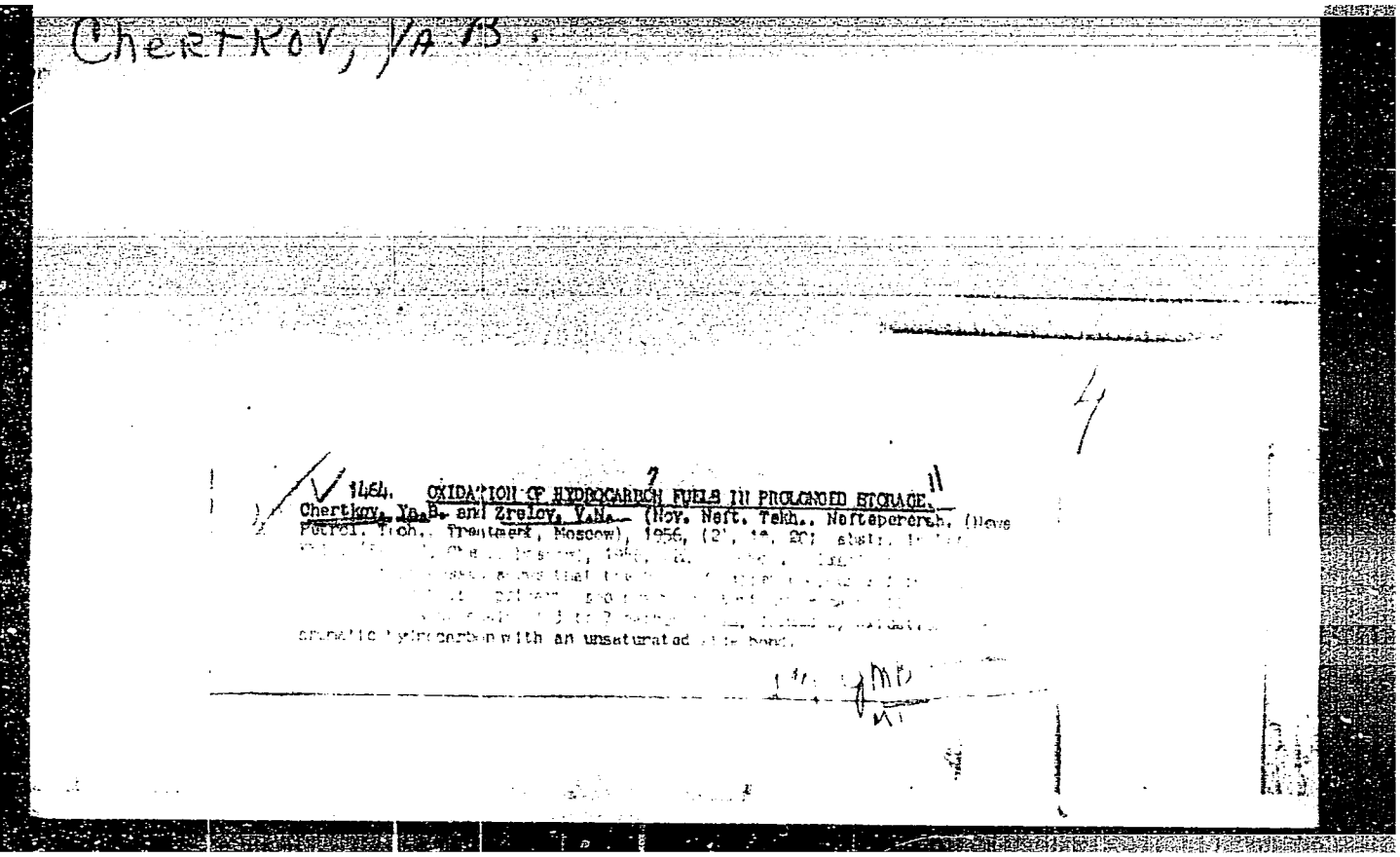


1451. CALORIFIC VALUE OF HYDROCARBON MIXTURES OF DIFFERENT STRUCTURE. Chertkov, Ya.B., Zreley, V.I. and Kuleshov, [illegible] Tekh., Neftepererab. (Neft. Petrol. Tech., Treatment [illegible] 11-14) 1957. In Rus. [illegible]

[illegible] paraffin, naphthene and aromatic hydrocarbons separated by chromatography from 50° fractions, obtained by distilling fuels of different origins boiling between 100 and 300°C. A correlation is established between the structure of hydrocarbons and their calorific value, and it is concluded from it that to produce fuels with a high calorific value per unit volume it is necessary to start with naphthene hydrocarbons.

CHERTKOV, YA. B.

1538. STABILIZATION OF CRACKED KEROSINES. Chertkov, Ya. B. [illegible] Zrelov, V. N. (Nov. Neft. Tekh., Neftepererab. (News Petrol. Tech. Refining, Moscow), 1956, (2), 17 [illegible] abstr. in Ref. Zh. Khim. (Abstr. J. Chem., Moscow), 1956, (22), 72712). Variation in the quantity [illegible] compounds in straight distillate fuels and fuels from thermal cracking [illegible] stored in 200 l. drums was determined. The quantity increases slightly in straight distillates but considerably in cracked fuels. The [illegible] compounds are oxy acids and form a small proportion of the oxy[illegible] of which 97-[illegible] are neutral compounds, mainly aromatic alcohols [illegible] unsaturated side chains. In the ligroin-kerosine fractions the [illegible] most subject to oxidation are monocyclic aromatic hydrocarbons with unsaturated side chains of [illegible] to 7 carbon atoms. Oxidation of cracked kerosines at 70°C by atmospheric oxygen, subsequent removal by chromatography of the oxygen compounds formed and addition of paraoxydiphenylamine as an anti-oxidant produces a fuel of approximately the same stability as the straight distillate fuel.



Chertkov, Ya B.

1454. OXIDATION OF HYDROCARBON FUELS IN PROLONGED STORAGE.

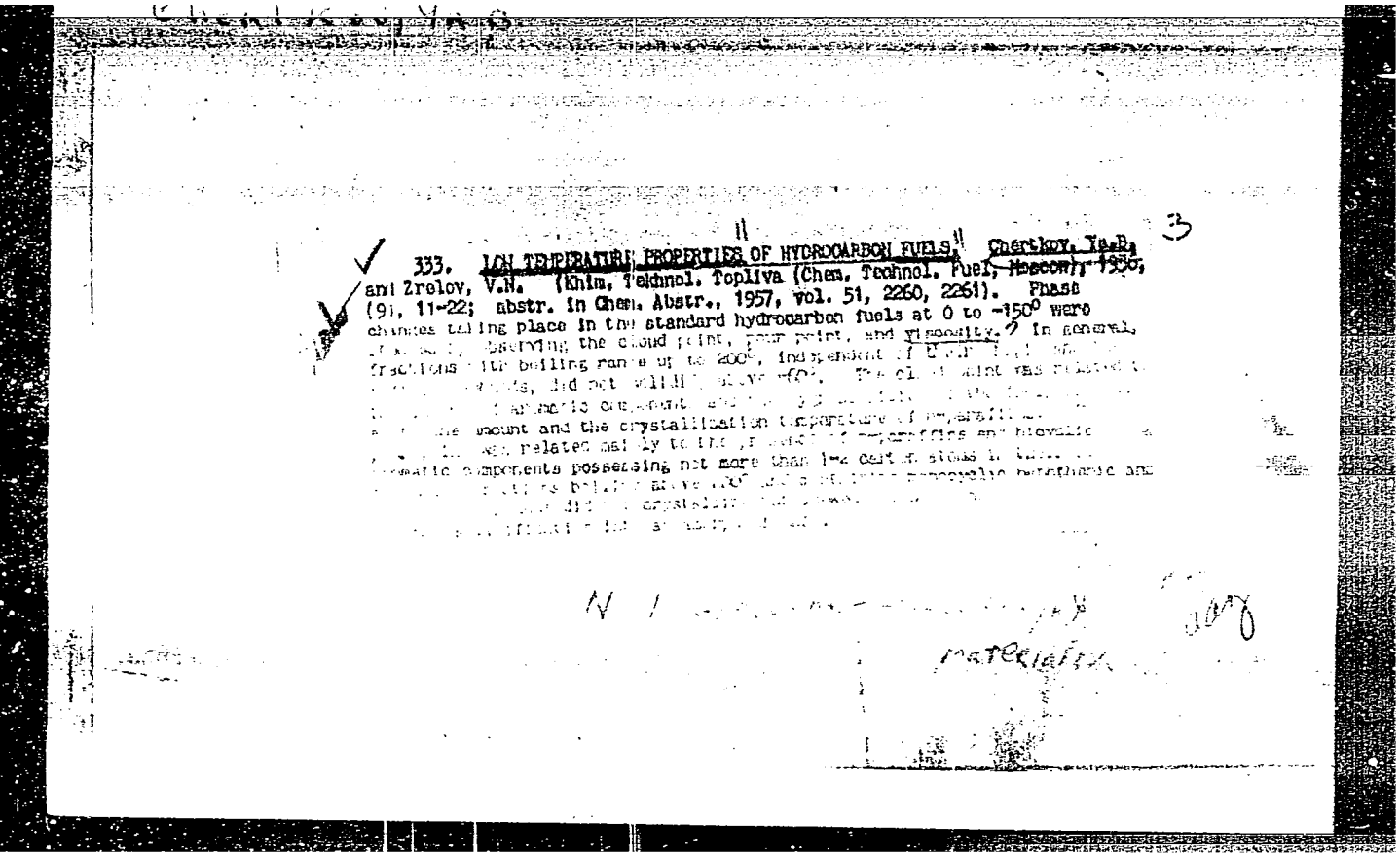
Chertkov, Ya.B. and Zrelov, V.N. (Nov. Neft. Tekh., Neftepererab. (News Petrol. Tech., Treatment, Moscow), 1956, (2), 14-20) stabil.

aromatic hydrocarbon with an unsaturated side chain.

CHERTKOV, Ya.B.

3

1465. DETERMINATION OF PERMISSIBLE STORAGE TIME FOR PETROLEUM FUELS CONTAINING CRACKED COMPONENTS. Chertkov, Ya.D. and Zrelov, V.N. (Nov. Neft. Tekh., Neftepererab. (News Petrol. Tech., Treatment, Moscow), 1956, (2), 21; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1956, (24), 79097). A graph is given of the relationship between the induction period, measured by the [illegible] absorption method, and the storage time, for fuels containing [illegible] components and having initial tar concentrations of 3 to 8 and 8 to 12 mg per 100 ml. The permissible final tar concentration is 15 mg per 100 ml. The graph was obtained from experimental storage of fuels with different induction periods.



333. LOW TEMPERATURE PROPERTIES OF HYDROCARBON FUELS. Chertkov, Ya.B. and Zrelov, V.N. (Khim. Tekhnol. Topliva (Chem. Technol. Fuel, Moscow) 1956, (9), 11-22; abstr. in Chem. Abstr., 1957, vol. 51, 2260, 2261). Phase changes taking place in the standard hydrocarbon fuels at 0 to -150° were observing the cloud point, pour point, and viscosity. In general, fractions [illegible] boiling range up to 200°, independent [illegible] did not solidify above -60°. [illegible] the amount and the crystallization temperature [illegible] related mainly to the [illegible] components possessing not more than 1-2 carbon atoms [illegible] crystalline [illegible]

materials

The effect of mercaptans on the formation of [illegible] fuel oil. Yu. B. Chertkov, V. N. Zr[illegible] [illegible] and L. M. Shchagin. Khim. [illegible] 1952, [illegible] 12, 47-61. Straight-run fuel oils [illegible] aliphatic mercaptans although [illegible] present. In [illegible] [illegible] Aliphatic mercaptans [illegible] high rate and form sediment [illegible] proportional to the [illegible] mercaptans [illegible] of fuel oil, but the complex formed inhibits [illegible] and sediment formation decreases with time.

W. [illegible]

USSR /Chemical Technology. Chemical Products and Their Application I-17

Industrial organic synthesis

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 32033

action zone. By changing the concentration of O_2 it is possible to alter the extent of processes during the initial and the subsequent stages of oxidation. For example, oxidation of low-stability mixtures of hydrocarbons, proceeds, at low temperatures, essentially in the direction of the formation of alcohols, and at higher temperatures in the direction of the formation of acids. It is pointed out that fatty acids are the primary products of decomposition of divalent hydroperoxides. Processes of oxidation are complicated by secondary reactions. It is shown that condensation of peroxides results in the formation of tarry substances and occurs to a

Card 2/3

USSR /Chemical Technology. Chemical Products and Their Application I-17

Industrial organic synthesis

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 32033

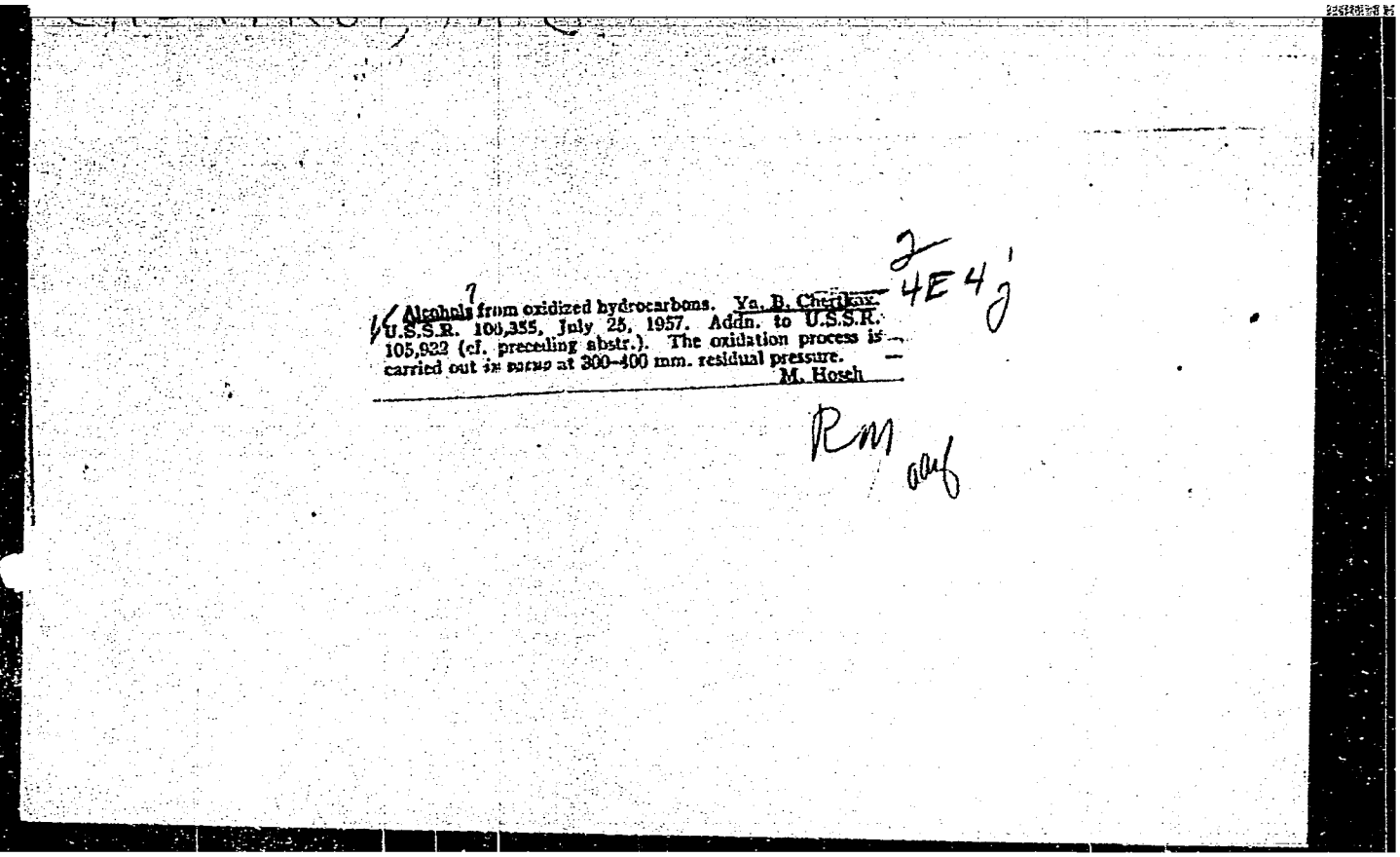
greater extent with increasing concentration of peroxides. Characteristics are listed of the oxidation products of cracking kerosene on its storage for 18 months (at temperatures of -20 +30°) and on oxidation for 15 hours at 70°. Schemes are given for the formation and the decomposition of hydroperoxides of the initial stage of oxidation of paraffin hydrocarbons of normal structure. Bibliography 16 references.

Card 3/3

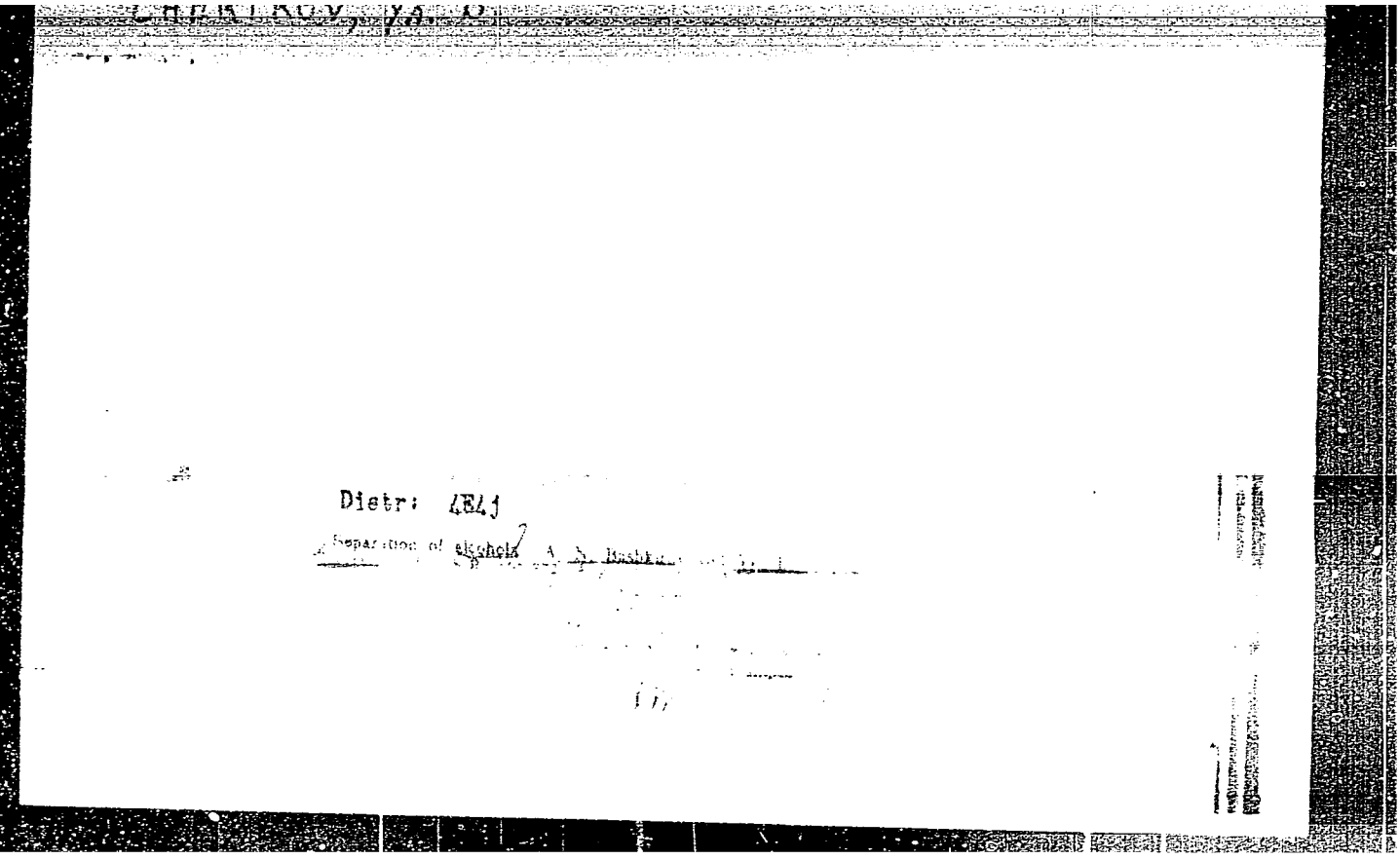
Fuel

The effect of chemical structure on the temperature-viscosity relation of hydrocarbon mixtures. Ya. B. Chertkov, K. I. Klimov, and V. N. Zrelov (Inst. Fuels and Lubricants, Moscow). *Zhur. Fiz. Khim.* 30, 2429-34(1956).—Sixteen hydrocarbon mixts. suitable as fuels and obtained from various Russian crude oils and from the products of the hydrogenation of coal and heavy petroleum fractions were sepd. into a total of 100 50° fractions by fractional distn. and chromatographic sepn. with SiO_2 gel; they were composed of naphthenes, aromatic hydrocarbons, and paraffins. The fractions were free from O and had a uniform group compn. Their viscosities were detd. at 20 to −60°, and the results are presented in tables. The monocyclic naphthenic hydrocarbons with an av. of more than 4.2 C atoms in side chains and the bicyclic naphthenic and aromatic hydrocarbons can be tolerated in the fuel if the viscosity at −40° of the principal constituents of the fuel is lower than the permissible limit. Paraffin hydrocarbons crystg. at above −60° can be used in mixts. limited by their soly. in the fuels. Normal and little-branched paraffins crystg. at below 60° are the most effective viscosity-depressing components; the elimination of cyclic hydrocarbons, especially of the naphthenes, results in a reduction of the viscosity at low temp. The general conclusion is that the viscosity-temp. relation of fuels is detd. entirely by the structure of the constituent hydrocarbons and not by the origin of the fuel or the method of processing.

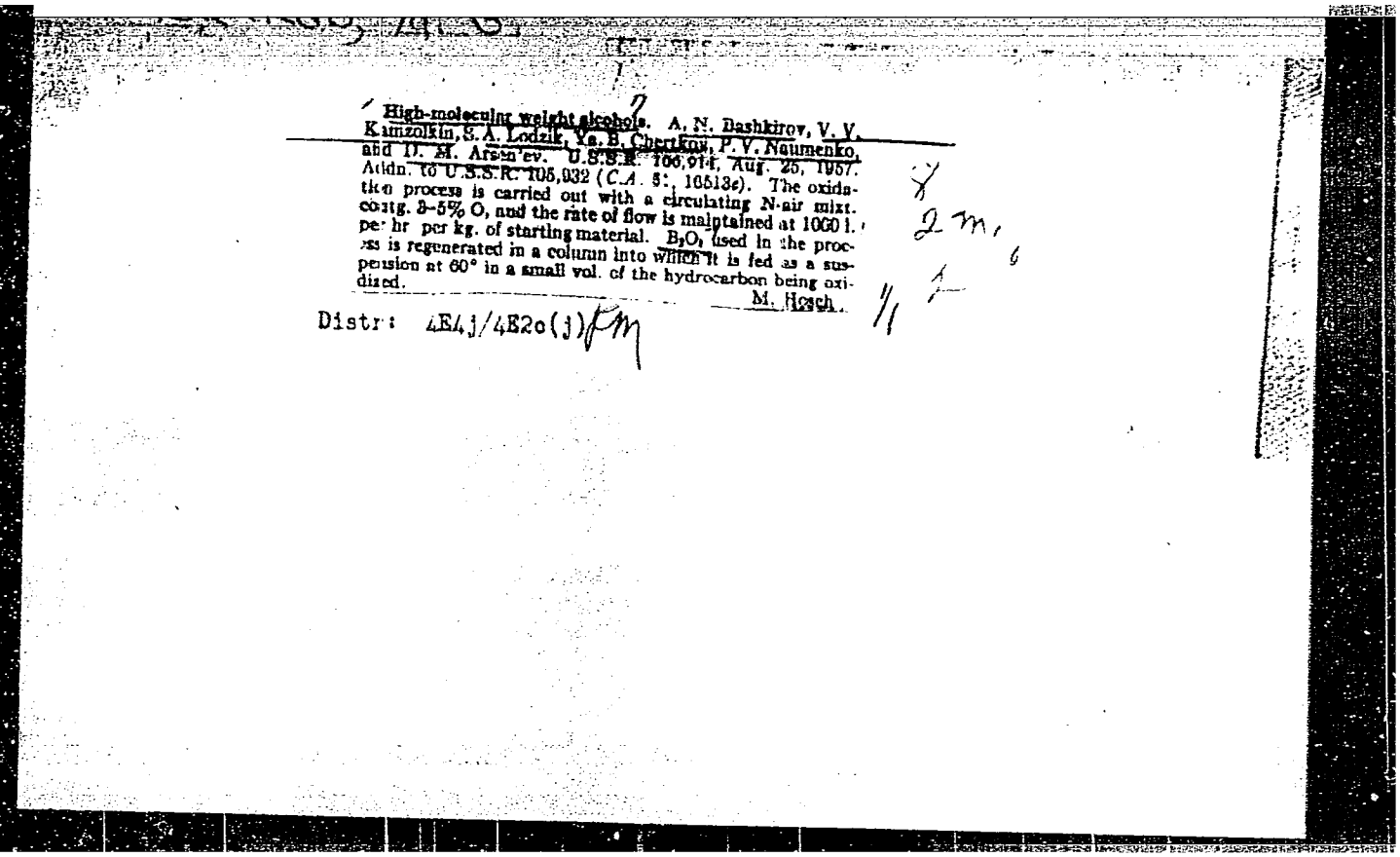
M. Hirsch



Alcohols from oxidized hydrocarbons. Ya. B. Chertkov. U.S.S.R. 100,355, July 25, 1957. Addn. to U.S.S.R. 105,922 (cf. preceding abstr.). The oxidation process is carried out in vacuo at 300–400 mm. residual pressure.
M. Hosch



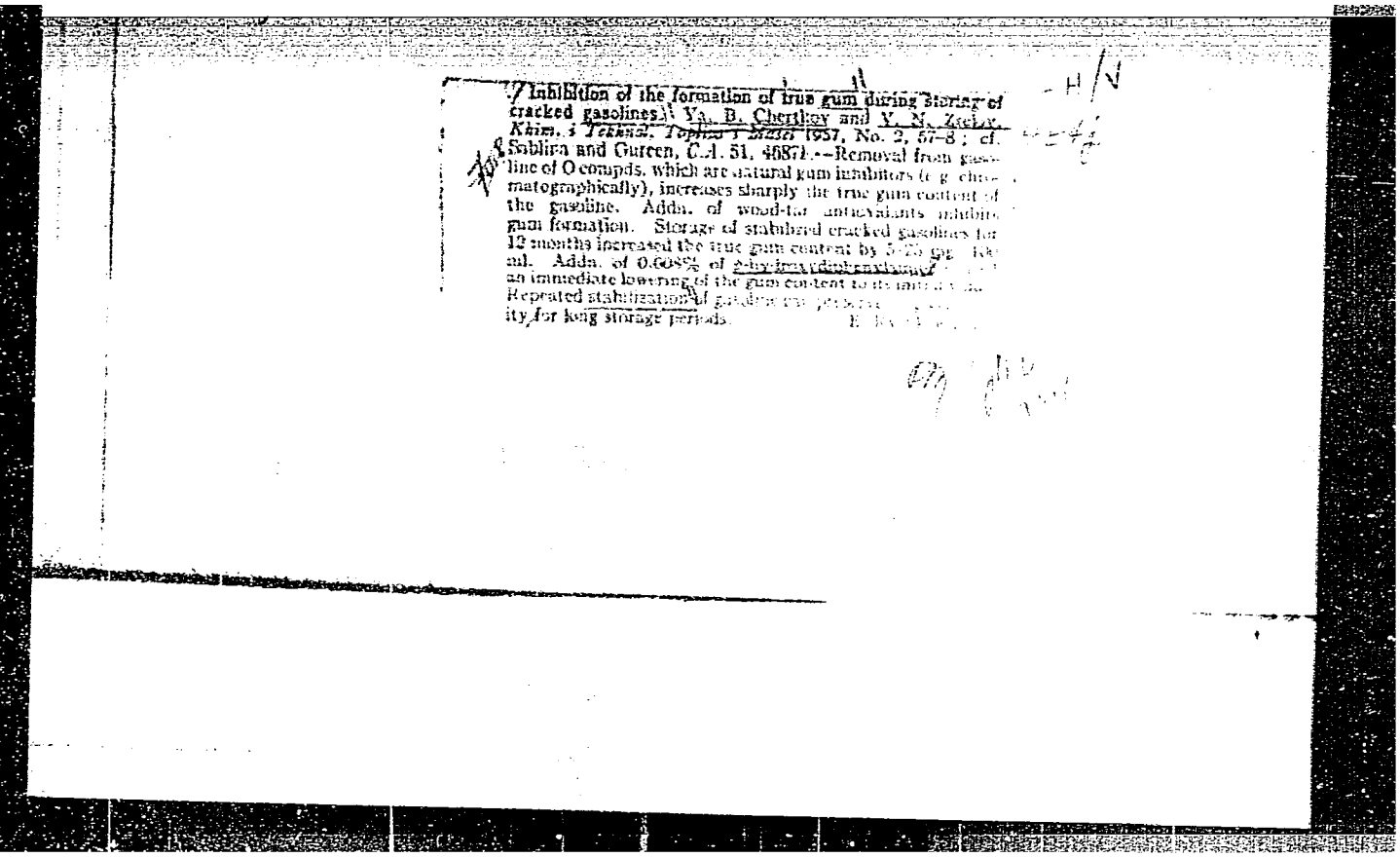
Distr: 4E4J



High-molecular weight alcohols. A. N. Bashkirov, V. V. Kamzolkin, S. A. Lodzik, Ya. B. Chertkov, P. V. Naumenko, and D. M. Arsen'ev. U.S.S.R. 106,914, Aug. 25, 1957. Addn. to U.S.S.R. 105,932 (C.A. 51, 16513e). The oxidation process is carried out with a circulating N-air mixt. contg. 3–5% O, and the rate of flow is maintained at 1000 l. per hr per kg. of starting material. B_2O_3 used in the process is regenerated in a column into which it is fed as a suspension at 60° in a small vol. of the hydrocarbon being oxidized.

M. Hosch

Distr: 4E4j/4E2c(j)



Inhibition of the formation of true gum during storage of cracked gasolines. Ya. B. Chertkov and Y. N. Zaslov. *Khim. i Tekhnol. Topliv i Masel* 1957, No. 2, 57–8; cf. Sablina and Gureen, C.A. 51, 4687h.—Removal from gasoline of O compds. which are natural gum inhibitors (e.g. chromatographically), increases sharply the true gum content of the gasoline. Addn. of wood-tar antioxidants inhibits gum formation. Storage of stabilized cracked gasolines for 12 months increased the true gum content by 5–7.5 mg. per 100 ml. Addn. of 0.005% of 2-hydroxy-diphenylamine caused an immediate lowering of the gum content to the initial value. Repeated stabilization of gasoline was necessary for stability for long storage periods.

Precipitate Formation in Fuels for Gas Turbine Engines

of the metal and the amount of insoluble precipitate in the fuel. A number of fuels of various origins (Table 1) were tested by this method and the elementary composition of the precipitates formed and that of the ash were determined (Tables 2 and 3, respectively). Conclusions: straight run fuels, well-refined with a minimum content of unsaturated hydrocarbons and non-hydrocarbon admixtures (compounds containing sulphur, nitrogen and oxygen and impurities of mineral origin) possess the highest thermal stability at 120 °C. The source of the formation of precipitates insoluble in fuels are: a) products of interaction of active sulphurous and oxygen compounds in an oxidising medium, b) products of deep oxidising transformations of compounds containing sulphur, nitrogen and oxygen which are present in fuels; c) products of deep oxidising transformations of hydrocarbons, mainly of an unsaturated character: d) products of deep polymerisation and condensation of unsaturated compounds which are accompanied by carbonisation of the molecule; e) mineral admixtures present in fuels due to insufficient alkali purification and the washing with strongly-contaminated-with-mineral-admixtures water; admixtures passing into the fuel after contact-catalytic

Precipitate Formation in Fuels for Gas Turbine Engines 65-7-11/14

purification, metals from storage vessels; dust which finds its way into the fuel during transport and storage. As nearly all processes of the formation of insoluble in fuel precipitates take place in oxidising medium, and the composition of precipitate is characterised by a high content of oxygen, it can be assumed that by preventing or minimising the supply of oxygen to fuels, the velocity of the formation as well as the total amount of precipitates formed can be decreased, thus increasing the thermal stability of fuels. There are 3 tables and 13 references, 3 of which are Russian, 8 English and 2 German.

ASSOCIATION: NII GSM

AVAILABLE: Library of Congress

Card 3/3

CHERTKOV, Ya. B.

86-8-13/22

AUTHORS: Chertkov, Ya. B., Prof., Doctor of Technical Sciences, Eng. Lt. Col., and Zrelov, V. N., Candidate of Technical Sciences, Eng. Maj.

TITLE: Prevention of Corrosion Caused by Aviation Fuel (Bor'ba s korrozionnoy agressivnost'yu aviatsionnogo topliva)

PERIODICAL: Vestnik Vozdushnogo Flota, 1957, Nr 8, pp. 63-65 (USSR)

ABSTRACT: The article gives some information on how, why, and what parts or materials of the fuel system, apparently of the jet engine, are affected by the corrosive properties of aviation fuels. The TS-1 and T-2 fuels, sulfur compounds and water, as corrosive agents, and steel, alloy steels, non-ferric metals and their alloys, especially copper, copper alloys, cadmium, antimonous bronze, and zinc, as materials, are mentioned and some details given. It is stated that fuels must not produce tarry deposits nor hard insoluble particles. Temperature, temperature changes, intensive stirring of the fuel, and the mercaptan content are the factors variously increasing the corrosive properties of some fuels. The VK-1 engine is mentioned; its take-off revolutions decreased by 350 to 400 r.p.m. when fuel deposits

Card 1/2

Prevention of Corrosion Caused by Aviation Fuel (Cont.) 86-8-13/22

formed in a valve and impaired its hermetic tightness, causing leakage. The fuel pump plungers may be affected by corrosion which may cause the engine to stop. The [redacted]ant, ferric hydroxide, developing as a result of the corrosion of steel, may clog the filters or other fuel system parts, or jam the fuel pump plungers. The authors recommend compliance with the established norms, State Standards, specifications, and the preventive maintenance measures. There are three figures.

AVAILABLE: Library of Congress.

Card 2/2

CHERTKOV, Ya.B.

CHERTKOV, Ya.B.; ZRELOV, V.N.

Self-oxidation of cracking-kerosenes. Zhur.prikl.khim. 30 no.12: 1875-1877 D '57. (MIRA 11:1)

1.Nauchno-issledovatel'skiy institut goryuche-smazochnykh materialov.

(Oxidation) (Kerosene)

CHERTKOV YA. B.

11(4) PHASE I BOOK EXPLOITATION SOV/1319

Akademiya nauk SSSR. Bashkirskiy filial

Khimiya sero-organicheskikh soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh; materialy II nauchnoy sessii (Chemistry of Sulfur-Organic Compounds Contained in Petroleum Products; Papers of the 2nd Scientific Session) v. 1. Ufa, Izd. Bashkirskogo filiala AN SSSR, 1958. [illegible] p. 1,500 copies printed.

Ed.: Sadertkina, K.I.; Editorial Board: Ayvazov, B.R., Mashkina, A.V., Obolentsev, R.D. (Resp. Ed.), Rozhdestvenskiy, V.P., and Shemin, L.L.; Tech. Ed.: Rakhimov, R. Sh.

PURPOSE: This book is intended for petroleum specialists of scientific research establishments, educational institutions, and petroleum refining plants.

COVERAGE: This collection is the first of a multivolume publication on the results of scientific research work carried out in the Soviet Union on the chemistry and technology of sulfur- and nitrogen-organic compounds during the period 1954-1955; and according to a coordinated research project outlined in 1956 by the sponsoring agency (Bashkir Branch, AS USSR).

Card 1/15

Chertkov, Ya. B., and V.N. Zrelov, Nauchno-issledovatel'skiy institut goryuche-[illegible] materialov--Scientific Research Institute for Fuel and Lubricating Materials). Activity of Sulfur-Organic Compounds in Relationship to the Metal

Card 5/15

of the Fuel System of Gas-Turbine Engines

Various fuels from the ligroin-kerosene fractions of petroleum, products of both direct distillation and thermal cracking, with an average content of sulfur (0.12 - 0.94 percent), mercaptan (0.004 - 0.060 percent and elementary sulfur (0.001 - 0.010 percent), were investigated for corrosive, resin- and residue-forming properties in relationship to copper, bronze, cadmium, zinc and chromium-steel alloys with various surface finishes (nitrided, casehardened, etc.). Illustrations of laboratory apparatus, graphs of the corrosive effects of elementary sulfur and aliphatic and aromatic mercaptans, and tables showing the content of these substances in fuels are given.

CHERTKOV YA.B.

92-58-3-14/32

AUTHORS: Chertkov, Ya.B., and Zrelov, V.N., Scientific Workers

TITLE: Water Treatment of Petroleum Distillates (Ochistka neftyanykh distillyatov vodnoy promyvkoy)

PERIODICAL: Neftyanik, 1958, Nr 3, pp 13-14 (USSR) (13-15?)

ABSTRACT: The author states that the treatment of straight-run distillates and cracked distillates with caustic solution is widely used at refineries for removing hydrogen sulfide, part of the mercaptanes, and the organic acids. The disadvantage of the treatment is that a considerable quantity of alkali is spent in this process. Therefore, in 1953 the Odessa refinery started to treat gasoline first with water and then with alkali solution. As a result, the consumption of alkali substantially dropped.

Card 1/3

Water Treatment of Petroleum Distillates 92-58-3-14/32

Studies of the Ufa Petroleum Scientific Research Institute have proved that the reactivation of the alkali and the re-utilization of 25-30 percent of the spent alkali solution can considerably reduce the consumption of the reagent. Further studies have shown that only 50 percent of aggressive sulfur compounds can be removed by alkali treatment. Results of tests made by the Groznyy Petroleum Institute in 1955 indicated that the treatment of the gasoline distillate with industrial water produces better results than the treatment with alkali. The author emphasizes that the treatment of petroleum distillates with water at present is attracting considerable attention from refiners and scientists. In this connection the author refers to United Kingdom patent Nr 705267 of March 10th, 1954, and USA patent Nr 2728714 of May 20th, 1954. He also refers to the American periodical "Petroleum Refiner" (Nr 2, 1956) which describes the procedure of water treatment and the apparatus used. In addition, the author outlines results of his study of sulfur compounds contained in various commercial fuels obtained from sulfurous

Card 2/3

crudes. He found that a considerable amount of sulfur can be extracted by mercury from commerical fuels with E P. 100°-300°C which were obtained from sulfurous crudes and treated at the refinery with caustic soda. It is clear, therefore, that caustic soda treatment does not ensure a complete removal of sulfur compounds. The composition of sulfur compounds contained in petroleum distillates produced at various refineries from sulfurous crudes is given by the author in Table 1. Characteristics of cracked kerosene treated with water and of cracked kerosene treated with caustic soda is given in Table 2. The author points out that the problem of treating fuels with water instead of caustic soda deserves the most serious attention.

AVAILABLE: Library of Congress

Card 3/3

CHERTKOV, Ye. B.

Oxidation of the mono-olefinic hydrocarbons. Zhur.prikl.khim. 31 no.3:471-476 Mr '58. (MIRA 11:4)
(Hydrocarbons) (Oxidation)

SOV/ 65-58-7-10/12

AUTHORS: Chertkov, Ya. B; Zrelov, V. N; Shchagin, V. M. and Marinchenko, N. I.

TITLE: The Corrosive Activity of Hydrocarbon Fuels in the Presence of Elementary Sulphur. (Korroziynaya aktivnost' uglevodorodnykh topliv v prisutstvii elementarnoy sery).

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr.7. pp. 62 - 66. (USSR).

ABSTRACT: By using radioactive indicators, the authors found that the formation of a layer on metal is not due to adsorption, but to chemical interaction the elementary sulphur penetrates into the metal. Investigations on the changes of the metals in fuel mixtures under the influence of elementary sulphur and oxygen were carried out to define the character of occurring processes. Bronze was used as the investigated metal, and white spirit as the hydrocarbon mixture. The absorption of oxygen by the fuel was measured at 125°C, at normal pressure according to the PK method (Ref.6). The corrosion of bronze and the quantity of deposits formed on the metal in fuel mixtures to which elementary sulphur had been added was also determined at 120°C during six hours (Ref.7).

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SOV/ 65-59-7-10/12

The Corrosive Activity of Hydrocarbon Fuels in the Presence of Elementary Sulphur.

Fig.1: A graph giving curves of the oxidation of white spirit. When white spirit was oxidised in the presence of elementary sulphur (concentration = 0.001 - 0.01%), when not in contact with bronze, it was seen that elementary sulphur acted in all cases as a strong anti-oxidant; the induction period = 300 minutes. During these oxidations it was found that the polished surface of the bronze showed definite catalytic activity. When the bronze surface was covered with a layer of cupric oxide or cuprous sulphide no catalytic activity could be observed. When elementary sulphur is contained in the fuels in quantities of 0.002 - 0.003% and higher, considerable corrosion occurs and precipitates are formed which penetrate into the fuel and cause accumulation of hard deposits. There are 4 Figures and 7 References: 4 English and 3 Soviet.

1. Fuels--Corrosive effects 2. Sulfur--Properties

Card 2/2

SOV/65-58-9-8/16

AUTHORS: Englin, B. A; Chertkov, Ya. B; Tugolukov, V. K.

TITLE: Disintegration of Cadmium Coatings in Fuels With Increased Mercaptan Content and Methods of Preventing the Same. (Razrusheniye kadmiyevykh pokrytiy v toplivakh s povyshennym soderzhaniyem merkaptanov i puti ego predotvrashcheniya)

PERIODICAL: Khimiya i Tekhnologiya Topliv i Masel, 1958, Nr 9, pp 38 - 43, (USSR)

ABSTRACT: When using fuels with increased mercaptan content gelatinus deposits are formed which can lead to a reduction or cutting off of the fuel supply into the engine. In aeroplane engines a decrease in the temperature leads to separation of the excess water from the fuel and deposition on the surface of the engine components in the form of microscopic droplets. According to I.Ye. Bespolov et al. the degree of disintegration of coating is proportional to the weight loss of the article which is made of cadmium and inversely proportional to the mercaptan content in the fuel. On analysing the deposits it was found that they mainly consist of cadmium mercaptides (Ref.4). Analogous results were obtained by the authors. Fuels with the following mercaptan con-

Card 1/4

Disintegration of Cadmium Coatings in Fuels With Increased Mercaptan Content and Methods of Preventing the Same.

tent were tested: TS-1 (0.047%), fuel T-2 (0.052%), cracking-kérosene (0.059%) and also fuel TS-1 (GOST 7149-54: 0.005%) and T-1 (GOST 4138-49: 0.0003%). Three samples were prepared from each fuel (desiccated, saturated with water and with natural water content). Cadmium coils were placed in these samples and stored for ten days under conditions analogous to those which occur in the fuel systems of aeroplanes. Table 1 gives the results obtained during the storing of cadmium coils in fuels with varying water and mercaptan content after ten days. The formation of deposits in the fuel and precipitation on the cadmium coils is accompanied not only by a decrease in the mercaptan content and loss of weight of the coils, but by decrease in the amount of water dissolved in the fuel (Table 2). Table 3: the composition of the deposit formed on the cadmium coil during prolonged storing in a tank containing the standard oil TS-1. Spectral semi-quantitative analysis of the ash was carried out by the Institute of Geochemistry, AN USSR (Institut geokhimii AN SSSR), and the composition

Disintegration of Cadmium Coatings in Fuels With Increased Mercaptan Content and Methods of Preventing the Same.

was as follows: Cd - 43.75%, Si - 10%, Cu - 7.5%, Mg - 1.9%, Al - 1.9%, Fe - 0.3%, Zn - 0.3%, Cr - 0.3%, Ca - 0.3%, Pb, Ba, Sb, Ni, Na - traces. Elementary analysis confirmed that the disintegration products consisted of sulphur compounds of cadmium, and that the formation of deposits is mainly due to the presence of aliphatic mercaptans and an increased water content. During further tests the addition of amine vat residues as effective additives to the fuel was investigated. These residues had a boiling point above 100°C, a molecular weight of 150 and contained 7% of N. 0.005 - 0.03% of this residue was added to the fuel TS-1 containing 0.047% mercaptans. Results are given in Table 4. These additives inhibited the disintegration of the cadmium coatings. The amines used as surface active agents protect the metallic surface from direct contact with and the action of mercaptans. Table 5: data on the disintegration of cadmium coils in fuels containing 0.03% of amine vat residues (water content in the fuel = 0.0099%). The amine residues dissolve

SOV/65-58-9-8/16

Disintegration of Cadmium Coatings in Fuels With Increased Mercaptan Content and Methods of Preventing the Same.

easily in the fuel and do not separate out either at low or at increased temperatures. There are 5 Tables and 7 References: 1 English and 6 Soviet.

1. Fuel additives--Chemical effects 2. Fuels--Moisture factors
3. Cadmium coatings--Disintegration 4. Thiols--Performance
5. Fuels--Test methods

Card 4/4

CHERTKOV, Ya.B.; ZHELOV, V.N.

Effect of sulfur compounds on efficiency of hydrocarbon fuels.
Zhur. prikl. khim. 31 no.9:1384-1389 S '58. (MIRA 11:10)
(Sulfur compounds) (Fuel research)

Chertkov Ya.B.

PHASE I BOOK EXPLOITATION SOV/3663

Akademiya nauk SSSR. Institut khimicheskoy fiziki

Okisleniye uglevodorodov v zhidkoy faze; sbornik statey (Oxidation of Hydrocarbons in the Liquid Phase; Collection of Articles) Moscow, Izd-vo AN SSSR, 1959. 334 p. Errata slip inserted. 2,200 copies printed.

Ed.: N. M. Emanuel', Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: K. M. Dyumayev; Tech. Ed.: I. F. Kuz'min.

PURPOSE: This collection of articles is intended for chemists interested in hydrocarbon oxidation reactions, particularly for those specializing in petroleum fuels.

COVERAGE: This collection of 35 articles represents the results of investigations over a period of several years on problems of hydrocarbon oxidation. The authors present their own theoretical and experimental data and also draw from current literature. No personalities are mentioned. References accompany most of the articles.

Ma'levskaya, N.K., G.I. Moskvina, and V.P. Kudryashova [Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov i Kombinat sinteticheskikh zhirnykh kislot i zhirnykh spirtov (All-Union Research Institute of Fats; Combine of Synthetic Fatty Acids and Fatty Alcohols)]. Oxidation of High-Molecular Hydrocarbons to Fatty Acids 268

The authors have synthesized fatty acids and several neutral oxygen derivatives by oxidizing paraffinic hydrocarbons with atmospheric oxygen. Catalysis with 0.2% potassium permanganate increased oxygen absorption fourfold and yielded 47% fatty acids after 20 hours.

Tretyannikov, B.N. and A.A. Perchenko. [Khar'kov Polytechnical Institute imeni V.I. Lenin]. Role of a Mixture of Manganese Oxides as an Accelerator of Paraffin Oxidation by Atmospheric Oxygen 275

Manganese oxide waste-products of the vitamin industry and manganese oxide residue from treating paraffin with a potassium permanganate solution increased the rate of air oxidation of paraffin. The authors cite a method for the preparation of active catalysts for this reaction from pyrolusite.

Varlamov, V.S., and A.I. Il'ina [Vsesoyuznyy nauchno-issledovatel'skiy institut zhirov (All-Union Scientific Research Institute of Fats)]. Effect of Temperature and a Catalyst on Liquid-Phase Oxidation of Paraffin to Monatomic Fatty Acids 282

Petrov, G.S. (Deceased), and A.P. Grigor'yev. Preparation of Various Types of Acids From Solar Distillate 293

The authors give data on the extraction of sulfo acids from the sulfonated solar oil fraction of petroleums, and on the oxidation of vaseline oil to obtain carboxylic and hydroxy carboxylic acids.

Chertkov, Ya.B., and V.N. Zrelov [Nauchno-issledovatel'skiy institut goryuche-smazochnykh materialov (Scientific Research Institute of Combustibles and Lubricating Materials)]. The Oxidation of Hydrocarbon Fuels in Storage 299

The authors state that the oxidation of fuels stored at moderate temperatures may be minimized by removing low-stability cyclic hydrocarbons having unsaturated side chains, or by introducing additives which will prevent their oxidation or the thickening of their oxidation products into resinous substances. It is also stated that low temperatures and nearly hermetic conditions also inhibit oxidation.

10

S/081/62/000/012/032/063
B166/B101

AUTHORS: Chertkov, Ya. B., Zrelov, V. N., Shchagin, V. M.

TITLE: Organosulfur compounds in fuels as inhibitors of corrosion in copper and its alloys

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 12, 1962, 350-351, abstract 12I202 (Sb. "Khimiya seraorgan. soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh". M., AN SSSR, 1959, 284-292)

TEXT: The question of the corrosive activity of fuels containing sulfurous compounds, and the corrosion of fuel system elements in gas turbine engines, made from Cu and Cu alloys is examined. [Abstracter's note: Complete translation.]

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AUTHOR: Chertkov, Ya. B.

SOV/80-32-2-23/55

TITLE: On the Role of Catalyzing Additions in the Processes of Production of Fatty Acids and Alcohols by Direct Oxidation of Paraffin Hydrocarbons (O roli kataliziruyushchikh dobavok v protsessakh polucheniya zhirnykh kislot i spirtov pryamym okisleniyem parafinovykh uglevodorodov)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol XXXII, Nr 2, 363-369 (USSR)

ABSTRACT: The production of high-molecular alcohols and acids from paraffin hydrocarbons by oxidation is investigated here. Oxidation is obtained by the addition of various catalyzing substances. The optimum temperature for the production of acids is 105 - 115°C. The output is less than 60% of the oxidized hydrocarbons. For alcohols the optimum temperature is 165 - 175°C and the yield is more than 70%. The primary products are in both cases monoatomic hydroperoxides. The thermal decomposition of the hydroperoxides in which the peroxide group is close to the methyl group leads to the production of alcohol and formaldehyde, or aldehyde and methanol, or ketone

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On the Role of Catalyzing Additions in the Processes of Production of Fatty Acids and Alcohols by Direct Oxidation of Paraffin Hydrocarbons

and water. In the presence of $KMnO_4$ monocarboxylic acids will be obtained. Boric acid oxidizes hydrocarbons to alcohols. There are 29 references, 10 of which are Soviet,,7 English, 4 American, 4 German, 2 Italian, 1 Dutch, and 1 Japanese.

SUBMITTED: July 17, 1957

Card 2/2

CHERTKOV, Ya.B.; ZRELOV, V.N.; OBOLENTSEV, R.D.

Thermal stability of sulfur compounds and their effect on the performance characteristics of fuels. Khim.sera-i azotorg.soed.v neft.i nefteprod. 3:461-468 '60. (MIRA 14:6)

1. Nauchno-issledovatel'skiy institut goryuche-smazochnykh materialov, Bashkirskiy filial AN SSSR.
(Sulfur organic compounds—Thermal properties)
(Fuel—Testing)

82958

S/065/60/000/004/001/017
E073/E435

11.1210

AUTHOR: Chertkov, Ya.B.

TITLE: Methods of Increasing the Energy Content of Hydrocarbon Fuels

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1960, No.4, pp.1-4

TEXT: In earlier work (Ref.1) the author arrived at the following conclusions:
1) Liquid hydrocarbon fuels with a maximum combustion heat can be obtained only by blending of hydrocarbons, taking fully into consideration their chemical structure.
2) For hydrocarbons of all classes, the density and the specific heat of combustion per unit of volume increases with increasing quantity of short side-chains (methyl groups), which are distributed with maximum compactness on the basic chain of the paraffin or the rings of the naphthene or aromatic hydrocarbons.
3) For hydrocarbons with a naphthene ring structure and saturated side chains, an increase in the combustion heat per unit volume occurs with only an insignificant change in the heat of combustion per unit of weight.

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Methods of Increasing the Energy Content of Hydrocarbon Fuels

Later experiments (Ref.2) enabled determining directly and by calculation the limits of the changes in density and of the lower combustion heat of paraffinic, naphthenic and aromatic liquid fuel constituents for Soviet crudes of a variety of origins, these are given in Table 2. Furthermore, a plot is given of the combustion heat (per litre and per kilogram) as a function of the molecular weight for paraffin hydrocarbons (curves 1), for naphthene hydrocarbons (curves 2), for paraffin-naphthene hydrocarbons (curves 3), monocyclic aromatic hydrocarbons (curves 4) and bicyclic aromatic hydrocarbons (curves 5). The author concludes that a realistic approach to solution of the problem would be investigation of methods for obtaining suitable monocyclic and bicyclic aromatic hydrocarbons with specific gravity close to unity and their blending with liquid fuels. The energy content can be increased easily only by increase of the specific heat of combustion per unit of volume; this can be achieved by the blending mentioned above. Difficulties which arise from the low degree of combustibility of such hydrocarbons in engines can be overcome by improving combustion methods. American and British

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Methods of Increasing the Energy Content of Hydrocarbon Fuels

results are cited (Ref.3 to 6), e.g. the use of small amounts of isopropylbenzene hydroperoxide, indium laurate, and certain copper compounds, which serve as catalysts in the combustion process. There are 1 figure, 1 table and 6 references: 2 Soviet and 4 English.

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82503

S/065/60/000/009/002/003
E194/E184

11.5000

AUTHOR: Chertkov, Ya.B.

TITLE: The Mechanism of Deposit Formation in Type T Fuels

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1960, No 9, pp 57-61

TEXT: The thermal stability of ligroin-kerosene type fuels has been important for some years. It has been found that increasing the temperature increases the deposit formation only up to a certain point and at still higher temperatures deposit formation diminishes and becomes negligible. The temperature range for maximum deposit formations of straight run fuels type T is 150-200°C. If the fuel is heated to temperatures above 200 °C little deposit formation is observed. The present article attempts to explain the reasons for the existence of a temperature threshold for deposit formation or of a narrow temperature range of maximum deposit formation. Deposits are formed from non-hydrocarbon components of the fuel, particularly compounds of oxygen, sulphur or nitrogen and also ash-containing substances. The resinous components of fuel contain from 4.5 to 10.4% oxygen whilst deposits formed from the fuel at 150 °C contain about 50% oxygen. Obviously deposits are

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The Mechanism of Deposit Formation in Type T Fuels

formed by oxidation of non-hydrocarbon components. Whereas the proportion of resinous compounds in T-1 fuel is about 123-166 mg per 100 ml the quantity of insoluble deposit formed at 120 °C is about 2-2.5 mg per 100 ml and at 150 °C 6.5-10 mg per 100 ml. Thus, the weight of deposit is only a small proportion of the total weight of resinous compounds. Thus, only part of the total oxidation products are precipitated. In work on the oxidation of kerosene at various temperatures, Malinovskiy et al. (Ref 8) concluded that with increasing temperature and duration of oxidation there is an increase in the oxy-acid content of the kerosene, then of combined acids in the form of esters of the type of lactones, lactides, and other products of condensation and polymerisation. Access of oxygen to the fuel is then considered. Considerable quantities of oxygen can be dissolved in kerosene and the solubility of oxygen in jet fuel increases with increasing temperature up to 100 °C at which it may be 40 ml per 100 ml of fuel. Petroleum hydrocarbons can also absorb gas, including oxygen, to the extent of a gram-mole of oxygen per gram-mole of hydrocarbon at temperatures somewhat below the boiling point. This is, of course, much greater

The Mechanism of Deposit Formation in Type T Fuels

than the amount of dissolved oxygen. The amount of oxygen combined in the deposit is only 7-8% of that dissolved in the fuel. Thus plenty of oxygen is available for deposit formation. Vapour phase oxidation occurs at much higher temperatures than liquid phase oxidation. The rate of liquid phase oxidation increases with rise in temperature, but so does the vapour pressure of the fuel until finally it boils. The process of boiling greatly hinders further oxidation. Data on the boiling characteristics of fuels T-1 and TS-1 are given in a Table and it will be seen that as the temperature of the fuel in a closed container is raised the difference between the equilibrium boiling point of the fuel and the temperature to which it is heated diminishes. A temperature of 150-200 °C is the maximum limit at which the fuel can vapourise without boiling; at higher temperatures boiling occurs though the pressure increases. Maximum deposit formation is observed in type T fuel at temperatures of 150-200 °C because boiling is not yet then strong enough to hinder liquid phase oxidation. In systems open to atmosphere the equilibrium boiling temperature is 15-29 °C above 150 °C and then the maximum deposit formation is observed at 150 °C. During the process

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of liquid phase oxidation of high molecular paraffinic hydrocarbons at a temperature of 160-175 °C the formation of resinous compounds is practically completely prevented if the oxygen content of the gas blown through the liquid is 3-4%. On oxidising with air the amount of resin in the oxidate was over 30%. Similarly the rate of oxidation of benzole strongly depends on the benzole-oxygen ratio and the partial pressure of oxygen in the oxidation zone. It is concluded that at temperatures above 200 °C deposits do not form in the fuel because: the concentration of oxygen in the fuel is reduced by vapourisation leaving only fuel soluble oxygen compounds; oxygen is driven from the liquid fuel together with the fuel vapours; and there is no further oxygen exchange in a system open to the air because of the increasing difference between the vapour pressure of the hot fuel above the liquid phase and the surrounding medium. There are 1 table and 16 references: 14 Soviet, 1 English and 1 German.

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CHERTKOV, Ya.B.

Hydrocarbon jet fuels of the U.S.A. Khim.i tekh.topl.i masel 5 no. 10:64-68 O '60. (MIRA 13:10)
(United States--Jet planes--Fuel)

S/080/60/033/008/011/013
A003/A001

AUTHORS: Chertkov, Ya.B., Zrelov, V.N., Afanas'yeva, N.A.

TITLE: The Characteristic of the Non-Hydrocarbon Composition of the Ligroin-Kerosene Fractions of Petroleum

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol. 33, No. 8, pp. 1883-1893

TEXT: Chromatographic methods were used to separate the components of the non-hydrocarbon part of petroleum usually designated as resins. The ligroin-kerosene fractions are studied here. ШСМ (ShSM) silicagel with 65-120 mesh and a volumetric rate of 1 hour^{-1} was used to separate the ligroin-kerosene fractions obtained from Baku and Volga petroleum. The fuels Т-1 (T-1)(ГОСТ 4138-49 - GOST 4138-49) and ТС-1 (TS-1)(ГОСТ 7149-54 - GOST 7149-54) were produced by direct distillation and two tractor kerosenes (ГОСТ 1842-52 - GOST 1842-52) were obtained by thermal cracking. The isopentane fraction boiled away to 40-43°C was used as desorbent. The resins were distilled in a vacuum of 2 mm Hg. The yield of the distillates from fuels of direct distillation was 80-85%, from cracking kerosenes 70-78%. The content of the acidic part did not exceed 1.5-2%. The distillates of the neutral resins were separated on activated silicagel into a

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A003/A001

The Characteristic of the Non-Hydrocarbon Composition of the Ligroin-Kerosene Fractions of Petroleum

fraction desorbed by isopentane and a fraction desorbed by methanol. From the resins of Baku kerosene separation by isopentane yielded no results. From the resins of T-1 practically all sulfur compounds pass into the isopentane part and the nitrogen compounds into the methanol part. The yield and the characteristics of the principal nitrogen compounds is given. From resins of Baku fuels, concentrates with a high content of nitrogen were obtained. 68-71% of the total of nitrogen compounds was extracted out of these resins. The color reactions showed that in all fractions aliphatic amines are absent. There is only a slight amount of aromatic amines. Quinoline derivatives are present in a small amount in the last fractions of cracking-kerosene resins. The fractions of nitrogen compounds after additional purification on activated aluminum oxide were characterized by a basicity of 1.73 mg·KOH/g, an acidity of 0.22 mg·KOH/g, an ester number of 128.3 mg·KOH/g, a hydroxyl number of 39.3 mg·KOH/g and a carbonyl number of 40.2 mg·O_2/g. After separation of the nitrogen compounds the sulfur compounds were separated from the resins by their treatment with mercury acetate. The high molecular weight of the sulfur compounds from directly distilled fuels is noted.

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36543

S/081/62/000/006/076/117
B167/B101

11.013

AUTHORS: Chertkov, Ya. B., Zrelov, V. N., Marinchenko, N. I.

TITLE: The ash of deposits appearing in sulfur-containing fuels

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 537, abstract 6M225 (Sb."Khimiya seraorgan. soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh. v4.M.,Gostoptekhizdat, 1961, 222-230)

TEXT: A study of the composition of residues obtained by oxidizing fuel of type T (T) for 6 hours under laboratory conditions (at 120 and 150°C, in the presence or in the absence of bronze), and also of the residues from the filters of actual engine assemblies at various temperatures. Elementary analyses were carried out as follows: metals by semiquantitative emission spectroscopy on an ИСП-28 (ISP-28) apparatus for 28 elements, alkali metals on an СТ-7 (ST-7) stylometer, and copper colorimetrically. It is shown that organo-sulfur compounds (and mercaptans in particular) are the principal source of residues. The amount of deposit increases rapidly with temperature and with the

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B167/B101

catalytic effect of metal. The deposits consist of the products of extensive oxidation of the organic compounds of fuel and of metal corrosion products. The ash contains great amounts of Fe, Zn, Si, and Na at low temperatures. Cd undergoes low-temperature corrosion. At higher temperatures, metal corrosion is intensified, and Cu, Al, and Pb undergo corrosion. The portion of organic material is highest at the temperature of maximum formation of deposit. At both higher and lower temperatures, ash-forming elements account for the major part of the deposit. Fuel containing a cracking component undergoes intensive oxidation, catalyzed by brass, with formation of resin-like compounds. [Abstracter's note: Complete translation.]

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09591

S/065/61/000/004/009/011
E194/E284

26.1120

AUTHORS: Chertkov, Ya. B., Ragozin, N. A. and Marinchenko, N. I.

TITLE: The Composition of Deposits Formed on the Fuel Filters of Transport Jet Aircraft

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1961, No. 4, pp. 57-60

TEXT: Jet fuel filters are required to retain particles of 1-2 microns and completely to prevent the presence in the fuel of particles of 5 microns or more. As the fuel is filtered immediately before delivery to the aircraft the engine might be expected to operate for the full-service time without filter-blocking. However, in fact, filter blocking does occur, partly as a result of non-organic contamination and partly by high molecular weight non-hydrocarbon organic compounds. A study was accordingly made of the composition of deposits trapped by 40 micron filters on transport jet aircraft after 100 hours operation on standard fuel grade TC-1 (TS-1) to standard ГОСТ 7149-54 (GOST 7149-54). A study was also made of the composition of deposits formed on the filters of fuel delivery vehicles. The temperature of the fuel in

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the aircraft did not exceed 45-50°C and in the fuel in the vehicle it was at ambient temperature. The deposits were removed from the metal filters by ultrasonic means in distilled water. After evaporation of the water the deposits were washed with isopentane to remove the fuel and dried to constant weight at 105°C. The composition of the dry residues is given in Table 1. It will be seen that the deposits in the aircraft filters have a very high ash content. The deposits on the filters of the fuelling vehicles consist mainly of iron and zinc, mainly in the form of oxides. The ash deposits on the aircraft filters contain much less iron that in the fuelling vehicle but much more copper, tin, cadmium, sodium, calcium and magnesium. Evidently the ash component on the aircraft filters consists of corrosion products of metals in the aircraft fuel system and engine, in the first place copper and cadmium compounds and tin alloys. The organic part of the deposit does not exceed 20-30%. In the fuelling vehicle the organic deposits are very low. The high content of sulphur, nitrogen and

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particularly oxygen in the deposits formed on the filters indicates that the source of formation of the organic part of the deposit is mainly the non-hydrocarbon part of the fuel. Corrosion of non-ferrous and ferrous metals is also largely due to the presence in the fuel of non hydro-carbon components. The better that non-stable hydrocarbon and non-hydrocarbon components are removed from the fuel the less will be the tendency to form resinous deposits and the less will be the filter blocking. Ash elements act as centres of coagulation of viscous organic compounds and by more complete removal from the fuel of corrosion products, contaminants and other ash containing parts it will be possible to limit or prevent the increase in the particle size of oxidation products which lead to filter blocking. Accordingly, it is now considered essential to store fuel in tanks with anti-corrosion linings which are completely hermetically sealed and to filter the fuel delivered to transport aircraft with complete removal from the fuel of mechanical admixtures with particle size

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greater than 1-2 microns. There are 1 table and 3 references: 2 Soviet and 1 non-Soviet.

Table 1

Состав абсолютно сухих отложений, образующихся на 40-микронных фильтрах, при работе на топливе ТС-1 (% вес.)

Наименование Denomination	Топливозаправщик Fuel delivery truck	Топливная система самолета Aircraft fuel system			
	March март	November ноябрь	December декабрь	February февраль	April апрель
Углерод . . . C	8,36	21,55	10,07	19,16	12,97
Водород . . . H	2,43	3,48	1,80	2,44	2,02
Азот . . . . N	0,37	0,61	0,47	0,64	0,47
Сера . . . . S	0,63	0,54	1,70	0,64	0,85
Ash components Зольные элементы	46,18	44,07	56,12	47,27	57,02
Кислород . . O	42,03	29,75	29,54	29,35	26,67

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The Composition of Deposits Formed on The Fuel Filters of Transport Jet Aircraft

Table 1

Всего Total		100	100	100	100	100
Зола Ash		70,24	70,34	90,42	73,30	77,92
Ash composition Состав золы						
	железо Fe	30,0	3—10	3—10	3—10	10,0
	медь Cu	1,0	11,0	16,0	7,9	13,0
	олово Sn	0,3—1,0	10,0	10,0	10—15	10—15
	кадмий Cd	1—3	5—10	10,0	10—20	10,0
	цинк Zn	20—30	1—3	1—3	1—3	1—3
	кремний Si	3—6	4,0	1—4	1—3	3—10
	алюминий Al	0,3	3,0	1,0	1,0	1,0
	натрий Na	0,4—1,0	3—10	3—10	10,0	11,0
	кальций Ca	0.3	3—10	1—3	1,0	1,0
	магний Mg	0,1—0,3	1—3	1—3	1—4	1,2
	хром Cr	—	1,0	0,4—1,0	0,3—1,0	1,0
	никель Ni	—	0,3—1,0	0,4—1,0	0,4	0,4—1,0
	свинец Pb	0,4—1,0	1,0	1,0	0,4—1,0	0,4—1,0

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KREYN, S.E.; CHERTKOV, Ya.B.

Sixth scientific session on the chemistry of sulfur organic compounds of petroleum and petroleum products. Khim. i tekh. topl. i masel. 6 no.10:70-71 O '61. (MIRA 14:11)
(Petroleum products)

SEMENIDO, Ye.G., prof., doktor tekhn. nauk; ENGLIN, B.A.; PAPOK, K.K., prof. doktor tekhn. nauk; ZARUBIN, A.P.; RAGOZIN, N.A.; SHIMONAYEV, G.S.; CHERTKOV, Ya.B.; LIVSHITS, S.M.; BESSMERTNYY, K.I.; LOSIKOV, B.V.; SABLINA, Z.A.; ROZHKOV, I.V.; GUREYEV, A.A.; FAT'YANOV, A.D.; ZRELOV, V.N.; ZARUDNYY, P.P.; BRATKOV, A.A.; BARON, I.G.; LEVINA, Ye.S., ved. red.; TITSKAYA, B.F., ved. red.; FEDOTOVA, I.G., tekhn. red.

[Motor, jet, and rocket fuels] Motornye, reaktivnye i raketnye topliva. 4., perer. i dop. izd. Moskva, Gos. nauchno-tekhn. izd-vo neftianoi i gorno-toplivnoi lit-ry, 1962. 741 p. (MIRA 15:2)

(Rockets (Aeronautics))—Fuel)
(Jet propulsion)
(Motor fuels)

S/065/63/000/002/008/008
E194/E484

AUTHOR: Chertkov, Ya.B.

TITLE: Increasing the energy content of hydrocarbon fuels

PERIODICAL: Khimiya i tekhnologiya topliv i masel, no.2, 1962, 63-67

TEXT: As there is little practical hope of increasing the heat content per unit weight of jet fuels, the increase of energy content by selecting hydrocarbon groups of a certain structure and high density was investigated. The yield, refractive index, density, molecular weight, empirical formula, mean content of CH atoms in side chains and specific heat of combustion of monocyclic aromatic hydrocarbons produced from 50°C fractions from various feedstocks are tabulated. The results show that in industrial hydrocarbon fractions boiling in the range 100 to 350°C, the monocyclic hydrocarbon content ranges from 8 to 38% depending on the feed and the method of refining. These hydrocarbons meet the viscosity/temperature requirements of aviation fuel T1 down to a temperature of -60°C. Increasing the number of carbon atoms in the side chains of monocyclic aromatic hydrocarbons increases

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their heat of combustion by weight. Analysis of changes in the heat of combustion of monocyclic aromatic hydrocarbons leads to the conclusion that for fractions boiling in the range 100 to 350°C the heat of combustion per unit weight is 2 to 4.5% lower than that of fuel T1 (10250 kcal/kg) but the specific heat of combustion per unit volume is greater than the standard for fuel TC-1 (TS-1) (8000 kcal/litre) by some 4 to 17%. The use of monocyclic aromatic hydrocarbons as feedstock for producing new naphthenic fuels for supersonic aircraft is proposed.
There are 2 tables.

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S/065/62/000/010/003/004
E075/E136

11.0132

AUTHORS: Chertkov, Ya.B., Zrelov, V.N., Rybakov, K.V., Shagin, V.M., and Fomishenko, B.A.

TITLE: Characteristics of micro-impurities in middle distillate fuels

PERIODICAL: Khimiya i tekhnologiya topliv i masel, no.10, 1962, 56-59

TEXT: The authors investigated the nature of micro-impurities in fuel TC-1 (TS-1) used in aviation gas-turbine engines. The impurities in the fuels form through the interaction of metal containing compounds with high molecular weight, resinous compounds and moisture. The metal-containing compounds originate from corrosion of tanks and moving parts of various mechanisms, as well as leaching of certain fillers from plastic materials. The relatively coarse particles of the impurities form mainly by the agglomeration of finely dispersed material. The formation of particles having the size of 0.1-1 micron is speeded up by increasing temperature, agitation and excessive pressures.

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