Done

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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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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A003/A001

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

After separation of the sulfur compounds the oxygen compounds were separated. These compounds comprised about 80% of the remaining resins. The fractions of the oxygen compounds were characterized by a high purity and non-saturation. The amount of hydroxyl compounds among the oxygen compounds of methanol fractions is 30-50%, in Baku cracking kerosene 70%. Compounds with an ester grouping contain 15-30% of the total oxygen of methanol resins. There are 9 tables and 19 references: 13 Soviet, 3 German, 2 English and 1 Italian.

SUBMITTED: April 13, 1959

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APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

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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The ash of deposits appearing in ...

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.]

X

34890
S/081/62/000/005/070/090
B149/B101

11.0132

AUTHORS: Tereshchenko, Ye. R., Tararyshkin, M. Ye., Turov, A. I., Zyelov, V. N., Baranov, B. N.

TITLE: Thermal stability and corrosive activity of sulfur-containing fuels at elevated temperatures

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 3, 1962, 489, abstract 3M193 (Sb. "Khimiya seraorgan. soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh. v. 4"., M., Gostoptekhizdat, 1961, 231 - 235)

TEXT: The following fuels were investigated: standard TS-1 (TS-1), TS-1 purified by hydrotreating, TS-1 with high mercaptan content, and a T-2(T-2) type fuel from a wide fraction containing components of thermal cracking. The thermal stability and corrosive activity of the sulfur-containing fuels were studied under static conditions in a bomb; and also when the fuel was pumped through a filter and through an actual fuel system of a motor. It was shown that of the fuels investigated, T-2 containing cracking components and TS-1 with a high mercaptan content had the lowest thermal stability at

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S/081/62/000/003/070/090
B149/B101

100°C. Pumping of these fuels at the temperature mentioned results in rapid clogging of the filter and is accompanied by the formation of a deposit on the fuel-utilizing components of the unit. TS-1 with a high content of mercaptans (0.03%) had the highest corrosive activity; T-2 had low corrosive activity . TS-1 purified by hydrotreating had the best thermal stability and insignificant corrosive activity. It was shown that hydrotreating during the production of fuels of the TS-1 type resulted in considerably higher thermal stability and in lowered corrosive activity of fuels obtained from Eastern petroleums. [Abstracter's note: Complete translation.]

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

34891
S/081/62/000/003/071/090
B149/B101

11.0170

AUTHORS: Zrelov, V. N., Melekhin, V. M.

TITLE: Investigation of the effect of organic nitrogen compounds on the corrosive activity and on the thermal stability of the fuels from sulfur-containing petroleums

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 3, 1962, 489, abstract 3M194 (Sb. "Khimiya seraorgan. soyedineniy, soderzhashchikhsya v neftyakh i nefteproduktakh v. 4, M., Gostoptekhizdat, 1961, 236 - 244)

TEXT: Organic nitrogen compounds (di-octadecylamine, phenyl-α-naphthyl-amine, aniline, hexamethylene diamine, and others) were added to the fuels TC-1 (TS-1) and T-2 (TS-2) with a high content of mercaptans (0.045 and 0.05%); these fuels have high corrosive activity and low thermal stability. The corrosive activity and the thermal stability of these fuels after addition of organic nitrogen compounds were determined by the "ASC" (KCS) method, at 120°C and in the presence of bronze BS-24 (VB-24) over a period of 6 hr. It was shown that hexamethylene diamine, benzidine, and 2-alkyl-

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Investigation of the ...

(C_9 - C_{12})-imidazoline inhibited most effectively the corrosive activity of the above fuels; the addition of other organic nitrogen compounds to these substances usually increased their anticorrosive action, but in some occasions they inhibited it. The thermal stability of the fuels TS-1 and TS-2 is increased most effectively in the presence of aliphatic monoamines (dioctadecylamine, paraffinic methylamines), aromatic tertiary monoamines, and also some secondary aromatic monoamines, such as monomethylaniline and phenyl-α-naphthylamine. Joint addition to the fuel of the anticorrosive compounds studied and the substances inhibiting the formation of sediments does not promote simultaneous increasing of thermal stability and anti-corrosive properties of the fuels. [Abstracter's note: Complete translation.]

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89960

S/065/61/000/002/007/008
E194/E284

26.1120

AUTHOR: Zrelov, V. N.

TITLE: Methods of Assessing the Quality of Jet Fuels

PERIODICAL: Khimiya i tekhnologiya topliv i masel, 1961, No. 2, pp. 66-70

TEXT: This is a general review article of Soviet and foreign practice. At present particular attention is being directed to methods of assessing the quality of new high boiling jet fuels. Increasing the boiling range of jet fuels results in an increase in the content of aromatic hydrocarbons to as much as 28% which can result in increased deposit formation. To assess deposit formation small laboratory apparatus has been devised in which the fuel is burned and the amount of deposit measured. Paushkin and others (Ref. 2) have developed an instrument similar to that of Starkman, Cattaneo and McAllister (Ref. 3). Both methods only assess deposit forming on the instrument walls but not deposit which is carried over. The total deposit may be assessed in a quartz tube instrument in which the deposit is trapped in special absorbents and is weighed. This gives a better assessment of

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Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

S/065/61/000/002/007/008
E194/E284

Methods of Assessing the Quality of Jet Fuels

deposit forming tendencies than the earlier instruments. The kerosene lamp test used in the USA to assess the deposit forming tendencies of jet fuels is described. For research purposes deposit forming tendencies of jet fuels are assessed in rigs with small scale jet turbine combustion chambers, rigs of this kind have been developed in the USSR by Tereshchenko (Ref. 9) and abroad by C. G. Williams (Ref. 10) and others. Tereshchenko's equipment is widely used to study other properties of jet fuel. Foreign work on the relationships between burning of combustion chambers and flame luminosity is described. The American fluorescent indicator adsorption method of testing hydrocarbon types and particularly for assessing aromatics is described. At supersonic speeds the fuel is heated to over 100°C and solid deposits may be formed which block filters. The deposit forming tendencies of jet fuels under these conditions may be assessed by static or dynamic tests. Static tests may be made in the bomb which was formerly used to determine the induction period of gasoline or in the ИСА (ISA) apparatus which is also used to determine the

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Methods of Assessing the Quality of Jet Fuels

stability of aviation gasoline. The two methods are briefly compared. In addition, there is the complex method KOC (KOS) which permits of simultaneous determination of deposit forming tendencies and corrosivity of fuels.. The advantage of this method is that it determines the corrosivity as well as the deposit forming tendencies which is particularly important in studying fuels at temperatures of 200-250°C when the amount of deposit is small but corrosion of bronze increases considerably. Chertkov and Shagin (Ref. 21) have developed a sieve analysis method for assessing the size of deposit particles formed which can classify deposits of from 5 to 120 microns. The structure and size of deposits can also be assessed with an ordinary electron microscope. Dynamic fuel stability filter blocking tests are described, results have been found in agreement with those obtained by the ISA, KOS and bomb tests. Methods have been developed for assessing the deposit forming tendencies and corrosivity of fuels by circulation through a jet engine fuel apparatus. By this means it is possible to obtain results comparable with those of rig tests on engines and

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E194/E284

Methods of Assessing the Quality of Jet Fuels

with laboratory bench tests. The methods used in the USA to assess the deposit forming tendencies of jet fuels are described. Storage stability of jet fuels is assessed by changes in resin content and acidity. The resin content is determined in the standard instrument used for evaporating fuel by water vapours. A combination of vacuum and molecular distillation may also be used to assess resin content of jet fuels. The stability of jet fuels containing cracking components may be determined in the laboratory on the ПК (PK) apparatus which is based on measurement of oxygen absorption by the fuel in a thin layer at a temperature of 120°C. The permissible storage life of the fuel may be assessed from the test results and a nomogram has been described for this purpose. English, French and American methods of assessing the stability of jet fuels are briefly reviewed. English work on foaming tests of jet fuels is described. American and English work on water solubility in jet fuels is described. American methods of calculating the calorific value thus avoiding complicated bomb tests are described. Several methods have been developed to test

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S/065/61/000/002/007/008
E194/E284

Methods of Assessing the Quality of Jet Fuels

the corrosive properties of jet fuels, but it is usual to assess the corrosivity from the content of hydrogen sulphide, mercaptans and elemental sulphur. Moguchaya (Ref. 44) has proposed that before the mercaptan content of fuels is determined they should be treated with a 10% solution of ammonia. The absence of elemental sulphur is usually checked by the copper strip test but Ryasnyanskaya and Muzychenko (Ref. 45) have developed a quantitative method of determining elemental sulphur in type T-fuels which is based on the ability of elemental sulphur to react with caustic soda when a mixture of the fuel and isopropyl alcohol is heated, the end products formed being sodium sulphide and hyposulphide which are not hydrolysed under these test conditions. The accuracy of determination of elemental sulphur is 0.0002%. There are 4 figures and 46 references: 26 Soviet and 20 non-Soviet.

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APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

30201
S/080/61/034/011/014/020
D228/D301

11.0137

AUTHORS: Zrelov, V.N., and Melekhin, V.M.

TITLE: Investigating the influence of phenol and amino compounds on the sediment-forming capacity of fuels containing cracking-components

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 11, 1961, 2537 - 2544

TEXT: The author present the results of their investigation into the influence on the sediment-forming capacity of aviation fuel of certain antioxidant ingredients: 6 phenols, 18 amines, 7 oxyamines, and 6 heterocyclic and other nitrogen-bearing compounds. The studied fuels which are used in gas-turbine engines, have a 30 % content of cracking-components and consists of two types: low sulfur Groznyy oil and Tatar oil containing 0.38 % S. The sediment forming capacity of these fuels was assessed at 120° by a method which also permits simultaneous determination of their corrosive aggressiveness and the magnitude of the deposit on the surface of

30201

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D228/D301

Investigating the influence of ...

ББ-24 (VB-24) bronze. The experimental data suggest that such antioxidants have little effect on the sediment-forming capacity of both kinds of fuel. They cannot be employed together with metal deactivators; the addition of salicyliden-o-aminophenol, n-oxydiphenylamine, and shale- and coal-phenols diminishes the degree of sediment-formation in low-sulfur fuel, but the amount of material precipitated on the bronze - through the reaction of salicyliden-o-aminophenol with Cu - markedly increases at the same time. The greatest reduction of sediment that may be achieved by means of certain phenols, primary monoamines, polyamines, and aminophenols does not exceed 50 - 70 %. Moreover, only β-naphthol in a concentration of 0.001 % is equally effective for both types of fuel. Amines and oxyamines appear to be more efficient antioxidants for sulfurous fuel, while phenols are better in low-sulfur fuel-. But high concentrations of diatomic phenols increase the fuel's corrosive aggressiveness. With regard to heterocyclic and other nitrogen-containing compounds the least amount of residue was noticed in the presence of 0.005 % 2-alkyl(C_9 - C_{12}) imidazolene and triaminotrimethyltrimethylene. In conclusion, the authors mention the

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Investigating the influence of ... S/080/61/034/011/014/020
D228/D301

high antisediment-forming capacity of the amide of stearic acid which prevents any deposition of sediment in hot fuel; however, it cannot be used in the case of hot fuel that is subsequently cooled to room temperature, since precipitation then takes place. There are 2 figures, 6 tables and 7 references: 1 Soviet-bloc and 6 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: C.R. Johnson et al, Ind. Eng. Chem. 46, 10, 2166, 1954; C.B. Biswell et al, Ind. Eng. Chem. 47, 8, 1598, 1955; H.I. Andress, U.S.A. Pat. 2867515 (6.1.1959); D. Dobson, Petroleum 21, 4, 119, 1958.

SUBMITTED: October 31, 1960

Card 3/3

SEMENIDO, Ye.G., prof., doktor tekhn. nauk; ENGLIN, B.A.; PAPOK, K.K., prof. doktor tekhn. nauk; ZARUBIN, A.P.; RAGOZIN, N.A.; SHIMONAYEV, ?.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)

35791
S/120/62/000/001/039/061
E032/E314

24 6720

AUTHOR: Zrelov, V.P.

TITLE: Polarization selectivity of an Sb-Cs photocathode and some problems in the recording of Vavilov-Cherenkov radiation

PERIODICAL: Pribory i tekhnika eksperimenta, no. 1, 1962, 159 - 163

TEXT: A study is reported of the polarization selectivity of 50 photomultipliers of Soviet and foreign manufacture. In the apparatus employed the plane-polarized light was incident at an adjustable angle of incidence to the photocathode and the output of the photomultiplier was measured directly with a microammeter. The photomultipliers investigated were: ФЭУ(FEU)-33 and FEU-24 (Soviet), M-12FS (East Germany), 51-UVP "Dario" and 55-AVP "Dario" (France). Since the light incident on the polarizer from a monochromator was elliptically polarized, the intensity of light polarized in the plane of incidence $I_{\parallel}$ was not equal to the intensity polarized in the

perpendicular direction $I_{\perp}$ and was a function of wavelength. Therefore, a determination was made of $I_{\parallel}/I_{\perp}$ as a function of wavelength. It was found that the above ratio had a maximum at λ = 6 800 Å ($\varphi = 75^{\circ}$). It is pointed out that this polarization selectivity, which is particularly pronounced at near normal incidence on the photocathode, must be taken into account in the recording of Vavilov-Cherenkov radiation. Examination of this effect leads to the conclusion that it is better to detect the Cherenkov reflection after several reflections, by which time it becomes elliptically polarized. If the Cherenkov radiation must be detected directly, i.e. without any reflections, then it is better to use photomultipliers which have a minimum polarization effect. It is pointed out that the discrepancy noted by Millar and Hincks in Ref. 4 (Canad. J. Phys., 1957, 35, 363) between the theoretical and experimental results on the intensity of Vavilov-Cherenkov

Polarization selectivity S/120/62/000/001/039/061
E032/E314

radiation as a function of particle velocity may have been due to polarization effects. There are 5 figures and 2 tables.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute for Nuclear Research)

SUBMITTED: May 9. 1961

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L0625

11.0132

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

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.

Card 1/2

ZHELOV, Vsevolod Nikolayevich; KICHKIN, Grigoriy Ignat'yevich; VIROBYANTS, R.A., retsenzent; MAZITOVA, F.A., retsenzent; ORLOVA, Kh.Ya., retsenzent; YENISHERLOVA, O.M., ved. red.; KREYN, S.E., prof., doktor tekhn.nauk, red.; POLOSINA, A.S., tekhn.red.

[Chromatography in the petroleum and petrochemical industries] Khromatografiia v neftianoi i neftekhimicheskoi promyshlennosti. Pod red. S.E.Kreina. Moskva, Gostoptekhizdat, 1963. 287 p. (MIRA 17:1)

(Petroleum industry) (Petroleum chemicals) (Chromatographic analysis)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRELOV, V.N.; SHCHAGIN, V.M.; MARINCHENKO, N.I.; RYBAKOV, K.V.

Composition of microcontaminations in T-1 fuel from Azerbaijan petroleums. Neftepер. i neftekhim. n. 10:8-11 '63. (MIRA 17:2)

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

Analyzing the microcontaminants and residues in middle distillate fuels. Nefteper. i neftekhim. no. 11:16-18 '63. (MIRA 17:5)

ZRELOV, V.N.; MARINCHENKO, N.I.; SHCHAGIN, V.M.; RYBAKOV, K.V.

Chemical composition of trace contaminants in jet fuels made from sulfur-bearing crude oils. Khim.i tekh.topl.i masel 8 no.11: 57-61 N '63. (MIRA 16:12)

ZRELOV, V.N.; MELEKHIN, V.M.

Effect of esters and salts of hydroxy- and polyamines on the precipitability and corrosion activity of fuels containing cracked constituents. Zhur.prikl.khim. 36 no.2:389-394 F '63. (MIRA 16:3)
(Petroleum as fuel--Additives) (Corrosion and anticorrosives)
(Precipitation (Chemistry))

CHERTKOV, Ya.B.; RYBAKOV, K.V.; ZRELOV, V.N.; MARINCHENKO, N.I.; INOZEMTSEVA, M.N.

Formation of trace impurities in middle-distillate fuels. Zhur. prikl. khim. 36 no.8:1825-1833 Ag '63. (MIRA 16:11)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ACC NR: AP5026359

SUPPL DATA: Jet fuel, fuel thermal stability, fuel test, fuel deposit formation/T-1 jet fuel, TS-1 jet fuel, T-4 jet fuel

ABSTRACT:

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

L 1859-66 EWT(m)/EPF(c)/T WE

ACCESSION NR: AP5024952

UR/0065/65/000/010/0046/0050
665.521.4

AUTHOR: Zrelov, V. N.

TITLE: Mechanism of formation of minute contaminants in jet fuels

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 10, 1965, 46-50

TOPIC TAGS: jet fuel, fuel contamination

ABSTRACT: The mechanism of formation of minute contaminant particles in jet fuels in the course of transport, storage, and aircraft refueling has been studied. M[illegible]scope and electron microscope study of transparent standard jet fuels showed that jet fuels should be regarded as hydrocarbon mixtures containing contaminants whose particle size is typical of [illegible] (less than 1 micron) and finely divided (1—30 micron) systems. [illegible] size and by sedimentation [illegible] composition (see Table 1 [illegible] solid contaminant particles [illegible], corrosion products, mineral contaminants, and vegetable residues) showed that in adsorption capacity, they equal ASK-brand activated silica gel. Therefore, when contamination of fuels from the outside occurs,

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L 1859 -66
ACCESSION NR: AP5024952

...minants adsorb gums and water (the most surface active constituents of the ... until settling ... promote progressive ... of minute contaminants until settling ... from a true solution of gums, which takes ... sediment ... steps (time given for each step) in the ... broken down into ... steps ... gums with solid particles and of solid particles origina... The interaction ... with dissolved water is discussed. Orig. art. has: ... figures and 3 tables. [SM]

ASSOCIATION: none

SUBMITTED: 0...

ENCL: 01

SUB CODE: FP

NO REF SOV: ...

OTHER: 000

ATD PRESS: 4112

Card 2/3

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

L 1859[illegible]6
ACCESSION NR: AP5024952

ENCLOSURE: 01

Table 1. Composition of [illegible] contaminants (%)

Contaminants	From corrosion products		Mineral contaminants		Vegetable residues		Dust particles	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Contaminant particle	Contained by
From corrosion products	Filter (fineness, 75—100 microns)
Vegetable residues	Filter (fineness, 25—50 microns)
Mineral contaminants	Filter (fineness, 20 microns)
Dusty particles	Fraction

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APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

[illegible]

ACCESSION NR [illegible] UR/0286/65/000/015/0067/0067
665.543

AUTHOR: Cherkov, Ya. [illegible]; Shchagin, V. M.

TITLE: Method of removing contaminants from [jet] fuels. Class 2[illegible], No. 17[illegible]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 15, 1965, 67

TOPIC TAGS: jet fuel, fuel additive, fuel contamination

ABSTRACT: An Author Certificate has been issued for a method of removing minute contaminants from [jet] fuels by filtration. To speed up and improve the effec- [illegible] the contaminants is added [illegible]

ASSOCIATION: none

SUBMITTED: 07Feb63 ENCL: 00 SUB CODE: FP

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4111

Card 1/1

ZRELOV, V.N.

Mechanism of the formation of microimpurities in jet fuels.
Khim. i tekh. topl. i masel 10 no.10:46-50 O '65.
(MIRA 18:10)

L 7216-66 EWT(m)/EWP(t)/ETI IJP(c) JD/HW/JG

ACC NR: AP5028677 SOURCE CODE: UR/0318/65/000/011/0007/0010

AUTHOR: Grelov, V. M., Marinchenko, N. I.

ORG: none

TITLE: Formation of deposits in fuel-oil heat exchangers of jet engines

SOURCE: Neftepererabotka i neftekhimiya, no. 11, 1965, 7-10

TOPIC TAGS: jet fuel, fuel deposit formation, heat exchanger

ABSTRACT: A study has been made of deposits formed in the fuel lines of jet fuel-oil heat exchangers. The experiments were conducted with deposits formed from standard T6-z fuel, TS-1 fuel containing 0.16% mercaptan sulfur, and T-7 fuel containing 30% thermal cracking components after 50, over 200, and over 400 hr of service. The [illegible] gums of the deposits were extracted first with chloroform and then with an alcohol-benzene mixture. The insoluble portion of the deposits was removed mechanically. Microanalysis showed that the chloroform-soluble gums are mainly oxidation products of unstable hydrocarbons, while the alcohol-benzene-soluble gums are oxidation products of organosulfur and organonitrogen compounds. The insoluble deposits were corrosion products of copper (sulfates, oxide). Increasing the service time, temperature, and cracking component concentration or mercaptan sulfur content in the fuel [illegible] the amount of deposits formed. Erosion or rinsing corrosion products or of mineral impurities in the fuels played little part in the

Card 1/2 UDC: 62-714:66.065

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6

ACC NR: AP5028677

formation of deposits in the heat exchangers, even at elevated temperatures. Orig. art. has 3 tables. [BO]

SUB CODE FP SUBM DATE none ORIG REF 005/ ATD PRESS: 4d / 5c /

Card 2/2

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

L 22691-66 EWT(m)/T WE

ACC NR: AP6007937 SOURCE CODE: UR/0318/66/000/001/0009/0011

AUTHOR: Zrelov, V. N.; Rybakov, K. V.

ORG: none

TITLE: Changes in the contamination of jet fuels during storage after filtration

SOURCE: Neftepererabotka i neftekhimiya, no. 1, 1966, 9-11

TOPIC TAGS: jet fuel, fuel storability, fuel contamination, fuel filtration

ABSTRACT: A study has been made of the effect of preliminary filtration on jet fuel [illegible]ation in storage. T-1 jet fuel conforming to GOST 10227-62 specifications was used. Fuel samples were filtered at the same rate through each of three filter media, [illegible] a nonwoven filter medium. After filtering, [illegible] were stored for [illegible] months in small containers with or without air access. The number and particle-size distribution of [illegible] contaminants present in the fuel was determined periodically through the use of a 180X microscope. The experimental results are given in tabular and graphic form in the source. It was found that filtration of the fuels through each of the three filter media caused contaminant peptization to increase the number of colloidal and finely divided contaminant particles. This colloidal system remained stable for only one month of storage. Then, rapid coagulation of the colloidal system began, with the formation of particles typical of

UDC: 621.45.002.637.004.4:66.067.12

Card 1/2

ACC NR: AP6007937

fine- and large- particle size suspensions. To a greater extent than twill, swanboy cloth and the nonwoven medium removed oxidation products of organo-sulfur and -nitrogen compounds from the fuel, and, as a result, lowered the coagulation rate of the minute contaminants. Orig. art. has: [illegible].

SUB CODE: 21/ SUBM DATE: none/ ATD PRESS: 4216 [SM]

Card 2/2 Bw

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

Cont

L 46745-66 EWT(m)/T DJ/WE (A,N) SOURCE CODE: UR/0318/66/000/009/0013/0017

ACC NR: AP6032057

52
B

AUTHOR: Zrelov, V. N.; Marinchenko, N. I.

ORG: none

TITLE: Formation of sediments in jet fuels [11]

SOURCE: Neftepererabotka i neftekhimiya, no. 9, 1966, 13-17

TOPIC TAGS: jet fuel, fuel storability, fuel thermal stability, fuel contamination, fuel deposit formation, fuel sediment formation/TS-1 jet fuel, T-1 jet fuel

ABSTRACT: A study has been made of the composition of sediments formed in TS-1 and T-1 jet fuels 1) on prolonged storage and 2) on heating to 150C. It is noted that sediments cause premature clogging of fuel filters, deposits in oil—fuel heat exchangers, and accelerated wear of fuel systems, and that sediments contribute to the build-up of static electricity on fuel transfer. The sediments, whose elemental composition is given in the original article, were separated into seven components: water-soluble organic compounds, acid inorganic compounds, methanol-soluble neutral organic compounds, ethyl ether-soluble neutral organic compounds, acid organic compounds, pounds, sulfates, and solid residue. The percentage and chemical composition of these components were determined and are given in tabular form in the original article. It was found that the following products take part in sediment formation both on storage and at elevated temperatures: solids consisting of iron, silicon,

UDC: 665.635—4:629.13

Card 1/2

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

calcium, manganese, aluminum, and sodium compounds and organic salts thereof; sulfates; sulfuric acid; water-soluble and insoluble mono- and bi-nuclear aromatic hydroxy acids, bi- and tri-nuclear aromatic acids; and neutral high-molecular-weight gums which are products of the further polymerization of neutral resins found in the fuel and formed by the polymerization of olefinic-aromatic alcohols. On prolonged storage, sediment formation occurs mostly on account of iron corrosion products of mineral contaminants containing silicon, calcium, magnesium, aluminum, and sodium compounds, and of sulfates. The part played by organic gum-type products is small. On heating to 150C, sediment formation occurs mostly due to organic products. The part played by sulfuric acid, sulfates, and copper corrosion products increases. The share of iron corrosion products and mineral contaminants decreases. To prevent sediment formation on storage, it is recommended that storage tanks be provided with anticorrosion coatings [unspecified] and equipped with air filters to prevent contamination from the outside air. To decrease sediment formation at elevated temperature, jet fuel thermal stability should be improved by better removal of unstable and resinous products at the refinery or by the use of the highly effective additives [unspecified; no reference given] recently developed for this purpose. [Microbiological contamination is not discussed].

[BM]

SUB CODE: 21/ SUBM DATE: none/ ORIG REF: 010/ ATD PRESS: 5088

Card 2/2

L 41934-66 EWT(m)/T/EWP(t) IJP(c)

ACC NR: AP6029039 (A) SOURCE CODE: UR/0413/66/000/014/0055/0055

INVENTOR: Chertkov, Ya. B.; Zrelov, V. N.; Shchagin, V. M.; Pel'dshteyn, M. S.; Rybakov, K. V.

ORG: none

B
46

TITLE: Method of removing minute contaminants from [jet] fuels!!" Class 23, No. 183859

SOURCE: Izobret prom obraz tov zn, no. 14, 1966, 55

TOPIC TAGS: jet fuel, fuel additive, fuel contamination, ~~coagulant additive~~ coagulation

ABSTRACT: An Author Certificate has been issued for a method of removing minute contaminants from [jet] fuels as per Author Certificate No. 173363 but involving sulfenamide derivatives [unspecified] of 2-benzothiazole as the coagulating additive. [Author Certificate No. 173363 concerned a method of removing minute contaminants by filtration, featuring the addition to the fuel of octadecylamidoxylbutyric acid [sic] as a coagulating additive to increase the speed and degree of purification]. [SM]

SUB CODE: 21/ SUBM DATE: 02Nov63/ ATD PRESS: 5061

Card 1/1 egh UDC: 665.541

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6

AP6005514 SOURCE CODE: UR/0256/66/000/001/0083/0084

AUTHOR: Ireley, V. M.; Engineer, Lieutenant Colonel, Candidate of Technical

TITLE: Prevention of jet fuel contamination

SOURCE: Vestnik protivovozdushnoy oborony, no. 1, 1966, 83-84

TOPIC TAGS: jet fuel, fuel contamination, fuel storage, aircraft fuel system

Card 1/2

UDC: 621-732

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

L 16674-66

ACC NR: AP6005514

sible to decrease substantially the contamination of aviation fuels in [illegible] storage [illegible] system [illegible] filtration during aircraft fuel- [illegible] operations.

Card

CHERTKOV, Ya.V.; RYBAKOV, K.N.; ZHELOV, V.N.; FOMISHENKO, B.A.

Efficiency of fuel storage filters. Transp. i khran. nefti no. 3:22-25 '63. (MIRA 17:7)

1. NII-25

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRILOV, V.N.

Energy-producing characteristics of fuels for aviation gas-turbine engines. Nefteper. i neftekhim. no.1:22-26 '64. (MIRA 17:6)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6

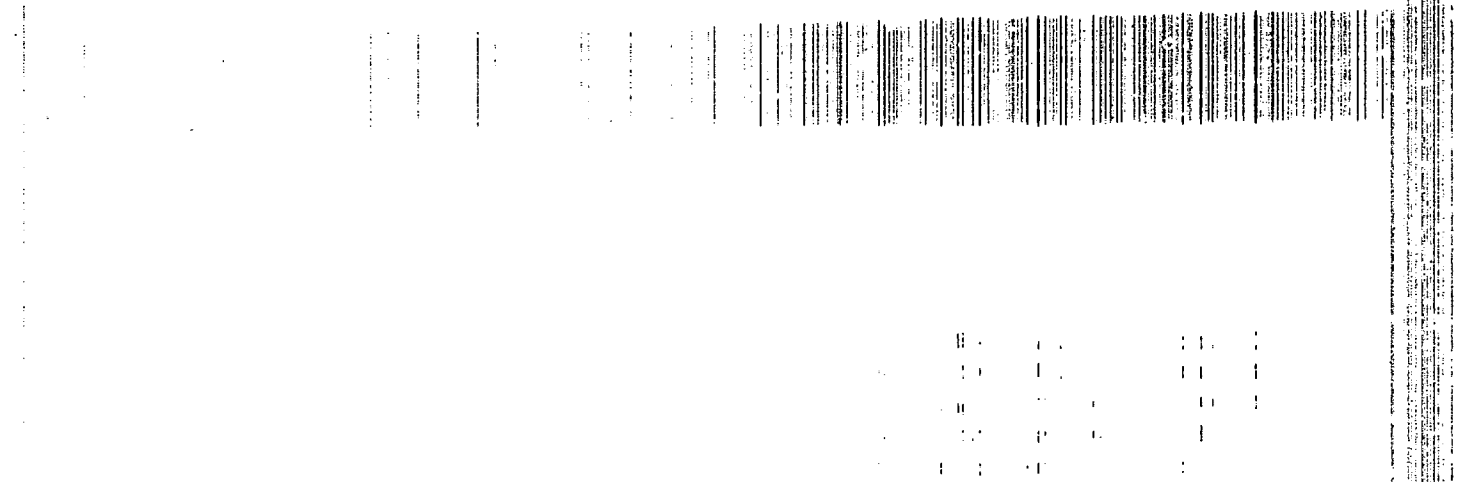
APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRELOV, V.N.; RYBAKOV, K.V.

Improving the filtration of jet fuels in an aerodrome fuel warehouse. Neftepер. i neftekhim. no.5:20-22 '64. (MIRA 17:8)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"



APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRELOV, V.I.; GINDILIS, L.M.; VZOROV, I.K.

Energy spectra of π^+ mesons in the pp-$np\pi^+$ reaction at 556 and 657 MeV (II/57a)

Magnetic analysis of the pp-$np\pi^+(I)\pi^0 pp$-pn (II) and pp-$d\pi^+$(III) reactions at the energy of 550 MeV (II/57b)

CERN-Symposium on High Energy Accelerators and Pion Physics.

Geneva 11-23 June 56
In. Branch #5

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6

ZRELOV, V.P., MEGANOV, B.S., SHABUDIN, A.F., YERMOV, [illegible] MESCHERYAKOV, M.G

Charged pion production by 660 MeV protons on Be and C
(II/47)

CERN-Symposium on High Energy Accelerators and Pion Physics.

Geneva 11-23 June 56
In. Branch #5

:ZRELOV, V.P.

C-3

USSR/Nuclear Physics

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11093

Author : Meshcheryakov, M.G., Zrelov, V.P., Neganov, B.S., Vzorov, I.K., Shabudin, A.F.

Inst : Institute of Nuclear Problems, Academy of Sciences, USSR

Title : Energy Spectra of Positive Pions in the pp np Reaction at 556 and 657 Mev.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 31, No 1, 45-54

Abstract : The magnetic analysis method was used at an angle of 24° relative to the proton beam to measure the spectra of the positive pions of the pp np reaction at collision energies of 556 and 657 Mev. For an angle of 45°, in the center of mass system, the ratio of the differential cross sections of the reaction pp np amounts to $(d\sigma^+/d\sigma)_{657}$: $(d\sigma^+/d\sigma)_{556}$ 2.2:1. At both

Card 1/2

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11093

collision energies, an average of 80% of the accessible energy is consumed in the formation of a positive pion in one elementary act of the pp→ np π^+ reaction. Comparison of the measured spectra with the energy distributions corresponding to the statistical weights of the final states, calculated under the assumption that the formation of mesons takes place directly, has shown that in the low-energy portion of the positive-pion spectra the matrix element that connects the initial and final states of the pp → np π^+ reaction increases linearly with the momentum of the meson and for equal values of momentum it has approximately the same magnitude for both collision energies.

Z. RELOV, V. P.

USSR/Nuclear Physics C-3

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11094

Author : Meshcheryakov, M.G., Vzorov, I.K., Zrelov, V.P., Neganov, B.S., Shabudin, A.F.

Inst : Not given

Title : Formation of Charged Mesons on Beryllium and Carbon by Protons with 660 Mev Energy.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 31, No 1, 55-62

Abstract : The method of magnetic analysis was used to measure the energy spectra of positive and negative pions, emitted in the p + Be and p + C collisions at an angle of 240 relative to the beam of the 660 Mev protons. The spectra of the positive pions have clearly pronounced maximum at 210 Mev in the laboratory system, while the number of negative pions changes insignificantly in the range from

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APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

USSR/Nuclear Physics

Abs Jour : Ref Zhur - Fizika, No 5, 1957, 11094

60 to 250 Mev. It was observed that the probability of formation of positive pions in collision of protons with the protons bound in the beryllium and carbon nuclei, is at least one third the probability of formation on free protons. The maximum in the spectrum of the positive pions in the center of mass system is located near 100 Mev. The ratio of the positive and negative pion yields for beryllium and carbon was determined over the entire extent of the spectra.
The ratio total yields of the positive and negative pions for these elements is 5.3 ± 0.6 and 7.0 ± 0.8 respectively.

ZRELOV, V.P.

SUBJECT USSR / PHYSICS
AUTHOR MEŠČERJAKOV,M.G., NEGANOV,B.S., VZOROV,I.K., ZRELOV,V.P., SABUDIN,A.F.
TITLE The Magnetic Analysis of the Reactions pp → npπ⁺(I), pp → ppπ⁰ (II) and pp → dπ⁺(III) at an Energy of 660 MeV.
PERIODICAL Dokl.Akad.Nauk,109, fasc.3, 499-502 (1956)
Issued: 9 / 1956 reviewed: 10 / 1956

For the purpose of the determination of further data concerning the character of the production processes of positive pions on the occasion of (p-p) collisions the authors studied the momentum spectra and angular distributions of the secondary protons emitted on the occasion of the reactions I and II at 660 MeV. Independent interest was caused by the possibility of separating (for the purpose of a subsequent determination of their degree of polarization) the deuterons produced on the occasion of reaction III from the total flux of secondary particles. In connection with some further measurements such an experiment permits a complete phenomenological analysis of reaction III including the determination of the ratio between the intensities of the two possible transitions $^1S_0 \rightarrow {}^3S_1$ and $^1D_2 \rightarrow {}^3S_1$, which correspond to the emission of mesons in the p-state. The experiments were carried out with the 6-meter synchrocyclotron of the Institute for Nuclear Problems of the Academy of Science of the USSR. The energy of the protons was (660±3) MeV and the half width of the proton spectrum was ± 5 MeV. The scheme and the setting up of the spectrometer are then discussed.

Dokl.Akad.Nauk,109, fasc.3, 499-502 (1956) CARD 2 / 2 PA - 1424

The relative momentum spectrum of the particles was measured by changing the magnetic field strength. The effect on hydrogen was determined from the difference of the yields of polyethylene- and carbon targets. The momentum spectrum of secondary protons and deuterons determined through an angle of 7° is shown in a diagram. The most intense peak at Hϱ = 4260.10^3 Gauss.cm corresponds to the protons elastically scattered on protons through an angle of 17° (in the center of mass system. The peaks at Hϱ = 4520.10^3 and Hϱ = 2880.10^3 Gauss cm correspond to the deuterons of reaction III scattered under 43° and 153,5° (in the center of mass system) respectively. The experimental and the computed location of the deuteron peaks with respect to the peak of the elastically scattered protons differ by less than 1%.

The continuous spectrum belongs to the secondary protons of the reactions I and II. Its upper limit is in agreement with the computed value (for the investigated reactions 3560.10^3 and 3590.10^3 Gauss.cm respectively). The spectrum of the secondary particles produced on the occasion of (p-p) collisions was also obtained at an angle of 12.2° towards the primary bundle. In this case the deuteron peaks were about Hϱ = 3220.10^3 and Hϱ = 3950.10^3 Gauss.cm. The form of the momentum spectrum of the secondary protons changes considerably with angular distribution. The protons with more than 250 MeV/c are emitted mainly towards the front and the rear, but protons with smaller momenta have a nearly isotropic distribution.

INSTITUTION: Institute for Nuclear Problems of the Academy of Science in the USSR.

ZRELOV, V.P., MESHCHERYAKOV, M.G., NEGANOV, B.S., USANOV, Y.K., SHABUDIN, A.F.

"Energy Spectra of π^+ Mesons in the $pp \rightarrow np\pi^+$ reaction at 556 and 657 MeV," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

ZRIBNYAK, M.; DUNAY, N., kand. sel'skokhozyaystvennykh nauk

Over-all mechanization of corn cultivation. MTS 18 no.8:18 Ag '58.
(MIRA 11:9)

1. Zamestitel' nachal'nika Khar'kovskogo oblastnogo upravleniya sel'skogo khozyaystva (for Zribnyak).
(Corn (Maize)) (Agricultural machinery)

ZRELOV, V.P., NEGANOV, B.S., MESHCHERYAKOV, M.G., VZOROV, I.K., SHAPUDIN, A.F.

"Charged Pion Production by 660 MeV protons on Beryllium and Carbon," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

ZRELOV, V.P., MESHCHERYAKOV, M.G., NEGANOV, B.S., VZOROV, I.K., SHABUDIN, A.F.

"Magnetic Analysis of the Reactions $pp \rightarrow np\pi^+$ (I), $pp \rightarrow pp\pi^0$ (II) and $pp \rightarrow d\pi^+$ (III) at an Energy of 660 MeV," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRELOV, V.P.

Polarization selectivity of an oxygen-cesium photocathode.
Prib. i tekh. eksp. 8 no.6:183 N-D '63. (MIRA 17:1)

1. Ob"yedinennyy institut yadernykh issledovaniy.

ACCESSION NR: AP4034043 S/0020/64/155/006/1449/1451

AUTHOR: Kravchenko, N. A.; Zrelov, V. P.; Klabunovskiy, Ye. I.

TITLE: On enzymatic and optical changes of activity in lysozyme upon irradiation with electrons and protons

SOURCE: AN SSSR. Doklady*, v. 155, no. 6, 1964, 1449-1451

TOPIC TAGS: lysozyme, lysozyme enzymatic activity, lysozyme specific rotation, electron irradiation, proton irradiation, proton energy, electron energy, lysozyme chromatography

ABSTRACT: This activity was studied on crystalline lysozyme from chicken eggs under the influence of comparatively rapid electrons and protons with insignificant ionization losses (2-3 Mev. cm^2/g). Prior to irradiation the ampoule with the lysozyme was evacuated for 1 hour; some tests were conducted without evacuation. For spectroscopic determination a solution of 4 $\mu g/ml$ was used. The activity was determined with acetonized Micrococcus lysodeikticus powder in a 6.2 pH phosphate buffer. Details on the polarimetric conditions are given; a 1% lysozyme solution was used. The protons had an energy of 665 Mev (synchrocyclotron). Results showed

ACCESSION NR: AP4034043

the usual decreased enzymatic activity, and the specific rotation value of the protein increased after irradiation. Electron irradiation was carried out with a Tl^{204} source placed so that only electrons with an energy above 0.35 Mev could reach the enzyme; their average energy was 0.3 Mev, and they constituted 20% of the Tl^{204} electron spectrum. Electron irradiation had the opposite effect on the lysozyme, increasing enzymatic activity which reached 120% at a $3.2.10^5$ dose, and decreasing slowly afterwards. Some decrease of specific rotation was also observed. Enzymatic activity returned to initial values 2-3 months after irradiation. The non-evacuated samples were more stable. Preliminary chromatographic tests showed the increased enzymatic activity to derive from a mixture of the original protein with other more active, as well as partly inactivated products. Orig. art. has: 3 figures.

ASSOCIATION: Institut organicheskoy khimii im. N. S. Zelinskogo Akademii nauk SSSR (Institute of Organic Chemistry, Academy of Sciences, SSSR); Ob"yedinennyy institut yadernykh issledovaniy (Joined Institute for Nuclear Research)

SUBMITTED: 08Jul63 ENCL: 00

Card 2/3

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

L 01134-66 EWT(m) [illegible]

ACCESSION NR: AP5016382 UR/0120/65/000/003/0100/0103
539.1.074.4

AUTHOR: Zrelov, V. P.

TITLE: Unused potentialities of total-internal-reflection Cerenkov counters

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1965, 100-103

TOPIC TAGS: Cerenkov counter, total internal reflection counter

ABSTRACT: Total-internal-reflection (TIR) Cerenkov counters developed hereto-fore (e.g., by G. W. Hutchinson, Progr. Nucl. Phys., 1960, 8, 197) have had a rather low velocity resolution (at best 0.01). The present article suggests two versions of the TIR [illegible] suitable for strictly collimated particle beams and [illegible] as high as that of differential gas [illegible]. Both versions are based on [illegible] sensitivity of the direction of emerging radiation to the angle of the Cerenkov radiation inside the radiator when this angle [illegible] to the TIR angle. In the [illegible] the angle of Cerenkov-radiation reflection

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APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

L 01134-66

ACCESSION NR: AP5016382

by the radiator face perpendicular to the particle-motion direction is measured; a sketch of such a counter with an achromatic system is shown. In the second version, the refraction takes place at the radiator faces parallel to the particle-motion direction; this counter is more complicated in design than the first version. Orig. art. has: 4 figures and 12 formulas.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Nuclear Research Institute)

SUBMITTED: 15May64 ENCL: 00 SUB CODE: NP

NO REF SOV: 003 OTHER: 005

Card 2/2

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRELOV, V.P.

Testing the properties of Vavilov - Cherenkov radiation in a uniaxial calcite. Zhur. eksp. i teor. fiz. 46 no.2:447-456 F '64. (MIRA 17:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

KRAVCHENKO, N.A.; ZRELOV, V.P.; KLABUNOVSKIY, Ye.I.

Change in the enzymatic and optical activity of lysozyme irradiated by electrons and protons. Dokl. AN SSSR 155 no.6:1449-1451 Ap '64. (MIRA 17:4)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR i Ob"yedinennyy institut yadernykh issledovaniy. Predstavlano akademikom B.A.Kazanskim.

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6

ACCESSION NR: AP4019205 S/0056/64/046/002/0447/0456

AUTHOR: Zrelov, V. P.

TITLE: Verification of the properties of Cerenkov radiation in uniaxial Iceland spar crystals

SOURCE: Zhurnal eksper. i teor. fiz., v. 46, no. 2, 1964, 447-456

TOPIC TAGS: Cerenkov radiation, Vavilov Cerenkov radiation, Iceland spar, Cerenkov radiation directivity, Cerenkov radiation polarization, Cerenkov radiation threshold, Cerenkov radiation angular distribution, ordinary wave, extraordinary wave

ABSTRACT: A set of experiments has been devised to check on various properties (directivity, polarization, threshold, and angular distribution of the intensity) of Cerenkov radiation excited by 663-MeV protons with relative velocity $\beta = 0.81$ in a calcite crystal. The proton beam was made to pass through the crystal and through a lens

Joint Inst. Nuclear Research.

Card 1/2

in optical contact with it. The lens served not only to focus the radiation excited in the crystal but also to guide to the outside the radiation trapped by total internal reflection. In addition, the Cerenkov radiation excited by the protons in the lens itself was used as a reference to calculate the angles of the radiation emitted from the crystal. Measurements were made for particles moving along and transverse to the crystal optical axis. Theoretical predictions that a single cone of extraordinary waves is excited by longitudinal particles and that two radiation cones (ordinary and extraordinary) are excited by transverse particles were confirmed by the experiment, as were other theoretical deductions.

"In conclusion I take this opportunity to thank I. M. Frank for a discussion and interest in the work, L. M. Belyayev and A. B. Gil'varg for the calcite crystals, and Professor G. Barwich and G. Jungclausson for help in acquiring the Agfacolor negative film."

Orig. art. has: 9 figures, 13 formulas and 2 tables.

ZRELOV, V.P.

Calculating the intensity of Vavilov-Cherenkov radiation with allowance for dispersion. Zhur. eksp. i teor. fiz. 45 no.2: 291-293 Ag '63. (MIRA 16:9)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Cherenkov radiation)

ZRELOV, V.P.

Two possible methods for measuring the mean energy of a particle beam. Prib. i tekh. eksp. 8 no.2:29-33 Mr-Ap '63. (MIRA 16:4)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Electronic measurements) (Cherenkov radiation)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R000200551001S-6

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZRELOV, V.P.

Polarization selectivity of the Sb-Cs photocathode and some problems in the recording of Cherenkov-Vavilov radiation. Prib.i tekh.eksp. 7 no.1:159-163 Ja-F '62. (MIRA 15:3)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Photoelectric multipliers)(Cherenkov radiation)

ZRELOV, V.P.; STOLETOV, G.D.

Range - energy relationship of 660 Mev. protons. Zhur.eksp. i teor.fiz. 36 no.3:658-668 Mr '59. (MIRA 12:5)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Protons)

21(7) SOV/56-36-6-4/66

AUTHORS: Azhgirey, L. S., Vzorov, I. K., Zrelov, V. P., Meshcheryakov, M. G., Neganov, B. S., Ryndin, R. M., Shabudin, A. F.

TITLE: Interaction Between Protons and Atomic Nuclei at Energies of 660 Mev and the Intra-nuclear Distribution of the Nucleon Momenta (Vzaimodeystviye protonov s atomnymi yadrami pri energii 660 MeV i vnutriyadernoye raspredeleniye impul'sov nuklonov)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1631 - 1649 (USSR)

ABSTRACT: Apart from theoretical discussions, this very detailed paper above all deals with the momentum distribution in quasi-elastic proton-nucleon collisions, and gives a detailed description of the experiments carried out as well as a great number of experimental data concerning the angular distributions and energy spectra of secondary particles (mainly protons with energies of $\gtrsim$ 60 Mev) emitted at angles of 7, 12.2, 18, 24 and 30° in reactions between 660 Mev protons and nuclei of Be, C, Cu and U. Table 3 gives for all 4 elements the $d\sigma/d\omega$ measured for 8 different emission angles ϕ between 7 and 40°.

Thus, the following was found for $\phi = 7^{\circ}$: $d\sigma/d\omega = (1.100 \pm 0.055).10^{-24} cm^2$/steradian, for 40° $(0.074 \pm 0.004).10^{-24} cm^2$/steradian. Figure 2 shows these results in form of a diagram. It is found that in the general sense, the dependence of $d\sigma/d\omega$ on A decreases with a decrease of ϕ. The 4 diagrams in figure 3 show the energy spectra of the charged secondary particles at 7°, the following figures each show (in 4 diagrams) the energy spectra for the other angles. At 7° the characteristic peak ($d^2\sigma/d\omega\, dE$ in $10^{-27} cm^2$/steradian.Mev is the ordinate) is narrow and is practically near 660 Mev; a second maximum is only vaguely discernible and a weak minimum can be observed only in the case of Cu at about 500 Mev. At 12.2° the peak is already broader and shifted somewhat towards lower energies; the minima are more marked and are at energy values of somewhat below 500 Mev. At 18° these peaks are still broader and are found already at energies of < 600 Mev; the minima are especially low in the case of Cu and U at about 400 Mev. At 24° the broad maxima (especially in the case of U)

are at about 500 Mev, the minima are distinctly observable at about 400 Mev; in the case of U the ordinate values are about $E < 200$ Mev above the maximum at $\sim$ 500 Mev. At 30° this development is more marked; the maxima are flat and are at about 400 Mev; Cu and U have very high ordinate values at low energies, which decrease to a minimum at about 300 Mev, after which they again increase somewhat and again decrease sharply towards zero with increasing energies. In general, the cross sections for the emission of such secondary particles increase with a decrease of the angle. Passing from high to low energies, the spectral regions of the investigated elements correspond to diffractional scattering of protons on nuclei (small angle region), single quasi-elastic proton-nucleon collisions, pion production on bound nucleons and intranuclear cascade processes, respectively. In chapter 5 of this paper the authors compare the experimental energy spectra for quasi-elastic proton-nucleon scattering with the calculated spectra (in momentum approximation under various assumptions with respect to the momentum distributions of the nucleons in the nucleus) (Figs

8 and 9). In the case of p-Be- and p-C-scattering agreement is found (between experiment and theory) when using a Gaussian momentum distribution having a 1/e-value at about 20 Mev, which is in keeping with the results obtained in Berkeley. The authors finally thank R. N. Fedorova and I. V. Popova for programming and carrying out calculations, and further also S. M. Bilen'kiy, N. P. Klepikov, L. M. Soroko and N. A. Chernikov for valuable discussions. There are 9 figures, 3 tables, and 25 references, 6 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: December 20, 1958

AUTHORS: Zrelov, V. P., Tyapkin, A. A., Farago, P. S. SOV/56-34-3-4/55

TITLE: Measurement of the Proton Mass at 660 MeV (Izmereniye massy protonov pri energii 660 MeV)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 555-558 (USSR)

ABSTRACT: The present work compares the values computed by means of the relativistic relation $m_2 = m_0\left[1 - (v^2/c^2)\right]^{-1/2}$ based on the velocity measured with the values $m_1 = p/v$ of the mass which were determined from the measured momenta and velocities of protons. The measurements were made on an external proton beam with about 660 MeV which made essentially easier the determination of possible errors. The general scheme of the measuring device is shown in a diagram. The external beam of a 6 m-synchrocylotron passes a system of collimators, then was deflected within the field of an electromagnet with a pole diameter of 1 m, passed a second collimator and then impinged upon ionization chamber. The control measurements are also described. In the determination of the momentum of protons by means of a current carrying conductor the values

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Q = 300.0± 0.3 and I = 0.681±0.001 amp. were obtained. Q denoting the load applied to a silk thread. From this the value p = 1296,5±2.3 MeV/c is obtained for the momentum. Various measurements carried out at Q = 200,0 g showed results which coincide within the limit of measuring errors with earlier obtained results. Various details of the measurements are discussed. Also the second correction of the energy loss in air must be taken into account which amounts to $\Delta E_2 = 1,5$ MeV. The total correction of the energy amounts to $\Delta E = \Delta E_1 + \Delta E_2 =$ = 8.1 MeV. The authors intend to determine the deviations from the fundamental law of relativistic theory $m = m_0 [1-(v^2/c^2)]^{1/2}$, and use relativistic relations in the determination of the corrections ΔE and Δv. When the found values for the momentum and velocity of the protons are taken into account $m_1 = p/v = 1598.2 \pm 3$ MeV $/c^2$ and $m_2 = m_0 [1-(v^2/c^2)]^{-1/2}$ = 1604.3 ± 1.9 MeV/c^2 are obtained. From this further results $\Delta m = m_2 - m_1 = 6.1(1 \pm 0.3)$ or $\Delta m/m = 0,004(1 \pm 0.3)$. The errors mentioned are the mean square deviations. Thus the results obtained here coincide with the relativistic law for the increase of mass with increasing velocity within the error limits mentioned.

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Measurement of the Proton Mass at 660 MeV SOV/56-34-3-4/55

There are 1 figure and 9 references, 2 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy
(United Institute for Nuclear Research)

SUBMITTED: September 12, 1957

Card 3/3

21(1) SOV/56-36-3-3/71

AUTHORS: Zrelov, V. P., Stoletov, G. D.

TITLE: The Range-Energy Ratio for Protons of 660 Mev (Sootnosheniye probeg - energiya dlya protonov 660 MeV)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 658-668 (USSR)

ABSTRACT: In the introduction the fact is discussed that, according to the theory of ionization losses, the average ionization potential I of the matter through which the charged particles pass, is assumed to depend only on the atomic properties of matter but not on the velocity of the particles passing through it; actually, however, experimental data show (as shown in table 1) that for elements with Z > 13, I has the tendency of increasing with an increase of particle velocity. The present paper contributes towards explaining these conditions by means of an experimental investigation of the range-energy ratio in copper in the case of a proton energy of 660 Mev. The proton beam, which is homogeneous up to ±4 Mev, was produced by the synchrocyclotron of the OIYaI. Figure 1 shows the experimental arrangement, which is, however, not further described. The method is based upon using the Cherenkov effect.

Determination of proton velocity was carried out by the exact measurement of the angle of emission of Cherenkov radiation in plexi-glass. Whereas, in the case of a flux of 10^6 protons/cm^2.sec comparatively thick emitters (2.9 g/cm^2) and an exposure of 3 minutes was necessary (Ref 11), it was possible, by increasing intensity to 4.10^7 protons/cm^2.sec, to reduce exposure to 3 - 5 seconds (Ref 11). (The photographic camera used had a "Jupiter-3" 1:1.5 lens; a "Negativ-A" film with a sensitivity of 50 GOST-units was used.) Measurement of refraction indices was carried out by means of the refractometer IRF-23 for λ = 5461 Å and amounted to 1.4926 ± 5.10^{-4} (absolute). The angle of emission of Cherenkov radiation was determined for this λ as amounting to $\theta = (34^\circ\ 0.5') \pm 3'$, and proton energy according to formula (4) as 938.2 Mev; for the emitter center 654.9, and, if slowing down was taken into account, 658.4 Mev was measured. The error Δ E is given as amounting to $\pm$ 2.1 Mev. Together with proton energy measurement, the total range in copper was measured as amounting to (257 $\pm$ 1.2) g/cm^2. (Figure 1b shows the experimental arrangement). Results are discussed in detail. From the results obtained by energy- and range measurements

the ionization potential is then calculated in the following according to

$$R = \int_0^E \left(\frac{dE}{dx}\right)^{-1} dE$$

(R = proton range in g/1 cm^2, dE/dx - ionization losses in Mev/g; dE/dx is obtained according to the Bethe (Bete) formula (Ref 15)). It is determined as amounting to I_{Cu} = (305±10)ev, a value which agrees well with that obtained by Mather and Segrè (Mazer, Segre) (Ref 6). The value was calculated on the assumption that the ionization potential is independent of particle velocity. Finally, the authors give results concerning measurements of the relative stopping power for H, Be, C, Fe, Cu, Cd and W for 635 Mev protons (Table 2) and they discriminate results in the last paragraph. They thank Yu. D. Prokoshkin and I. M. Vasilevskiy for discussions and for data concerning the absolute energy losses of 650 Mev protons. There are 4 figures, 2 tables, and 20 references, 5 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (**Joint** Institute

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AZHGIREY, L.S.; VZOROV, I.K.; ZRELOV, V.P.; MESHCHERYAKOV, M.G.; NEGANOV, B.S.; SHABUDIN, A.F.

Knockout of deuterons from Li, Be, C, and O by 675-Mev protons. Zhur. eksp. i teor. fiz. 33 no.5:1185-1195 N '57. (MIRA 11:3)

1. Ob"yedinennyy institut yadernykh issledovaniy.
(Nuclear reactions) (Deuterons) (Protons)

APPROVED FOR RELEASE: Thursday, September 26, 2002 CIA-RDP86-00513R002065510015-6"

ZHELOV, V.P.; TYAPKIN, A.A.; FARAGO, P.S.

Measurement of the mass of 660 Mev protons. Zhur.eksp. i teor. fiz. 34 no.3:555-558 Mr '58. (MIRA 11:4)

1.Ob"yedinennyy institut yadernykh issledovaniy.
(Protons)

ZRELOV, V.P.

56-5-19/46

AUTHOR: Azhgirey, L.S., Vzorov, I.K., Zrelov, V.P., Meshcheryakov, M.G., Neganov, B.S., Shabudin, A.F.

TITLE: The Knocking Out of Deuteron from the Nuclei Li, Be, C and O by 675 MeV Protons (Vybivaniye deytronov iz yader Li, Be, C i O protonami s energiyey 675 MeV)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 5, pp. 1185-1195 (USSR)

ABSTRACT: With the help of the magnetical analysis below 7,6°, with respect to the primary proton ray, the momentum spectrum of the charged particle was recorded which is produced when deuterium, lithium, beryllium, carbon and oxygen are bombarded by 675 MeV protons. The occurrence of deuteron groups with an energy of ~ 600 MeV was observed for all five elements. In the case of deuterium the fast deuterons result from the elastic scattering of the protons by deuterons. In all other cases the production mechanism of the reaction must be ascribed to p + (Z,A) → d + p + (Z - 1, A - 2). These reactions, therefore, correspond to the scattering of the protons by the quasi-deuteron groups within the target nucleus. The following differential cross sections were measured:

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