

USSR

KARTUZHANSKIY, A. L., TROFIMOVA, L. G., YURCHENKO, A. F.

UDC 77

"Secondary Processes in the Aging of Photographic Layers"

V sb. Mezhdunar. kongress po fotogr. nauke, Moskva, 1970, Priroda fotogr. chuvstvitel'nosti (International Congress on Photographic Science, Moscow, 1970, Nature of Photographic Sensitivity -- Collection of Works), no place of publication given, Vneshtorgizdat, no year given, pp 171-184 (from RZh-Fizika, No 12(I), Dec 70, Abstract No 12D1325)

Translation: The results of experiments to isolate and identify the separate processes occurring in photographic layers under storage and complicating the elementary picture of aging as the growth of all sensitivity centers under normal aging and the dissipation of all sensitivity centers in anomalous aging are considered. The process caused by the change in the size of the sensitivity centers (the growth of deep centers due to surface centers) and essential in those cases of exposure when the participation of deep sensitivity centers is considerable (the action of brief exposure and of ionizing particles) is explained.

1/2

USSR

KARTUZHANSKIY, A. L., et al, Mezhdunar. kongress po fotogr. nauke, Moskva, 1970, Priroda fotogr. chuvstvitel'nosti, no place of publication given, Vnesh-torgizdat, no year given, pp 171-184

Also explained is the existence of processes not associated with a change in the dimensions of the sensitivity centers but with conditions for their functioning. Among these is the effect of moisture, the adsorption of which not only lowers the height of the potential barrier of the sensitivity centers but also affects deep sensitivity centers (without contacting them) by changing their equilibrium with surface sensitivity centers. Included in this group of processes is the effect of an optical sensitizer, which in the initial form has p-type acceptor properties and does not compete with surface sensitivity centers but forms a complex with  $O_2$  in the course of aging, taking on electron-acceptor properties and competing with surface sensitivity centers the more a part of it goes into the complex. 12 references. A. L. Kartuzhanskiy.

USSR

UDC 615.285.7.065:639

TRCFIMOVA, M. G., and MITRCFANOV, A. M., Institute of Medical Parasitology and Tropical Medicine imeni Ye. P. Martsinovskiy, Ministry of Health USSR, Moscow

"Effect on Aquatic Organisms of Granulated DDT Applied for the Control of Mosquitoes"

Moscow, Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 41, No 5, Sep-Oct 72, pp 620-622

Abstract: Ten percent granulated DDT in the amount of 5 kg/ha dusted from aircraft was used on an experimental basis for the control of Aedes mosquitoes in the vicinity of the town of Mirnyy in the Yakut ASSR. A study carried out on three bodies of water with areas in the range from 4.5 to 9.0 sq. m. and a depth of 0.3-1.5 m showed that the larvae of Aedes mosquitoes were exterminated completely in 24 hrs. The DDT accumulated in the bottom silt, killing the Chironomidae that inhabited the bottom layer. The Copepoda and Cladocera distributed throughout the thickness of the water did not diminish in number, but in the case of Copepoda even increased in comparison with the amount present in bodies of water not treated with DDT. DDT was not present either in the upper layers of water or in the water vegetation.

1/1

USSR

UDC 539.21:536.42

SIROTA, N. N. and TROFINOVA, Zh. P.

"Investigating Ordering Processes in Films Similar in Composition to  $Ni_3Fe$ "

V sb. Kristallizatsiya i faz. prevrashcheniya (Crystallization and Phase Transformations--collection of works) Minsk, "Nauka i tekhn." 1971, pp 146-151 (from RZh-Fizika, No. 9, 1971, Abstract No. 9E350)

Translation: The ordering process in ferromagnetic films similar in composition to  $Ni_3Fe$  was studied. The investigation was made by measuring the electrical resistivity of the films directly in the course of isothermic annealing. For the sake of comparison, similar curves were plotted for nickel films. Analysis of the results obtained permit the assertion that regions of the  $Ni_3Fe$  compound are formed and grow along with the annealing processes of defects in permalloy films. Author's abstract

1/1

USSR

UDC:629.78.002.3

TROFIMOVICH, A. N., TVERDOKHLEB, S. I., KRAVETS, N. I.

"Self-Lubricating Antifriction Material Based on Thermally Stable Aromatic Polyamides"

Probl. Treniya i Iznashivaniya. Resp. Mezhved. Nauch.-Tekhn. Sb. [Problems of Friction and Wear. Republic Interdepartmental Scientific and Technical Collection], 1973, No 4, pp 119-123 (Translated from Referativnyy Zhurnal Raketostroyeniye, No 10, 1973, Abstract No. 10.41.164 from the resume)

Translation: Laboratory studies of new self-lubricating thermally stable materials based on aromatic polyamides with teflon are performed. The dependence of physical-mechanical and antifriction properties on content of teflon is demonstrated and the optimal quantity of filler is established. The maximum wear resistance is achieved by a material based on poly-m-p-phenylene isophthalamide containing 15-20% teflon. 3 Figures; 2 Tables; 11 Biblio. Refs.

1/1

- 73 -

UNCLASSIFIED

PROCESSING DATE--09OCT70

TITLE--THE ANTIFRICTION PROPERTIES AND WEAR RESISTANCE OF THE HEAT  
RESISTANT PLASTIC FENILON -U-  
AUTHOR--(04)--TROELMOVICH, A.N., PRIKTODKO, O.G., FOMICHEV, I.A.,  
SOLODOVNIKOV, N.S.  
COUNTRY OF INFO--USSR

SOURCE--MOSCOU, VESTNIK MASHINOSTROYENIYA, NO 2, 1970, PP 50-51  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--WEAR RESISTANCE, HEAT RESISTANCE, POLYAMIDE RESIN, FRICTION  
TEST, HIGH TEMPERATURE EFFECT, MACHINE INDUSTRY/(U)FENILON POLYAMIDE  
RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1993/0889

STEP NO--UR/0122/70/000/002/0050/0051

CIRC ACCESSION NO--AP0113732

UNCLASSIFIED

CIRC ACCESSION NO--AP0113732  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--09OCT70

ABSTRACT. THE LOW HEAT RESISTANCE OF POLYMERS RESTRICTS THEIR APPLICATION AS ANTIFRICTION MATERIALS AT FRICTION NODES OF MACHINES. RECENTLY A NUMBER OF HEAT RESISTANT POLYMERS HAS BEEN DEVELOPED, WHICH RETAIN THEIR BASIC PROPERTIES AT 250-300DEGREESC AND HIGHER. AMONG SUCH MATERIALS ARE AROMATIC POLYAMIDES, A REPRESENTATIVE OF WHICH IS FENILON, ITS VITRIFICATION TEMPERATURE IS 280DEGREESC. IT IS PROCESSES BY PRESSING INTO A PLASTIC WITH SUFFICIENTLY HIGH PHYSICAL AND MECHANICAL PROPERTIES. AN INVESTIGATION WAS MADE OF THE ANTIFRICTION PROPERTIES AND HEAT RESISTANCE OF FENILON UNDER CONDITIONS OF NORMAL AND INCREASED TEMPERATURES FOR VARIOUS FRICTION CONDITIONS IN ORDER TO DETERMINE THE POSSIBILITIES OF ITS APPLICATION IN FRICTION NODES OF MACHINES. FENILON MANIFESTED A COMPARATIVELY SMALL AMOUNT OF WEAR UNDER TEMPERATURE CONDITIONS IN WHICH LESS HEAT RESISTANT POLYMER PLASTICS CANNOT FUNCTION. IN SPITE OF THE INCREASED WEAR WITH A HIGHER TEMPERATURE, THE SAMPLE REMAINED HARD, WITH NO SIGNS OF VOLUMETRIC DEFORMATION, OR OTHER SYMPTOMS OF HEAT DAMAGE. THE CONDUCTED TESTS INDICATE THAT FENILON CAN FIND APPLICATION AS A MATERIAL FOR FRICTION NODES OF HEAVILY LOADED MACHINES.

UNCLASSIFIED

USSR

UDC: 629.78.002.3

TROFIMOVSKAYA, L. S., NEMCHENOK, L. S., and KOZLOV, S. G.

"Materials for the Cages of Instrument Ball Bearings"

Tr. Leningr. in-t aviats. priborostr. ("Works of the Leningrad Institute of Aviation Instrument Building), 1971, vyp. 73, pp 97-102 (from RZh-41. Raketostroyeniye, Moscow, No 3, Mar 1972, Abstract No 3.41.242)

Translation: The authors present the results of a study on the wear resistance and coefficient of friction of the AFQM-80 materials, DE3 sheet graphite and textolite on a polished base, all of which can be used for cages of high-speed bearings. Original article: four illustrations, one table, and two bibliographic entries. Resume.

1/1

- 49 -



USSR

UDC 621.771.07

TROFIMOVSKIY, V. A., RUDNITSKIY, L. S., BERKOVSKIY, V. S., YELIZAROV, I. I.,  
and AVRUNIN, P. M., Lutuginskiy Plant of Rolling-Mill Rolls; Moscow Insti-  
tute of Steels and Alloys; "Dneprospetsstal" Plant, "Dnepropetrovsk Metal-  
lurgical Institute

"Rolls for Rolling Hard-to-Work Steels"

Moscow, Metallurg, No 1, Jan 71, pp 31-34

Abstract: Rolling-mill rolls from both low-alloy and plain carbon cast iron steels with lamellar graphite, which have been used in the past did not provide proper-quality rolling stock or make possible rhythmic operation of the mills. In recent years extensive use has been made of alloyed quality steels having a higher hardness value and a low rolling temperature range. As a result, the industry faces higher requirements with respect to the wear resistance of passes and over-all service strength. This study involves rolls from cast iron injected with magnesium and cerium with a lower content of chromium, silicon, and phosphorus. Spheroidal graphite and a compact-grained structure stemming from reduced contents of chromium and silicon as well as from injection with magnesium have given the rolls good wear resistance, low  
1/2

USSR

TROFIMOVSKIY, V. A., et al, Metallurg, No 1, Jan 71, pp 31-34

uniform frictional wear, and surface finish. Low phosphorus (up to 0.28%) and chromium (up to 0.3%) contents provide the required strength since the number of brittle components (carbides) is reduced. The new rolls have been introduced on all break-down and prefinishing stands of the Dnepros-petsstal' Plant. Tables in the original article cite test results of mechanical properties of rolls from magnesium cast iron and cast iron with lamellar graphite as well as comparative data on the resistance of both experimental and ordinary rolls.

2/2

- 90 -

172 024

TITLE--SCIENCE IN SIBERIA -U- UNCLASSIFIED

PROCESSING DATE--16OCT70

AUTHOR--(02)--LAVRENTYEV, M.A., TROFIMUK, A.A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, PRIRODA, NO. 1, 1970, PP 2-6

DATE PUBLISHED-----70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--R AND D MANPOWER SUPPLY, SCIENCE CENTER, SCIENCE ACADEMY  
MEMBERSHIP, SCIENTIFIC PERSONNEL, ACADEMIC PERSONNEL, ACADEMIC  
INSTITUTION, UNIVERSITY, ACADEMY OF SCIENCE R AND D, HIGHER EDUCATION  
INSTITUTE R AND D/(U)NATIONAL ACADEMY OF SCIENCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1987/1433

STEP NO--UR/0026/70/000/001/0002/0006

CIRC ACCESSION NO--AP0104743

UNCLASSIFIED

GIRC ACCESSION NO--AP0104743  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--16OCT70

ABSTRACT. THE HISTORY, ORGANIZATIONAL COMPOSITION, AND SOME OF THE RECENT ACTIVITIES OF THE SIBERIAN BRANCH OF THE USSR ACADEMY OF SCIENCES ARE DESCRIBED BRIEFLY. AT PRESENT, THERE ARE 24 ACADEMICIANS, 51 CORRESPONDING MEMBERS, MORE THAN 2000 DOCTORS AND CANDIDATES OF SCIENCES AND ABOUT 24,000 OTHER SCIENTIFIC AND TECHNICAL PERSONNEL WITHIN THE SIBERIAN BRANCH. THE HEADQUARTERS OF THE SIBERIAN BRANCH IS AT NOVOSIBIRSK, WHICH ALSO INCLUDES 17 VARIOUS RESEARCH INSTITUTES. THERE ARE ALSO REGIONAL SCIENTIFIC RESEARCH CENTERS AT IRKUTSK, KRASNOYARSK, VLADIVOSTOK, AND YAKUTSK, WITH SMALLER FACILITIES AT ULAN-UDE, MAGADAN, PETROPAVLOVSK-KAMCHATKA, AND ON SAKHALIN ISLAND. MOST OF THE ARTICLE DEALS WITH THE PAST ACHIEVEMENTS AND PRESENT ACTIVITIES OF THE VARIOUS DEPARTMENTS IN PHYSICOMATHEMATICAL, GEOLOGICAL, MINERALOGICAL, GEOGRAPHICAL, BIOLOGICAL, AND CHEMICAL SCIENCES. IN CONCLUDING IT IS STATED THAT ALL OF THE LEADING SCIENTISTS ALSO WORK AT THE UNIVERSITY AT NOVOSIBIRSK.

UNCLASSIFIED

Organometallic Compounds

USSR

UDC 539.193:547.242

KONDRAT'YEVA, O. I., TROITSKAYA, A. D., CHADAYEVA, N. A., CHUYKOVA, A. I.,  
USACHEVA, G. M., and IVANTSOV, A. Ye., Kazan' Chemical Technological  
Institute Imeni S. M. Kirov and Kazan' Institute of Organic and Physical  
Chemistry Imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Investigation of the Complex Compounds of Chromium (I) With Organic  
Derivatives of Arsenic by the EPR Method"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 9, Sep 73, pp 2087-2088

Abstract: Eight new complex compounds of chromium (I) with organic derivatives  
of arsenic (III) were obtained in acetone solution. The reaction occurred  
instantaneously at room temperature with a slight excess of the arsenic com-  
ponent. It was found that changes even in remote areas surrounding arsenic  
had a definite effect on the characteristics of the chromium(I)-arsenic(III)  
bond, which could be due to a possible decrease of the participation of S  
electrons in formation of  $sp^n$ -hybrid orbitals.

1/1

Organophosphorous Compounds

USSR

UDC 546.74-386

TROITSKAYA, A. D., SENTEMOV, V. V., GINZBURG, G. D., Kazan' Institute of  
Chemical Technology imeni S. M. Kirov

"Spectrophotometric Study of the Complex Formation of Nickel Rhodanide (II)  
with Trialkyl Phosphites in Benzene"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol XVIII, No 1, 1973, pp 270-271

Abstract: A study was previously made of the complex formation of nickel  
bromide (II) with trialkyl phosphites in ethanol and benzene [G. D. Ginzburg,  
et al., Tr. Kazansk. khim.-tehnolog. in-ta, No 34, 38, 1965; No 36, 124,  
1965; Zh. neorgan. khimii, No 13, 1585, 1968; No 16, 1923, 1971]. The  
spectrophotometric method has now been used to study the complex formation  
of nickel rhodanide (II) with triethyl, tripropyl, triisopropyl, tributyl,  
triisobutyl and trifluorobutyl phosphites in benzene. The experimental  
procedure, synthesis of the initial materials and preparation of the sol-  
vents are described in the above-mentioned references and by P. M. Zavlin,  
et al., [Zh. Prikl. khimii, No 10, 2376, 1960; C. Puglisi, et al., J. Inorg.  
Nucl. Chem., No 4, 1069, 1967].

1/2

USSR

TROITSKAYA, A. D., et al., Zhurnal Neorganicheskoy Khimii, Vol XVIII, No 1, 1973, pp 270-271

The intensity of the shortwave absorption band of the nickel rhodanide (II) complexes with trialkyl phosphites is different and increases from the nickel (II) complexes with triethyl phosphite to complexes with triisopropyl phosphite. The intensity of the long wave absorption band increases for complexes with n-trialkyl phosphites: from the nickel (II) complexes with triethyl phosphite to the complexes with tributyl phosphite; it decreases for the complexes with isobutyl phosphite greater than trifluorobutyl phosphite. The absorption spectra of the complexes of nickel rhodanide (II) with trialkyl phosphites in benzene show that the increase in length of the hydrocarbon radical chain in the molecules of n-trialkyl phosphites does not in practice have any effect on the position of the absorption band peaks of the complexes. The iso-radical in the trialkyl phosphite molecule in the  $\beta$ -position with respect to the phosphorus atom also has no essential effect: the absorption band peaks of the complexes of nickel (II) rhodanide with tributyl phosphate and triisobutyl phosphate correspond to the same wavelength. If the iso-radical is in the  $\alpha$ -position with respect to the phosphorus atom, however, this causes a shift of the absorption bands of the complexes to the shortwave range.

## Crystals and Semiconductors

UDC 537:226:537:311:53]:538

USSR

KOSHKIN, L. I., DUNAYEVA-MITLINA, T. A., TROITSKAYA, G. V., NAYDENKO, V. N.,  
MITLINA, L. A., DUBENSKAYA, N. Ye.

"Properties of Monocrystalline Films of Mg-Mn Ferrite Alloyed with  $\text{Li}^{1+}$  and  $\text{Zn}^{2+}$  Cations"

Uch. zap. Kuybyshevsk. gos. ped. in-t., [Scientific Writings of Kuybyshev State Pedagogics Institute], No 67, 1969, pp 75-97, (Translated from Referativnyy Zhurnal Fizika, No 10, 1970, Abstract No 10 Ye 1214 by N. A. Smol'kov).

Translation: The magnetic, electrical, and optical properties of monocrystalline films of Mg-Mn ferrite alloyed with  $\text{Li}^{1+}$  and  $\text{Zn}^{2+}$  cations are studied. The study was based on  $\text{Mg}_{0.75}\text{Mn}_{0.25}\text{Fe}_2\text{O}_4$  including one mol. %  $\text{Li}_2\text{O}$  and up to 5 mol. %  $\text{ZnO}$  in place of  $\text{MgO}$ . Films grown on fresh chips of magnesium oxide in plane (100) had various thicknesses due to various synthesis times. It was established that the coercive force  $H_c$  of the films depends on conditions of their synthesis and changes from a fraction of one oersted to 10-12 oe. The value of  $H_c$  for the axis of easy magnetization is greater than in the

1/3



USSR

UDC 537:226:537:311:33]:538

KOSHKIN, L. I., DUNAYEVA-MITLINA, T. A., TROITSKAYA, G. V., NAYDENKO, V. N.,  
MITLINA, L. A., DUBENSKAYA, N. Ye., Uch. zap. kuybyshevsk. gos. ped. in-t.,  
[Scientific Writings of Kuybyshev State Pedagogics Institute], No 67, 1969,  
pp 75-97

[100] direction. The decrease in the growth rate of films and heating of the substrate during the process of transport leads to a reduction in  $H_c$ . With increasing film thickness  $d$ , force  $H_c$  decreases, becoming constant in the region  $d = 8-12 \mu$ . The coefficient of rectangularity of the hysteresis loop  $k = B_r/B_m$  decreases almost linearly. Introduction of 1 mol.%  $Li_2O$  does not lead to a significant change in  $k$  and  $H_c$ . Introduction of up to 5 mol.%  $ZnO$  increases the magnetization from 135 gs to 157 gs, while the rectangularity  $k$  increases to 0.96. In lithium-alloyed films the width of the resonance curve is 60 and 80 oe respectively for the easy and difficult axes with  $k = 0.94$  and  $H_c = 1$  oe. With zinc alloying, the width of the resonance curve

2/3

- 58 -

USSR

UDC 537:226:537:311:33]:538

KOSHKIN, L. I., DUNAYEVA-MITLINA, T. A., TROITSKAYA, G. V., NAYDENKO, V. N.,  
MITLINA, L. A., DUBENSKAYA, N. Ye., Uch. zap. kuybyshevsk. gos. ped. in-t.,  
[Scientific Writings of Kuybyshev State Pedagogics Institute], No 67, 1969,  
pp 75-97

deteriorates sharply. Alloying with lithium and zinc increases the total  
electrical conductivity. The optical absorption of the films shows two  
maxima in the area of  $0.9 \mu$  and  $1.1 \mu$ , which fact is explained by the election  
transitions in the  $Fe^{3+}$ ,  $Mn^{2+}$  and  $Fe^{2+}$ ,  $Mn^{3+}$  ions respectively.

3/3

2/2 047

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0054587

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LICHEN REINDEER MAN FOOD CHAIN HAS BEEN FOUND TO EXERT A CUMULATIVE ACTION ON RADIOISOTOPES. IN THIS CONNECTION, STUDIES WERE CARRIED OUT TO DETERMINE THE PRIME210 PB CONTENT OF BIOSAMPLES FROM SUBARCTIC REGION, COLLECTED BOTH BEFORE AND AFTER THE ATOMIC BOMB TESTS; IN ADDITION, THE PRIME226 RA AND PRIME228 TH CONTENT OF LICHENS AND REINDEER BONES WAS ALSO DETERMINED. THE SPECIMENS WERE COLLECTED IN THE MURMANSK AND NENETS REGIONS; THE BONES OF NATIVE INHABITANTS OF ARCTIC REGIONS WERE OBTAINED FROM THE LENINGRAD MUSEUM. THE RESULTS INDICATED THAT THE PRIME210 PB CONTENT IN THE NORTHERN FOOD CHAIN BEFORE (1900 TO 1945) AND AFTER (1958, 1965-66) THE ATOMIC TESTS DID NOT DIFFER SUBSTANTIALLY. THE PRIME210 PB DATA OF REINDEER BONES ALSO REVEALED THAT THE CONCENTRATION OF THIS ELEMENT DOES NOT CHANGE WITH TIME. THE DIFFERENCES OBSERVED IN HUMANS MAY BE ATTRIBUTED TO CONTAMINATION. IT WAS CONCLUDED THAT THE PRIME210 PB CONTENT IS PROBABLY DUE TO THE NATURAL DECAY OF PRIME226 RA; THE EFFECT OF ATOMIC TESTING IS SMALL. THE INTERNAL SKELETAL DOSE OF REINDEER POLONIUM WAS CALCULATED TO AMOUNT TO 0.8 RAD-YEAR UP TO 1900, 1 RAD-YEAR FROM THE 1900 TO 1945 AND 1945 TO 1966 PERIODS. THE DATA ALSO INDICATE THAT PRIME210 PB IS CUMULATED IN REINDEER BY A FACTOR OF 4 AND PRIME226 RA BY A FACTOR OF 8; THESE VALUES ARE MUCH LOWER THAN THOSE REPORTED FOR MAN. FACILITY: GOSUDARSTVENNYI KOMITET PO ISPOL'ZOVANIYU ATOMNOI ENERGII SSSR, MOSCOW.

UNCLASSIFIED

1/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--RADIOECOLOGICAL PARAMETERS OF THE CHAIN, LICHEN, NORTHERN DEER, MAN

AUTHOR--(05)--RAMZAYEV, P.V., TROITSKAYA, M.N., IBATULLIN, M.S., MOISEYEV, A.A., NIZHNIKOV, A.I.

COUNTRY OF INFO--USSR, ARCTIC OCEAN

SOURCE--GIGIYENA I SANITARIYA, 1970, NR 6, PP 38-42

DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CESIUM ISOTOPE, RADIOACTIVE WASTE, ECOLOGY, GEOGRAPHIC LOCATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--3001/0925

STEP NO--UR/0240/70/000/006/0038/0042

CIRC ACCESSION NO--AP0126584

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--A0126584

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. ON THE BASIS OF INVESTIGATIONS CARRIED OUT FOR A PERIOD OF FIVE YEARS (1962-1966) ALONG THE SOVIET COAST OF THE ARTIC OCEAN FROM CHUKOTKA TO THE KOLA PENINSULA THE AUTHORS DETERMINED THE EXTENT OF MIGRATION OF RADIONUCLIDES, ESPECIALLY THAT OF CS PRIME137 IN THE CHAIN "LICHEN, NORTHER-DEER, MAN". THE FINDINGS MAKE IT POSSIBLE TO PREDICT THE CONTAMINATION LEVEL OF THE CHAIN. THE AUTHORS POINT TO THE NECESSITY OF WIDER RADIOBIOLOGICAL INVESTIGATION OF THE NORTHERN CHAIN, AS THE DOSES ABSORBED IN ITS LINKS APPROACH THE EXISTING MAXIMAL PERMISSIBLE RADIOACTIVE DOSES. FACILITY: Leningrad. N-1 INST. RADIATIONNOY GIGIYENY MINISTERSTVA ZDRAVOCOKHRANENIYA RSFSR.

UNCLASSIFIED

USSR

UDC: 51

LEBEDEV, B. D., SAVITSKIY, V. Ye., TROITSKAYA, N. A.

"Integer Model of a Freight Transfer Problem"

Moscow, Mat. metody resheniya ekon zadach--sbornik (Mathematical Methods of Solving Economics Problems--collection of works), No 3, "Nauka", 1972, pp 201-208 (from RZh-Kibernetika, No 5, May 73, abstract No 5V724 by Yu. Finkel'shteyn)

Translation: In a number of sectors of the national economy the necessity arises of transferring freight from certain production points to predetermined points of consumption. Most problems of this type are formulated as a transport model. Rather frequently in practice a modification of the ordinary transport problem is encountered where the delivery of freight to each consumption point must be carried out at a strictly defined time, i. e. the freight transfer problem according to a time schedule. An approximate method of directional sorting has been proposed for solving an analogous problem. This article gives its main attention to distin-

1/2

USSR

LEBEDEV, B. D. et al., Mat. metody resheniya ekon. zadach, No 3, "Nauka", 1972, pp 201-208

guishing a number of classes of models for which the problem of freight transfer according to a time schedule reduces to a transport problem of linear programming. Also given are some models which are not reducible to a transport model. A numerical example is considered.

2/2

- 82 -

USSR

UDC 512.25/.26+519.3:330.115

KUBRIN, E. Ye., LEBEDEV, B. D., SAVITSKIY, V. Ye., TROITSKAYA, N. A.

"Integer Model of Problem of Transfer of Cargos Using Hourly Schedules"

Vopr. Kibernet. i Vychisl. Mat. [Problems of Cybernetics and Computer Mathematics -- Collection of Works], No 40, Tashkent, 1970, pp 30-38, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V528 by Yu. Finkel'shteyn).

Translation: Points of consumption ( $s = 1, 2, \dots, S$ ) are fixed, each of which must be supplied at fixed moments in time  $T_1^{(s)}, \dots, T_{k_s}^{(s)}$  with cargos of predetermined types and quantities. Also fixed are  $m$  points of production, each moment  $T_p^{(s)}$  corresponding to a subset  $I_p^{(s)} \subset I = \{1, \dots, n\}$  points of production, the specialization of which allows the  $s$ th point of consumption to be supplied at the fixed moment in time. The problem is to determine a plan of cargo transfer optimizing a certain criterion of effectiveness. The following model of integer linear programming is produced. Find the number  $\theta_{fij}$  minimizing  $\sum_{j=1}^n \sum_{i=1}^m \theta_{fij}$  under the conditions

$$\sum_{f=0}^{j-1} \sum_{i \in I_j} \theta_{fij} = 1, \quad j=1, 2, \dots, n,$$



USSR

UDC 512.25/.26+519.3:330.115  
KUBRIN, E. Ye., LEBEDEV, B. D., SAVITSKIY, V. Ye., TROITSKAYA, N. A., Vopr.  
Kibernet. i Vychisl. Mat., No 40, Tashkent, 1970, pp 30-38.

$$\sum_{i=0}^{j-1} \sum_{l \in I_j} (T_l + t_{(ij)}) \theta_{lij} < T_j, j=1, 2, \dots, n,$$
$$\sum_{i=1}^m \sum_{j=i+1}^n \theta_{ij} < 1, i=0, 1, \dots, n, \theta_{ij} \in \{0, 1\}.$$

An investigation of the model is performed. Important particular cases are indicated, when it is reduced to the transport problem.

USSR

UDC[537.226+537.311.33]:[537+535]

BURAFEV, V. I., ZEMIN, V. N., KRASOVSKIY, V. M., RYABININ, I. V., and  
~~TROTSKIYA, N. V.~~

"Structural and Electrophysical Properties of Aluminum Oxide-on-Silicon Films"

Elektron. tekhnika. Nauch.-tekhn. sb. Mikroelektronika (Electronic Engineering. Collection of Scientific and Technical Works on Microelectronics), 1971, vyp. 3(29), pp 75-79 (from RZh-Fizika, No 1, Jan 72, Abstract No 1Y51406 by authors)

Translation: The authors studied the structural and electrophysical properties of aluminum oxide films as a function of the procedure of their deposition on silicon, as well as the electrophysical properties of the Al-Al<sub>2</sub>O<sub>3</sub>-Si structure.

172 011

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--DIFFERENCES IN SOME BIOCHEMICAL INDEXES IN DI AND TETRAPLOID SUGAR BEETS -U-

AUTHOR--(03)-VECHER, A.S., TROITSKAYA, T.M., MASNYI, M.N.

COUNTRY OF INFO--USSR

SOURCE--VESTSI AKAD. NAVUK BELARUS. SSR, SER. BIYAL. ANVUK 1970, (1), 24-9

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--AGRICULTURE CROP, SUCRSOE, PLANT GENETICS, CHLOROPLAST, CELL PHYSIOLOGY, TRACE ELEMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1150

STEP NO--UR/0440/70/000/001/0024/0029

CIRC ACCESSION NO--AP0130178

UNCLASSIFIED

2/2 011

CIRC ACCESSION NO--AP0130178

UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CHLOROPLA A AND B CONTENT OF LEAVES OF YOUNG TETRAPLOID SUGAR BEETS WAS LESS THAN THAT OF DIPLOID PLANTS BUT IT INCREASED WITH AGE AND FINALLY EXCEEDED THE LATTER. THE CHLOROPHYLL CONTENT PER UNIT WT. OF CHLOROPLASTS WAS HIGHER IN THE FORMER THAN IN THE LATTER. DIFFERENCES WERE ALSO FOUND IN FIXATION OF MANY MINERAL ELEMENTS (FE, MN, CU, ZN, NI, MO).  
EKSPO. BOT., MINSK, USSR. FACILITY: INST.

UNCLASSIFIED

USSR

UDC 632.95

SHOGAM, S. H., STONOV, L. D., ~~TROITSKAYA, T. V.~~ PANKHUTIN, S. M., and  
BARANOVA, L. N.

"Granulated Herbicides for Control of Overgrowth on Reclamation and Drainage  
Ditches"

V sb. Khim. sredstva zashchity rast. (Chemical Plant Protectants -- collection  
of works, ), vyp 1, Moscow, 1970, pp 216-224 (from RZh-Khimiya, No 13, 10 Jul  
72, Abstract No 13N532 by T. A. Belyayeva)

Translation: Formulas and a technique have been devised for the preparation  
of granulated herbicides (monuron, diuron, atrazine, simazine) having any  
prescribed resistance to elution by water, and hence carrying effective lives,  
as well as any prescribed particle-size range. A procedure has been devised  
for determining resistance to elution by water by comparison with a sample  
of a granulated preparation of the same herbicide taken as a standard. The  
highest herbicidal activity is provided by preemergence application or by  
application during the growing period. Under rapid water-flow conditions,  
granulated diuron preparations that have been dried at 90° or subjected to  
prolonged drying at 60-70° are recommended.

1/1

USSR

UDC 531.36

KOLOVSKIY, M. Z. and TROITSKAYA, Z. B.

"The Stability of Linear Systems With Random Parameters"

Moscow, Prikladnaya Matematika i Mekhanika, No 2, 1972, pp 218-224

Abstract: An approximate method is proposed for investigating the stability of systems of linear equations with steady random coefficients; this method is based upon use of the perturbation method. The problem is reduced to an investigation of the stability of a system of finite-difference equations, the coefficients of which are determined on the basis of the spectral densities of random parameters. Three examples are worked out. 1 figure, 6 references.

1/1

- 63 -

USSR

UDC 542.97:547.1'13:546.815:547.1'118

RAZUVEYEV, G. A., TROITSKIY, B. B., D'YACHKOVSKAYA, O. S., TROITSKAYA, L. S.,  
MALYSHEVA, I. P., and LEPAYEV, A. F., Institute of Chemistry, Academy of  
Sciences USSR

"Study of the Stabilizing Activity of Certain Organic Lead Compounds and  
Their Mixtures With Organic Phosphites During Thermal Degradation of  
Polyvinyl Chloride"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 12, Dec 73,  
pp 2759-2764

Abstract: Triphenyllead isocyanate (I) was obtained for the first time in  
a 72% yield and its thermal degradation was studied in the temperature  
interval 180-220°. (I) exhibits stabilizing effect on the thermal degradation  
of the polyvinyl chloride. This stabilizing activity of (I) and  $(C_6H_5)_4Pb$   
is due to an effective acceptance of HCl. In case of (I) it is also due to  
the reaction with conjugated double bonds of polyvinyl chloride macromolecules.  
 $(C_6H_5)_3PbNCO$ ,  $(C_6H_5)_3PbCl$  and  $(C_6H_5)_4Pb$  form mixtures with organic phosphites  
acting synergistically on the rate of dehydrochlorination, crosslinking and  
color changes of polyvinyl chloride.

1/1

- 61 -

Acc. Nr.

AP0048833

Abstracting Service:  
CHEMICAL ABST.

5-76

Ref. Code  
UR0460

90953b Effect of mercury on the thermal decomposition of poly(vinyl chloride). Myakov, V. N.; Troitskiy, B. B. (USSR). *Vysokomol. Soedin. Ser. B* 1970, 12(2), 100-1 (Russ). The effect of Hg on the kinetics of thermal dehydrochlorination of suspension poly(vinyl chloride) (I, mol. wt. 62,000) was investigated. The decomph. was carried out in sealed ampuls at  $190-200 \pm 0.5^\circ/10^{-1}-10^{-2}$  mm. Photomicrographs showed that Hg markedly retarded the dehydrochlorination of I and autocatalyzed thermal degradation was not obsd. in the presence of Hg. At  $200^\circ$ ,  $\leq 0.3-0.5$  mg/hr g Hg stabilizer was converted into  $Hg^{2+}$ . The stabilizing effect of Hg was attributed to its high effectiveness as a Cl<sup>-</sup> acceptor.

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REEL/FRAME  
19800600

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Receivers and Transmitters

USSR

UDC: 621.376.332

SAMONTOV, I. M., TROITSKIY, B. S.

"Linear Distortions in Demodulators of FM Oscillations"

V sb. Metody pomekhoustoychivogo priyema ChM i FM (Methods of Interference-Free FM and PM Reception--collection of works), Moscow, "Sov. radio", 1970, pp 192-202 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12D61)

Translation: Critical remarks are presented relative to the relationship found by certain authors between linear distortions in frequency detectors and the index of modulation. Expressions are derived which define the frequency and phase characteristics of various types of frequency detectors. It is shown that there is an increase in output voltage and phase displacements with an increase in the modulation frequency and a reduction in the band of each of the frequency detection circuits in all types of frequency detectors. Minimum linear distortions occur in frequency detectors with mutually detuned tank circuits. The condition for minimum distortion is found for such a frequency detector. Bibliography of 10 titles. N. S.

1/1

1201 SKIY, E. Ye.

So: 3PKS 55015  
27 304 92

INDICES OF QUALITY OF ROENTGENOLOGICAL DIAGNOSIS  
(53) 8078 (Petrova Kisevich) et al  
Article by I.M. Yakhnich, L.N. Gorbilova, E.Ye. Troitskiy, Moscow Scientific  
Research Institute of Roentgenology and Radiology, Director: Professor I.G.  
Ruzhansky, No 12, 1971, published 22 June 1971, pp 33-37

UDC: 616-073.75:658-562

The quality of medical care and, in particular, of roentgenological  
prophylactic and scientific research institutions, is inseparable from the  
level of development of science, the state of the material and technical  
of public health, and quality of management of its different branches.  
Herein, dated 5 July 1968, "Measures for Further Improvement of Health  
and Development of Medical Science in the Country," indicates that it is  
necessary to devote particular attention to improving the quality of medical  
care for the people and standards of work in public health institutions. In  
accordance with this, public health agencies have done much in the last few  
years to improve roentgenological services for the people.

Along with the increase in quantity of roentgenographic and fluorographic  
units applied to therapeutic and prophylactic institutions, and in number of  
roentgenologists and x-ray technicians, increased use of roentgenology for  
diagnostic and prophylactic purposes, there have also been qualitative changes  
in the roentgenological service.

It is not only the scientists of specialized scientific research insti-  
tutions (I.M. Yakhnich, V.P. Viktorina, V.I. Petrov) but also some specialists  
in roentgenological practice (S.N. Popov, L.N. Bogdanov, V.I. Namyov, and others)  
who have devoted attention to development of indices of the quality of roentge-  
nological diagnosis. The need to develop such indices was observed in speeches  
and radiologists in Bilibid (1970).

For many years, the scientific organizational department of Moscow  
Scientific Research Institute of Roentgenology and Radiology has been studying

Acc. Nr:

AP0047328

Ref. Code: UR-U300

PRIMARY SOURCE: Ukrayns'kiy Biokhimichniy Zhurnal, 1970,  
Vol 42, Nr 1, pp 39-43

SPECTROPOLARIMETRIC CHARACTERISTICS OF ALBUMIN  
AND GLOBULIN WITH THYROID TOXICOSIS

K. F. Selivanova, Yu. N. Gordeev, G. V. Troitsky

Departments of Biochemistry and Hospital Therapeutics,  
the Crimean Medical Institute, Simferopol

Summary

Conformation changes of albumin and  $\gamma$ -globulin of blood serum were studied in 26 patients with thyroid toxicosis of different degree of gravity and in five healthy persons. Proteins were isolated by the method of the preparative electrophoresis in the agar-agar gel. Homogeneity of proteins was confirmed by paper electrophoresis. Optical rotation was measured by means of a photoelectrical spectropolarimeter. Unusually great variation of  $a_D$  and  $b_D$  was found.

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19790850

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The spectropolarimetric investigations of blood proteins in patients with thyroid toxicosis made it possible to observe the conformation changes in albumin and  $\gamma$ -globulin. Parallelism is marked between the degree of disease gravity and changes in protein conformation. The most essential changes occurred in a molecule of  $\gamma$ -globulin. The found qualitative changes in proteins may be of definite biological interest from the view point of the effect of thyroid gland hormones on biosynthesis of proteins.

2/2

19790851

llh

USSR

UDC 678.742.2:66.018.887.01:53

BRAGINSKIY, R. P., PARFENOVA, D. S., ~~TROITSKIY, I. D.~~ FINKEL', E. E.,  
and CHERVONTSEVA, G. M.

"Radiation Modification of Self-Extinguishing Polyethylene Compositions"

Moscow, Plasticheskiye Massy, No 1, Jan 72, pp 15-18

Abstract: The authors consider possibilities for radiation modification of self-extinguishing compositions based on low-density polyethylene to improve thermal stability and physical and mechanical characteristics at high operating temperatures. The self-quenching composition studied was made up of 77.0 percent P2015KU polyethylene, 11.3 percent chloroparaffin 70, and 11.7 percent  $Sb_2O_3$ . The control specimens were unmodified P2015KU polyethylene. Pressed plates about 0.3 mm thick were exposed to  $Co^{60}$  gamma radiation at room temperature in helium to absorbed doses of 1-500 Mrad. The gel fraction content was then determined. Deformation characteristics were measured on special specimens. The thermomechanical characteristics and quenching properties were also studied. It was found that an optimum dose of about 15 Mrad considerably improves the deformation characteristics of the self-extinguishing composition. Thermomechanical tests of specimens which had absorbed this dose showed that shape stability is adequate for use of

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USSR

BRAGINSKIY, R. P., et al., *Plasticheskiye Massy*, No 1, Jan 72, pp 15-18

finished articles at 100°C, which extends the region of application of this material. The authors thank L. Ye. Sokolova, L. Khokhlova and N. K. Kozlova for assistance in the experimental studies. Four figures, bibliography of twenty-four titles.

2/2

- 72 -

Acc. Nr:

AP0042480

Abstracting Service:  
CHEMICAL ABST.

4-70 Ref. Code:  
UR0367

84984w Properties of low-lying 2+ levels in nuclei. Malov, V. V.; Troitskii, M. A. (Inst. At. Energ. im. Kurchatova, Moscow, U.S.S.R.). *Yad. Fiz.* 1970, 11(1), 70-85 (Russ). Changes in the properties of low-lying 2+ levels are investigated with a change in the no. of particles in the region of the nuclei, magical with respect to one kind of particle. The relation is presented between the quadrupole moment of the 2+ level and the quadrupole moments of the neighboring nuclei in the ground state, and between the energy shift of the 2+ level which appears when certain particles are added to the nucleus. The strong drop in energy of the 2+ level, when 2 particles are added to the closed shell, is explained. An expression is obtained which can be used to calc. the change of the static moments of the 2+ levels, when the no. of particles in the nucleus is changed. L. Karr

REEL/FRAME  
19760445

19

USSR

UDC 542.91.547.455:547.1'118

SHIBAYEV, V. N., KUSOV, Yu. Yu., TROITSKIY, M. F., and KOCHETKOV, N. K.,  
Institute of Organic Chemistry imeni N. D. Zelinskiy, Academy of Sciences  
USSR

"Chemistry of Glycosyl Phosphates and Their Derivatives. Communication 4.  
Phosphorylation of Benzoylated Glycosylacetates of the Phosphoric Acid and  
Synthesis of  $\alpha$ - and  $\beta$ -Anomers of 4-O-Methylsulfonyl-D-galactopyranosyl  
Phosphate"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 8, Aug 73,  
pp 1862-1867

Abstract: The synthesis of  $\alpha$ - and  $\beta$ -anomers of 4-O-methylsulfonyl-D-galactopyranosyl phosphate was carried out by fusion of 1-O-acetyl-2,3,6-tri-O-benzoyl-4-O-methylsulfonyl- $\beta$ -D-galactopyranose with anhydrous  $H_3PO_4$ . During phosphorylation of glycosylacetates containing a benzoyl group at C-2, the reaction products may be predominantly  $\beta$ -anomers of glycosyl phosphates. It was shown to be possible to use ion exchange chromatography for the separation of a mixture of anomers of the shielded glycosyl phosphates.

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USSR

UDC 542.91:547.455:547.1'118

KOCHETKOV, N. K., SHIBAYEV, V. N., KUSOV, YU. YU., and TROITSKIY, M. F., Institute of Organic Chemistry imeni N. D. Zelinskiy, Academy of Sciences USSR

"The Chemistry of Glycosyl Phosphates and Their Derivatives. Communication I. The Synthesis of 4-Thio- $\alpha$ -D-Glucopyranosyl Phosphate"

Moscow, Izv. Akad. Nauk SSR, Ser. Khimicheskaya, No 2, 1973, pp 425-430

Abstract: This is the first reported synthesis of 4-thio- $\alpha$ -D-glucopyranosyl phosphate (I). The reaction sequences leading to the synthesis of I were as follows: 5.6 g 2,3,6-tri-O-benzoyl-4-O-methylsulfonyl- $\alpha$ -methyl-D-glucopyranoside and 4.8 g  $C_6H_5COSK$  were dissolved in 50 ml DMF and heated to 140°; the mixture was cooled, sediment removed, and the filtrate concentrated in vacuo. The resultant residue from the filtrate was dissolved in  $CHCl_3$ , filtered through a column of activated charcoal, concentrated by vacuum evaporation, and recrystallized from absolute ethanol.

1/3

- 45 -

USSR

KOCHETKOV, N. K., et al., *Izv. Akad. Nauk SSR, Ser. Khimicheskaya*, No 2, 1973, pp 425-430

Three and eight tenths g (64%) of 2,3,6-tri-O-benzoyl-4-thio-4-S-benzoyl- $\alpha$ -methyl-D-glucopyranoside (II) were obtained. The structure of II was confirmed by IR spectra. Subsequently, 1 g II was treated with 50% HBr in glacial AcOH (20 ml); the suspension was stirred for 24 h at 20 $^{\circ}$ , poured into 20 ml of glacial AcOH, and extracted three times with 50 ml CHCl<sub>3</sub>. The extract was washed with NaHCO<sub>3</sub>, ice water, dried over MgSO<sub>4</sub>, concentrated by evaporation, and yielded 0.95 g of 2,3,6-tri-O-benzoyl-4-thio-4-S-benzoyl- $\alpha$ -D-glucopyranosyl bromide (III). Five tenths g of the chromatographically homogenous III was dissolved in 10 ml CHCl<sub>3</sub> (alcohol free), and 0.5 g AgOAc added. The suspension was stirred 24 h, filtered through celite, concentrated by evaporation, and the residue recrystallized from abs. ethanol to yield 0.32 g (64.5%) 1-O-acetyl-2,3,6-tri-O-benzoyl-4-thio-4-S-benzoyl- $\beta$ -D-glucopyranose (IV) m.p. 129-132 $^{\circ}$ ,  $[\alpha]_D^{20} + 56.5^{\circ}$ . IR and PMR spectra confirmed IV. 0.2 g IV were then phosphorylated with 0.21 g crystalline H<sub>3</sub>PO<sub>4</sub> in vacuum for 3 h at 50 $^{\circ}$ , the mixture cooled,

USSR

KOCHETKOV, N. K., et al., Izv. Akad. Nauk SSR, Ser. Khimicheskaya, No 2, 1973, pp 425-430

5 g crushed ice added, and extracted with  $\text{CHCl}_3$  containing 0.8 ml trioctylamine. The  $\text{CHCl}_3$  extract was concentrated by evaporation, applied to a Dower-1x4 ( $\text{HCO}_3^-$ ) column, and eluted with a linear gradient (0.1-0.5 M) of a water-methanol solution of triethylammonium bicarbonate. Fractions containing organic phosphorus were pooled, concentrated by evaporation, and yielded 7.9 g (3.1%) of 2,3,6-tri-O-benzoyl-4-thio-4-S-benzoyl- $\alpha$ -D-glucopyranosyl phosphate as the triethylammonium salt (V). Finally, 2.29 g of V was debenzoylated with 3 ml  $\text{CH}_3\text{ONa}$  in argon saturated methanol for 48 hr at  $0^\circ$ . The mixture was filtered through a Dowex-50 column ( $\text{H}^+$ ), the eluate neutralized with 5%  $\text{NH}_4\text{OH}$ , evaporated, dissolved in cold water, washed with ether, and rapidly evaporated to dryness. I was obtained in a yield of 1.83 g (79%);  $[\alpha]_D^{20} + 60.5^\circ$ .

3/3

- 46 -

USSR

UDC 577.391+575.23

TROITSKIY, N. A.

"Some Results Obtained in the Study of the Genetic Effectiveness of Intermediate Neutrons"

Minsk, Voprosy Genetiki i Seleksii (Aspects of Genetics and Selection),  
"Nauka i Tekhnika," Minsk, 1970, pp 301-302

Abstract: A summary is presented of the results of investigations concerning the genetic effectiveness of small doses of intermediate neutrons as compared with that of gamma-radiation and fast neutrons. It was established that the relative genetic effectiveness (RGE) of intermediate neutrons is higher than that which might have been expected on the basis of the theoretical computations which serve as a basis for the computation of maximum allowable doses and the shielding of personnel from nuclear reactors.

On the basis of literature data and results of institute activities, the limitation of the concept concerning the link between RGE and linear energy losses (LEL) is indicated, and a basis is established for the necessity to reexamine the concept with regard to cases of irradiation by neutrons.

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USSR

TROITSKIY, N. A., Voprosy Genetiki i Seleksii (Aspects of Genetics and Selection), "Nauka i Tekhnika," Minsk, 1970, pp 301-302

Biological effects not noted during gamma-irradiation have been discovered. The fact that intermediate neutrons because of the characteristics of the primary biophysical processes intensify the recombination process, initiating also cell division in Escherichia coli was established.

2/2

- 74 -

USSR

UDC 577:576.851.48+547.963.3

TROITSKIY, N. A., BATURO, V. A., SILKOVA, T. A., and KUDLOVICH, K. G.

"Use of Phosphorus<sup>32</sup> in the Investigation of the Reasons for the Increase in the Number of Recombinants Upon Irradiation of Escherichia coli With Neutrons"

Minsk, Voprosy Genetiki i Seleksii (Aspects of Genetics and Selection), "Nauka i Tekhnika," Minsk, 1970, p 302

Abstract: Data concerning the utilization of the radioactive phosphorus isotope for the investigation of the recombination process in Escherichia coli irradiated with intermediate neutrons, and also data on the isolation of DNA from radioactive zygotes, are cited. The assumption is advanced that increase in the frequency of recombinants induced by irradiation of the donor has no connection with the increase in the number of formed merozygotes and is probably the result of intensification of the integration process of the donor genotype in the recipient chromosome of Escherichia coli.

1/1

UNCLASSIFIED

PROCESSING DATE--27NOV70

TITLE--EFFECT OF IRRADIATION OF THE DONOR ON THE FREQUENCY OF THE APPEARANCE OF PROXIMAL NONSELECTIVE MARKERS

AUTHOR--(03)--NOVITSKAYA, M.A., TROITSKIY, N.A., BYLINSKIY, A.F.

COUNTRY OF INFO--USSR

SOURCE--VESTSI AKAD. NAVUK BELARUS. SSR, SER BIYAL. NAVUK 1970, (2), 106-1

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--NEUTRON IRRADIATION, CHROMOSOME, RADIATION BIOLOGIC EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--3007/0213

STEP NO--UR/0440/70/000/002/0106/0108

CIRC ACCESSION NO--AP0135709

UNCLASSIFIED

272 033

CIRC ACCESSION NO--AP0135709  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT. IRRADN. OF THE DONOR WITH 1 MEV NEUTRONS CREATES A SHARP INCREASE IN THE NO. OF RECOMBINED PAIRS OF THE SELECTIVE MARKER ARG PLUS SM. THE PERCENTAGE OF RECOMBINED PAIRS WAS 2.6 TIMES GREATER THAN IN THE CASE WHEN A NONIRRADIATED DONOR WAS TAKEN FOR CROSSING. EXPTS. SHOWED THAT THE INCREASE IN RECOMBINED PAIRS CANNOT, HOWEVER, BE EXPLAINED MERELY BY THE INCREASE IN EFFECTIVE PAIRS. IRRADN. OF THE DONOR WITH NEUTRONS PROBABLY BRINGS ABOUT A CHANGE IN ITS CHROMSOMES WHICH, IN TURN, INCREASES THE FREQUENCY OF RECOMBINATION IN THE MEROZYGOTE. IT CAN BE ASSUMED THAT IRRADN. WITH NEUTRONS INDUCES AT LEAST 2 TYPES OF DONOR CHROMOSOME DAMAGE. FACILITY: INST.

UNCLASSIFIED



Acc. Nr:

AP0040336

Abstracting Service:  
CHEMICAL ABST.

4-70

Ref. Code:

UR0205

75399g Characteristics of a neutron source with average energy of 200 keV for radiobiological experiments on IRT 2000. Troitskij, N. A.; Drozd, G. G.; Naumov, V. A. (Inst. Genet. Tsitol., Minsk, USSR). *Radiobiologiya* 1969, 9(5), 778-81 (Russ).

Neutron spectra were adjusted with the help of Fe, Ta, and Mo filters having thicknesses of 50 cm. The application of these filters resulted in spectra having energy max. in the region of lower energies. Ta, Mo, and Fe yielded spectra wherein 90% of neutrons had energies of 10-180, 10-300, and 1-700 keV, resp. These spectra are markedly different from spectra of neutrons from the reflector. There a 20% portion of neutrons had energies within 20-300 keV. Low energies were cut off by both Ta and Mo filters. In the case of the Fe filter an addnl. layer of B carbide has to be used. Measurements of the spectrum were performed with the aid of threshold detectors (<sup>113</sup>P, <sup>192</sup>Ba, <sup>113</sup>In). Good agreement was obtained between the calcd. and measured spectra. The measurements of the dose were performed by 4 different methods. The measured values (rad per hr) were 50.9, 50.8, 47.7, and 46.2; the calcd. value was 35.5. The calcd. and measured av. energies were 220 and 160 keV. At distances of 5, 10, 20, 40, 60, 80, and 100 cm from the filter the following dose rate values (rad per hr) were found: 50, 33, 25.6, 21, 17.3, 13.8 and 10.

M. Rakovic

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USSR

UDC 577.391:576.8

TROITSKIY, Nikolay Aleksandrovich, TURBIN, Nikolay Vasil'yevich, and ARSEN'YEVA, Militsa Al'fredovna; Institute of Genetics and Cytology, Academy of Sciences, Belorussian SSR

Geneticheskiye Effekty Promezhutochnykh neytronov (Genetic Effects of Intermediate Neutrons), Minsk, "Nauka i Tekhnika," 1971

Translation: Annotation: The book presents data on the genetic effectiveness of neutrons with an average energy of 200 keV, as compared with the effect of gamma rays and fast neutrons. For the first time in the Soviet literature, the question of the biological effect of elastic nuclear collisions is examined and the corresponding experimental data are given. The relationship between the genetic effectiveness of neutrons and biophysical parameters of irradiation, and, in particular, linear energy losses, are discussed. The book is intended for specialists in the field of radiation biology and genetics. 23 tables, 56 figures, 307 references, 168 pp.

Table of Contents:

Introduction	Page
Sources of Intermediate Neutrons, Spectrometry and Dosimetry for Biological Experiments	3
1/3	9

USSR

TROITSKIY, Nikolay Aleksandrovich, et al., Geneticheskiye Effekty Promezhu-  
tochnykh neytronov, Minsk, "Nauka i Tekhnika," 1971

	Page
Neutron spectrum	12
Neutron dose	17
Irradiation technique	24
Relative Biological Effectiveness of Neutrons	30
The history of the study of genetic effectiveness of neutrons	34
Relationship between RBE and linear energy loss of high-energy charged particles	37
Relationship between RBE and linear energy loss of low-energy charged particles	44
Biological effectiveness of elastic nuclear collisions	45
Role of nuclear collisions in the biological effect of neutrons	51
Biological effectiveness and linear energy loss of neutrons	70
Peculiarities of the relationship between RBE and biophysical parameters of irradiation of micro- organisms	77
Primary injuries during irradiation with neutrons	82
Principal types of radiation genetic effects	84
Genetic effects of irradiation of microorganisms	85

2/3

USSR

TROITSKIY, Nikolay Aleksandrovich, et al., Geneticheskiye Effekty Promezhu-  
tochnykh neytronov, Minsk, "Nauka i Tekhnika," 1971

	Page
Changes in the ability of nonlysogenic cells to form colonies	85
Induction of prophage in lysogenic bacteria	93
Effect of neutrons on bacterial chromosomes	104
Genetic effect of neutrons upon irradiation of plants, animals, and human lymphocytes	125
Conclusion	148
Bibliography	151

3/3

- 103 -

USSR

TROITSKIY, O. A.

UDC: 539.4

"Current-Stimulated Radiation-Plastic Deformation of Metal"

V sb. Teoriya i prakt. vysokoskorost. deformatsii metal. materialov (Theory and Practice of High-Velocity Deformation of Metallic Materials--collection of works), Moscow, 1971, p 10 (from RZh-Mekhanika, No 5, May 72, Abstract No 5V979)

Translation: The author studied the effect which electrons injected into a metal by a particle accelerator have on the magnitude of peaks of the electroplastic effect of abrupt changes in the cold plastic deformation of loaded metals when current pulses of  $10^2-10^3 \text{ A}\cdot\text{mm}^{-2}$  lasting  $10^{-4} \text{ s}$  pass through the metals. It is shown that irradiated crystals of zinc, lead and tin have higher peaks at low temperatures than crystals without irradiation. In studying the velocity dependence of the effect, it is found that there is somewhat of an increase in the effect when the stretching rate is increased. With an increase [in the energy] of the injected electrons from 1 to 3.5 MeV and a reduction in temperature, the effect of irradiation is also intensified. It is shown that irradiation affects relaxation processes during

1/2

USSR

TROITSKIY, O. A., Teoriya i prakt. vysokoskorost. deformatsii metal. materialov, Moscow, 1971, p 10

deformation more strongly than it affects the active deformation of specimens, while current pulses on the other hand have an appreciable effect on active deformation and a weak effect on relaxation processes. Thus the irradiation factor leads to a further intensification of cold plastic deformation of metal.

2/2

- 124 -

Miscellaneous

USSR

UDC 539.214:537.3

TROITSKIY, O. A., and ROZNO, A. G., Institute of Solid State Physics,  
Academy of Sciences USSR

"Effect of the Electrical Current on the Plastic Flow of Metal"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 30, No 4, Oct 70, pp 824-829

Abstract: A study was made of the plastic flow of zinc single crystals and polycrystals of zinc, cadmium, lead, and indium under the effect of direct and pulsed electrical current. Plastic flow was not observed under the effect of direct current. In the case of the pulsed method (600-4800 amp, pulse duration  $10^{-4}$  sec) considerable peaks of the plastic flow were detected. In the elastic region the current pulses showed no influence. An anomalously large number of peaks was observed in the area of the yield point of the specimens. This phenomenon is explained by the disruption resulting from the current pulses of fluctuating dislocation configurations.

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USSR

UDC 615.849.19.015:612.46

OGNEV, B. V., VISHNEVSKIY, A. A., Jr., TROPISKIY, R. A., POLONSKIY, A. K.,  
VAL'NER, E. O., TIMIKHINA, N. I., KASSIN, V. Yu., and CHERKASOV, A. V.  
Institute of Surgery imeni A. V. Vishnevskiy, Academy of Medical Sciences USSR,  
Moscow

"Investigation of the Action of Gas Laser Rays on the Kidney Under Experimental  
Conditions"

Moscow, Urologiya i Nefrologiya, No 2, Mar/Apr 73, pp 33-36

Abstract: Laparotomy was performed under local anesthesia in rabbits, and the left kidney was transected with a focused impulsed neodymium laser beam. The transection was bloodless, and renal temperature rose to 42-43°C for a brief period. Penicillin was applied in the abdominal area, and the kidney and the abdomen were closed with sutures. During the uncomplicated postoperative month, the animals were sacrificed at intervals. Histological examination of renal tissue taken 1 hr after surgery revealed a wedge-shaped crater on the surface, 216 μ wide and 90 μ deep, from which cracks extended up to 110 μ deep into the renal cortex. The crater was covered with a homogeneous, foamy coagulate. The lesion was surrounded by a thin layer of necrotic tissue. In 1 day, the edges of the fibrous capsule were peeled off 500 μ from the center of the crater. The necrotic zone was 360 μ wide and 300 μ deep, and it was

1/2



USSR

OGNEV, B. V., et al., Urologiya i Nefrologiya, No 2, Mar/Apr 73, pp 33-36

surrounded by an infiltrated layer separating it from healthy tissue. On subsequent days, the necrotic zone enlarged to a maximum of 900  $\mu$ , but no hemorrhages or suppurative inflammation developed. On the 10th day, the surface of the lesion was covered with a thin connective tissue capsule which gradually grew thicker. New capillaries formed in the parenchyma. On the 20th day, the lesion was filled with scar tissue whose thickness diminished to about 100  $\mu$  on the 30th day. The right kidney was free of pathology throughout the experimental period. Thus, transection of the kidney with laser is bloodless and causes strictly local morphological changes, leaving surrounding tissue intact. Organization of scar tissue is not completed in 30 days.

2/2

- 77 -

USSR

UDC 615.849.19:061.3

OGNEV, B. V., Corresponding Member of the Academy of Medical Science, USSR,  
~~TROITSKIY, R. A.~~ Doctor of Medical Science, and BEREZINA, S. P., (Moscow)

"Symposia on the Problems of Application of Lasers in Medicine and Biology"  
Moscow, Khirurgiya, No 12, 1971, pp 118-119

Translation: At the present time, we have been given the possibility of employing and developing a promising achievement of quantum physics -- optical quantum generators (lasers). Besides the medical aspect, the laser is also important because the construction of lasers was first accomplished by the Soviet physicists N. G. Basov and A. M. Prokhorov, who were awarded the Lenin Prize in 1959 for their work. Later, in 1964, they were awarded the Nobel Prize for work in this field along with the American scientist Towns (Tauns). The most important properties of lasers, high coherence, monochromaticity of radiation, immense energy density, and the possibility of focusing, have attracted the attention of specialists in various scientific fields. In spite of a comparatively short period since the creation of lasers, several experiments have been run on their use of biology and medicine. As a result, we have succeeded in obtaining many valuable and encouraging results not only under experimental conditions, but also in actual therapy.

1/8

USSR

OGNEV, B. V., et al., *Khirurgiya*, No 12, 1971, pp 118-119

Results of medical and biological studies with lasers are presented in over 800 published works. Symposia, which took place in May 1971 in Kiev (All Union) and in Leningrad, were dedicated to this important new field. Short abstracts of the proceedings are presented in this article. Physicians, biologists and engineers shared in the work of these symposia. A study of the use of lasers in biology conducted at the Kiev Institute of Oncology, deserves attention. Specifically, the report of N. F. Gamaley, et al., showed that irradiation with ultraviolet laser microwaves provided valuable data on the metabolism not only of normal cells, but also cells treated with various stains, antibiotics and vitamins. The same authors, using local exposure of the mitochondria of cardiac muscle cells in rats, succeeded in accelerating, retarding and even halting the reduction of cells. We may hope that the results of expanded, intensive supplemental studies will help the study of the metabolism of living cells and will in the future be used by clinicians.

Another important aspect of the biological significance of the problem, as described by V. M. Inyushin et al., in their report, is the ability of laser

2/8

USSR

OGNEV, B. V., et al., *Khirurgiya*, No 12, 1971, pp 118-119

radiation to cause a shift in the energy state of the cell, which leads to the stimulation of the redox process and which, in the final analysis, will make possible acceleration or inhibition of cell growth. We may assume that it will prove possible to control processes in living organisms by means of laser rays. At this time this would apply only to the very simplest structures; microbes, plant cells, etc. The data cited by the authors, shows the importance of laser applications in genetics; which, in principle, could provide regulation and control of cellular processes.

Furthermore, the first and most successful application of lasers in medicine was in ophthalmology at the institute imeni F. P. Filatov. The reason for this was, on one hand, because the transparent medium of the eye is permeable to the passage of the laser ray. However, on the other hand, it is difficult to imagine any other organ consisting of tissues with a higher range of contrast. For this reason, after many experimental studies by oculists, they were able to determine guidelines for the application of lasers in clinical (therapeutic) conditions, treating retinal detachment, ocular neoplasms, and even to experimentally approach the creation of an artificial pupil, all of which will be significant in therapeutic application (the results of work in 3/8

USSR

OGNEV, B. V., et al., Khirurgiya, No 12, 1971, pp 118-119  
this area were presented in the report of L. A. Vedmedenko, L. A. Liunik,  
G. G. Melikov, N. A. Puchkovskaya, L. S. Terent'yeva).

The application of lasers in oncology is of special interest. In the reports of V. V. Gorodilova, I. G. Lagunova, I. R. Kazerev, V. Ye. Likhtenshteyn, R. Ye. Kavetskiy, B. V. Ognev, S. D. Pletnev, et al., it was shown that pulsed and continuous laser rays were able to coagulate malignant tumors in humans and animals. In particular, encouraging results were obtained from the irradiation of experimentally-produced Harding-Passy tumors, the carcinoma RSM [Rous Sarcoma in mice], Brown-Pearce tumors, and also melanoma, skin cancers, angiomas, fibromas and nevi in man. It was established that the tumor and its metastasis must be fully irradiated, and that pigmented tumors show greater sensitivity to lasers than unpigmented tumors. This clarifies and provides a scientific basis for the initial results in erasing a tattoo, as obtained by A. A. Vishnevskiy (the younger) of the Institute of Surgery imeni A. V. Vishnevskiy. The valuable properties of laser therapy, in comparison to other methods of treating surface tumors, are the speed and painless nature of irradiation. It is usually conducted in one sitting,

4/8

USSR

OGNEV, B. V., et al., Khirurgiya, No 12, 1971, pp 118-119

without anesthesia, there is an absence of side effects and rapid healing of the irradiated site, usually not accompanied by infection (R. Ye. Kavetskiy).

The reports of B. V. Ognev, et al., and R. A. Troitskiy, A. K. Polonskiy, B. M. Khromov were devoted to the application of the continuous action laser rays as a "light scalpel." Surgery without hemorrhage, such as dissection and resection of the kidney, liver, intestine and amputation of limbs, is possible using the coagulating property of laser rays. This is extremely important. When B. M. Khromov, et al., compared operations performed with a scalpel, by thermocautery and with laser rays, it was found that the surgical incisions from the rays are replaced by connective tissue. The scar forms in 3-4 weeks depending on the organ and the nature of the tissue. At the same time, in analogous operations performed with a scalpel and using thermocautery, much slower regeneration was observed. The scar from the operation with a scalpel is more tender than that from the laser.

A most promising application of laser rays will be in neurosurgery, where bloodless operations have future importance. Even today R. A. Troitskiy and A. K. Polonskiy have succeeded in stopping rather extensive hemorrhage of

5/8

USSR

OGNEV, B. V., et al., *Khirurgiya*, No 12, 1971, pp 118-119

large vessels of rabbits with defocused laser rays. In addition, it was shown that surgery using lasers takes considerably longer than scalpel operations. This is explained by the still inadequate laser equipment. In connection with this problem, great interest was given to the report of the Engineering Academy, by N. D. Devyatkov, V. P. Belyayev, I. V. Kudravnsev, et al., which discussed the prospects of creating new lasers for surgical work.

Another series of reports described the characteristic effect of lasers on different organs and tissues. It was established that the destructive effect of laser radiation is determined by the biological make-up of the irradiated objects (B. V. Ognev, et al., and B. M. Koromov, et al). The characteristics of the effect of lasers on laryngeal cartilage, (A. Ye. Lapko), tooth pulp (E. Ye. Tarsis, et al.), liver (V. G. Pinchuk, et al.), spine and spinal cortex (A. A. Vishnevskiy, et al.) intestinal walls and lymph nodes (R. A. Troitskiy, A. K. Polonskiy), and skin (V. V. Byalik, et al.) were determined. The reports of D. D. Kopytniy, L. Ya. Zazulevskiy provided experimental confirmation of the stimulation of phagocytosis by local laser irradiation.

6/8

USSR

OGNEV, B. V., et al., *Khirurgiya*, No 12, 1971, pp 118-119

P. P. Chekurov showed the stimulating effect of laser radiation on regeneration of bone tissue. They also succeeded in adapting lasers in clinics for treatment of polyarthrititis, radiculitis and endarteritis obliterans.

Of utmost importance to future development of medical and biological research is the problem of reliable protection of healthy body parts -- especially the eyes of the researcher. Principles of organization are being developed for laser laboratories, as well as for laser operations, clothing, and safety glasses. The results obtained to date cannot be considered satisfactory. This is especially true since great importance is attached to the effect of reflected laser rays (report of B. P. Korichinskiy, I. R. Lazarev, et al.).

Experiments have shown dystrophic effects in the 17th sector of the cortex and other sections of the brains of rabbits and guinea pigs, after laser irradiation of their eyes. This confirms the importance and complexity of the problem of protection from laser radiation, both direct and reflected (A. A. Vishnevskiy, R. A. Troitskiy, N. I. Timokhina). In this respect, therefore, it is necessary to examine the rapid development of laser technology. Already, new devices have been developed, such as liquid lasers, which, undoubtedly, will be used

7/8



USSR

OGNEV, B. V., et al., Khirurgiya, No 12, 1971, pp 118-119  
in biology and medicine since they combine the merits of solid and gas lasers.

It must, however, be stressed that for medical and biological studies, there are few good lasers in spite of the great importance attached to work in this field. Questions on focusing, depth of penetration of light in living tissue and absorption of laser radiation remain undecided. For this reason, the members of the symposia concluded that medical and biological studies with lasers must be conducted in cooperation with engineers working in this field. In conclusion, we should note the fine organization of the symposia in Kiev and in Leningrad.

8/8

- 86 -

UNCLASSIFIED

PROCESSING DATE--09OCT70

TITLE--THE COURSE OF CANCER OF THE LARGE INTESTINE IN ADHESIONS IN  
EXPERIMENT -U-

AUTHOR--TROITSKIY, R.A.

COUNTRY OF INFO--USSR

SOURCE--EKSPERIMENTAL'NAYA KHIRURGIYA I ANESTOLOGIYA, 1970, NR 2, PP 44-47

DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--TUMOR, TISSUE TRANSPLANT, LARGE INTESTINE, ADHESION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1990/0645

STEP NO--UK/0481/70/000/002/0044/0047

CIRC ACCESSION NO--AP0108856

UNCLASSIFIED

022

CIRC ACCESSION NO--AP0108856  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--09OCT70

ABSTRACT. THE AUTHOR DEMONSTRATES THE ROLE OF ADHESIONS IN THE SPRED OF CANCER. EXPERIMENTS ON 133 RABBITS WERE CARRIED OUT. BROWN-PEARCE TUMOR WAS TRANSPLATED INTO THE WALL OF THE LARGE INTESTINE AFTER WHICH THE INTESTING WAS SUTURED TO ABDOMINAL ORGANS. THE TUMOR SPREAD ALONG ADHESIONS INTO DIFFERENT ORGANS AND AT VARIOUS PERIODS. THE URINARY BLADDER, TESTIS AND MUSCLES OF THE ABDOMINAL WALL WERE LESS RESISTANT TO THE NEOPLASTIC GROWTH. THE UTERUS, SPLEEN AND LIVER PROVED TO BE HIGHLY RESISTANT. THE FACILITY: KAFEDRA OPERATIVNOY KHIRURGII I TOPDGRAFICHESKOY ANATOMII TSENTRAL'NOGO INSTITUTA USOVERSHENSTVOVANIYA VRACHI, MOSCOW.

UNCLASSIFIED

USSR

UDC 615.849.19.015.4:612.35

OGNEV, B. V., VISHNEVSKIY, A. A., TROITSKIY, R. A., KEGUM, E. V., RAZYGREN, B. A., and FEDOTKIN, G. F., Institute of Surgery imeni A. V. Vishnevskiy, Academy of Medical Sciences, Chair of Operative Surgery and Topographical Anatomy, USSR, and Central Institute of Advanced Training of Physicians, Ministry of Health USSR, Moscow

"Effect of Laser Radiation on Rabbit Liver"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 6, 1972, pp 20-23

Abstract: Following laparotomy, the right lobes of the livers of rabbits were exposed to either pulsed or continuous laser waves. The pulsed waves produced a local burn and coagulation necrosis of the tissue together with hemorrhages and thrombosis of the blood vessels. Continuous laser irradiation resulted in bloodless incision of liver parenchyma and formation of a scar at the site of entry 5 days later. Vascularization was restored within 15 to 30 days with the formation of blood vessels possessing an atypical structure (narrowed, enlarged, amputated, bent, etc.).

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- 77 -

FROM SKIK, O. R.

JPRS 60634  
27 November 1973  
(B)

EXPERIMENTAL STUDY OF AN AC LIQUID-METAL CONDUCTION MACHINE

Abstract of a Paper by Yu. A. Babanov, L. G. Yuzenkov, S. K. Dorchik, N. Ya. Zandets, V. K. Zhuravlevich, V. Ye. Strizhina, A. Tolmach, S. R. Tulevskiy given at the Magneto-hydrodynamic Conference, pp 140-142

A study was made of a high-temperature aluminum machine with a C-type magnetic excitation system, four pole-piece connected channels. The channels were created from 111-type step-up transformer (Figure 1). The channels are electrically connected to each other and to an active length of 250 mm. The transformer (including the lateral faces) has a constant cross section stability to 60°C. The machine has electrical insulation with thermal several thermocouples. Depending on the operating mode in the experiment, various windings of the windings were realized.

- 1) In the pump mode the excitation winding and the output winding of the transformer were fed from a constant energy source;
- 2) In the generator mode independently of the excitation, the excitation to the useful load;
- 3) In the generator mode, with self-excitation of the windings, the excitation capacitance and the useful load were included according to the scheme in Figure

500 °C. The studies were made on a sodium loop with a sodium temperature of 300-

The characteristic features of the conduction machine of this type and, in particular, the characteristic features of the parallel hydraulic coupling circuit from the sign-variable magnetic field were noted.

USSR

UDC 538.4

BAKANOV, Yu. A., DRONNIK, L. M., LEVIN, M. N., MAKAREVICH, V. K.,  
RESHET'KO, L. M., STRIZHAK, V. Ye., TOLMACH, I. M., TROITSKIY, S. R.,  
YANTOVSKIY, Ye. I.

"Experimental Study of Liquid-Metal Induction Machine in Pump Mode"

7-ye Soveshch. po Magnit. Gidrodinamike. T. 1 [Seventh Conference on Magnetic Hydrodynamics, Vol 1], Riga, Zinatnye Press, 1972, pp 20-23, (Translated from Referativnyy Zhurnal, Mekhanika, No 11, 1972, Abstract No 11 B43 by V. V. Blagov).

Translation: The operation of a liquid-metal induction machine in the pump mode was studied in a potassium circuit with a working pressure of up to 60 kg/cm<sup>2</sup>. The working characteristics of the machine are presented for a temperature of 500°.

The experimental results allowed the relationship of the dimensionless criterion  $\Pi = \Delta P V_s / \sigma U^2$  to the velocity ratio  $V/V_s = i - S$  to be established (where  $V_s$  is the synchronous speed of the rotating field,  $V$  is the velocity of the metal,  $\Delta P$  is the pressure drop developed,  $S$  is the slipping,  $\sigma$  is the conductivity,  $U$  is the applied voltage). As the temperature changes from 1/2

USSR

UDC 538.4

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BAKANOV, Yu. A., DRONNIK, L. M., LEVIN, M. N., MAKAREVICH, V. K.,  
RESHET'KO, L. M., STRIZHAK, V. Ye., TOLMACH, I. M., TROITSKIY, S. R.,  
YANTOVSKIY, Ye. I., 7-ye Soveshch. po Magnit. Gidrodinamike. T. 1, Riga,  
Zinatnye Press, 1972, pp 20-23.

280 to 500° and the voltage varies from 80 to 150 v, the dependence of  $\Pi$  on  $V/V_s$  is universal. The maximum head is produced at small flow rates, depends on the applied voltage and where  $T = 500^\circ$  and  $\Delta U = 150$  v is about 37 kg/cm<sup>2</sup>; the efficiency of the machine is about 24% under these conditions. Where  $T = 300^\circ$ , these figures are 42 and 30% respectively. The total operating time of the machine was 120 hours.

2/2

- 192 -

USSR

TROITSKIY, S. V.

JDC 621.372.853.3.092.22

~~Scattering of Electromagnetic Waves in the Fluctuations of a Plasma Layer~~  
in a Rectangular Wave Guide"

Radiotekhnika. Resp. mezhved. nauchno-tekhn. sb. (Radio Engineering. Republic  
Interdepartmental Scientific and Technical Collection), 1970, vyp. 14, pp 43-  
53 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4B133)

Translation: The scattering cross sections of H-waves in the fluctuations of  
a layer of isotropic plasma are obtained using the principle of duality.  
There are 2 illustrations and a 5-entry bibliography.

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- 143 -



USSR

TROITSKIY, S. V.

UDC 621.372.853.3.092.22

"Scattering of Electromagnetic Waves in a Rectangular Wave Guide with a Magnetically Active Plasma"

Radiotekhnika. Resp. mezhved. nauchno-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 14, pp 54-60 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4B132)

Translation: The scattering of electromagnetic waves in fluctuations in a cold magnetically active plasma completely filling a rectangular wave guide is investigated.

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- 152 -

USSR

UDC 613.6:/678.632:678:046.36

TROITSKIY, S. Yu., KUZ'MINYKH, A. N., ANDREYEVA, T. D., and BUNIMOVICH, G. I.,  
Sverdlovsk Scientific Research Institute of Labor Hygiene and Occupational  
Diseases

"Hygienic Aspects of Working Conditions in the Production of Phenol-Formalde-  
hyde Plastics With Asbestos Filler"

Moscow, Gigiyena i Sanitariya, No 9, Sep 70, pp 89-91

Abstract: Hygienic conditions at plants producing phenol-formaldehyde plastics with asbestos filler were investigated. Dust concentrations of 3.7-5 mg/m<sup>3</sup> were found in the air. The dust developed in connection with the charging of asbestos in mixers. In those sections of the plants in which the resin is heated, concentrations of phenol vapor in the air exceeded the maximum permissible limit. The concentration of formaldehyde in the air generally did not exceed 1 mg/m<sup>3</sup>, but in connection with such operations as the discharging of mixers and drying chambers, the highest concentrations exceeded the maximum permissible level by up to a factor of three. Ventilation systems were improperly designed. A medical examination of 103 workers employed in this type of production showed that: 65 had various subjective complaints; 21 who were

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USSR

TROITSKIY, S. Yu., et al, *Gigiyena i Sanitariya*, No 9, Sep 70, pp 89-91

exposed to the action of phenol and formaldehyde vapors suffered from constant headaches. Pathological changes in the nervous system (neuritis, neurasthenic syndrome, cerebral angiodystonia, etc.) due to exposure to these vapors were found in 19 cases. Of those engaged in polishing and pressing, 12 had skin diseases and 14 had chronic atrophic rhinitis and folliculitis. Three employees in a mechanical workshop showed symptoms of pneumoconiosis. Increased mechanization and automation of operation, including transfer to a continuous process, will improve these working conditions and reduce the impairment of health. Introduction of automated discharge from the bottom of mixers, automatic opening of sacks with asbestos and feeding of asbestos into mixers, enclosed units for certain operations, and improved ventilation systems and local exhausts are important measures which should be taken.

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- 79 -

USSR

PETUKHOV, L. V.; ~~TROTSKIY, V. A.~~ (Leningrad)

"Variational Problems of Optimization for an Hyperbolic-Type Equation"  
Moscow, Prikladnaya Matematika i Mekhanika; July-August, 1972; pp 578-88

ABSTRACT: The article concerns problems of the optimization of control processes for systems described by second-order hyperbolic equations put in a form related to the bivariate Bolza equation of variational calculus. The necessary conditions for stability are found. It is shown that Lagrange multipliers which may have discontinuities within the region of allowable variation correspond to optimal solutions.

Optimal problems for hyperbolic equations with conditions for the characteristics for the simplest type of functional have been studied by A. I. Yegorov by means of Pontryagin's maximum principle ("Optimal Equation for Processes in Distributed Plants", PFM, 1963, Vol 28, No 4; "Necessary Conditions for Optimality in Systems with Distributed Parameters", Mat. Sb., 1966, Vol 68, No 3).

1/1 The article includes 60 equations. There are seven references.

1/2 010 UNCLASSIFIED PROCESSING DATE--23OCT70  
 TITLE--OPTIMIZATION PROBLEMS WITH PHASE COORDINATE CONSTRAINTS -U-  
 AUTHOR--(02)-SEMENOV, A.S., TROITSKIY, V.A.  
 COUNTRY OF INFO--USSR  
 SOURCE--PRIKLADNAIA MATEMATIKA I MEKHANIKA, VOL. 34, JAN.-FEB. 1970, P.  
 127-131  
 DATE PUBLISHED-----70

SUBJECT AREAS--MATHEMATICAL SCIENCES, MECH., IND., CIVIL AND MARINE ENGR  
 TOPIC TAGS--COORDINATE SYSTEM, OPTIMAL AUTOMATIC CONTROL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAME--1988/1450

STEP NO--UR/0040/70/034/000/0127/0131

CIRC ACCESSION NO--AP0106206  
 UNCLASSIFIED

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CIRC ACCESSION NO--AP0106206  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--23OCT70

ABSTRACT. INVESTIGATION OF OPTIMIZATION PROBLEMS FOR CONTROL PROCESSES WITH FIRST AND HIGHER ORDER CONSTRAINTS ON THE PHASE COORDINATES. A CONDITION IS FORMULATED WHICH FACILITATES THE DETERMINATION OF THE POINT OF DEPARTURE OF THE PHASE TRAJECTORY FROM THE BOUNDARY OF THE REGION OF ADMISSIBLE COORDINATE VARIATIONS.

UNCLASSIFIED

ELECTRICAL ENGINEERING  
Equipment

UDC 621.318.1(049)

USSR

ADAMENKO, A. I., Doctor of Technical Sciences, TROITSKIY, V. A., Candidate of  
Technical Sciences, YAKOVLEV, A. I., Candidate of Technical Sciences

"Application of Magnetodielectrics in Electric Machines"

Moscow, Elektrotehnika, No 3, 1971, pp 59-60

Abstract: This article contains abstracts of reports given at the plenary session of the electric machine section of the Ukrainian NTO i EP on the problems of using magnetodielectrics in electric machines held in November 1970 at the Institute of the Electrodynamics of the Ukrainian SSR Academy of Sciences in Kiev. The following topics were discussed in the reports: the state of the art and prospects for development of magnetodielectrics in the USSR and experience in applying these materials in electric machines, the possibility of obtaining magnetodielectrics with high magnetic and dielectric indexes, the study of magnetodielectric materials and their industrial application for magnetic wedges, several types of free-phase and single-phase salient pole asynchronous electric motors with open slots magnetically encapsulated with FMDM [ferromagnetic dielectric mass based on furane-epoxy resin and powdered iron with different technological additives] and interchangeable coils with

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USSR

ADAMENKO, A. I., et al., Elektrotehnika, No 3, 1971, pp 59-60

ordered stacking of conductors, industrial introduction of a developed process for manufacturing magnetic wedges from FMDM, applications of these wedges, industrial testing of experimental models of different motors with magnetic wedges, and practical utilization of integrally molded magnetic circuits made of magnetodielectrics in direct and alternating current micromachines. In the resolutions of the session, it was recommended that magnetodielectrics, especially for the manufacture of FMDM magnetic wedges, be introduced broadly.

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- 108 -



UDC 621.791.03.756

USSR

T  
TROITSKIY, V. A., and KALINNIKOV, S. A., Electric Welding Institute imeni Ye. O. Paton, Academy of Sciences UkrSSR

"Comparison of Sources for Electroslag Welding"

Kiev, Avtomaticheskaya Svarka, No 7, Jul 70, pp 49-53

Abstract: A method of regulating transformers, called "magnetic commutation," has been developed at the Electric Welding Institute imeni Ye. O. Paton. Adjustment is effected by means of a gear mechanism which moves the magnetic commutator or by DC magnetization. Transformers adjustable by magnetic commutation are close to nonadjustable transformers with respect to their weight and energy characteristics. Data on TShS-1000-1 (with a control) and TRMK-1000-1 (adjustable by magnetic commutation) transformers show that a change-over from stepped adjustment to smooth adjustment by magnetic commutation reduced the cost of the source. Electroslag welding with currents up to 3000 amp is done with transformers of 2 types: 1) mechanically adjustable, and 2) adjustable by DC magnetization. A diagram shows that transformers with magnetic commutation by magnetization are not inferior to nonadjustable transformers with respect to their stringent external and energy characteristics. The new

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USSR

TROITSKIY, V. A., and KALINNIKOV, S. A., *Avtomaticheskaya Svarka*, No 7, Jul 70,  
pp 49-53

transformers hold great promise for reliability, cost, and quality of secondary  
voltage characteristics; expenditures for active materials are only 20-30%  
higher than those for nonadjustable transformers.

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UNCLASSIFIED

PROCESSING DATE--02 OCT 70

TITLE--MEASUREMENT OF THE BRIGHTNESS TEMPERATURE OF THE EARTH'S  
ATMOSPHERIC EMISSION IN THE SUBMILLIMETER BAND FROM A HEIGHT OF 35 KM  
AUTHOR--(05)-LAPSHIN, V.I., SALOMONOVICH, A.E., SOLOMONOV, S.V., TROITSKIY,  
V.F., FRADKOV, A.B.  
COUNTRY OF INFO--USSR

SOURCE--IZVYUZ, RADIOFIZIKA, VOL. 13, NO. 3, 1970, P. 398-399

DATE PUBLISHED-----70

SUBJECT AREAS--NAVIGATION, PHYSICS, ATMOSPHERIC SCIENCES

TOPIC TAGS--RADIOMETER, RADIO BRIGHTNESS TEMPERATURE, SUBMILLIMETER WAVE,  
RADIO EMISSION, ATMOSPHERIC RADIATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1991/0846

STEP NO--UR/0141/70/013/003/0388/0394

CIRC ACCESSION NO--AP0110567

UNCLASSIFIED

PROCESSING DATE--02OCT70

UNCLASSIFIED

2/2 030

CIRC ACCESSION NO--AP0110567  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. DESCRIPTION OF A RADIOMETER AND THE RESULTS OF PRELIMINARY MEASUREMENTS OF THE BRIGHTNESS TEMPERATURE OF THE EARTH'S ATMOSPHERIC EMISSION, TAKEN AT A HEIGHT OF 35 KM AT WAVELENGTHS FROM 0.5 TO 2MM. THE SENSITIVE ELEMENTS OF THE RADIOMETER CONSISTED OF N-TYPE INSB PHOTORESISTORS COOLED TO LIQUID HELIUM TEMPERATURE. ANGULAR DISTRIBUTIONS OF BRIGHTNESS TEMPERATURE WERE OBTAINED IN THE VERTICAL PLANE. THE NATURE OF THE DISTRIBUTION AND THE RELATIVELY LOW BRIGHTNESS TEMPERATURE INDICATE THAT THE MAIN CONTRIBUTION TO THE SUBMILLIMETER RADIATION IS MADE BY THE RELATIVELY COLD UPPER LAYERS OF THE ATMOSPHERE.

FACILITY: AKADEMIIA NAUK

SSSR, FIZICHESKII INSTITUT, MOSCOW, USSR.

UNCLASSIFIED

UDC:621.793:661.862.2:533.9.666.765

USSR

BUDNIK, N. M., LYAKH, Yu. A., MESHCHERYAKOV, V. M., BOGATIKOV, Ye. N.,  
TROITSKIY, V. K.

"Plasma Application of a Protective Coating of Aluminum Oxide on Refractory Materials"

Moscow, Svarochnoye Proizvodstvo, No 12, Dec 73, pp 16-17

Abstract: The Department of Welding of Rostov-na-Donu Institute of Agricultural Machine Building has designed and manufactured an experimental 17 kw plasma installation for application of protective aluminum oxide coatings to refractory materials. The new design increases the operating life of the anode nozzle to 20 hours. The influence of atomizing mode parameters on properties of the coatings produced is studied. A technology is developed for application of aluminum oxide to chamotte materials. Application of protective aluminum oxide coatings to the lining of steel teeming ladles by plasma atomization increases lining life by a factor of 2.

1/1

Coatings

UDC 669.14:621.746.328

USSR

BUDNIK, N. M., LYAKH, Yu. A., MESHCHERYAKOV, V. M., TROITSKIY, V. K., LOGAIKOV, Ye. N., URINSON, A. I., and KHOKHLOV, V. M., Taganrog Metallurgical Plant; Rostov-on-Don Institute of Agricultural Machinery

"Increasing the Resistance of the Lining of Steel-Teeming Ladles"

Moscow, Metallurg, No 8, Aug 70, pp 31-33

Abstract: The resistance of the lining of steel-teeming ladles may be increased by heat-resistant protective coatings applied by the plasma method. The powder to be sprayed passes through a high-temperature zone (10,000-20,000°C) and strikes the surface in a plastic state. The powder particles, possessing high kinetic energy, sinter and form a homogeneous high-quality dense coating of adequate thickness. In most cases it is necessary to heat the surface. Aluminum oxide with a particle size of 80-100 microns was used as the protective coating. The technology of the plasma spraying of Al<sub>2</sub>O<sub>3</sub> on chamotte brick is described and the technological parameters were determined. Maximum cohesive strength with the brick was obtained at a 0.4-0.6 mm coating thickness. The aluminum oxide coating applied by the plasma method appears to be double the lining's resistance of steel-teeming ladles under service conditions. The yearly savings per 50-ton ladle at the Taganrog Metallurgical Plant amount to 2,650 rubles.

1/1

UDC 666.1.056

USSR

SHIROKSHINA, Z. V., Candidate of Sciences, TROITSKIY, V. M.

"Coating of Heat-Resistant Oxygenless Glass"

Leningrad, Optiko-mekhanicheskaya promyshlennost', No. 1, Jan 71, pp 46-48

Abstract: A method for coating heat-resistant oxygenless glass with thin layers of organosilicon polymers is studied. The purpose of the work was to find a heat-resistant coating that is transparent in the infrared region and has an index of refraction of  $\sim 1.5-1.6$ . The development of infrared technology made it necessary to produce equipment designed for operation at temperatures in the range  $300-350^{\circ}\text{C}$ . The high index of refraction of existing glasses with the resulting losses in light made it necessary to use optical systems consisting of only three elements which transmit less than 30% of the incident radiation. Coatings developed to increase transparency are not suitable for use at temperatures exceeding  $200^{\circ}\text{C}$ . Several representative classes of organic and inorganic compounds with a thermal stability in the range  $300-500^{\circ}\text{C}$  according to published data were studied. The best results were obtained using solutions of phenylmethylpolysiloxanes of types FM-29 and KMF-29 as film compounds. The chemical structure of these polymers is

1/2

USSR

SHIROKSHINA, Z. V.; TROITSKIY, V. M.; Optiko-Mekhanicheskaya Promyshlennost'  
No. 1, Jan 71, pp 46-48

given. The index of refraction of films of FMF-29 resins was measured as  $1.4 \pm 0.02$  and for films of FM-29 resins was  $1.58 \pm 0.02$ . The films were practically transparent in the infrared region. The coatings were kept for more than 500 hrs at a temperature of  $350^\circ$  and did not break down even when the temperature was raised to  $400^\circ\text{C}$  for 30 min. The optical and mechanical parameters of the film does not change after  $\gamma$ -irradiation and the alternating effect of high and low temperatures.

2/2

- 78 -



USSR

UDC 621.3.023.669.295  
TROITSKIY, V. N., GREBTSOV, B. M., and AYVAZOV, M. I., Institute of New Problems  
in Chemistry of the Academy of Sciences USSR

"The Production of Titanium Boronitride Powders in the Plasma of SHF (Super  
High Frequency) Discharge"

Kiev, Poroshkovaya Metallurgiya, No 11(131), Nov 73, pp 6-9

Abstract: A study was made of the possibility of producing alloys in the Ti-B-N system during a very short duration ( $\sim 10^{-2}$  sec) of stay of the reacting mixture in the plasma-chemical reactor. For this purpose a previously described (Ibid.: No 3, 1972) installation was realized in which a joint reduction of titanium and boron chlorides was realized in nitrogen plasma generated by continuous SHF discharge of 15 kw power. The analysis of the temperature dependence of the electroconductivity of boronitrides shows that a dissolution of 16 wt % boron in titanium nitride results in a diminution of the temperature coefficient of the electric resistance of boronitrides by 2.5 times, when compared to pure titanium nitride. Two figures, one table, six bibliographic references.

1/1

UDO 621.371

USSR

TROITSKIY, V.N.

"Efficiency Of Angular Spaced Reception During Long-Distance Tropospheric Propagation"

Elektrosvyaz<sup>1</sup>, No 9, Sept 1972, pp 20-27

Abstract: The peculiarities are considered of angular spaced reception during long-distance tropospheric propagation. The dependence is studied of the signal level on the azimuthal and vertical reception angles. The correlation coefficient of rapid signal fluctuations is determined for the case of an arbitrary position in the space of antenna diagrams. Experimental statistical data are presented on the correlation coefficient. These data were obtained at various routes (280, 303, and 430 km) and at different wavelengths ( $\sim 7$  and 30 cm). Statistical data are presented on the correlation of slow signal fluctuations. The gain is determined with respect to slow fluctuations during angular spacing. 3 fig. 4 tab. 12 ref. Received by editors, 18 Nov 1971.

1/1

- 10 -

UDC 621.3.023:669.295

USSR

TROITSKIY, V. N., AYVAZOV, M. I., KUZNETSOV, V. M., and KORYAGIN, V. S.,  
Institute for New Chemical, Academy of Sciences USSR

Application of Superhigh-Frequency Discharge to Obtain Titanium Nitride Powder"  
Kiev, Poroshkovaya metallurgiya, No 3, 1972, pp 8-11

Abstract: A description is given of the equipment and the procedure for producing titanium nitride by hydrogen reduction of titanium tetrachloride in a nitrogen current heated in superhigh-frequency heater, reactor, and bubble-type chloride feeder. The overall conversion efficiency of  $TiCl_4$  is as high as 100%. Ammonium chloride is the by-product. The powder obtained is 98% nitride and is close in composition to  $TiN_{0.95}$  with a pycnometric density of  $5.11 \text{ g/cm}^3$ . It is finely dispersed and can be sintered at lower temperatures. Experimental sinters of the new powder at  $1200-1300^\circ\text{C}$  and low pressures yielded high-strength specimens with 3-5% porosity. It is also readily compactable (three illustrations, 4 bibliographic references).

Electromagnetic Wave Propagation

UDC 621.371.24

USSR

TROITSKIY, V.M. (Member, Scientific-Technical Society Of Radio Engineering,  
Electronics, And Communication Inani A.S. Popov)

"Study Of Long-Distance Tropospheric Propagation Of Centimeter And Decimeter  
Waves On The Route Leningrad-Petrozavodsk"

Radiotekhnika, Vol 27, No 3, Mar 1972, pp 29-35

Abstract: During 1968-1969 a study was made of long-distance tropospheric prop-  
agation of 30 and 6.7 cm waves on the route Leningrad-Petrozavodsk. The geo-  
graphical length of the route amounts to 270 km and the equivalent length of it  
altogether to 230 km. Nearly half of the route passes over Lake Ladogian. The  
basic goal of the experiment was to determine the dependence of the attenuation  
factor (ratio of real field intensity to the field intensity of free space) on  
the frequency. As long as the frequencies differed by 4.5 times, it was  
possible to expect a considerable difference in the magnitudes of the attenuat-  
ion factor. The methods of measurement are described and their results are  
analyzed. 9 fig. 1 tab. 1 ref. Received 30 Mar 1970.

UDC 621.371

USSR

TROITSKIY, V. N.

"Optimal Antenna Dimensions and Form in Long-Distance Tropospheric Propagation"

Moscow, *Elektrosvyaz'*, No. 7., 1971, pp 61-67

Abstract: The directivity of the antenna in tropospheric propagation has a practical effect on the signal parameters such that an increase in directivity results in enhanced amplitude but also increases signal losses and signal fluctuations. The theoretical work done in this article is directed toward determining the maximum value of the antenna directivity for optimal values of the signal parameters. The author limits himself to investigations of individual antenna designs which are most interesting from the practical viewpoint. Obtaining an antenna of optimal form, the author finds that it can be used with a gain of more than 50-55 dB, with lesser losses if it is asymmetrical. This theoretical result is confirmed by experiments performed with an asymmetrical antenna in which the directivity angle in one plane was twice that in another. The author concludes that, for the symmetrical antennas used in tropospheric communication, the maximum optimal gain is 43-45 dB.

UDC 621.371

USSR

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TROITSKIY, V. N.

"Effect of Antenna Directivity on Signal Level and Fluctuation in Remote Tropospheric Propagation"

Moscow, Elektrosvyaz', No 8, 1970, pp 43-47

Abstract: This paper is devoted to experiments performed in research on tropospheric communication in the central district of the European territory of the Soviet Union at a frequency of about 1000 MHz and for the most part over a distance of 300 km. The transmitter had a power rating of two to three kilowatts, used a horn antenna with a gain of 21 dB and a directional diagram width of about 20°. Reception was done with two antennas, one a horn similar to the transmitting antenna, the other parabolic, measuring 20 by 20 meters, and with a gain of 45 dB. The measurements were conducted at various seasons of the year, involving continuous, around-the-clock records of signal level with both antennas. Details are given of the method of computing reception parameters and of the method of analyzing the experimental results. Curves for the variation in signal levels for the various times of the year are presented.

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-92 -

1/2 029 UNCLASSIFIED PROCESSING DATE--2300110

TITLE--ON THE POSSIBILITY OF DETERMINING THE NATURE OF THE SURFACE MATERIAL OF MARS FROM ITS RADIO EMISSION -U-

AUTHOR--TROITSKIY, V.S.

COUNTRY OF INFO--USSR, UNITED STATES

SOURCE--INTERNATIONAL UNION OF RADIO SCIENCE, SYMPOSIUM ON PLANETARY ATMOSPHERES AND SURFACES, WOODS HOLE, MASS., AUG. 11-15, 1969. RADIO DATE PUBLISHED----FEB70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS

TOPIC TAGS--RADIO EMISSION, MARS PLANET, PLANETARY ATMOSPHERE, TEMPERATURE, PLANETARY SURFACE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2110

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PROCESSING DATE--23OCT70

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2/2 029

CIRC ACCESSION NO--AP0125694  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. CONSIDERATION OF THE THEORY OF RADIOEMISSION FROM MARS, THE INVESTIGATION OF WHICH MAY BE ILLUSTRATED BY CONSIDERING, E. G., THE HYPOTHETICAL SITUATION IN WHICH THE MOON COULD BE OBSERVED ONLY WHEN IT WAS FULL. IN SUCH A CASE, THE SAME DISTRIBUTION OF THE DAILY TEMPERATURE VARIATION OVER THE SURFACE WOULD BE SEEN. THE SAME IS TRUE FOR OBSERVATIONS OF MARS, SINCE MARS PRESENTS NO PHASE VARIATION. IF THE SURFACE OF MARS IS HOMOGENEOUS, PORTIONS OF THE VISIBLE DISK IN THE SAME APPARENT POSITION WILL HAVE THE SAME PENETRATION OF THE THERMAL WAVE EVEN THOUGH, FROM DAY TO DAY, THESE APPARENT POSITIONS ARE ASSOCIATED WITH DIFFERENT PLACES ON THE SURFACE. IF THE SURFACE IS NOT HOMOGENEOUS, THE THERMAL FIELD WILL VARY PERIODICALLY, DEPENDING ON THE INTERVAL REQUIRED FOR MATERIAL WITH THE SAME PROPERTIES TO REAPPEAR IN THE SAME APPARENT POSITIONS.

FACILITY: GOR'KOVSKII GOSUDARSTVENNYI UNIVERSITET, GORKI, USSR.

UNCLASSIFIED



1/3 028

TITLE--POSSIBILITIES OF INVESTIGATING THE PROPERTIES OF MARTIAN MATTER,  
FROM ITS RADIO EMISSION -U-  
AUTHOR--TROITSKIY, V.S.

PROCESSING DATE--23OCT70

COUNTRY OF INFO--USSR

SOURCE--RADIO PHYSICS INSTITUTE AT GOR'KIY UNIVERSITY; MOSCOW,  
ASTRONOMICHESKIY ZHURNAL, VOL 47, NO 2, 1970, PP 384-391  
DATE PUBLISHED-----70

SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS

TOPIC TAGS--RADIO EMISSION, MARS PLANET, ATTENUATION, ELECTROMAGNETIC WAVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
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STEP NO--UR/0033/70/047/002/0384/0391

CIRC ACCESSION NO--AP0126681

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PROCESSING DATE--23OCT70

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2/3 028

CIRC ACCESSION NO--AP0126681  
ABSTRACT/EXTRACT--(U) GP-0-

IMPOSSIBLE TO OBSERVE THE DIURNAL THERMAL WAVE PROPAGATING INTO THE MARTIAN SURFACE LAYER AND THEREFORE IT WOULD SEEM THAT THERE IS NO WAY TO OBTAIN DATA ON THE DEGREE OF ATTENUATION OF ELECTROMAGNETIC WAVES IN THIS PROBLEM. THE CONDITIONS FOR INVESTIGATING MARTIAN RADIO EMISSION CAN BE ILLUSTRATED IN THE EXAMPLE OF THE MOON IF IT IS ASSUMED THAT THE MOON COULD BE OBSERVED ONLY AT THE TOTAL PHASE. THIS IS THE SITUATION FOR MARS (THE SAME PHASE IS ALWAYS OBSERVED). A THOROUGH REVIEW OF EXPERIMENTAL DATA AND COMPARISON WITH THE THEORY FORMULATED IN THIS PAPER GIVES A PRILIMINARY ESTIMATE OF THE LOSS TANGENT OF 10 PRIME NEGATIVE 2 CM PRIME 3-G. THE DEPTH OF PENETRATION OF ELECTROMAGNETIC WAVES IN THE MILLIMETER AND CENTIMETER RANGES INTO MARTIAN MATTER IS ABOUT THREE WAVELENGTHS. USING INTERPRETATION METHODS DEVELOPED FOR THE MOON, THE AUTHOR GIVES ESTIMATES OF A NUMBER OF OTHER PARAMETERS OF MATTER IN THE UPPER COVERING MATERIAL. THE ANALYSIS AND COMPUTATIONS WERE MADE PRIMARILY TO DEMONSTRATE THE POSSIBILITIES OF THE METHOD. IN ACTUALITY, AT PRESENT THE INITIAL DATA ARE INADEQUATE FOR SOLVING THE PROBLEM. THE PRIMARY TASK FOR THE FUTURE IS TO ESTABLISH THE PRECISE RADIATION SPECTRUM OF MARS, FOR EXAMPLE, DURING THE TIME OF OPPOSITIONS. PRECISE MEASUREMENTS IN THE RANGE 0.1-2 CM ARE PREFERABLE. IT IS EQUALLY IMPORTANT TO MEASURE PRECISELY THE TOTAL RADIATION OF MARS IN IR LIGHT AND MEASURE THE TEMPERATURE OF INDIVIDUAL SECTORS DURING THE MARTIAN DAY, PARTICULARLY THE TEMPERATURE OF THE NIGHTTIME SIDE.

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3/3 028

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PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0126681

ABSTRACT/EXTRACT--HOWEVER, MEASUREMENT OF THE NIGHTTIME TEMPERATURE APPEARS FEASIBLE ONLY FROM A MARTIAN SATELLITE. THERE IS NEED FOR CONTINUED STUDIES OF THE ELECTRIC PROPERTIES OF TERRESTRIAL ROCKS SO THAT THEY CAN BE IDENTIFIED WITH MARTIAN ROCKS. IT IS ALSO VERY NECESSARY TO INVESTIGATE THE DEPENDENCE OF THE HEAT CONDUCTIVITY OF SILICATES ON THE DEGREE OF POROSITY AND ATMOSPHERIC PRESSURE, PARTICULARLY AT A PRESSURE CORRESPONDING TO MARTIAN CONDITIONS. FURTHER, THEORETICAL ESTIMATES OF THE EFFECT OF THE ATMOSPHERE ON THE TEMPERATURE OF THE MARTIAN SURFACE AND ITS DIURNAL VARIATIONS IS IMPORTANT.

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