

1/2 007

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--NQR NUCLEAR QUADRUPOLE RESONANCE SPECTRA OF ANTIMONY 121 AND  
ANTIMONY 123 IN R SUB3 SBX SUB2 COMPOUNDS -U-  
AUTHOR--(05)-SVERGUN, V.I., BORISOV, A.YE., NOVIKOVA, N.V., BABUSHKINA,  
T.A., BRYUKHOVA, YE.V.  
COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (2), 484-5

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--NUCLEAR RESONANCE, CHLORIDE, ANTIMONY ISOTOPE, BROMINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1997/1519

STEP NO--UR/0062/70/000/002/0484/0485

CIRC ACCESSION NO--AP0120300

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0120300

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

ABSTRACT.

THE NQR SPECTRA OF PRIME121 SB AND PRIME123 SB WERE REPORTED FOR R SUB3 SBX SUB2 WHERE R WAS SELECTED FROM ME, ISO BU, BU, CL, PH, CIS AND TRANS CLCH:CH, AND X WAS SELECTED FROM CL AND BR. THE MEASUREMENTS WERE TAKEN AT 77DEGREESK. PH SUB3 ASCL SUB2 IS ISMORPHOUS WITH PH SUB3 SBCL SUB2 AS THEIR RESP. NQR DATA ARE READILY TRANSLATABLE. FACILITY: INST. ELEMENTORG. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--23OCT70

1/2 014  
TITLE--NQR NUCLEAR QUADRUPOLE RESONANCE SPECTRA OF ARSENIC 75 AND CHLORINE  
35 OF CHLORINE CONTAINING ORGANOARSENIC III COMPOUNDS -U-  
AUTHOR-(05)-SHVEDOVA, G.N., SVERGUN, V.I., BABUSHKINA, T.A., KUDRYAVTSEVA,  
L.V., SEMIN, G.K.  
COUNTRY OF INFO--USSR

S  
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (2), 482-3

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--NUCLEAR RESONANCE, SPECTRUM, ARSENIC ISOTOPE, CHLORINE  
ISOTOPE, ORGANIC ARSENIC COMPOUND, MOLECULAR ORBITAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1997/0648

STEP NO--UR/0062/70/000/002/0482/0483

CIRC ACCESSION NO--AP0119560

UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE—23OCT70

CIRC ACCESSION NO--AP0119560

ABSTRACT/EXTRACT--(U) GP-0-- ABSTRACT. NQR SPECTRA WERE REPORTED FOR  
PRIME75 AS AND PRIME35 CL IN ASCL SUB3, ME SUB3 AS, ET SUB3 AS, PH SUB3  
AS, PH SUB2 ASC SUB6 H SUB4 CO SUB2 H P AND M ISOMER, PH SUB2 ASCL,  
MEASCL SUB2, ETASCL SUB2, PRASCL SUB2, AND BUASCL SUB2. THE P CHARACTER  
OF THE SP HYBRIDIZED UNSHARED ELECTRONS OF AS INCREASES UNDER THE  
INFLUENCE OF DIVERSE SUBSTITUENTS ON AS; THIS CORRESPONDS TO INCREASED  
ANGLE BETWEEN METAL ORBITALS RELATIVE TO THE VALENCE ANGLE AND DEVIATION  
OF THE ORBITAL OCCUPIED BY THE LONE PAIR FROM THE PSEUDOGAXIS OF THE 3RD  
ORDER. FACILITY: INST. ELEMENTORG. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 538.113 + 543.42 + 547.242 + 546.13

S  
SVERGUN, V. I., BABUSHKINA, T. A., SHVEDOVA, G. N., KUDRYAVTSEVA, L. V., and SEMIN, G. K., Institute of Organoelemental Compounds, Academy of Sciences USSR

"As<sup>75</sup> and Cl<sup>35</sup> NQR Spectra of Chlorine-containing Organoelemental Compounds of Trivalent Arsenic"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, Feb 70, pp 482-483

Abstract: The As<sup>75</sup> and Cl<sup>35</sup> NQR spectra for compounds of the type  $R_xAsR_{3-x}$  were studied. It was found that sharply different substituents in these compounds produce a significant increase in the angle between the atomic hybridized orbitals of the metal, which increases the p-character of the sp-hybridized pair of the metal, resulting in a sharp increase in the As<sup>75</sup> NQR frequency. The angle becomes much

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SVERGUN, V. I., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, Feb 70, pp 482-483

greater than the valence angle. In addition, deviation of the orbital occupied by the unshared pair from the third-order pseudocaxis also brings about an increase in  $\text{As}^{75}$  NQR frequencies. The authors thank A. YE. BORISOV for his interest in the work and G. KH. KAMAY for providing samples of  $\text{Ph}_2\text{AsPh}^*$ .

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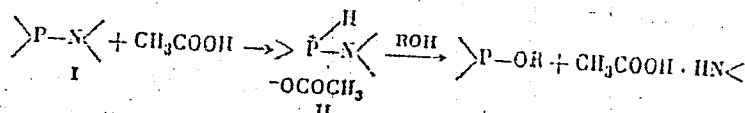
UDC 547.26\*118

YEVDKOV, V. P., BEKETOV, V. P., and SVERGUN, V. I.

"Interaction of Amido Phosphites and Acetyl Phosphites with Acetic Acid, Alcohols and Phenol"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp 55-59

Abstract: By studying the interaction of the amides of the acids of trivalent phosphorus (I) with hydroxyl-containing compounds it has been shown that the phosphorylation of the alcohols by amides is accelerated in the presence of acetic acids [E. Ya. Nifant'yev, et al., Vestn. MGU, No 4, 104, 1968; E. Ye. Nifant'yev, et al., ZhOKH, No 39, 854, 1969; E. Ye. Nifant'yev, et al., ZhOKH, No 36, 865, 1966]. This phenomenon is related to the formation of the extremely reactive intermediate quasiphosphonium compound (II) by which a nucleophilic attack of the alcohol takes place ending in the formation of the trialkyl phosphite.



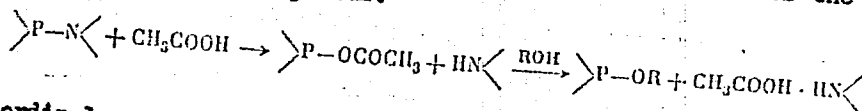
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USSR

YEVDKOV, V. P., et al., Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp. 55-59

Upon treating the amides (I) with acids under mild conditions, the corresponding acyl phosphites are formed [E. Ye. Nifant'yev, et al., ZhOKh, No 38, 1909, 1968], in turn the acyl phosphites easily phosphorylate the alcohols [V. I. Yevdakov, et al., ZhOKh, No 33, 3770, 1963]. Thus, possible the acceleration of the reaction with alcohols in the presence of acetic acid is connected with the appearance in the reaction mixture of the acetyl derivative of trivalent phosphorus.



Accordingly, a study was made of the interaction of the amides (I) and acetyl phosphites with alcohols and phenols in the presence of acids and without them. The acceleration of the phosphorylation of the hydroxyl-containing compounds by amides of the trivalent phosphorus acids in the presence of acids for phenol is connected with the formation of acyl phosphites or aryl phosphites in the reaction mixture. The alcoholysis of the acyl phosphites is accelerated by tertiary amine additives.

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USSR

UDC: 621.372.061.3

SVERKUNOV, Yu. D., Scientific and Technical Society of Radio Engineering,  
Electronics and Communications imeni A. S. Popov

"On Analyzing the Spectrum at the Output of a Nonlinear System"

Moscow, Radiotekhnika, Vol 27, No 8, Aug 72, pp 24-31

Abstract: A formula is derived for calculating the amplitude and phase of any combination component at the output of an inertialess nonlinear system given by a finite number of terms of a Taylor series when the sum of a finite number of sinusoidal signals acts on the input of the system.

USSR

SVESHNIKOV, A. A.

"Application of the Theory of Continuous Markov Processes to the Solution of Nonlinear Problems of Applied Gyroscopy"

Tr. V Mezhdunar. Konf. Po Nelineyn. Kolebaniyam. T. 3 [Works of 5th International Conference on Nonlinear Oscillations, Vol 3], Kiev, Institute of Mathematics, Acad Sci., Uk SSR, 1970, pp 659-665. (Translated from Referativnyy Zhurnal Mekhanika, No 1, 1972, Abstract No 1A129 by L. Ya. Roytenberg).

Translation: Kolmogorov equations are written for the probability density of errors in two specific gyroscopic systems: a gyrovertical with relay correction and a gyroscopic linear acceleration integrator. The motion of the instruments is described by essentially nonlinear differential equations (sign-type nonlinearity).

Assuming the input perturbations to be stable processes with piece-wise-rational spectral density, the author makes a transition from Kolmogorov equations to the equations for the characteristic function, replacing the essential sign-type nonlinearities with discontinuous integrals. Studying the integro-differential equation produced, the author arrives at an infinite system of equations for the 7 invariants of the system of random quantities studied, cutting it off at a certain finite number for practical solution. In the examples studied, the first two moments of the errors of the system are calculated.

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USSR

UDC 519.21

SVESHNIKOV, A. A.

"Determination of Probability of Attainment of the Bounds of a Given Region by a Normal Random Function With Fractionally-Rational Spectral Density"

Nelineyn. i optimal'n. sistemy - Sbornik (Nonlinear and Optimal Systems - Collection of Works), Moscow, "Nauka," 1971, pp 392-399 (from Referativnyy Zhurnal - Matematika, No 8, Aug 71, Abstract No 8B142)

Translation: Calculation of a probability of the existence of a random function in a given region reduces to solving the second Kolmogorov differential equation for a multidimensional Markovian process. It is shown that assumptions required here coincide with the assumptions adopted ordinarily in applications of correlation theory. A new method is given for solving the Kolmogorov equation for the given case, consisting in reducing the problem to a solution of a first-order Fredholm equation. A numerical example is presented that characterizes the accuracy attained with the method. Author's abstract.

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USSR

UDC 519.2

SVESHNIKOV, A. A., Editor

"Collected Problems on the Theory of Probabilities, Mathematical Statistics and Random Functions"

Sbornik Zadach Po Teorii Veroyatnostey, Matematicheskoy Statistike i Teorii Sluchaynykh Funktsiy, [English Version Above], Second Edition, Revised and Supplemented, Moscow, Nauka Press, 1970, 656 pages, (Translated from Referativnyy Zhurnal Kibernetika, No. 5, 1971, Abstract No. 5V127 K).

Translation: The second, supplemented edition of the well-known collection of problems.

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USSR

ZHAKHAROV, A. V., SAMARSKIY, A. A., SVESHNIKOV, A. G.

"Application of the Large Particle Method to Calculating the Motion of a Charged Beam in an Electromagnetic Field, Considering the Space Charge of the Beam"

Moscow, Vychislitel'nyye Metody i Programirovaniye, XVI, 1971, pp 225-243

Abstract: The large particle method is used in the nonstationary problem of calculating the motion of a charged beam in an electromagnetic field, considering the space charge of the beam. The study was made to discover a number of procedural problems in particular, the problems connecting with selecting the numerical method of determining the charge particle density. The essence of the method consists in subdividing the region of existence of the charge at the initial point in time into small volumes  $\Delta V$  and concentrating each charge contained in the volume  $\Delta V$  at the center of inertia of the volume  $\Delta V$ . The charge obtained in this way is considered a "large particle." The  $i$ -th particle contains  $M_i \gg 1$  elementary charges.

The motion of the large particles is defined by the system of equations coinciding, with respect to form, with the equations of motion of an elementary charge:

$$\frac{d\vec{r}}{dt} = \vec{v}, \quad \frac{d\vec{v}}{dt} = e/m(\vec{E} + (1/c)\vec{v} \times \vec{H}).$$

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USSR

ZHAKHAROV, A. V., et al., Vychislitel'nyye Metody i Programirovaniye, XVI, 1971, pp 225-243

It is assumed that far interactions are essentially greater than near interactions and the latter can be neglected inside  $\Delta V$  (the charged particle density is small) and that during a time interval  $0 \leq t \leq T_0$  ( $T_0$  is the time during which the behavior of the system is studied) the real particles inside  $\Delta V$  behave as a unit; this is admissible for a finite  $T_0$  and sufficiently small  $\Delta V$ . The calculations are made in time cycles in which each cycle is divided into three steps: 1) calculation of the electromagnetic field at a fixed point in time  $t = T$ ; 2) calculation of the motion of the large particles during the time interval  $T < t \leq T + \Delta T$ ; and 3) determination of the charge particle density  $\rho(r)$  in the layer  $t = T + \Delta T$  by the known values of the coordinates of the particles.

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1/2 008 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--FROM THE HISTORY OF THE KURSK MAGNETIC ANOMALY INVESTIGATION -U-  
AUTHOR--(02)-SEMENOV, A.S., SVESHNIKOV, G.B.  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK LENINGRADSKOGO UNIVERSITETA, NO 6, GEOLOGIYA, GEOGRAFIYA,  
1970, NR 1, PP 19-30  
DATE PUBLISHED-----70  
SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--MAGNETIC ANOMALY, DEEP DRILLING, IRON ORE/(U)KURSK MAGNETIC  
ANOMALY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1991/0839 STEP NO--UR/0307/70/000/001/0019/0030  
CIRC ACCESSION NO--AP0110562  
UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0110562

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE KURSK MAGNETIC ANOMALY (KMA) WAS DETECTED BY ACADEMICIAN P. B. INOHODTSEV IN 1783 AND DISCOVERED FOR THE SECOND TIME BY I. N. SMIRNOV IN 1873. THE INDIVIDUAL ENTHUSIASTIC MAGNITOLOGISTS, N. D. PILCHIKOV, P. G. POPOV AND ESPECIALLY E. E. LEIST, INVESTIGATED IT IN THE POSTERIOR YEARS. THEY CARRIED OUT THEIR WORK WITHOUT ANY ESSENTIAL HELP FROM THE STATE AND INDUSTRIAL ESTABLISHMENTS OF TSARIST RUSSIA. IMMEDIATELY AFTER THE GREAT OCTOBER SOCIALIST REVOLUTION KMA CAME TO BE AN OBJECT OF ATTENTION OF THE YOUNG SOVIET STATE. ON THE PROPOSAL OF THE SOVIET GOVERNMENT A SPECIAL COMMISSION FOR INVESTIGATING THE KURSK MAGNETIC ANOMALY (O. C. KMA) WAS FOUNDED. OUTSTANDING SCIENTISTS WERE INVITED TO TAKE PART IN THE WORK OF THE COMMISSION. THE SOVIET GOVERNMENT AND V. I. LENIN PERSONALLY RENDERED AN ASSISTANCE AND GAVE ALL KINDS OF HELP TO THE COMMISSION. DUE TO THIS IN A SHORT PERIOD OF TIME IT CARRIED OUT COMPLEX GEOPHYSICAL OBSERVATIONS AND DRILLING DEEP WELLS ON A LARGE SCALE. THE RESULTS OF THE WORK WERE THE ASCERTAINMENT OF THE IRON STONE NATURE OF THE ANOMALY AND EXPOSURE OF ITS PRESENCE ON A LARGE TERRITORY OF THE COUNTRY. GIGANTIC BEDS OF RICH IRON ORE WERE DISCOVERED THERE IN THE FOLLOWING YEARS.

UNCLASSIFIED



USSR

UDC: 621.317.7.088.6

SVESHNIKOV, P. A., REKYAVICHUS, K. I.

"Compensation of Systematic Errors in Panoramic Instruments"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 2 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 2), Novosibirsk, 1970, pp 173-175 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A312)

Translation: The authors compare various methods of compensating systematic measurement errors due to differences in the SHF frequency response of sub-assemblies and crystal detectors in panoramic instruments without selection for identity and without extreme demands on manufacturing technology. Selection of the method for error compensation is determined by residual error requirements, design complexity of the correction device, and operational convenience. Bibliography of three titles. E. L.

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USSR

UDC: 621.317.343

CHUPROV, I. I., ZUBKA, A. I., NAYDENOV, A. Ye., SVESHNIKOV, P. A.

"Measuring the S-Parameters of Remote Objects"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 2 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 2), Novosibirsk, 1970, pp 62-63 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A348)

Translation: In developing panoramic instruments for measuring the parameters of remote objects, particular attention is given to selecting the scheme for connections of SHF units for simultaneous minimization of additional error and maximization of operational convenience. From the operational standpoint, the most suitable scheme is connection of remote objects through a section of high-uniformity cable whose electric length is compensated by introducing another cable in the reference arm of the meter, but in this case an error arises. More accurate but much less convenient is a circuit with a decoupling attenuator. Additional errors (on a fixed frequency) are almost completely eliminated when a double coupler (reflector) is brought out from the instrument to the object; the singularities of this method are pointed out. Bibliography of three titles. E. I.

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USSR

UDC: 621.317.79.029.6(088.8)

SVESHNIKOV, P. A., REKEVICHUS, K. I.

"A Panoramic Device for Measuring the Parameters of a Superhigh Frequency Channel"

USSR Author's Certificate No 266970, filed 14 Nov 68, published 15 Jul 70  
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A361 P)

Translation: The proposed instrument is designed like many similar devices on the principle of separating the incident and reflected waves by using directional couplers; it consists of a sweep oscillator, SHF modules, an indicator and a program device. To increase measurement precision, a number of changes are made in the device such as connecting the outputs of a cadence pulse oscillator and modulator of the SHF oscillator to the phen-tastron inputs in the program device. These changes improve the accuracy of the image of the characteristic on the CRT screen, reduce measurement error and eliminate the necessity for selecting the elements for the SHF channel with identical frequency responses in the channels of the reflected and incident waves. E. L.

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USSR

UDC: 621.317.7.088.6

SVESHNIKOV, P. A., REKYAVICHYUS, K. I.

"Selecting an Approximation Method for Discrete Compensation of Systematic Errors in Panoramic SWR Meters"

V sb. Radioelektronika. T. 5 (Radio Electronics--collection of works, Vol 5), Kaunas, 1969, pp 323-328 (from RZh-Radiotekhnika, No 6, Jun 70, Abstract No 6A364)

Translation: Methods of piecewise-step and piecewise-linear approximation are considered for discrete compensation of systematic errors in panoramic SWR meters. It is concluded that the use of piecewise-linear approximation is preferable in most cases. Resumé.

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USSR

UDC: 519.2

BELYAYEV, Yu. K., NOSKO, V. P., SVESHNIKOVA, A. A.

"Probabilistic Characteristics of Overshoots of a Two-Dimensional Random Field"

Teoriya veroyatnostey i mat. stat. Mezhd. nauch. sb. (Probability Theory and Mathematical Statistics. Interdepartmental Scientific Collection), 1972, vyp. 6, pp 24-31 (from RZh-Kibernetika, No 8, Aug 72, Abstract No 8V124)

Translation: A bilateral estimate is obtained for the average number of overshoots of the random two-dimensional field  $z=z(x,y)$  beyond level  $\alpha$ . The paper gives results relating to the characteristics of the contours and stationary points of the field, and revising the results of a section in a monograph by A. A. Sveshnikov (RZhMat, 1969, 3V141K) dealing with random functions of several variables. Authors' abstract.

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USSR

UDC 669.15.24'26-194.620.178.156.4

BORZDYKA, A. M., and SVESHNIKOVA, G. A., Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Increasing the Relaxation Stability of Heat-Resistant Nickel-Chromium Alloys by the Method of Training"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 53-57

Abstract: The effect of repeated loadings (training) on the relaxation stability of KhN77TYu, KhN67VMTYu, and KhN62VMTYu at 750, 800, and 850°C was studied. The solid solution of the two last alloys was strengthened by a considerable amount of W and Mo. Each alloy was subjected to 3 loadings with 1-15 hour intervals at specified temperature. The obtained experimental data indicated that the relaxation stability of Ni-Cr alloys increases as a result of training. The residual relaxation stresses,  $\sigma_{1000}$  and  $\sigma_{3000}$ , of the KhN77TYu alloy increased by 15-25% after training at 750°C. Approximately the same increase of  $\sigma_{1000}$  and  $\sigma_{3000}$  was obtained for the remaining two alloys trained at 800°C. The alternation of stresses ( $\sigma_0 \leq 0.8 \sigma_T$ ) at 750-850°C with relaxation periods, as well as the repeated loading of samples during the initial stage of experiments, did not change

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USSR

BORZDYKA, A. M., and SVESHNIKOVA, G. A., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 53-57

the structure of the alloy, which remained the same after the heat treatment. The method of training these alloys should be conducted at 750-800°C because higher temperatures are detrimental to their mechanical properties.

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UDC 669.018.85'784'781

USSR

SVESHNIKOVA, G. A., and ZIMINA, L. N., Central Scientific  
Research Institute of Ferrous Metallurgy

"Characteristics of Kh50MBVYu Alloy with Carbon and Boron"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov,  
No 8, 1970, pp 6-11

Abstract: An investigation was made of the effect of carbon and boron additions on the structure and characteristics of the Kh50MBVYu Alloy strengthened with the intermetallic compound  $\text{Ni}_3\text{Nb}$ . The investigation involved melts containing identical amounts of the basic alloying elements (15% Cr, 1% Al, 7.5% Mo; 4.8% W, 5.3% Nb, and 8% Fe) prepared in an induction furnace with a 40-kg magnesite crucible. The boron was added in the form of ferroboration and the carbon in the form of broken-up electrodes; both were put into the bath under slag for two or three minutes before the metal was poured from the furnace. The metal was poured into square-cross-section molds in ingots weighing 7 kg; the ingots were then forged at temperatures of 950-1150° C. The effect of carbon additions was studied in melts with 0.02, 0.05, 0.1, and 0.2% carbon with no boron. With the addition of 0.05% carbon, the forgeability of the alloy deteriorated



USSR

SVESHNIKOVA, G. A., and ZIMINA, L. N., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, 1970, pp 6-11

and was especially poor with the additions of more than 0.1%. The effect of boron additions in amounts of 0.004, 0.009, 0.05, and 0.8% with a constant carbon content of 0.01% were then checked. With 0.05% boron, the forgeability of the alloy deteriorated considerably; nevertheless, all the samples were forged into rods 15 mm in diameter at 1160°. It is concluded that the increase in the carbon content from 0.02 to 9.2% increases the amount of the carbide phase precipitations and reduces the size of the grain, and increases the temperature of eutectic formation. It was also found that the addition of 0.0004 to 0.08% of boron increases the amount of excess phases, shrinks the grain, and leads to the formation of boride eutectics. With a concentration of up to 0.08%, the boron changes the mechanical characteristics of the alloy only slightly at 20 and 750° C and reduces the plasticity.

2/2

1/2 011 UNCLASSIFIED PROCESSING DATE--11DEC70  
TITLE--KINETICS OF THE CHEMICAL ETCHING OF INDIUM ARSENIDE IN ACID  
SOLUTIONS OF FERRIC CHLORIDE -U-  
AUTHOR--(03)-ORLOVA, G.M., SVESHNIKOVA, L.L., NIKIFOROVSKAYA, L.P.  
COUNTRY OF INFO--USSR  
SOURCE--Zh. Prikl. Khim. (Leningrad) 1970, 43(4), 784-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--AQUEOUS SOLUTION, CHEMICAL REACTION KINETICS, FERRIC CHLORIDE,  
CHEMICAL DECOMPOSITION, INDIUM ARSENIDE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAPE--3004/0946 STEP NO--UR/0080/70/045/004/0784/0788  
CIRC ACCESSION NO--AP0131531  
UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--11DEC70

CIRC ACCESSION NO--AP0131531

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THE RATE OF DISSOLN. OF MONOCRYST.  
INAS WAS INVESTIGATED IN PERCHLORIC ACID SOLNS. OF FERRIC CHLORIDE AS A  
FUNCTION OF MIXING, TEMP., AND COMPN. OF THE SOLN. FACILITY:  
LENINGRAD. GOS. UNIV. IM. ZHDANOVA, LENINGRAD, USSR.

UNCLASSIFIED

Acc. Nr:

AP0034405

Ref. Code: UR 0297

PRIMARY SOURCE: Antibiotiki, 1970, Vol 15, Nr 2, pp 99-102

A NEW SPECIES OF MICROMONOSPORA PRODUCING  
MANNOSIDOSTREPTOMYCIN

Gauze, G. F.; Brazhnikova, M. G.; Sveshnikova, M. A.  
Ukholina, R. S.; Nechayeva, N. P.

Institute for New Antibiotics, Academy of Medical Sciences of the USSR, Moscow

Two cultures (1570 and 1575) of *Micromonospora* were isolated from a sample of tropical soil. The strains are described as a new species designated as *Micromonospora pallida* sp. nov. *M. pallida* differs from other species by the absence of the mycelium coloration and an ability to form well developed non-sporulating aerial mycelium on certain media. Antibiotic mannosidostreptomycin was isolated from the culture fluid of strain 1575.

D.R.

6

REEL/FRAHE

19711065

USSR

UDC 632.955

TADZHIBAYEV, T., and SVESHNIKOVA, N. M., Scientific Research Institute of Plant Protection, Tashkent, and All-Union Institute of Plant Protection

"Application of Nematocides Against the Gall-Forming Nematode Meloidogyne sp. on Kenaf Plants"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 9, No 5, 1971, pp 34-35

Abstract: A nematode Meloidogyne sp. causes considerable damage to the valuable crop of the bast plant kenaf (ambary, Deccan hemp - Hibiscus cannabinus) in Tashkent Oblast'. This nematode forms galls on the roots of the kenaf plants, inhibiting the growth of the plants and reducing the yield by more than 20%. The USSR nematocides carbathion (Na methylthiocarbamate), DDB (dichloroisobutylene 30, dichloroisobutane 40%), nemagon, and thiazon, on being introduced into the soil before the sowing of kenaf, proved effective in the control of the gall-forming nematode.

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Epidemiology

USSR

UDC 59:616.986.7:56:591

SVESHNIKOVA, N. P., Moscow

"Paleogenesis of Leptospirosis"

Moscow, Zoologicheskiy Zhurnal, Vol 50, No 9, 1971, pp 1,369-1,379

Abstract: An analysis of the numerous serological groups and types of *Leptospira*, their relation to certain orders of mammals, and the phylogeny and history of their spread over the five continents is related. It is suggested that the transition of *Leptospira* from aquatic to parasitic microorganisms was mediated by marsupials. *Leptospira* migrated with the marsupials from the tropics of the Old World to Australia and South America not later than the end of the Cretaceous period or the beginning of the Tertiary period. Subsequently, the number of animals hosting *Leptospira* increased to include insectivores, predators, and rodents, with Muridae becoming infected not later than the end of the Miocene period. This flourishing family of animals became a very important focus of leptospirosis. On the basis of the high number of *Leptospira* serotypes belonging to the hebdomadis group, the large geographical area in which they are found, and the various orders of animals they inhabit, it is suggested that the antigenic structure of *Leptospira hebdomadis* is of the most ancient origin.

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UDC 575.373.2

YERMOLAYEV, V. L. and SVESHNIKOVA, YE. B.

"Singlet-Triplet Energy Transfer in Liquid Solutions"

Leningrad, Optika i Spektroskopiya, Vol. 28, No 3, Mar 70, pp 601-603

Abstract: Quenching of the fluorescence of anthracene derivatives in a liquid solution at 293°K upon the addition of naphthalene was studied. The fluorescence of 9,10-dibromoanthracene was most strongly quenched by the naphthalene. It was concluded in a previous study that this is caused by nonradiative singlet-triplet transfer of energy from anthracenes to naphthalenes. Further studies were made of quenching and shortening of the fluorescence damping time of 9,10-dichloro- and 9,10-dibromoanthracene in toluene at 293°K by naphthalene, fluorene, diphenyl, and stilbene. It was shown that the high constant of singlet-triplet and triplet-singlet transfer in liquid solutions is caused by the close interaction of donor and acceptor molecules. A diagram is given of the electron levels of molecules which illustrates energy transfer from a singlet excited level of a donor molecule to a triplet level of an acceptor molecule.

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USSR

UDC 535.370

SVESHNIKOVA, Ye. V., and YERMOLAYEV, V. L.

"Mechanism of Nonradiative Reactivation of Excited Rare Earth Ions in Solutions"

Leningrad, Optika i Spektroskopiya, Vol 30, No 2, 1971, pp 379-380

Abstract: The authors attempted to determine the extent to which nonradiative deactivation of rare element ions results from inductive-resonance interactions between the excited rare earth ions and the surrounding molecules of the solution. The data presented indicated that inductive-resonance transfer of energy from rare earth ions to oscillations of the solvent makes a significant contribution to the process of nonradiative deactivation of the ions. In their calculations, the authors ignored the quadrupole-dipole interactions, fluctuations of the solvent, and the presence of electron oscillation bands in the spectra of the ions. These simplifications prevent the authors from answering the question as to whether the entire process of nonradiative deactivation of the ions can be explained by inductive-resonance interactions

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USSR

YERMOLAYEV, V. L., SVESHNIKOVA, Ye. B.

UDC 535.373.2

"Non-Dependence of Quantum Yield of Rare Earth Luminescence on Wavelength of Exciting Light in H- and D-Containing Solvents"

Leningrad, Optika i Spektroskopiya, Vol 28, No 1, Jan 70, pp 186-189

**Abstract:** The article considers the question whether the quantum yield of rare-earth ion luminescence depends on the frequency of the absorbed light in liquid H- and D-containing solvents. The most direct way of solving the question of the pathways of degradation of electron energy is to compare excitation spectra with absorption spectra under the same conditions. This was the method used by the authors, who investigated solutions of nitrates of  $\text{Sm}^{3+}$ ,  $\text{Eu}^{3+}$ ,  $\text{Tb}^{3+}$ , and  $\text{Dy}^{3+}$  in acetone, as well as  $\text{Tb}^{3+}$  in acetonitrile, dimethylformamide, dimethyl sulfoxide,  $\text{H}_2\text{O}$  and  $\text{D}_2\text{O}$ , and  $\text{Eu}^{3+}$ -tetrakis benzoylacetonate with piperidine in ethanol. It was found that for all the studied rare-earth ions, regardless of the force of their interaction with the surroundings, the excitation spectra coincide with the absorption spectra. This indicates that in the studied cases there is no direct radiationless transition from high excited levels to ground level: i. e., there is a cascade transition to the resonance level, from which

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YERMOLAYEV, V. L., SVESHNIKOVA, Ye. B., Optika i Spektroskopiya, Vol 28, No 1, Jan 70, pp 186-189

there is radiation and degradation of energy. The Vavilov law (non-dependence of quantum luminescence yield on frequency of exciting light) is met for rare-earth ions in H- and D-containing solvents if the interval between excited levels is  $\leq 6000 \text{ cm}^{-1}$ .

The absorption spectrum measurements of  $\text{Eu}^{3+}$ -tetrakis benzoylacetonate with piperidine was carried out by N. A. Kazanskaya.

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1/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--SINGLET TRIPLET ENERGY TRANSFER IN LIQUID SOLUTIONS -U-  
AUTHOR--(02)--YERMOLAYEV, V.L., SVESHNIKOVA, YE.B.  
COUNTRY OF INFO--USSR  
SOURCE--LENINGRAD, OPTIKA I SPEKTROSKOPIYA, VOL. 28, NO 3, MAR 70, PP  
601-603  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, PHYSICS  
TOPIC TAGS--FLUORESCENCE, ANTHRACENE, NAPHTHALENE, BENZENE, STILBENE,  
ELECTRON ENERGY LEVEL, ELECTRON SINGLET STATE, ELECTRON TRIPLET STATE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3006/1787 STEP NO--UR/0051/70/028/003/0601/0603  
CIRC ACCESSION NO--AP0135352  
UNCLASSIFIED

2/2 022

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0135352

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. QUENCHING OF THE FLUORESCENCE OF ANTHRACINE DERIVATIVES IN A LIQUID SOLUTION AT 293DEGREESK UPON THE ADDITION OF NAPHTHALENE WAS STUDIED. THE FLUORESCENCE OF 9,10,DIBROMOANTHRACINE WAS MOST STRONGLY QUENCHED BY THE NAPHTHALENE. IT WAS CONCLUDED IN A PREVIOUS STUDY THAT THIS IS CAUSED BY NONRADIATIVE SINGLET TRIPLET TRANSFER OF ENERGY FROM ANTHRACINES TO NAPHTHALENES. FURTHER STUDIES WERE MADE OF QUENCHING AND SHORTENING OF THE FLUORESCENCE DAMPING TIME OF 9,10,DICHLORO, AND 9,10,DIBROMOANTHRACINE IN TOLUENE AT 293DEGREESK BY NAPHTHALENE, FLUORENE, DIPHENYL, AND STILBENE. IT WAS SHOWN THAT THE HIGH CONSTANT OF SINGLET TRIPLET AND TRIPLET SINGLET TRANSFER IN LIQUID SOLUTIONS IS CAUSED BY THE CLOSE INTERACTION OF DONOR AND ACCEPTOR MOLECULES. A DIAGRAM IS GIVEN OF THE ELECTRON LEVELS OF MOLECULES WHICH ILLUSTRATES ENERGY TRANSFER FROM A SINGLET EXCITED LEVEL OF A DONOR MOLECULE TO A TRIPLET LEVEL OF AN ACCEPTOR MOLECULE.

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1/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--DEACTIVATION OF ELECTRON EXCITATION OF RARE EARTH IONS ON  
VIBRATIONS OF THE SOLVENT LOCALIZED IN VARIOUS COORDINATION SPHERES -U-  
AUTHOR--(02)-KAZANSKAYA, N.A., SVESHNIKOVA, YE.B.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(4), 699-704

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--EXCITATION ENERGY, RARE EARTH COMPOUND, ION, LIGHT EXCITATION,  
DEUTERIUM, SOLVENT ACTION, LUMINESCENCE, METHANOL, ETHANOL, PROPANOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--3001/0718

STEP NO--UR/0051/70/023/004/0699/0704

CIRC ACCESSION NO--AP0126430

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0126430

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LUMINESCENCE LIFETIMES,  $\tau$ , FOR SM, EU, TB, AND DY NITRATES IN MECH, CD SUB3 OH (100PERCENT D), MECH (96PERCENT D), CD SUB3 OD (99PERCENT D), ETOH, ETOD (93PERCENT D), C SUB2 D SUB5 OD (90PERCENT D), ISO, PROH, PROD (90PERCENT D), H SUB2 O, AND D SUB2 O (99.5PERCENT D) WERE DETD. FOR EXCITATION OF IONS AN IMPULSE LAMP WAS USED, WITH IMPULSE LENGTH 1 MU SEC. LUMINESCENCE QUENCHING FOLLOWED BY OSCILLOGRAPH WAS FOUND TO BE EXPONENTIAL IN ALL THE CASES. THE VALUES FOR SM PRIME3 POSITIVE AND DY PRIME3 POSITIVE IN H SUB2 O WERE APPROX. ONLY, SINCE  $\tau$  WAS OF THE SAME ORDER OF MAGNITUDE AS THE IMPULSE LENGTH ITSELF. LUMINESCENCE INTENSITY WAS MEASURED, ALSO, AND THE RATIO  $I_{\text{SUBD}}/I_{\text{SUBH}}$  OF THE INTENSITY INDEUTERATED SOLVENTS AND THAT IN FULLY HYDROGENATED SOLVENT WAS EQUAL TO THE SIMILAR RATIO  $\tau_{\text{SUBD}}/\tau_{\text{SUBH}}$ . AS  $\tau$  VALUES FOR EACH OF THE ION IN MECH, ETOH, AND PROH WERE EQUAL, IT WAS CONCLUDED THE ION SOLVATION SHELL WAS THE SAME IN DIFFERENT ALCS. ALSO FOR DEUTERATED ALCS. EQUAL VALUES WERE OBTAINED AFTER EXTRAPOLATION OF DILN. CURVES TO THE PURE SOLVENT (100PERCENT D). EXTRAPOLATED  $\tau$  VALUES ARE GIVEN. EVENTUALLY, AN ADIABATIC APPROXN. OF THE RADIATIONLESS PROCESS WHICH INVOLVE TRANSFER OF THE ELECTRONIC EXCITATION OF THE ION TO THE HIGH FREQUENCY O,H, O,D IN THE 1ST AND C,H OR C,D VIBRATIONS IN THE 2ND SPHERE, WAS GIVEN. THE RATIO  $\alpha_{\text{SUB1}}/\alpha_{\text{SUB2}}$  OF THE VALUE OF INTERACTION OF ELECTRONIC EXCITATION WITH VIBRATIONS IN THE 1ST AND THOSE IN THE 2ND SPHERE WAS EVALUATED. THE STRENGTH OF THESE INTERACTIONS INCREASES IN THE ORDER EU, TB, DY, AND SM.

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PROCESSING DATE--18SEP70

TITLE--INDEPENDENCE OF THE QUANTUM YIELD OF RARE EARTH LUMINESCENCE FROM  
THE WAVELENGTH OF EXCITING LIGHT IN HYDROGEN AND DEUTERIUM CONTAINING  
AUTHOR--(02)-YERMOLAYEV, V.L., SVESHVIKOVA, YE.B.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(1) 186-9

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY, PHYSICS

TOPIC TAGS--RARE EARTH METAL, LUMINESCENCE SPECTRUM, ABSORPTION SPECTRUM,  
SOLVENT ACTION, DEUTERIUM, WATER, ACETONITRILE, COMPLEX MOLECULE, LIGHT  
EXCITATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1984/1910

CIRC ACCESSION NO--AP0100478

STEP NO--UR/0051/70/028/001/0186/0189

UNCLASSIFIED

212 026  
CIRC ACCESSION NO--AP0100478  
ABSTRACT/EXTRACT--(U) GP-0-  
UNCLASSIFIED  
PROCESSING DATE--18SEP70  
ABSTRACT. THE LUMINESCENCE AND ABSORPTION  
SPECTRA OF TRIVALENT RARE EARTH ELEMENTS WERE COMPARED. IN ALL  
INVESTIGATED SOLVENTS (MECN, ME SUB2 CO, ME SUB2 NCHO, ME SUB2 SO, H  
SUB2 O, D SUB2 O), THE LUMINESCENCE AND ABSORPTION SPECTRA WERE  
SUPERIMPOSABLE. ANALOGOUS TO COMPLEX ORG. MOLs., THE RARE EARTH IONS  
HAVE RADIATIONLESS TRANSITIONS IN H AND D CONTG. SOLVENTS. IN COMPLEX  
ORG. MOLs. INTRAMOL. INTERACTIONS PLAY A MAJOR ROLE IN THE TRANSITION  
PROCESSES (ELECTRONIC ENERGY INTO VIBRATIONAL ENERGY) WHEREAS FOR RARE  
EARTH IONS, INTERACTIONS OF THE VIBRATIONS OF THE SOLVATE SHELL WITH THE  
RARE EARTH IONS ARE RESPONSIBLE FOR THE ENERGY TRANSFER.

UNCLASSIFIED



USSR

SVESHNIKOV, A.G., IL'INSKIY, A.S., PAVLOV, A.L.

UDC 538.577.32

"Diffraction Of Plane Wave At An Ideally Conducting Cylinder In A Non-Uniform Medium"

Radiotekhnika i elektronika, Vol XVII, No 7, July 1972, pp 1367-1391

**Abstract:** The problem of diffraction at bodies, the dimensions of which are commensurable with the wavelength, and which have a nonuniform medium surrounding the body, gives rise to great difficulties during theoretical investigation. In the present paper the potentialities are illustrated of the use of numerical methods during the solution of diffraction problems of this type on contemporary electronic computers. The results are presented of a solution of the problem of the diffraction of a plane wave of TE polarization at infinitely long cylindrical bodies located in a nonuniform medium. Amplitude patterns of the directivity in the far zone are presented for cylinders with a cross section in the form of an ellipse and in the form of an isosceles triangle with a smoothed vertex. The authors point out that the results of the calculations presented do not pretend to be an exhaustive analysis of the problems considered and rather bear an illustrative character, making it possible to demonstrate the possibilities of the method used. 5 fig. 4 ref. Received by editors, 16 June 1971.

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- 22 -

SVET, D. Ya.

AUTOMATIC PYROMETER FOR MEASURING THE TRUE TEMPERATURE OF  
RESULTS ON THE BASIS OF RADIATION

Article by D. Ya. Svet, V. V. Orlov, I. N. Ponomarev, Yu. G. Mironov,  
B. P. Muraviev, Russian, pp. 319-321, no further information available

JPRS 59651  
31 July 1975

(5)

The most important problem in the pyrometry of radiation is the measurement of the temperature of a body on the basis of radiation when the radiating capacity of the body changes during measurement.

We know that the solution to this problem is subject to difficulties in solving it has involved radiators whose surface exhibit diffuse and reflection that obeys the Lambert law. In these cases, the spectral radiant energy capacity is obtained from the additional flux of radiation  $\epsilon_{\lambda}$  from a lateral source, reflected by the surface of the radiator  $\epsilon_{\lambda}$ . Polarization of the radiation from a metallic mirror was used in [3,4] to obtain the missing information.

It has been shown [5,7] that within the limits of validity of the Brode formula the values for the true temperature can be determined by the spectral energy density of thermal radiation. However, the method can only be used at a relatively low temperature range. It has also been shown [5,8] that there are several new possibilities of measuring the true temperature with changing radiating capacity, based on acquisition of additional information obtained directly from the flux of polychromatic radiation  $\epsilon_{\lambda}$  on the basis of a new form of distribution of spectral density of Wien-Planck radiation [10].

It has been shown in these papers that although the values of the true temperature and radiating capacity cannot be determined directly from the value of the fluxes of intrinsic radiation, the view which is widely held in optical pyrometry concerning the impossibility of estimating separately the temperature the influence of the radiating capacity on the results of measurements of the flux of the temperature radiation itself is not always valid.

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SVET, D. Ya.

JPRS 59660  
31 July 1973

UXX 536.3:536.32

ONE FORM OF DISTRIBUTION OF SPECTRAL ENERGY DENSITY OF THERMAL RADIATION  
Article by D. Ya. Svet, Moscow, Doklady Akademii Nauk SSSR, Fizmatnauk, Vol. 170,  
No. 6, 1969, signed to press 29 April 1969, pp. 105-107.

The distribution of spectral energy density of thermal radiation of  
real bodies  $b(\lambda, T)$  may be represented in the form of a derivative:  
where  $a(\lambda) = a(\lambda) \cdot a(\lambda)$  is a function which characterizes the spectral distri-  
bution of the coefficient of radiating power  $\epsilon(\lambda)$  of a radiator and the  
transmissivity  $\tau(\lambda)$  of the intermediate medium (including the elements of the  
optical system);  $b_0(\lambda, T)$  is the Wien-Planck function at wavelength  $\lambda$  and the  
temperature of an absolutely black body  $T$ .

In optical pyrometry  $\sqrt{1}$  and in astrophysical measurements  $\sqrt{2}$  -  
there are those who feel that it is impossible to perform a separate measu-  
re of the influence of the parameter  $a(\lambda)$  on the result of their measu-  
ment of intrinsic thermal radiation flux, characterized by distribution  
 $b(\lambda, T)$ . A more detailed examination will show that this is not the case.

Let us examine one form of spectral distribution  $b(\lambda, T)$  which is  
obtained from the distribution of spectral density of an absolutely black  
body  $b_0(\lambda, T)$  within the limits of validity of the Wien approximation, if  
the values of each 1-th spectral component of the isotherm at temperature  $T$   
is related to a power having an exponent which is equal to the wavelength  $\lambda$ :

Here the constants are  $C_1 = 3.7413 \cdot 10^{-16} \text{ W} \cdot \text{cm}^2 \cdot \text{K}^4$  and  $C_2 = 1.4388 \text{ K} \cdot \text{deg} \cdot \text{K}$ .

An important characteristic of the spectrum which is obtained for  
 $b_0(\lambda, T)$  is the lack of displacement of its maximum with temperature. As a  
result, the relative spectral distribution  $B_0(\lambda, T) = b_0(\lambda, T) / b_0(\lambda_j, T)$   
is independent of temperature.

\*It is easy to show that the function  $b_0(\lambda, T)$  has its maximum at wavelength  
 $\lambda_m = 1.90 \mu\text{m}$ .

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SVIRIDENOK, A. I.

So: JPAS 59610  
25 JULY 1973

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UFC 678.01.539.61

MICROTROBOMETRIC STUDY OF SELF-LUBRICATING COMPOSITE MATERIALS BASED ON POLYMERES  
[Article by A. I. SVIRIDENOK, V. H. KEN'KO, V. A. BEL'YI, Institute of Machine-  
Building, Academy of Sciences of the Republic of the USSR, Moscow, U.S.S.R.,  
No 1, 1973, submitted 3 December 1971, pp 102-104]

The microtribometric method is described, and results are  
presented from studying the frictional properties of  
polymers and composite materials based on them. There  
are five illustrations and a 6-entry bibliography.

The actual solid-state contact is discrete as a result of roughness of  
the interacting surfaces. When selecting the calculation schemes for the  
frictional interaction, the unevennesses of the real surfaces are usually  
simplified by a set of bodies of regular shape, for example, spherical [1].  
Accordingly, the investigation of the interaction of the unevennesses of one  
body with the surface of another is of definite theoretical and practical  
interest. The method of studying the friction of a microtribometer com-  
posite materials and the structural elements is called  
the microtribometric method [2]. By means of this method it appears possible  
to investigate the frictional properties in connection with the structure of  
the material [3, 4]. It is of special interest to use microtribometry to study  
self-lubricating composite materials based on polymers and dry lubricants  
having a clearly expressed discrete structure. As a result of such studies  
it appears possible from the point of view of achieving the required frictional  
properties to obtain information about the selection of the binder, fillers,  
their disperseness and optimal distribution, and so on and to estimate the  
friction mechanism of the composite self-lubricating materials. In connection  
with the discussion in this report a study has been made of certain results of  
estimating the frictional properties of composite materials based on polymers  
and dry lubricants.

The study was made by the method of microtribometry on the DS-type device  
[3] using electron and optical microscopy. A corundum needle with a radius  
of curvature of the operating section of 15 microns was used as the indenter.  
This corresponds to dimensions of the unevennesses of the point actual surface  
of approximately 10th class 6. The experiments were performed with a slider

rate of 0.005-0.01 mm/sec and an indenter load of 1-8 gram force. The choice of material was determined by trying to reduce the effect of the frictional heating. With the actual operating conditions using the following procedure [1] beginning material: the outline pressure on the contact — up to 100 kilogram-force/cm<sup>2</sup> the Young's modulus of the material  $E = 5 \cdot 10^4$  kilogram-force/cm<sup>2</sup>; the Poisson coefficient  $\nu = 0.4$ .

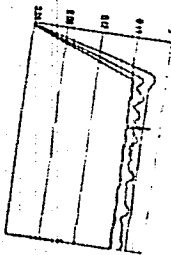


Figure 1. Tribograms of the following binders: 1 — PVF; 2 — EPP; 3 — SBS-1.

When taking the tribograms, the structure and the trail were photographed simultaneously using an optical microscope with 200 x magnification. The period in the form of films up to 8000 x magnification. After this, the binder with filler from 100 to 200 microns thick (from the pure binder with the experimental data using a pin friction machine. The specimens were prepared by a study was made of the frictional behavior of three types of binders: furfural (PVF), phenol formaldehyde resin (SBS-1) and polyvinyl

During movement of a single-spherical indenter over the plastic half-space, the magnitude of the friction coefficient is defined both by the molecular interaction of the contact surfaces depending on the nature of the character of the deformation of the material which can be of the nature of the polymer material [1]. Accordingly, when estimating the effect of the frictional contact tests were made for a constant magnitude of the rate  $b/\dot{u} = 0.2$ . As a result of the difference in mechanical properties of the selected binders, the identical value of  $b/\dot{u} = 0.2$  is achieved corresponding to different loads by the magnitude of which it is possible to judge the carrying capacity of the binder.

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UDC 536.521.3:535.51(088.8)

SVET, D. Ya., Institute of Metallurgy imeni Baykov

"Method of Determining the Correction of Radiation Pyrometer Readings  
During Changing Emittance"

USSR Author's Certificate No 249683, filed 19 Apr 68, published 4 Jan 70  
(from RZh-Metrologiya i Izmeritel'naya Tekhnika, No 8, Aug 70, Abstract  
No 8.32. 622 P)

Translation: In order to raise the accuracy of measurements of the corrections of radiation pyrometer readings from the flux, discernible by the pyrometer which is mounted at certain angle to the radiation surface, are isolated the parallel and perpendicular components of polarized radiation of the same spectral composition and according to their magnitude of correction is estimated.

V. S. K.

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UNCLASSIFIED  
TITLE--METHOD FOR MEASURING TRUE TEMPERATURES BASED ON THE CORRELATION OF  
POLARIZED RADIATION FLOWS IN THE VISIBLE SPECTRAL REGION -U-  
AUTHOR-(02)-SVET, D.YA., SAYAPINA, V.I.  
PROCESSING DATE--23OCT70

COUNTRY OF INFO--USSR

5

SOURCE--ZH. PRIKL. SPEKTROSK. 1970, 12(3), 518-22

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--CRYSTAL POLARIZATION, TANTALUM, TUNGSTEN, HAFNIUM, NIOBIUM,  
MOLYBDENUM, PHENIUM, IRIDIUM, SPECTRUM, EMISSIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1996/1815

CIRC ACCESSION NO--AP0118779

STEP NO--UR/0368/70/012/003/0518/0522

UNCLASSIFIED

031  
CIRC ACCESSION NO--AP0118779 UNCLASSIFIED  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING TABULATED OPTICAL  
CONSTS., THE SPECTRAL EMISSIVITIES WERE CALCD. OF SOME METALS (HF, NB,  
TA, MO, W, RE, IR, AND PT) WITH PURE POLISHED SURFACES AT RADIATION  
ANGLES OF 0, 60, 70, AND 80DEGREES AND WAVELENGTHS OF 0.45 AND 0.65 MU.  
BY STARTING FROM THE EMISSIVITY VALUES, BOTH BRIGHT AND COLOR TEMPS. ARE  
COMPUTED AS A FUNCTION OF RADIATION ANGLE AT A TRUE TEMP. OF  
1500DEGREESK. FOR ALL THE METALS STUDIED THE TRUE TEMPS. CAN BE DETD.  
WITHIN EXPTL. ERRORS (SMALLER THAN 1PERCENT) BY MEASURING THE COLOR  
TEMPS. BASED ON RATIO OF PARALLEL RADIATION FLOWS AT AN ANGLE OF  
SIMILAR TO 80DEGREES. THE CONCLUSION IS EXPTL. VERIFIED BY TAKING COLOR  
TEMP. MEASUREMENTS (1500-2400DEGREES) ON NB, TA, MO, AND W AT 0.49 AND  
0.64 MU. THE VALUES OF BRIGHT TEMP. OBTAINED UNDER THE SAME CONDITIONS  
(WAVELENGTH OF 0.66 MU) DIFFER FROM TRUE VALUES BY 1-2PERCENT (TA, W)  
AND BY SIMILAR TO 6PERCENT (MO, NB).

PROCESSING DATE--23OCT70

UNCLASSIFIED



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UNCLASSIFIED

PROCESSING DATE--30OCT70  
CURRENT FOR HARDENING

TITLE--EXPERIMENTAL APPLICATION  
COMPLEXLY SHAPED PARTS -U-  
AUTHOR--SVET, I.T.

COUNTRY OF INFO--USSR

SOURCE--KIEV, TEKHNOLOGIYA I ORGANIZATSIYA PROIZVODSTVA, NO 1, 1970, P 51

DATE PUBLISHED--70

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

TOPIC TAGS--TRACTOR, FUEL PUMP, MACHINE TOOL, INDUCTION HARDENING/(U)T74  
TRACTOR FUEL PUMP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FAME--1989/1312

CIRC ACCESSION NO--AP0123271

STEP NO--UR/0418/70/000/001/0051/0051

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123271

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MACHINE TOOL IS DESCRIBED WITH A  
SPECIAL PROFILE INDUCTOR FOR HIGH FREQUENCY CURRENT HARDENING OF  
MULTICAM DISTRIBUTIVE ROLLERS FOR USE IN THE T-74 TRACTOR FUEL PUMP.

UNCLASSIFIED

"APPROVED FOR RELEASE: 08/09/2001

CIA-RDP86-00513R002203220009-1

UNCLASSIFIED  
TITLE--THE EFFECT OF POLARIZATION UPON THE PRECISION OF TEMPERATURE  
MEASUREMENTS BY OPTICAL PYROMETERS --U--  
AUTHOR--(02)--SVET. L. YA. SAYAPINA, V.I.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, IZMERITEL'NAYA TEKHNIKA, NO 2, PP 49-51  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, METHODS AND EQUIPMENT  
TOPIC TAGS--OPTIC PYROMETER, LIGHT POLARIZATION, ERROR ANALYSIS, LIGHT  
REFRACTION, LIGHT REFLECTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1993/1544  
CIRC ACCESSION NO--AP0114139  
STEP NO--UR/0115/70/000/002/0049/0051  
UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001

CIA-RDP86-00513R002203220009-1"

2/2 021

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0114139  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE PRESENCE, IN THE OPTICAL CIRCUIT OF PYROMETRIC SYSTEMS, OF VARIOUS COMPONENTS, MIRRORS, FLAT AND TRANSPARENT PLATES, AND PRISMS, THAT ARE AT AN ANGLE TO THE OPTICAL AXIS, MAY BRING ABOUT AN ERROR IN THE MEASUREMENT OF TEMPERATURE IN A CASE WHERE THE RADIATION IS POLARIZED. A CHANGE OF THE INCLINATION ANGLE OF SUCH COMPONENTS ALSO AFFECTS THE PRECISION OF TEMPERATURE MEASUREMENT. ACCORDING TO THE CALCULATIONS MADE IN THIS ARTICLE, IF THE RADIATION PROCEEDS FROM THE SOURCE AT A SMALL ANGLE (UP TO 20 DEGREES) AND IS REFLECTED (REFRACTED) ALSO AT A SMALL ANGLE OF INCIDENCE, THEN POLARIZATION DOES NOT AFFECT THE MEASURED TEMPERATURE. IN THE CASE OF LARGE ANGLES OF RADIATION (UP TO 80 DEGREES) AND ANGLES CLOSE TO 0 DEGREES, AND ALSO DIFFERS FROM THE TEMPERATURE COMPUTED ON THE BASIS OF THE MEAN VALUES OF THE REFLECTING POWER AND THE REFRACTION FACTOR FOR THE CORRESPONDING ANGLES. THE USE OF A TURNABLE PRISM FOR DEFLECTING THE RADIATION DOES NOT AFFECT THE READINGS OF THE PYROMETER WHEN THE DEGREE OF RADIATION POLARIZATION IS CHANGED.

UNCLASSIFIED

USSR

IVAKHNENKO, A. G., STETSNEKO, N. D., and SVETAL'SKIY, B. K. (Kiev)

"The Structural Objective Identification of the Process of Photosynthesis by Methods of Self-Organization"

Kiev, Avtomatika, November-December 1972, pp 22-32

Abstract: One of the authors of the article (N. D. Stetsenko) has developed methods and apparatuses for the multiple observation of the photosynthesis of organic substances and has carried out these investigations with corn leaves.

The other two authors (A. G. Ivakhnenko and B. K. Svetal'skiy), using the experimental data obtained, applied their cybernetic method to the self-organization of mathematical modeling of this process. As a result, two mathematical models of the photosynthesis were obtained (for two methods of supplying plants with moisture).

Both models proved to be nonlinear, combined, open-closed automatic control systems with delayed arguments which agree closely with physiological concepts on photosynthesis.

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IVAKHNENKO, A. G., et al., Avtomatika, November-December 1972, pp 23-32

The models can be used for the prediction and optimal control of photosynthesis for the purpose of increasing productivity.

The article includes a number of equations, two figures, and two tables. There are 11 bibliographic references.

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1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--LIMITING CURRENTS ON A ROTATING DISK ELECTRODE IN TRICHLOROACETIC  
ACID SOLUTIONS. II. SOLUTIONS WITH VARYING SUPPORTING ELECTROLYTE  
AUTHOR--(02)--SVETASHOVA, YE.S., DUDIN, YA.V.

COUNTRY OF INFO--USSR

SOURCE--ELEKTRIKHIMIYA 1970, 6(4), 480-3

DATE PUBLISHED--70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTROLYTE, PLATINUM ELECTRODE, CHLORINATED ORGANIC COMPOUND,  
POTASSIUM CHLORIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/0659

STEP NO--UR/0364/70/006/004/0480/0483

CIRC ACCESSION NO--AP0124331

UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--30OCT71

CIRC ACCESSION NO--AP0124331

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RELATION BETWEEN THE LIMITING CURRENT AND THE SUPPORTING ELECTROLYTE CONC. WAS STUDIED ON A ROTATING PT DISK ELECTRODE IN SOLNS. OF KCL CONTG. HCL, CCL SUB3 CO SUB2 H, AND ALLYL ALC. AT HIGH CONCNS. OF THE SUPPORTING ELECTROLYTE, THE LIMITING CURRENT IS DUE TO THE DISCHARGE OF H SUB3 O PRIME POSITIVE ONLY, THE RELATIVE CONC. OF CCL SUB3 CO SUB2 PRIME NEGATIVE BEING LOW. BY DECREASING THE SUPPORTING ELECTROLYTE CONC., AN ELEC. FIELD IS FORMED IN THE DIFFUSION LAYER, INHIBITING ACCESS OF THE ANION TO THE ELECTRODE SURFACE. IN THE BINARY SOLN. CONC. RANGE OF THE ACIDS, THE LIMITING CURRENTS IN SYSTEMS WITH AND WITHOUT ALLYL ALC. ARE PRACTICALLY EQUAL; THE EXTRAPOLATED VALUE OF THE LIMITING CURRENT IS IN AGREEMENT WITH THE VALUE CALCD. FROM THE EQUATION OF LEVICH. AT EXCESS CONCNS. OF THE SUPPORTING ELECTROLYTE, THE RATIO OF THE LIMITING CURRENT DUE TO THE REDN. OF CCL SUB3 CO SUB2 PRIME NEGATIVE AMTS. TO 20PERCENT, AND IN CONC. REGIONS APPROACHING BINARY SOLNS. IT FALLS TO SIMILAR TO 3PERCENT, IN AGREEMENT WITH THE VALUE CALCD. FROM THE THEORY OF CONVECTIVE DIFFUSION. FACILITY: LENINGRAD. GOS. UNIV. IM. ZHDANGVA, LENINGRAD, USSR.

UNCLASSIFIED



Molecular Biology

UDC 577.1

USSR

SVETAYLO, E. N., Candidate of Biological Sciences, Moscow

"Satellite DNA"

Moscow, Priroda, No 11, 1970, pp 74-75

Translation: The rapid development of research in molecular biology and genetics yields all the more new data on internal processes in cells and on the structure of chromosomes and the mechanism of their activity. The majority of studies of chromosomes as structural formations of cells refer to those stages of the cell cycle during which the intensity of synthesis processes is minimal. We know very little of the interphase stage, when the chromosomes are no longer distinguishable and their metabolic activity is maximum. This is why the accumulation of new data on the features and localization of the various components of DNA in the cell makes it possible to gain an understanding of the genetic events that take place.

Several years ago a small component of DNA (obtained by centrifugation in a density gradient) which differs from the basic fraction in several properties found in the DNA fraction of higher animals. After centrifugation, DNA, mixed in a CsCl solution, accumulates in certain parts of the centrifuge test tube, in exact proportion to its density. The location of

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SVETAYLO, E. N., Priroda, No 11, 1970, pp 74-75

of these areas can be precisely determined by ultraviolet irradiation, because DNA absorbs strongly in the 260 millimicron band. The density of the areas of distribution of DNA thus obtained is determined on the basis of the known density of the DNA-marker taken as a standard. Study of the DNA of a large number of animals has shown that, together with the basic peak of DNA, there is a second, lesser peak almost blending in with the basic one. This fraction was named satellite DNA. K. Jones (England) attempted to determine the location of satellite DNA in the cell by making use of one of the basic qualities of the DNA molecule. It is known that the DNA molecule (a double helix) consists of two strands which are complementary in their composition and are easily separated from each other during denaturation. Under the proper conditions, the single strands can be recombined (reassociated) into a double helix. The reassociation takes place according to the principle of mutual structural correspondence between the bases of each strand. It can be observed that the strands of the separated satellite DNA reassociate much faster than the strands of basic DNA. By placing single-strand labelled DNA together with cells in which all DNA in situ (in the nuclei and the mitochondria) was in the form of single-strand molecules, it is possible to see that the strands of the labeled satellite DNA will again

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selectively combine with the satellite DNA of the cells. The process of satellite DNA pairing can be observed by means of radioactive labeling. The remaining cellular DNA remains unlabeled after reassociation.

For this work, Jones selected the satellite DNA of the mouse, obtained from a culture of embryonic cells. The cells were first incubated in the presence of a specific DNA component,  $H^3$ -thymidine, labeled with tritium. Single-strand labeled satellite DNA was obtained from these cells by means of denaturation. All of the cell DNA of the mouse and of the rabbit was also denatured into single strands, and the possibility of spontaneous pairing (recombination) was prevented by dehydration.

Did prolonged radioautography of these cells after introduction of the labeled DNA permit detection of the area where the satellite DNA is located in the cell?

The radioautograms of the rabbit cells did not show anything unusual after the mouse's satellite DNA had been added; consequently, the heterologous cell DNA did not pair. In mouse cell specimens, that is, in a homologous system, pairing was extensive and clearly visible. In the nuclei, during interphase, the radioactive zones were connected with the nuclear chromatin and the nucleoli. Cytologists have repeatedly pointed out the

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connection between the nucleoli and centromers of chromosomes. This location of labeled satellite DNA in the cell was confirmed by observations during cellular fractionation. Detailed study of the cell division process has shown that the zone adjacent to the chromosomes (the area of the centromer) contains a great deal more radioactive DNA, and that homologous zones are marked on two chromosomes of one pair.

This investigation of intracellular reassociation of DNA makes it possible to relate satellite DNA to definite cell structures. Such an experimental technique may make it possible in the future to locate certain DNA nucleotide sequences on the chromosome and to establish the correlation in the genetic information of various species.

W. Hennig and P. Walker (England) studied the DNA of 16 rodent species from the point of view of proportion in content and kinetics of renaturation of cell DNA. It was found that the proportion of satellite and basic DNA differed from one species to the next; the difference was especially great in related species. In mice (*Mus musculus*), for instance, satellite DNA constituted 12%, while in field mice (*Microtus agrestis*) it constituted not more than 6%; black rats (*Rattus rattus*) it constituted 10% and in voles (*Apodemus mystacinus*), 5%. Three very closely related species of voles

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yielded radically different curves of DNA distribution. The authors assume that satellite DNA contains numerous copies of base sequences with a limited number of bases themselves -- from 100 to 300. This, apparently, explains the fact that satellite DNA does not participate in protein synthesis (this is confirmed by the absence of association of single-strand satellite DNA with RNA).

In addition, there is a known fraction of DNA that has an intermediate pairing rate of basic and satellite DNA. The slow renaturation of DNA, attributed to it by R. Britten, D. Kokne (USA), J. Wetmur, and N. Davidson (USA), is due to the fact that each of the base sequences, corresponding to a single gene, is represented only once in each strand. It is this fact that reduces the speed of recognition and pairing. The speed of reassociation, therefore, serves as an index of the frequency of repetition of certain sequences. P. Walker reached the conclusion that the intermediate DNA found in all higher organisms that have been studied to date contains a "family of repeated sequences" and that the rapid satellite DNA must contain an even higher number of these repeated sequences.

What is the role and origin of these DNA's? If we take as a basis the experiments of K. Jones, who concentrates his attention on the connection of

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SVETAYLO, E. N., Priroda, No 11, 1970, pp 74-75

DNA with the centromers, then we may assume that satellite DNA has a connection with the pairing and motion of the chromosomes. What is its actual position and number in the chromosome? Do the sequences determine the recognition between homologous chromosomes? Do they have anything to do with polymerization of the proteins in the spindle? Are they not simply supplementary structures of the spindle? These are the questions which the investigators will have to answer in the near future. However, it already seems possible to assign to satellite DNA a regulatory and orientating role in the chromosome.

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1/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--DIURNAL RHYTHM OF MITOTIC ACTIVITY IN THE WHITE RAT RECTUM  
EPITHELIUM IN THE COURSE OF ACUTE RADIATION DISEASE -U-  
AUTHOR--SVETIKOVA, K.M.

COUNTRY OF INFO--USSR

SOURCE--TSITOLOGIYA; 12: 247-50 FEB 1970

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--RADIATION SICKNESS, LARGE INTESTINE, CELL PHYSIOLOGY, MITOSIS,  
DIURNAL VARIATION

CONTROL MARKING--NO RESTRICTIONS.

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1997/1983

STEP NO--UR/9053/70/012/000/0247/0250

CIRC ACCESSION NO--AP0120626

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0120626

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DIURNAL RHYTHM OF MITOTIC ACTIVITY IN THE RECTUM EPITHELIUM CRYPTS OF WHITE RATS WAS STUDIED. IN NORM, THE MAXIMUM IS ATTAINED IN THE AFTERNOON HOURS, 32.2 PLUS OR MINUS 4.3 0 OVER 00, WHEREAS THE MINIMUM IS REGISTERED AT MIDNIGHT, 19.0 PLUS OR MINUS 2.2 0 OVER 00 (P EQUALS 0.025). IT WAS SHOWN THAT AT THE CLIMAX OF ACUTE RADIATION DISEASE THE CORRESPONDING DIURNAL RHYTHM IS CHANGED, WITH THE MAXIMUM BEING IN THE EVENING HOURS, 6-9 P.M., MINUS 41.0 PLUS OR MINUS 3.8 0 OVER 00 AND THE MINIMUM IN THE MORNING HOURS, 6 A.M., 24.6 PLUS OR MINUS 4.8 0 OVER 00 (P EQUALS 0.0002). THE AVERAGE VALUE OF THE DIURNAL MITOTIC ACTIVITY IN THE IRRADIATED ANIMALS WAS HIGHER THAN THAT IN THE CONTROLS, 36.7 PLUS OR MINUS 2.7 AND 25.6 PLUS OR MINUS 2.2 0 OVER 00 RESPECTIVELY, P EQUALS 0.002. FACILITY: INST. OF EXPERIMENTAL MEDICINE, LENINGRAD.

UNCLASSIFIED



Nitrogen Compounds

USSR

UDC 547.292'464:547.415.1'821.3

SVETKIN, Yu. V., MUKHAMETOVA, D. Ya., and KOSYGIN, V. I., Bashkir State University of the 40th Anniversary of the October Revolution

"Synthesis and Some Properties of N,N'-Polymethylene-bis (2-chloroacetamides)"

Leningrad, Zhurnal Organicheskoy Khimii, Vol 7, No 6, Jun 71, pp 1159-1162

Abstract: N-Substituted chloroacetamides are used extensively as herbicides, defoliants, and bactericides. Furthermore, they serve as starting materials for the synthesis of compounds with local anesthetic, bactericidal, antifungal, oxytocic, and curariform activity. The following series of synthesis was carried out with the view of obtaining compounds with physiological activity. By reacting diamines with acetic-chloroacetic anhydride obtained from ketene and monochloroacetic acid, the N,N'-polymethylene-bis(2-chloroacetamides)  $\text{ClCH}_2\text{CONH}(\text{CH}_2)_n\text{NHCOCH}_2\text{Cl}$  (I;  $n = 2-10$ ) were prepared. The reaction of compounds I with diethylamine led to the formation of N,N'-bis (2-diethylaminoacetyl)- $\omega, \omega'$ -polymethylenediamines  $(\text{CH}_2)_n(\text{NHCOCH}_2\text{NEt}_2)_2$  (II;  $n = 2-10$ ). Upon the reaction of compounds I with pyridine, the polymethylene - $\omega, \omega'$ -bis/1-(2-amino-2-oxoethyl)pyridinium/chlorides  $(\text{CH}_2)_n(\text{NHCOCH}_2\text{N}^+\text{C}_5\text{H}_5)_2\text{Cl}^-$  (III;  $n = 2-10$ ) were obtained. The Cl content in compounds I could be determined by dissolving compounds III derived from them in  $\text{H}_2\text{O}$  and titrating the

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SVETKIN, Yu. V., et al, Zhurnal Organicheskoy Khimii, Vol 7, No 6, Jun 71, pp 1159-1162

Cl<sup>-</sup> ions by the Mohr method. Isolation of compounds III for the determination of Cl in them was not necessary; compounds I were boiled with an excess of pyridine and, on evaporation of the unreacted pyridine, titration of Cl<sup>-</sup> was carried out. Titration of Cl<sup>-</sup> on conversion of Cl-containing pesticides into pyridinium chlorides forms a convenient method for the quantitative determination of these pesticides.

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Water Treatment

USSR

UDC 536.423.1:661.184

BAKHANOVA, R. A., SVETLAKOV, A. M., and SOLYANEK, YE. G., Scientific-Research Institute of Hydrometeorology, Kiev

"Determination of the Coefficient of Water Evaporation From a Flat Surface Covered with a Surfactant Film"

Moscow, Kolloidnyy Zhurnal, Vol 33, No 5, Sep-Oct 71, pp 642-644

Abstract: The effect of surfactants deposited on an evaporating surface on the evaporation rate of vapors was studied. The coefficient of water evaporation was determined from the temperature dependence of the evaporation rate of pure water and water covered with surfactants. The temperature range studied was 0-40°. When cetyl alcohol was used as the surfactant the coefficient of water evaporation was  $6.8 \cdot 10^{-5}$ , with a mixture of higher aliphatic alcohols ( $C_{18}-C_{23}$ ) it dropped to  $3.8 \cdot 10^{-5}$ . A sharp change in the decrease of the evaporation rate due to surfactant films is observed with increasing water temperature. This is accounted for by the beginning of phase transition on the surface layer.

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Stress Analysis and Stability Studies

USSR

UDC 621.438-251:539.4

SVETLAKOV, Ch. L., MAKHNEV, A. G., KOZHEVNIKOV, V. F., (Kaluga, Moscow)

"One Case of Rupture of Turbine Disks in a Gas-Turbine Engine"

Kiev, Problemy Prochnosti, No 12, Dec. 1972, pp 106-110.

Abstract: Results are presented from studies of the strength of a gas turbine disk in a low power gas turbine engine, performed in relationship to cases of disk rupture which have occurred. Results are presented from calculation and experimental analysis (by the polarization-optical method) of the stress state, as well as the values of concentration factors at points of contact of circular projections with the body of the disk. It is noted that the reason for rupture was high concentration of stresses under three-dimensional stress-state conditions, the nature of which does not allow redistribution of stresses.

1/5 035 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--AN APPROXIMATE TECHNIQUE FOR DETERMINING EMERGENCY EXPLOSIVE LOADS  
-U-  
AUTHOR--SVETLAKOV, N.D.  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, STROITEL'NAYA MEKHANIKA I RASCHET SOORUZHENIY, NO. A 1970,  
PP 63-67  
DATE PUBLISHED-----70  
SUBJECT AREAS--ORDNANCE, PROPULSION AND FUELS  
TOPIC TAGS--COMBUSTION PRODUCT, MATHEMATIC ANALYSIS, STRUCTURE STABILITY,  
EXPLOSION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1991/1391 STEP NO--UR/0595/70/000/001/0063/0067  
CIRC ACCESSION NO--AP0110925  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0110925

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHOR HAS DEVELOPED A SET OF MATHEMATICAL EXPRESSIONS FOR PREDICTING THE OVERLOAD ON INDUSTRIAL STRUCTURES WHICH MAY BE CAUSED BY THE EXPLOSION OF SUBSTANCES WITH IN OR NEAR THESE STRUCTURES. HIS METHOD INVOLVES CONSIDERATION OF THE STRUCTURE TYPE, THE NATURE, SIZE AND DISTRIBUTION OF APERTURES, WINDOWS AND OTHER OPENINGS, AND THE NATURE AND PROPERTIES OF THE EXPLOSIVE SUBSTANCES TO BE HANDLED WITHIN THE BUILDINGS. THE CONSTANTS AND COEFFICIENTS INVOLVED IN THIS CALCULATION INCLUDE:  $U_{SUBH}$ , THE SPEED OF FLAME PROPAGATION IN THE GAS AIR MIXTURE UNDER CONSIDERATION, CALCULATED FOR A CLOSED VOLUME.  $U_{SUBC}$  EQUALS  $U_{SUBH} E$ , WHERE  $E$  IS THE DEGREE OF EXPANSION OF THE COMBUSTION PRODUCTS.  $U_{SUBC}$  IS THE AVERAGE SPEED OF FLAME PROPAGATION.  $P_{SUBMAX}$ , THE MAXIMUM PRESSURE PRODUCED BY THE EXPLOSION. THE AUTHOR DETERMINES THAT  $P_{SUBMAX}$  IS EQUAL TO  $P_{SUBO} (E-1)$ , WHERE  $P_{SUBO}$  IS THE ABSOLUTE INITIAL PRESSURE, CONSIDERED TO BE UNITY. HE STATES THAT THE VALUES OF  $P_{SUBMAX}$  FOR GAS AIR MIXTURES ARE ON THE ORDER OF 6-12 KG-CM PRIME2.  $\Delta P$ , THE PRESSURE ON THE SURROUNDING STRUCTURE, WITHOUT APERTURES.  $W_{SUBP}$ , RATED VOLUME. THE RATED VOLUME OF AN AREA IS CONSIDERED TO BE THE TOTAL VOLUME OF THE STRUCTURE IF THE CENTER OF EXPLOSION IS LOCATED NEAR THE CENTER OF THE STRUCTURE AND ITS SHAPE IS ROUGHLY CUBICAL; OTHERWISE, THE RATED VOLUME IS EQUAL TO THE VOLUME OF A SPHERE WITH ITS CENTER AT THE IGNITION POINT AND A RADIUS EQUAL TO THE SHORTEST DISTANCE BETWEEN THE IGNITION POINT AND A SURFACE OF THE SURROUNDING STRUCTURE.  $W_{SUBGAM}$ , VOLUME OF THE GAS AIR MIXTURE.  $F_{SUBA}$ , THE AREA OF APERTURES.

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PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0110925

ABSTRACT/EXTRACT--F SUB1, THE AREA OF APERTURES AS A PERCENT OF THE TOTAL WALL AREA. PHI SUB1 EQUALS DELTA PPRIME-DELTA P EQUALS Y-Y SUB0, WHERE Y SUB0 IS THE EXPECTED DEFLECTION IN THE STRUCTURE WITHOUT APERTURES, Y IS THE DEFLECTION WITH APERTURES AND DELTA PPRIME IS THE EXCESS PRESSURE WITH APERTURES, I. E., Y AND DELTA PPRIME CONSIDER THE EFFECTS OF GAS OUTFLOW. FAIRLY GOOD AGREEMENT WITH EXPERIMENTAL DATA WAS OBTAINED BY CONSIDERING Y EQUALS A EXP (-BF SUBA), WHERE A AND B ARE COEFFICIENTS WHICH DEPEND ON DELTA P, F SUBA AND T SUB1, THE TIME OF INCREASE OF THE DYNAMIC PRESSURE. T SUB1 IS EQUAL TO XR SUB1-U SUBH EK SUBT; K SUBT EQUALS B PLUS 6 SIGMA S SUB1-PI R PRIME1 SUB2. HERE K SUBT IS A COEFFICIENT WHICH CONSIDERS THE INCREASE IN THE SPEED OF COMBUSTION DUE TO THE INTRODUCTION OF TURBULENCE; X VARIES FROM 0.5 TO 0.7; B IS A VALUE WHICH ALLOWS FOR INTERNAL FACTORS (PULSATIONS) WHICH MAY CAUSE TURBULENCE, EQUAL IN THE FIRST APPROXIMATION TO ABOUT 0.3 E; S SUB1 IS THE PROJECTION OF THE I-TH PIECE OF EQUIPMENT ON THE BARRIER STRUCTURE IN M PRIME2 AND R SUB1 IS THE RADIUS OF THE EXPANDED MIXTURE FOR WHICH THE PRESSURE INCREASES. IN TURN, R SUB1 IS DETERMINED BY THE FOLLOWING FORMULA (SHOWN ON MICROFICHE). THE AUTHOR THEN DEVELOPS A RELATIONSHIP BETWEEN THE TEMPORARY STATIC LOADS A STRUCTURE CAN WITHSTAND, BASED ON THE FORMULA Y SUBMAX-Y SUBST EQUALS 2 SIN (PI T-T), WHERE Y SUBMAX IS THE DEFLECTION DUE TO A DYNAMIC LOAD, Y SUBST IS THE DEFLECTION DUE TO AN EQUAL STATIC LOAD, T IS THE TIME OF EFFECT OF THE DYNAMIC LOAD AND T IS THE NATURAL PERIOD OF OSCILLATION OF THE SYSTEM UNDER CONSIDERATION.

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PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0110925

ABSTRACT/EXTRACT--THE AUTHOR ALSO STATES THAT A CAN BE DETERMINED MORE ACCURATELY BY A REITERATION OF THE CALCULATIONS, USING A VALUE OF THETA FROM THE FIRST CALCULATION, ON THE ASSUMPTION THAT DELTA PPPRIME EQUALS A.  $K_{SUB1}$  IS EQUAL TO  $(2F_{SUB1} F_{SUBW}) (K_{SUBK} \text{ MINUS } 1) \text{ PLUS } 1$ , WHERE  $K_{SUBK}$  IS A COEFFICIENT WHICH CONSIDERS THE STRENGTH OF THE APERTURE COVERINGS, VARYING FROM 1 FOR A COMPLETELY OPEN APERTURE TO 5.0 FOR FIRMLY ATTACHED DOUBLE LAYERED 3 MM GLASS, AND  $F_{SUBW}$  IS THE WALL AREA. THE EMERGENCY OVERLOAD A IS THEN DETERMINED BY THE FORMULA FOR CASES IN WHICH THE COMPUTATIONS SHOWN DO NOT YIELD A SIGNIFICANT VALUE FOR EMERGENCY LOAD, OR WHEN IT IS IMPOSSIBLE TO DETERMINE THE EMERGENCY EXPLOSIVE LOADS, MINIMUM EMERGENCY LOADS CAN BE DETERMINED. THE AUTHOR LISTS SEVERAL SUCH LOADS: A SUBI, A SUBII, A SUBIII, A SUBIV AND A SUBV. THESE ARE DETERMINED AS FOLLOWS: A SUBI, THE OVERLOAD REQUIRED TO BREAK THE APERTURE COVERINGS; A SUBII, THE PERMISSIBLE LIFTING FORCE ON THE ELEMENTS OF THE OVERHEAD STRUCTURE; A SUBIII, THE LOAD FROM BENEATH FOR DESIGNING ROOF TILES, WITH THE SMALLEST LOAD FROM ABOVE (COLD SHINGLES, NO SNOW); A SUBIV EQUALS  $G_{SUBROOF} \text{ PLUS } A_{SUBIII} K_{SUB3}$ .  $G_{SUBROOF}$  IS THE DESIGN LOAD ON A ROOF UNIT FROM ABOVE, DETERMINED ACCORDING TO THE STANDARDS;  $K_{SUB3}$  IS A COEFFICIENT WHICH CONSIDERS THE EFFECT OF A VACUUM BENEATH AND THE EXCESS PRESSURE ABOVE DUE TO EXPELLED COMBUSTION PRODUCTS; A SUBV EQUAL  $(Q_{SUBR} \text{ PLUS } G_{SUB1} K_{SUB2} \text{ PLUS } P_{SUBEQ}) K$ .

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PROCESSING DATE--11SEP70

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CIRC ACCESSION NO--AP0110925

ABSTRACT/EXTRACT--Q SUBR IS THE DESIGN LOAD FROM BENEATH ON AN UNLOADED ROOF UNIT (AREA); G SUB1 IS THE TOTAL WEIGHT OF THE ROOF UNIT AND THE FLOOR CONSTRUCTION; P SUBEQ IS THE AVERAGE LOAD DUE TO THE NORMAL EQUIPMENT OF THE INSTALLATION IN WORKING CONDITION, K SUB2 EQUALS 1.1, AN OVERLOAD COEFFICIENT FROM THE SOVIET CONSTRUCTION STANDARDS AND K EQUALS  $H-LAMBDA PRIME^2$ . H IS THE DISTANCE FROM THE CENTER OF THE EXPLOSION TO THE OVERHEAD STRUCTURE AND LAMBDA IS THE DISTANCE FROM THE CENTER OF EXPLOSION TO THE NEAREST BARRIER, AS USED IN CALCULATING W SUBN. THE AUTHOR GIVES VARIOUS DIAGRAMS AND TABLES SHOWING THE EXPERIMENTALLY DETERMINED VALUES FOR SOME OF THE CONSTANTS INVOLVED IN THESE CALCULATIONS.

UNCLASSIFIED

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USSR

UDC 624.042.5

SVETLAKOV, N. D., Dzerzhinsk

"An Approximate Technique for Determining Emergency Explosive Loads"

Moscow, Stroitel'naya Mekhanika i Raschet Sooruzheniy, No. 1, 1970, pp. 63-67

Abstract: The author has developed a set of mathematical expressions for predicting the overload on industrial structures which may be caused by the explosion of substances within or near these structures. His method involves consideration of the structure type, the nature, size and distribution of apertures, windows and other openings, and the nature and properties of the explosive substances to be handled within the buildings.

The constants and coefficients involved in this calculation include:

$U_h$  -- the speed of flame propagation in the gas-air mixture under consideration, calculated for a closed volume.

$U_c = U_h \epsilon$ , where  $\epsilon$  is the degree of expansion of the combustion products.

$U_c$  is the average speed of flame propagation.

$P_{max}$  -- the maximum pressure produced by the explosion. The author determines that  $P_{max}$  is equal to  $P_0 (\epsilon - 1)$ , where  $P_0$  is the absolute initial pressure, considered to be unity. He states that the values of  $P_{max}$  for gas air mixtures are on the order of 6-12 kg/cm<sup>2</sup>.

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USSR

SVETLAKOV, N. D., Stroitel'naya Mekhanika i Raschet Sooruzheniy, No. 1, 1970, pp. 63-67

$\Delta P$  -- the pressure on the surrounding structure, without apertures.

$W_p$  -- rated volume. The rated volume of an area is considered to be the total volume of the structure if the center of explosion is located near the center of the structure and its shape is roughly cubical; otherwise, the rated volume is equal to the volume of a sphere with its center at the ignition point and a radius equal to the shortest distance between the ignition point and a surface of the surrounding structure.

$W_{GAM}$  -- volume of the gas air mixture.

$F_a$  -- the area of apertures.

$F_i$  -- the area of apertures as a percent of the total wall area.

$\phi_i = \Delta P' / \Delta P = y / y_0$ , where  $y_0$  is the expected deflection in the structure without apertures,  $y$  is the deflection with apertures and  $\Delta P'$  is the excess pressure with apertures, i. e.,  $y$  and  $\Delta P'$  consider the effects of gas outflow. Fairly good agreement with experimental data was obtained by considering  $y = a \exp(-bF_a)$ , where  $a$  and  $b$  are coefficients which depend on  $\Delta P$ ,  $F_a$  and

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USSR

SVETLAKOV, N. D., Stroitel'naya Mekhanika i Raschet Sooruzheniy, No. 1, 1970, pp. 63-67

$\tau_1$  -- the time of increase of the dynamic pressure.  $\tau_1$  is equal to  $xr_1/U_h K_t$ ;  $K_t = B + 6\sum s_i/\pi r_2^1$ . Here  $K_t$  is a coefficient which considers the increase in the speed of combustion due to the introduction of turbulence;  $x$  varies from 0.5 to 0.7;  $B$  is a value which allows for internal factors (pulsations) which may cause turbulence, equal in the first approximation to about 0.3;  $s_i$  is the projection of the  $i$ -th piece of equipment on the barrier structure in  $m^2$  and  $r_1$  is the radius of the expanded mixture for which the pressure increases. In turn,  $r_1$  is determined by the following formula

$$r_1 = 0.62 \sqrt[3]{W_p [1 - (1-a)/(\Delta P' + 1)]}, \text{ where } a = W_{GAM} / W_p.$$

$K_i$  is equal to  $(2F_i F_w) (K_{k-1}) + 1$ , where  $K_k$  is a coefficient which considers the strength of the aperture coverings, varying from 1 for a completely open aperture to 5.0 for firmly attached double-layered 3 mm glass, and  $F_w$  is the wall area.

The emergency overload  $A$  is then determined by the formula

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SVETLAKOV, N. D., Stroitel'naya Mekhanika i Raschet Sooruzheniy, No. 1, 1970, pp. 63-67

$$A = P_{\max} (W_{\text{CAM}} / W_p F_a) \sum F_i \varphi_i K_i.$$

The author then develops a relationship between the temporary and static loads a structure can withstand, based on the formula  $y_{\max} / y_{\text{st}} = 2 \sin (\pi \tau / T)$ , where  $y_{\max}$  is the deflection due to a dynamic load,  $y_{\text{st}}$  is the deflection due to an equal static load,  $\tau$  is the time of effect of the dynamic load and  $T$  is the natural period of oscillation of the system under consideration.

The author also states that  $A$  can be determined more accurately by a reiteration of the calculations, using a value of  $\theta$  from the first calculation, on the assumption that  $\Delta P' = A$ .

For cases in which the computations shown do not yield a significant value for emergency load, or when it is impossible to determine the emergency explosive loads, minimum emergency loads can be determined. The author lists several such loads:  $A_I$ ,  $A_{II}$ ,  $A_{III}$ ,  $A_{IV}$  and  $A_V$ . These are determined as follows:

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SVETLAKOV, N. D., *Stroitel'naya Mekhanika i Raschet Sooruzheniy*, No. 1, 1970, pp. 63-67

The author gives various diagrams and tables showing the experimentally determined values for some of the constants involved in these calculations.

172 016  
TITLE--SYNTHESIZING DIALKYL FLUOROPHOSPHATES -U- UNCLASSIFIED PROCESSING DATE--04DEC70  
AUTHOR--(03)-VIGALOK, I.V., MOISAK, I.E., SVETLAKOV, N.V.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(4), 936  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ORGANIC PHOSPHATE, FLUORINATED ORGANIC COMPOUND, ORGANIC SYNTHESIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1517  
CIRC ACCESSION NO--AP0135178  
STEP NO--UR/0079/70/040/004/0936/0936  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0135178

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TO A SOLN. OF 0.064 MOLE (RO) SUB2  
PHD AND 0.064 G ATOM NA IN C SUB6 H SUB6 WAS ADDED FCLO SUB3 AT LESS  
THAN 10DEGREES TO YIELD (RO) SUB2 POF (AND EFIDENTLY NACLO SUB3 IN  
SOLN.): R EQUALS BU, 50PERCENT ISO,C SUB5 H SUB11, 52.5PERCENT; AND C  
SUB6 H SUB13, 53PERCENT.

UNCLASSIFIED



USSR

SUDC: 547.26.118'221.07

VIGALOK, I.V., MOYSAK, I.YE., and SVETIAKOV, N.V., Kazan' Chemical Technological Institute imeni S.M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"A New Method for the Synthesis of Dialkyl Fluorophosphates"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, p 936

Abstract: Perchloryl fluoride fluorinates on the phosphorus atom, interact with salts of dialkylphosphorous acid after the pattern of the Michaelis-Becker reaction to give dialkyl fluorophosphates.

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USSR

UDC: 621.374.5(088.8)

VILITIS, O. Ye., AVRAMOV, Yu. T., SVETLAKOV, V. P.

"A Pulse Shaper"

USSR Author's Certificate No 264524, filed 20 Jan 69, published 17 Jun 70  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12G241 P)

Translation: This Author's Certificate introduces a pulse shaper which contains a shaping accumulator made in the form of a T-shaped CLC network with input connected to a DC voltage supply through a semiconductor diode in the conducting direction and a resistor. Also incorporated in the device is a discharge circuit which contains a controlled switch and load connected in series. The shaper also contains a commutating transistor whose emitter-collector circuit is connected in parallel with the input of the CLC network. To improve resistance to interference and simplify the shaper, it is equipped with a semiconductor diode connected in parallel with a capacitor, the anode of the diode being connected to the emitter of the commutating transistor while the cathode is connected to the load, and through a resistor to the base of the commutating transistor.

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USSR

UDC 615.355.099

PRIPUTINA, L. S., GBEARIUS, I. D., BOZSIAN, N. YE., CHAYLIK, V. N., and  
SVETLAYA, G. V., Laboratory for the Investigation of Food Additives, Kiev  
Scientific Research Institute of Nutritional Hygiene

"Determination of the Toxicity of Enzymatic Preparations of Microbial Origin  
Designed for Use in the Food Industry"

Moscow, Voprosy Pitaniya, No 6, Nov/Dec 71, pp 43-48

Abstract: The amylolytic preparation Migrin SR, made from *Asp. niger* strain EU-119 and used in the production of juices and nonalcoholic beverages, and a second enzymatic preparation, made from *Asp. oryzae* strain 476-1 and used in brewing of beer, were tested on white rats and ducklings. The preparations caused a reduction in serum antibodies, an increase in the relative weight of the liver, a decrease in the DNA phosphorus concentration in the liver, changes in liver glycogen content, hyperemia of the spleen, hyperplasia of lymphatic tissues, and degenerative changes in the liver and other organs. The disorders are ascribed to the presence of the fungi's metabolic products and unidentified fluorescent substances in the preparations. It is concluded that the Migrin SR preparation may be used after purification by the method described.

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Acoustics

USSR

UDC: 534

SVETLICHNYY, I. B., MARGOLIN, A. D., KUZNETSOV, A. A., FOKHIL, P. F.,  
MYSOV, V. G.

"Direct Method of Measuring the Acoustic Conduction of the Burning Surface  
of Powder"

Fiz. aerodispers. sistem. Mezhd. nauch. sb. (Physics of Aerodisperse  
Systems. Interdepartmental Scientific Collection), 1971, vyp. 4, pp 84-92  
(from RZh-Fizika, No 6, Jun 72, Abstract No 6Zh524)

Translation: A direct method is developed for measuring acoustic conduc-  
tivity of a burning surface as the ratio of the change in the velocity of  
outflow of combustion products from the surface to the pressure in the  
acoustic wave at the burning surface. The pressure is measured by a piezo-  
electric transducer, and the acoustic velocity at the burning surface is  
determined by an electromagnetic flowmeter system with transverse magnetic  
field in a tube of circular cross section with insulated walls. The high-  
-temperature ionized products of gunpowder combustion acted as the conduct-  
ing medium. The test specimen of powder was placed in the tube together  
with a noise emitter which generated plane longitudinal waves. Measurements

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USSR

SVETLICHNYY, I. B. et al., Fiz. aerodispers. sistem Mezhved. nauch. sb., 1971, vyp. 4, pp 84-92

could be made both at fixed and variable pressures and signal frequencies. A theory of the method is developed, and a theoretical analysis and experimental study are made of the effect of various factors on measurement results. The dimensionless acoustic conduction of the burning surface of nitroglycerin powders is measured, and satisfactory agreement with the results of measurements by other methods is obtained. Authors' abstract.

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1/2 053

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--MEASUREMENT OF THE ACOUSTIC CONDUCTIVITY OF A BURNING SOLID  
PROPELLANT SURFACE -U-

AUTHOR--(04)--MARGOLIN, A.D., SVETLICHNYI, I.B., POKHIL, P.F., TSIRULNIKOV,  
A.S.

COUNTRY OF INFO--USSR

SOURCE--PMTF ZHURNAL PRIKLADNOI MEKHANIKI I TEKHNICHESKOI FIZIKI,  
JAN.-FEB. 1970, P. 149-155

DATE PUBLISHED-----70

SUBJECT AREAS--PROPULSION AND FUELS, PHYSICS

TOPIC TAGS--SOLID PROPELLANT, MEASUREMENT, SURFACE PROPERTY, ACOUSTIC  
MEASUREMENT, PROPELLANT BURNING RATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1543

STEP NO--UR/0207/70/000/000/0149/0155

CIRC ACCESSION NO--AP0118526

UNCLASSIFIED

2/2 053

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118526

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

ABSTRACT. DEVELOPMENT AND APPLICATION OF TWO METHODS OF MEASURING THE ACOUSTIC CONDUCTIVITY OF A BURNING SOLID PROPELLANT SURFACE NAMELY, THE METHOD OF CRITICAL CONDITIONS AND THE VARIABLE SURFACE METHOD. THE METHOD OF CRITICAL CONDITIONS IS BASED ON MEASURING THE LIMIT OF SELF EXCITATION OF UNSTABLE COMBUSTION IN RESONATORS OF SIMPLE SHAPE THE ACOUSTIC LOSSES OF WHICH ARE RELIABLY CALCULATED. THE VARIABLE SURFACE METHOD CONSISTS IN MEASURING THE RATE OF INCREASE OR DECREASE IN THE AMPLITUDE OF THE OSCILLATIONS IN A CHAMBER DURING COMBUSTION OF A SPECIMEN OF SOLID PROPELLANT WITH A BURNING SURFACE THE AREA OF WHICH VARIES IN TIME.

UNCLASSIFIED

USSR

UDC: 621.382

PLASKIY, V. T., ZAKHAROV, A. P., ~~SVETLICHNYY, V. M.~~, STAROSTENKO, V. V.

"High-Frequency Noises of a Metal-Semimetal Point Contact"

Kiev, IVUZ Radioelektronika, Vol 15, No 5, May 72, pp 657-659

Abstract: The relative noise temperature of the point contact formed by a tungsten point with rounding radius of a few microns and a single crystal specimen of bismuth antimonide is experimentally determined by measurements in the 3-cm band by using P5-10 low-level power meters. Analysis of the results shows that possible noise sources may be thermal noises of the internal resistance of the semimetal and of the contact itself, noises due to fluctuations in the thermoelectric voltage, and also noises due to non-uniform passage of the charge carriers through the potential barrier at the metal-semimetal interface.

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USSR

UDC: 621.382.22

PLAKSIY, V. T., SVETLICHNYY, V. M., and PERESYN'KO, O. A.

"Inertia of Point-Contact UHF Detectors of BiSb Alloy"

Kiev, Izvestiya VUZ - Radioelektronika, vol. 14, No. 5, 1971,  
pp 588-589

Abstract: In this brief communication, the thermal time constant characterizing the BiSb alloy point-contact detector is defined as the time required for establishing a steady-state temperature distribution of the crystal lattice in yielding or accepting UHF power. This time constant is found by solving the heat conduction equation of the BiSb device and getting an expression for the temperature distribution of an ideally thermoconducting sphere in a medium of specified thermal conductivity, density, and specific heat capacity. The time dependence of the crystal lattice temperature after the application of a particular level of UHF power is examined. The authors find that a detector made of  $\text{Bi}_{90}\text{Sb}_{10}$ , to which UHF power modulated by short rectangular pulses is applied, detects the video signal envelope of 100 ns duration without noticeable distortion of the pulse shape.

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USSR

UDC: 621.382

SATYUKOV, A. I. and SVETLICHNYY, V. M.

"Mixing Characteristics of Germanium Thermoelectrical UHF  
Radiation Indicators With 'Hot' Charge Carriers"

Kiev, Izvestiya VUZ SSSR--Radioelektronika, No 10, 1972, pp 1238-  
1243

Abstract: After showing that the conversion losses of germanium thermoelectrical uhf radiation indicators are high under the conditions of their present use, the authors describe experiments performed to develop devices with lower losses. These experimental devices were prepared from p-type germanium with a resistivity of 0.15 ohm.cm and 0.5 ohm.cm, and were given small p<sup>+</sup>-p junction areas by pulsed-current melting of fine gold wires to the germanium plates. This method produced junctions whose geometric shape was approximately hemispherical. Of these specimens, those with resistances of 50 to 400-500 were selected; devices with resistances of 50-150 were used as mixers in coaxial lines while those with resistances of 400-500 ohms were used with waveguides. Results of these experiments are given in the form of  
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USSR

SATYUKOV, A. I., et al, Izvestiya VUZ SSSR--Radioelektronika, No 10, 1972, pp 1238-1243

curves of the conversion losses as a function of the heterodyne power and of the specimen resistance. Curves of intermediate frequency signal power for the specimens are also plotted. These experiments showed that the thermoelectrical effect of hot charge carriers in germanium can be successfully used in uhf mixers.

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# Mechanics (Velocity of Stationary motion)

## ON THE CRITICAL VELOCITY OF STATIONARY MOTION

(Article by V. I. Svetitskiy and V. I. Galperin, Kiev, Prikladnaya Mekhanika, Russian, Vol 2, No 6, 1966, pp 133-136)

11/25 578/3  
20 Dec 77

This article deals with an investigation of the conditions of existence of stationary motion by a closed-loop filament in a viscous medium.

The study derives the complete system of first integrals for the problem of stationary motion of a closed flexible filament in a viscous medium. Using as an example the solution to a particular boundary value problem, the critical value of the velocity of longitudinal filament velocities is established. The outcome of experimental studies of the critical

The investigated system comprises the flexible closed filament 1, passing around pulley 2 in Figure 1. When the pulley revolves at an angular velocity  $\omega$ , the filament moves longitudinally at a velocity  $v$  equal to  $\omega R$ , where  $R$  is the pulley radius.

Depending on the location of the pressing roller 3, the filament can be driven at any angle to the horizontal. Roller 4 is needed to stabilize the circuit's motion. The filament configuration depends appreciably on the velocity of its longitudinal motion.

As the experiments show, the reduction of the velocity of longitudinal filament motion has a limit below which stationary motion is impossible. In this study, using the example of a boundary value problem solving to the per unit aerodynamic resistance force equaling the per unit filament weight. The experimental curves shown confirm this assertion.

The differential equations of stationary filament motion in the Cartesian system XOY, with the Y-axis extending in the direction of the gravity field (see Figure 1), have the form

USSR

UDC: 531.391

SVETILITSKIY, V. A., MIROSHNIK, R. A., KURKIN, V. I., Moscow Higher Technical Academy imeni Bauman

"Determining the Forms of Steady-State Motion of a Filament in Media of Different Viscosities"

Kiev, Prikladnaya Mekhanika, Vol 8, No 4, Apr 72, pp 100-104

Abstract: The authors study forms of steady-state motion of a flexible inextensible closed filament with regard to forces of gravity and longitudinal drag of the medium. A closed solution is found in cartesian coordinates. An expression is found for determining tension in the filament. The boundary-value problem is solved in the case of motion of the filament in two media with different longitudinal drag. Both possible forms of steady-state motion are plotted for a numerical example in the case where the filament ascends from underwater into the air, and these forms are compared with the forms of motion of the filament in air alone or in water alone. Two illustrations, bibliography of four titles.

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USSR

UDC 531--391

SVETLITSKIY, V. A. and MIROSHNIK, R. A., Moscow Higher Technical School imeni  
N. Ye. Bauman

"Critical Velocities of the Steady Movement of a Flexible Thread in a Two-  
Dimensional Homogeneous Stream"

Kiev, Prikladnaya Mekhanika, Vol 9, No 5, May 1973, pp 94-98

Abstract: A study is made of the conditions under which steady movement of  
the thread of a ballistic antenna is possible in the case of a wind load. Two  
critical velocities are found, which respectively determine the minimum velocity  
necessary for the existence of movement, and the velocity that is of importance  
in practical applications, starting with which directional launching of the  
antenna can be conducted. The investigation is conducted without determination  
of the form of steady movement. 3 figures. 10 references.

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USSR

UDC 531.43.621.791.92

ORESHKIN, V. D., SVETLOPOLYANSKIY, V. I., and SEREBRYAKOVA, T. I., (Institute of Materials Science Problems, Academy of Sciences, Ukrainian SSR)

"Study of Wear Resistance of Surfaces Hard Faced with Borides"  
Poroshkovaya Metallurgiya, No 3, Mar 71, pp 78-82

Abstract: High-alloy hard faced layers formed of the borides of titanium, chromium, and tungsten were studied, as well as titanium-chromium diboride with a molar ratio  $TiB_2$ ;  $CrB_2$  = 4:1. All of the coatings were subjected to x-ray phase analysis. X-ray analysis indicated that the initial powders consisted of titanium diboride, a dual titanium-chromium diboride, a mutual solid solution based on  $TiB_2$  and chromium diboride, a mixture of the phases  $CrB_2$  and  $Cr_3B_4$ , as well as  $W_2B_5$ . The boride facings have excellent use properties resulting from the exceptionally high alloying ability of the facing layer, produced by introducing several refractory components which have different influences on the general properties of the alloy but give it an excellent structure.

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USSR

UDC 531.43.621.791.92

ORESHKIN, V. D., SVETLOPOLYANSKIY, V. I., and SEREBRYAKOVA, T. I., (Institute of Materials Science Problems, Academy of Sciences, Ukrainian SSR)

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USSR

UDC 541.183

SVETLOV, A. K., DEMENKOVA, T. N., TSVETKOV, YU. S., NESTEROVA, O. M., and  
KRYUCHKOV, V. V., Kuzbas Polytechnical Institute

"The Effect of the Structure of Ion Exchange Resin on the Process of Ion  
Exchange Sorption"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 46, No 10, Oct 72, pp 2596-2598

Abstract: The effect of the structure of ion exchange resins on the process of dye sorption in aqueous and organic media has been investigated. It was shown that the maximum adsorption value is obtained in monoporous samples with total pore volume of 0.8 cm<sup>3</sup>/g, and individual pore dimensions of 4.5-5.5 lg  $\mu$ eq, due to uniform accessibility of the granular structure. Maximum adsorption of rhodamine 6Zh by the cation exchange resin KU-2 occurs in acetone solution; sodium eosine is most effectively absorbed by the anion exchange resin AV-17 from aqueous solutions. It has been noted that the anion exchange resin AV-17 in the OH form shows a higher sorptive ability than in the chloride form.

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USSR

UDC 536.46

ALESHIN, V. D., SVETLOV, B. S., FOGEL'ZANG, A. Ye., Moscow

"The Specifics of Combustion of Mixtures Consisting of Rapidly Burning Explosives"  
Novosibirsk, Fizika Goreniya i Vzryva, No. 4, Dec. 70, p. 432-438.

Abstract: Combustion studies were performed using lead dinitrophenolate, with an oxygen balance of -47 and potassium perchlorate as an oxidizer. Mixed charges of fine powders were pressed at 4,000-6,000 kg/cm<sup>2</sup>, then burned in a constant pressure bomb, with the nature and rate of combustion recorded by drum photography. It is found that the addition of the KC10<sub>4</sub> has little influence on the burning rate. The influence which it does have can be explained by assuming that the burning occurs only in the rapid-burning component, and that the KC10<sub>4</sub> acts solely to divide the explosive into small channels, thus decreasing the burning rate when additive particle size and concentration become sufficient to reduce the channel diameter to below the critical size.

1/1

1/2 C19  
TITLE--MECHANISM OF THE THERMAL DECOMPOSITION OF INORGANIC OXIDIZING  
AGENTS -U-  
AUTHOR--(02)-SVETLOV, B.S., KUROBAN, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--FIZIKA GORENIYA I VZRYVA, VOL. 6, MAR. 1970, P. 12-18  
DATE PUBLISHED---MAR70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL REACTION MECHANISM, THERMAL DECOMPOSITION, PERCHLORIC  
ACID, SULFURIC ACID, INORGANIC SALT, HYDRAZONE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO---FD70/605002/D02 STEP NO--UR/0414/70/006/000/0012/0018  
CIRC ACCESSION NO--AP0139446  
UNCLASSIFIED