

## EQUIPMENT

Gyroscopic

UDC 62-752.4

USSR

IL'CHANINOV, V. P., Leningrad Institute of Aviation Instrument Building

"Effect of Forced Rotation of Gimbel Mount on Motion of Astatic Gyroscope"

Leningrad, Priborostroyeniye, Vol 13, No 12, 1970, pp 66-70

Abstract: It is established that the motion of the subject gyroscope relative to the inertial space is a pseudoregular precession the magnitude of which (radian/sec) is

$$\psi = \frac{E\omega_0^2}{2H} + \frac{A\omega_0^2}{4H} \operatorname{tg}^2 \theta_0.$$

where:  $\omega_0$  - angular speed of forced rotation of Gimbel mount, radian/sec

$$E = J_{HX} + J_{HY} - J_{HZ}$$

$J_{HX}, J_{HY}, J_{HZ}$  - moments of inertia of outer ring about X, Y, Z axis,

$$A = J_{BZ} + J_{HY} \text{ gram. cm. sec}^2$$

$J_{BZ}$  - moment of inertia of inner ring about Z axis, gram. cm. sec<sup>2</sup>

1/2

USSR

IL'CHANINOV, V. P., Priborostroyeniye, Vol 13, No 12, 1970, pp 66-70

H - kinetic momentum of gyroscope, gram. cm. sec

$\theta_0$  - constant term of Euler angle (angle between the axis of gyroscope and the axis of forces rotation) with the gyroscope axis fixed in space.

2/2

- 74 -

1/2 016 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--STRENGTH OF CRYSTALLIZATION STRUCTURES AFTER HYDRATION OF GROUND  
UNSLAKED LIME -U-  
AUTHOR-(03)-LAKINSKAYA, N.M., MANAKIN, B., ILCHENKO, A.I.  
COUNTRY OF INFO--USSR  
SOURCE--BUDIVEL'NI MATER. KONSTR. 1970, (1), 38-40  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, PHYSICS  
TOPIC TAGS--SORPTION, CRYSTAL STRUCTURE, CALCIUM OXIDE, CALCIUM CARBONATE,  
LIME  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO----FD70/605019/B03 STEP NO--UR/0635/70/000/001/0038/0040  
CIRC ACCESSION NO--AP0140894  
UNCLASSIFIED

272 016 UNCLASSIFIED PROCESSING DATE--04DEC70  
CIRC ACCESSION NO--AP0140894  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CUBES WERE FORMED FROM MIXTS. OF  
CAO, CACO SUB3, AND WATER IN VARIOUS RATIOS, WHERE CAO PLUS CACO SUB3  
EQUALS CONST. EQUALS 1 MOLE, WHILE WATER VARIED 1-5 MOLES, AND CAO-CACO  
SUB3 VARIED FROM 1-9 TO 10-0. THE CUBES WERE HARDENED FOR 28 DAYS AT  
15, 0, AND MINUS 15DEGREES AND THEN THEIR STRENGTH WAS TESTED. THE  
CHEM. PURE, HIGHLY EXOTHERMIC CAO, HEATED FOR 2 HR AT 900DEGREES AND  
SIEVED (SIEVE NO. 0085) AND FINELY GROUND, DRIED AND SIEVED (THE SAME  
SIEVE) LIMESTONE WERE USED. FOR ANY MIXT. THE MAX. STRENGTH OCCURRED AT  
A CERTAIN OPTIMUM INTERVAL OF WATER ADMIXTS., WHICH INCREASED WITH THE  
RISING CAO-CACO SUB3 VALUE AND AT 15DEGREES CHARPLY, AND AT MINUS  
15DEGREES ONLY LITTLE. THE OPTIMUM CONTENT OF WATER AT THE LATTER TEMP.  
WAS GENERALLY LOW (1-2.5 MOLE) AT ANY VALUE OF THE FORMER RATIO. CAO  
WITHOUT CACO SUB3 DID NOT HARDEN, IRRESP. OF THE WATER CONTENT AT  
15DEGREES, WHILE AT MINUS 15DEGREES IT HARDENED WELL (125 KG-CM PRIME2  
AT 2.5 MOLE WATER). GENERALLY, THE STRENGTH OF ALL SAMPLES THAT  
HARDENED AT MINUS 15DEGREES EXCEEDED THE STRENGTH OF SAMPLES HARDENED AT  
15DEGREES. THE HEAT OF HYDRATION OF CAO ELEVATES THE WATER TEMP. TO  
B.P. THUS FORMING GAS. THIS INTERFERES WITH THE SOPRTION PROCESSES AND  
DESTROYS THE FORMING CRYSTAL STRUCTURE, WHICH CONSEQUENTLY CAN FORM ONLY  
AT MINUS 15DEGREES. AFTER CACO SUB3 ADMIXT. THE STRUCTURES THAT POSSESS  
STRENGTH WERE PRESERVED ALSO AT 15DEGREES, WHILE AFTER THE TEMP.  
DECREASE THE INTERVAL OF COMPN. THAT YIELDS THE STRUCTURE STRENGTH  
EXTENDED THE MORE THE LOWER THE TEMP.

UNCLASSIFIED

USSR

UDC 629.78.002.3

LOGINOV, N. Z., IL'CHENKO, A. M.

"Probability Estimate of the Dispersion of the Fracture Coordinate and the Fatigue Limits in Connection with the Technological Process for Treating Specimens"

Tr. Kazan. avats. in-ta (Works of the Kazan' Aviation Institute), 1972, vyp. 141. pp 40-46 (from RZh-Raketostroyeniya, otdel'nyy vypusk, No 12, Dec 72, Abstract No 12.41.242)

Translation: The basic principles of the procedure for joint statistical and functional analysis of fatigue laws are presented. A study is made of the application of this method for comparing the effect of various progressive technological processes on strength under sign-variable loads. It is demonstrated that the least diameter of the toroidal specimens is not the dangerous cross section but the most probable fracture point. An estimate is made of the fracture coordinate and the relation of this variable to the fatigue characteristics of the material. Examples are also presented of the structure of the fatigue curve with the fracture probability equal to zero with respect to a small sample of specimens using equidistant transfer of the experimental points and analysis of the fracture coordinates. There are 4 illustrations, 2 tables and a 7-entry bibliography.

1/1

- 136 -

USSR

UDC 533.916

BREDIKHIN, M. Yu., IL'CHENKO, A. M., MASLOV, A. I., SKIBENKO, A. I.,  
SKIBENKO, Ye. I., YUFEROV, V. B.

"Study of a Dense Plasma Formed by an Electron Beam in a Magnetic Trap"

Fiz. plazmy i probl. upravl. termovader. sinteza. Resp. mezhved. sb.  
(Plasma Physics and Problems of the Controlled Thermonuclear Fusion.  
Republic Interdepartmental Collection), 1972, No. 3, pp 147-161 (from  
RZh-Fizika, No 11, Nov 72, Abstract No 11G237)

Translation: An experimental study of the possibility of the formation of a dense plasma in the interaction of a high-energy electron beam with a neutral gas in a magnetic field of helical configuration is described. The introduction of a neutral gas into the interaction region in the form of a supersonic jet made it possible to produce the necessary pressure drop without applying special differential pumping systems. Conditions for the exponential rise in plasma density as a function of the parameters of the beam-plasma discharge were determined. It was concluded on the basis of the experiments that it is possible to form a plasma with a density of  $5-7 \cdot 10^{14} \text{ cm}^{-3}$  with a supersonic jet of neutral gas.

1/1

USSR

UDC 533.9.03,621.039.616

BREDIKHIN, M. Yu., IL'CHENKO, A. M., MASLOV, A. I., SKIBENKO, A. I., SKIBENKO, Ye. I., and YUFEROV, V. B.

"Investigating Conditions for the Formation of a Dense Plasma in Electron Beam Injection Into a Magnetic Trap"

Moscow, Atomnaya energiya, Vol 29, No 4, Oct 70, pp 276-282

Abstract: The continuation of an earlier article by the same authors (Ukrainian Physical Journal, 14, 1969, p 1167), this paper describes experimental work they performed to study the conditions of plasma formation with a density of  $10^{14}$ - $10^{15}$   $\text{cm}^{-3}$  in a corkscrew-shaped magnetic trap into which an electron beam interacting with a neutral gas was injected. The experiments were performed with the VGL-2 equipment, in which the magnetic field is generated by two solenoids cooled with liquid nitrogen. Maximum magnetic field intensity is 21 kilogauss. A diagram of the VGL-2 together with details of the equipment's operation and the experimental method is given. Oscillograms showing the development of the beam-plasma discharge are reproduced, and curves of the growth time of plasma density as a function of electron beam current and the time rate of change of plasma density in the ionization of a neutral gas are plotted.

1/1

1/2 009 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--NUCLEOPHILIC SUBSTITUTION REACTIONS IN QUATERNARY PYRAZINIUM SALTS

-U-  
AUTHOR--(03)-RUDENKO, V.N., ILCHENKO, A.YA., ROZUM, YU.S.

COUNTRY OF INFO--USSR

SOURCE--DOPDV. AKAD. NAUK UKR. RSR, SER. B 1970, 32(2), 159-63

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--EXCHANGE REACTION, METHYLENE, BROMINATED ORGANIC COMPOUND,  
KETONE, AMINE, HETEROCYCLIC NITROGEN COMPOUND, BENZENE DERIVATIVE,  
ORGANIC AZINE COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1137

STEP NO--UR/0442/70/032/002/0159/0163

CIRC ACCESSION NO--AT0134822

UNCLASSIFIED



2/2 009

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AT0134822

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. QUATERNARY PHENAZINIUM SALTS WERE CONDENSED WITH COMPO. CONTG. ACTIVE METHYLENE GROUPS, WITH BROMO KETONES, AND WITH AMINES. THUS, I WAS CONDENSED WITH (XY)CH SUB2, WHERE THE METHYLENE GROUP IS ACTIVATED BY 2 ELECTRONEG. GROUPS, BY ADDING THE COMPO. AND NAME TO I (ALL 3 REAGENTS AS ALC. SOLNS.) AT ROOM TEMP. AND THE PPTD. II RECRYSTD. FROM MEQH. THE FOLLOWING II WERE PREPD. (X, Y, M.P., AND PERCENT YIELD GIVEN): ETCO SUB2, ETCO SUB2, 210DEGREES, 57; AC, ETCO SUB2, 172-4DEGREES, 38; CN, ETCO SUB2, 245DEGREES, 56; AC, AC, LARGER THAN 300DEGREES, 50; AC, H, LARGER THAN 300DEGREES, 50; ETCO, H, 153-5DEGREES, 57; AND BZ, H, 222DEGREES, 60. CONDENSATION OF I WITH BRCH SUB2 COB WAS CARRIED OUT UNDER SIMILAR CONDITIONS, CRYSTG. THE PRODUCT FROM CHCL SUB3. CONDENSATION OF 1,PHENYL,5,METHYLPHENAZINIUM SALTS WITH (XY)CH SUB2 GAVE THE FOLLOWING III (X, Y, M.P., AND PERCENT YIELD GIVEN): CO SUB2 ET, CO SUB2 ET, 174DEGREES, 70; AC, CO SUB2 ET, 153-5DEGREES, 80; CN, CO SUB2 ET, 250DEGREES, 80; AC, AC, 140DEGREES, 65; AND (XY EQUALS) 1,METHYL,5,OXO,2,THIOTHIAZOLIDIN,4,YLIDENE, 230DEGREES, 50. QUATERNARY 3,METHOXY,PHENAZINIUM SALTS (IV) WERE OBTAINED BY TREATING PHENAZIN,3,ONE WITH ME SUB2 SO SUB4. CONDENSATION OF IV WITH (XY)CH SUB2 GAVE THE FOLLOWING V (R, R PRIME, X, Y, M.P., AND PERCENT YIELD GIVEN): OME, R EQUALS ET, CO SUB2 ET, CO SUB2 ET, 115DEGREES, 46; OME, ET, CH, CO SUB2 ET, 240DEGREES, 50; MORPHOLINO, ME, CO SUB2 ET, CO SUB2 ET, 179DEGREES, 40; AND MORPHOLINO, ME, CN, CO SUB2 ET, LARGER THAN 300DEGREES, 40. FACILITY: INST. ORG. KHIM., KIEV, USSR.

UNCLASSIFIED

USSR

UDC 595.771-19(470.61-21)

IL'CHENKO, L. Ya., Rostov Scientific Research Institute of Medical Parasitology

"Culex pipiens molestus Forsk. Mosquitoes in the Cities of Rostovskaya Oblast"

Moscow, Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 41, No 5,  
Sep-Oct 72, pp 602-603

Abstract: Culex pipiens molestus Forsk. mosquitoes were found in many cities in the USSR and in other cities in the temperate zone. They breed in open bodies of water in the subtropical zone, while in the temperate zone they occur in buildings, where they may breed even during the cold season. In connection with many complaints during recent years by the population of cities in Rostovskaya Oblast' (Rostov-on-Don, Novocherkassk, Bataysk, etc) concerning the frequent occurrence of mosquito bites in the winter, a study was made of the distribution of C. p. molestus mosquitoes in these cities and of measures for their control. Mosquitoes of this species were found to breed in the cities of Rostovskaya Oblast' in warm flooded basements of buildings, in places where water supply or heating system pipes leaked, and in bath houses. The sanitary-epidemiological stations and city disinfection stations instituted measures for the control of the mosquitoes. Wherever the breeding places were accessible, a single treatment with a 12% dust of hexachlorocyclohexane in the amount of  $0.2 \frac{g}{sq. m.}$  exterminated the larvae completely. To exterminate adult  $\frac{1}{2}$

USSR

IL'CHENKO, I. Ya., Meditsinskaya Parazitologiya i Parazitarnyye Bolesni,  
Vol 41, No 5, Sep-Oct 72, pp 602-603

mosquitoes in buildings, a 2% solution of chlorophos and less frequently the  
12% hexachlorocyclohexane dust are being applied.

2/2

- 9 -

USSR

UDC 621.372.8.092.22

~~IL'CHENKO, M.YE.~~ KRASILIN, G.P.

"Study Of Resonances Of Helicon Waves in n-InSb"

Vestn. Kiyev. politekhn. in-ta. Ser. radiotekhn. i elektroakust. (Bulletin Of The Kiev Polytechnical Institute. Radio Engineering And Electroacoustics Series), 1971, No 8, pp 41-44 (from RZh--Radiotekhnika, No 9, 1971, Abstract No 9B96)

Translation: The results are presented of an experimental study of the resonances of helicon waves during turn-on of an induction coil with a magnetized specimen of n-InSb as an inhomogeneity in a matched transmission line. The dependences are given of the resonance frequency and the transmission factor on the intensity of the magnetization field. It is noted that a specimen of n-InSb in which resonance of helicon waves is accomplished behaves similarly to a cavity resonator. The degree of interaction of such a resonator with an electromagnetic field evaluates the coupling factor of the resonator with a high-frequency circuit. 4 ill. 2 ref. Summary.

1/1

USSR

UDC: 621.372.358.2

IL'CHENKO, N. Ye. and KUDINOV, Ye. V.

"Threshold Ferrite Resonator Power in a UHF Transmission Line"

Kiev, Izvestiya VUZ--Radioelektronika, Vol. 14, No. 1, 1971,  
pp 118-120

Abstract: This brief communication presents experimentally validated formulas for the threshold power level at which unstable effects arise in a ferrite resonator connected with a uhf transmission line. Curves are plotted for the threshold power as a function of the distance between the resonator and the short-circuiting plane as computed from a formula given in the communication. Also given are curves comparing the theoretical and experimental threshold power with the resonator shifted along the short-circuited coaxial line. The experimental values for this curve were obtained from a ZhIG resonator with a cavity volume of  $2.03 \text{ mm}^3$  and a magnetic susceptibility of 1250, and from a second resonator with a volume of  $6.4 \text{ mm}^3$  and a susceptibility of 1170. Agreement between the values is close.

1/1

USSR

UDC 621.165:681.14

BOGATYRENKO, K. I., IL'CHENKO, O. T., and PROKOF'YEV, V. Ye.

"Analog Computer Determinations of Elongations and Mutual Dislocations of the Rotor and the Body of a Steam Turbine"

Energ. Mashinostroyeniye. Resp. Mezhved. Temat. Nauch.-Tekhn. Sb. [Power Engineering. Republic Interdepartmental Thematic Scientific-Technical Collection], No 13, 1972, pp 77-81 (from Referativnyy Zhurnal, No 10, Oct 72. 49. Turbostroyeniye. Single Issue. Abstract No 10.49.42)

Translation: An account is given of the analog computer method of solution of problems of determining elongations and mutual dislocations of the rotor and the body of steam turbines. The facility for the solution of these problems, assembled from elements of the USM-1 machine, is described. Results are presented of the determination on the basis of a model of the elongation of the heated shaft and of mutual dislocations of coaxial cylinders. Three illustr. Two biblio. refs.

1/1

USSR

UDC: 621.165:536.212

IL'CHENKO, O. T., VORONOVICH, L. G.

"Nonstationary Temperature Field of a Turbine Rotor in the Case of Time-Variable Heat-Exchange Boundary Conditions"

Energ. mashinostroyeniye. Resp. mezhved. nauchno-tekhn. sb. (Power Machine Building. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 9, pp 39-45 (from RZh-Turbostroyeniye, No 8, Aug 70, Abstract No 8.49.32)

Translation: It is shown that generalized temperature functions of similar points are identical not only in identical elements of a single rotor, but also in identical elements of any one-piece rotors. On this basis, a conclusion is drawn on the possibility of calculating the temperature field of any one-piece rotor made up of similar elements with an arbitrary time change in boundary conditions on heat-exchange surfaces. The changes in temperature calculated from the thermal characteristics are compared with data from direct modeling of the problem. Three illustrations, two tables, bibliography of two titles.

1/1

USSR

UDC 621.372.822/.823

IL'CHENKO, P. M.

"Fabrication of Waveguides with Plastic Flanges"

V sb. Obmen opytom v radioprom-sti (Sharing of Experience in Radio Industry -- Collection of Works), Issue 5, Moscow, 1971, pp 34-35 (from RZh--Radiotekhnika, No 9, Sep 1971, Abstract No 9B148)

Translation: A method is described for fabrication of hollow waveguides with plastic flanges. The waveguide is fabricated from metal (brass or aluminum) tubes at the ends of which flanges are formed by the pressing [pressovaniye] method from press-material. After milling, the ends of the flanges are cut, lapped, and metallized. The merits of such waveguides are noted and also the absence of complicated and costly fittings. Use of the plastic filter reduces by 2-3 times the amount of labor in the fabrication of waveguide units and decreases their weight. The technological singularities of the process of fabricating a waveguide with plastic flanges are formulated. 1 ill. 1 ref. V. S.

1/1

- 171 -



USSR

CHEBURKIN, A. V., STEFANI, D. V., LEBEDEVA, N. N., YESIPENKO, N. V., and IL'CHENKO, T. P.

"Immunoglobulins in Nasal Secretions of Small Children"

Vopr. Okhrany Materinstva i Detstva (Problems of the Protection of Motherhood and Childhood), 1973, No 7, pp 53-57 (from RZh - Biologicheskaya Khimiya, No 22, Nov 73, Abstract No 1704)

Translation: By the method of simple radial immunodiffusion it is not possible to determine secretory immunoglobulins in the washout of nasal secretions of one month old babies. After the age of 2 months a small quantity of immunoglobulins of the class A and G are found. From the six months on -- the level of IgA is increased, while IgG remains quite low, increasing slightly with age. The immunoglobulins of the class M in nasal secretions are absent in small babies. High individual fluctuations of IgA may be explained by the lability of the system of local immunity. The results obtained support the point of view of the local synthesis of class A immunoglobulins.

1/1

USSR

UDC 539.3/5:678

UMANSKIY, E. S., KRYUCHKOV, V. V.; DEBRIVNYY, I. Ye.,  
IL'CHENKO, V. I., and TINYAKOV, V. G., Kiev Polytechnic Institute

"Stand for the Investigation of Creep and Fatigue Strength of  
Composition Films of Magnetic Carrier Type at Raised Temperatures"

Kiev, Problemy Prochnosti, No 5, May 73, pp 103-107

Abstract: A twelve-sectional experimental stand for creep and fatigue strength investigations, developed on the Chair of the Strength of Materials of Kiev Polytechnic Institute, is described by reference to its general view and electromechanical and functional schemata. The stand can also be used for testing short-term strength and relaxation. The instrumentation of the stand includes an automatic servomechanism for temperature control and registration (exactness  $\pm 1^{\circ}\text{C}$ ) and also a multichannel system for recording deformations on prolonged mechanical tests. Investigation methods of creep and fatigue strength of composition films of magnetic carrier type in the interval of working temperatures are discussed. The described stand and the developed method make it possible to study the rules of accumulation and diminishing not only of the total but also of the reversible (elastic and high-elastic) deformations. Four figures, five bibliographic references.

1/1

- END -

GSO: 1861-W

USSR

UDC 539.3/5:678

UMANSKIY, E. S., KRYUCHKOV, V. V., DEBRIVNYY, I. Ye., IL'CHENKO, V. I., and TINYAKOV, V. G. (Kiev)

"An Installation for Investigation of Creep and Long-Term Strength of Film Materials at Reduced Temperatures"

Kiev, Problemy Prochnosti, No 9, Sep 73, pp 107-111

Abstract: A description is given of an installation and a procedure for the study of creep and restoration, at static and pulsed loads, of composition films at reduced temperatures (plus 30 to minus 120°C). A distinguishing feature of the installation is the use of semiconductor thermoelectric batteries for cooling the working volume of the chamber.

Corresponding devices and appliances were developed with semiconductor sensors, which permitted the accuracy of measurement of the forces and deformations to be considerably increased in comparison to the existing methods. Typical diagrams of creep and restoration at static and subsequent pulsed loads are presented. 4 figures. 6 references.

1/1

USSR

UDC: 621.791.06:621.9-419

KOTEL'NIKOV, A. A., USHAKOVA, S. Ye., and IL'CHENKO, V. I., Kursk  
Polytechnical Institute

"Structure and Properties of the Transition Zone in Diffusion Welding of  
Steel 15 With AMts Alloy and ADI Aluminum Through a Nickel Interlayer"

Kiev, Avtomaticheskaya Svarka, No 11, Nov 70, pp 27-29

Abstract: The welding of aluminum and its alloys with steels presents difficulties due to marked differences in the physicochemical properties of these materials. Interaction of aluminum with iron produces intermetallics  $FeAl_3$ ,  $Fe_2Al_2$ ,  $Fe_2Al_5$ ,  $FeAl_2$ ,  $FeAl$  and others determining the brittleness of the weld. An attempt is described here to produce a quality weld of aluminum alloys with steel by diffusion welding in vacuum using a nickel interlayer. The latter was made by galvanic nickel plating of a steel strip with a copper backing so that the fusion zone became an iron-copper-nickel-aluminum system. Emphasis was placed on the problem as

1/2

USSR

KOTEL'NIKOV, A. A., et al, Avtomaticheskaya Svarka, No 11, Nov 70, pp 27-29

to which intermetallide is determining the optimum mechanical properties of the weld. The diffusion zone was studied by microstructural, local x-ray spectral, and x-ray structural analyses; the microhardness was measured and the mechanical properties were tested. It has been shown that the determining factor in evaluating the strength of the weld is the presence of the  $Al_3Ni_2$  phase; the maximum width of this phase is 1 micron.

2/2

USSR

UDC 533.6.011+533.69.01+533.662.013+533.6.521.661.013

IL'ICHEV, K. P., POSTOLOVSKIY, S. N., Moscow

"Calculation of Nonstationary Separation Plane Flow of a Nonviscous Fluid Over Bodies"

Moscow, Mekhanika zhidkosti i gaza, No. 2, Mar/Apr 72, pp 72-82

Abstract: Relationships are given for calculating the separation flow over bodies of arbitrary shape within the framework of the theory of an ideal fluid. Calculations of a plane flow over a circular cylinder and a plane plate are given as examples of a calculation by numerical methods using a computer. Ten initial assumptions were made concerning the motion of an ideal fluid under the presence in the flow of a line of tangential separation of the velocity-vortex sheet. It is concluded from the close agreement between the calculated kinematic picture of the flow and the actual picture and the satisfactory agreement between calculated and experimental quantitative characteristics of the flow that these assumptions on which the calculation of the separated flow was based and the theoretical relationship thus obtained reflect the essence of the process of separation flow of a nonviscous fluid over bodies in the automodeling region.

1/1

- 9-

USSR

UDC 612.13:797.22

GUREVICH, M. I., ~~IL'CHEVICH, N. V.~~ KARTSEVA, BRATUS', V. V., and DUKHIN, E. O.,  
Institute of Physiology imeni O. O. Bogomolets, Academy of Sciences, Ukrainian  
SSR, Kiev

"Effect of Underwater Activity on the Human Cardiovascular System"

Kiev, Fiziologicheskii Zhurnal, No 5, 1972, pp 606-613

Abstract: Hemodynamic shifts were studied in 10 aqualungers age 18 to 29 after submersion, while exercising under water, and while swimming with an oxygen apparatus. Immediately after submerging to a depth of 5 to 10 m in a No 2 outfit the men exhibited an increase in arterial pressure, decrease in pulse pressure, slowing of the heart rate, reduction in the cardiac output, and increase in resistance of the peripheral blood vessels. The performance of graduated physical exercise under water elevated arterial pressure, slowed the pulse rate, increased the resistance of the peripheral blood vessels, but had little effect on the cardiac output or heart rate. Underwater swimming elevated arterial pressure, slowed the heart rate, decreased the cardiac output, and increased the resistance of the peripheral vessels.

1/1

- 45 -

USSR

UDC: 8.74

SHKUTA, Yu. K., ILCHIN, A. S., Editorial Staff of "Izv. AN KirgSSR"

"Search Program of Optimum Approximations for the General Case of the Method of Least Squares"

Programma poiska nailuchshykh priblizheniy dlya obshchego sluchaya metoda naimen'shikh kvadratov (cf. English above), Frunze, 1971, 15 pp, No 3673-71 Dep. (from RZh-Kibernetika, No 4, Apr 72, Abstract No 4V561 DEP)

Translation: Conventionally, the polynomial which approximates an initial function  $f(x)$  is sought in some  $\epsilon$ -strip. Hence it becomes important not only to assign the function  $f(x)$  itself, but the width of the  $\epsilon$ -strip as well. If it is possible in this connection to consider the approximation of the initial function in a tube of diameter  $2\epsilon$ , then a situation arises where a function of one variable may be approximated by a function of two variables. This makes it possible to impose a considerably greater number of conditions on the curve for the same degree of the approximating polynomial. It is natural in this connection to expect improved approximations in just this region. The paper presents the APNICE program for search of optimum approximations developed for these purposes for the BESM-3M computer. Instructions are given for practical utilization of the program. Authors' abstract.

1/1

- 44 -



USSR

7 WDC 546.47'22:54 - 111.2

GRIGOR'YEV, O. N., IL'CHISHIN, V. A., KLOCHKOV, V. P., and TORCHILIN, N. M., Institute of Semiconductors, Academy of Sciences Ukrainian SSR

"The Crystalline Structure of Electroluminescent Zinc Selenide Films"

Moscow, Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 9, Sep 70, pp 1561-1563

Abstract: The literature contains no data on the structural properties of ZnSe films obtained by the two-step method, viz., evaporation of the substance on a cold substrate with subsequent heat treatment. The present article studies the effect of the following on the crystalline structure of ZnSe films: atmosphere, temperature and duration of heat treatment, the presence of a conducting layer ( $\text{In}_2\text{O}_3$ ,  $\text{SnO}_2$ ) on the glass substrate, the thickness of the ZnSe film and various activators (Cu, Mn). The batch of Zn and Se was selected in such a way that at different annealing temperatures the Zn and Se vapor pressure was 0.5 and 1 atm, respectively. Annealing temperature varied from 300 to 650° C in 50° C intervals, annealing time one hour. Elec-

1/2

USSR

GRIGOR'YEV, O. N., et al., Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 9, Sep 70, pp 1561-1563

tron-diffraction and roentgenographic studies were made of the crystalline structure of the resultant ZnSe films.

The results indicate that annealing without an activator in vapors of a metal or metalloid has no appreciable effect on the phase composition of the initial films. When copper is introduced as activator, annealing in zinc vapors contributes to the formation of the hexagonal modification; annealing in selenium vapors contributes to the cubic modification. With an increase in the film thickness a transition is observed from films containing cubic-modification crystals to only hexagonal-modification films. The transition from crystals of cubic modification to hexagonal modification results from errors in the application of the layers. Orientation of the crystals of hexagonal modification improves with increased thickness.

The authors thank N. A. VLASENKO for his advice and for discussing the results.

2/2

- 1 -

USSR

UDC: 539.37

MARKELOV, G. I., IL'GAMOV, M. A., and IVANOV, V. A.

"Deflections of Elastic Parallelepiped Under Action of Its Own Weight"

Kiev, Prikladnaya Mekhanika, Vol 7, No 12, 1971, pp 32-40

Abstract: The object of the paper is to compare alternate methods of setting up boundary equations.

The very long parallelepiped has one vertical face fixed and is subject to its own weight. The Z-axis of coordinates coincides with this face, the X-axis is normal to it and lays in the bottom face. The XX cross-section is covered by a grid. Finite difference equations in matrix form are written for the nodal points of this grid.

Alternates 1 and 2. The derivatives of the stresses with respect to distance along the face are used as boundary conditions.

Alternate 3. Unilateral difference equations are used normal to the faces, central differences along the faces.

The general solutions of the difference equations are given. They are expanded in series.

The numerical solutions of the deflections and stresses for the three alternate methods are shown on graphs. Alternate 3 (dotted lines) is the closest to the analytical solution (full lines).

1/1

- 112 -

USSR

UDC 539.376:534.1

IL'GAMOV, M. A., SAKHABUTDINOV, Zh. M., SHAKIR'YANOV, M. M.

"Nonlinear Radial Oscillations of a Cylindrical Shell Filled With a Compressible Liquid"

V sb. Konf. po kolebaniyam mekh. sistem. Tezisy dokl. (Conference on Oscillations of Mechanical Systems. Abstracts of the Reports), Kiev, "Nauk. dumka", 1971, p 44 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10V271)

Translation: The paper deals with the problem of forced steady-state oscillations of an ideal compressible liquid contained between two infinitely long circular cylindrical shells. The inner cylinder is a source of harmonic radial perturbations. Finite deformations of a "rubber-like" elastic outer cylinder are considered in the nonresonance case. The equation of motion of the ideal liquid is written in Lagrangian coordinates, which facilitates satisfaction of the contact boundary conditions.

An approximate solution is found by the method of successive iterations as applied to equations of motion of liquid and shell. The effect of various parameters on the oscillatory process is numerically analyzed in the second approximation.

1/1

USSR

GALIYEV, Sh. U., IL'GAMOV, M. A., SADYKOV, A. V. Kazan'

"Periodic Shock Waves in a Gas"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No 2, March-April 1970, pp 57-66

Abstract: This article contains the results of experimental investigations of longitudinal non-linear oscillations of a gas excited in a closed tube. The amplitudes and profiles of the shock waves are compared with their calculated values at excitation frequencies  $\omega$  close to the first natural frequency of the gas column  $\Omega = \pi a_0/L$  where  $a_0$  is the speed of sound in the unperturbed gas, and  $L$  is the length of the tube. The existence of shock waves has been discovered at an excitation frequency half the first natural frequency. The theory based on the method of successive approximations is developed for the latter case. A generalization is presented for excitation frequencies in the vicinity of  $\omega = N \Omega$  ( $2N = 1, 3, 5, \dots$ ).

The experimental setup and procedure are described, and the readings of a pressure-sensitive sensor at the closed end of tubes 340 and 170 cm long are presented in graphical form for a broad range of excitation frequencies. The experiment shows the low effect of viscosity on the amplitude of the shock waves.

1/2

USSR

GALIYEV, SH. U., Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti I Gaza, No 2, March-April 1970, pp 57-66

It is pointed out that whereas oscillations near  $\omega = N \pi a_0/L$  ( $N = 1, 2, 3, \dots$ ) have been investigated quite thoroughly previously, by repeating the calculations performed in this paper for this case, within the framework of the theory of an ideal liquid it is possible to construct a more exact solution than was found earlier since some new second order variables are considered here, and the boundary condition in the plunger is satisfied for  $x = L + Z \cos \omega t$  (and not for  $x = L$ ).

2/2

1/2 023 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--USE OF THE ODD HARMONICS OF A PIEZOEMITTER IN AN ULTRASONIC  
INTERFEROMETER FOR LIQUIDS -U-  
AUTHOR-(03)-ILGUNAS, V., PAULAUSKAS, K., TAMASHAUSKAS, A.  
COUNTRY OF INFO--USSR  
SOURCE--AKUST. ZH. 1970, 16(1), 148-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--FLUID STATE, INTERFEROMETER, ULTRASONIC ABSORPTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3007/1033 STEP NO--UR/0046/70/016/001/0148/0149  
CIRC ACCESSION NO--AP0136460  
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136460

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTERFEROMETRIC METHODS CAN BE USED FOR THE SIMULTANEOUS MEASUREMENT OF THE VELOCITY AND THE ABSORPTION OF THE ULTRASOUND. A SERIES OF ODD HARMONICS OF A PIEZOCRYSTAL WAS USED IN THE ULTRASONIC INTERFEROMETER. IT WAS SHOWN EXPTL, THAT THE REACTION CURVE ON THE ODD HARMONICS CORRESPONDS TO THAT OBTAINED ON THE BASE FREQUENCY; ONLY THE COEFF. OF THE STANDING WAVE DECREASES WITH INCREASING ORDER NO. OF THE HARMONIC. THE MEASUREMENTS OF THE VELOCITY AND ABSORPTION OF THE ULTRASOUND WERE CARRIED OUT BY THE METHOD AND WITH THE APP. USED PREVIOUSLY BY I. AND P. (LOC.CIT.). THE RESULTS WERE IN AGREEMENT FOR THE SAME HARMONIC. DIFFRACTION LOSSES WERE TAKEN INTO CONSIDERATION FOR THE LOWER HARMONICS. FACILITY: KAUNAS. POLITEKH. INST., KAUNAS, USSR.

UNCLASSIFIED



1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--CLOUD BRIGHTNESS, REVIEW OF A COMPLEX STUDY -U-

AUTHOR--(04)-ROZENBERG, G.V., ILICH, G.K., MAKAREVICH, S.A., MULLAMAA,  
YU.R.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, FIZIKA ATMOSFERY I OKEANA, VOL. 6,  
MAY 1970, P. 445-467  
DATE PUBLISHED----MAY70

SUBJECT AREAS--ATMOSPHERIC SCIENCES

TOPIC TAGS--LIGHT SCATTERING, OPTIC BRIGHTNESS, ATMOSPHERIC CLOUD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605011/F06 STEP NO--UR/0362/70/006/000/0445/0467

CIRC ACCESSION NO--A0140230

UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140230

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISCUSSION OF THE PROPERTIES OF SOME VERY GENERAL ASYMPTOTIC FORMULAS, FOR THE BRIGHTNESS OF THICK LAYERS OF LIGHT SCATTERING MEDIA, WHOSE CORRECTNESS WAS DEMONSTRATED BY PREVIOUS EXPERIMENTS. THE FORMULAS ARE USED IN CALCULATING THE CLOUD BRIGHTNESS AS A FUNCTION OF CLOUD PARAMETERS, ILLUMINATION, AND CONDITIONS OF THE UNDERLYING SURFACE. AN ANALYSIS OF EXTENSIVE EXPERIMENTAL DATA AND CALCULATIONS INDICATE THE EXISTENCE OF A RELATION BETWEEN THE MACROOPTICAL PARAMETERS OF CLOUDS AND THEIR MICROSTRUCTURE. A METHOD IS PROPOSED FOR DETERMINING THE EFFECTS OF THE SPATIAL STRUCTURE OF CLOUDS ON THEIR BRIGHTNESS CHARACTERISTICS AS A FUNCTION OF THE DIMENSIONS OF THE VISUAL FIELD. FACILITY: AKADEMIIA NAUK SSSR, INSTITUT FIZIKI ATMOSFERY, MOSCOW, USSR. FACILITY: AKADEMIIA NAUK BELORUSSKOI SSR, INSTITUT FIZIKI, MINSK, BELORUSSIAN SSR; AKADEMIIA NAUK ESTONSKOI SSR, INSTITUT FIZIKI I ASTRONOMII, TARTU, ESTONIAN SSR.

UNCLASSIFIED

USSR

UDC 669.721.046.4

KARPOV, A. B., IL'ICHEV, A. A.

"Dependence of Dehydration and Hydrolysis of Magnesium Chloride Crystal Hydrates on Gas Flow Rate"

Tr. Vses. N-i. i Projektn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 63-68. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G188 by the authors).

Translation: The influence of the speed of the gas stream blown directly through the filter material layer on the rate of processes of dehydration and hydrolysis of  $MgCl_2 \cdot 2H_2O$  and  $MgCl_2 \cdot H_2O$  in the 200-400° temperature interval is studied. The rate of dehydration increases with increasing gas flow rate. The degree of hydrolysis of  $MgCl_2$  is decreased with an equal degree of dehydration of its crystal hydrates. The data produced indicate that the rate of dehydration is significantly higher than the rate of hydrolysis. An increase in temperature causes an increase both in the rate of dehydration and in the rate of hydrolysis. However, the rate of hydrolysis increases more rapidly with increasing temperature. 3 figs; 1 table, 9 biblio refs.

1/1

USSR

UDC 537.312.62

IL'ICHEV, A. I., MOLOTILOV, B. V., SUVOROV, V. A., FEDOTOV, L. N., SHIRYAYEV, YU. P.

"Properties of Superconducting Materials"

Sb. tr. TsNII chern. metallurgii (Collected Works of the Central Scientific Research Institute of Ferrous Metallurgy), 1971, vyp. 78, pp 108-110 (from RZh-Radiotekhnika, No 6, Jun 72, Abstract No 6D450)

Translation: In recent years the Central Scientific Research Institute of Ferrous Metallurgy has developed and mastered the production of the following superconducting materials: 65BT, wire (ChMTU 1-29-66); 50BT, wire (ChMTU/TsNIChM 1458-67); 35BT, wire (ChMTU/TsNIChM 1489-69); 70B, tape (ChMTU/TsNIChM 1491-69); SKM, compositional material (ChMTU/TsNIChM 1487-69). In this survey a study is made of the technological and the physical-mechanical properties of the indicated materials, and recommendations are made with respect to their application.

1/1

USSR

UDC 615.471:615.849.5

DENISENKO, O. N., IL'ICHEV, B. V., KOZLOV, V. A., SKORCPAD, Yu. D.,  
STROYKOV, M. Ye.

"Fifty-Channel Dosimeter With Transistorized Detectors"

Moscow, Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

Translation: Department of Roentology and Radiology (Chief-Academician of Academy of Medical Sciences, USSR, G. A. Zedgenidze) of the Scientific-Technical Institute of Medical Radiology of the Academy of Medical Sciences, USSR, Obninsk.

Growth of means for measurement of dose fields lead to the creation of automatic isodoseographs of the following or scanning type (V. A. Volkov, Kh. Dzhons; E. G. Bochkarev and V. A. Mikhaylov). In essence such an isodoseograph is a dosimeter, the movement and recording of readings of which take place automatically. The principal disadvantages of a device of this type is the low operativeness, the impossibility of measurements in solid phantoms, and also with the use of mobile methods of irradiation provide a way so that the isodosograph pertains to the class of single-channel recording systems.

Transition to multichannel methods of recording because of the basic trend in measuring techniques makes it possible to eliminate the disadvantages mentioned above.

1/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

In the literature a 10-channel isodoseograph with ionization chambers (Birkner) is described; however, the small number of detectors requires additional transfer of them which for practical purposes reduces the principal advantages of a multichannel system to nothing.

A fifty-channel system of recording a dose field with megavolt radiation energy was developed by us.

The over-all block diagram of the multichannel dosimeter shown in Fig. 1 is constructed on the principle of time sharing of the channels. The commutator  $K_1$ , which is triggered by the generator  $G$ , successively connects the detectors  $D_1$ -- $D_{50}$  to the input of the d-c amplifier (UPT). The amplified signal passes by way of commutator  $K_2$ , operating in step with the commutator  $K_1$ , through the correcting network  $K_{Ts1}$ -- $K_{Ts50}$  intended for balancing the sensitivity of the detectors, and is admitted into the recording device. The recording device is a digital voltmeter  $TsV$ , the frequency of the measurement cycle of which is also determined by the generator  $G$ . The response of the digital voltmeter can be recorded visually, photographically or with the aid of the digital-printing device  $TsU$ . During the comparative representation of the results of the measurements, the signal  $J_0$  of the reference detector is

2/15

- 87 -

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

established with the aid of a resistor R, 100 percent equal to 100 units (mv). The sensitivities  $J_n$  of the other detectors automatically represent the ratio  $J_n/J_0$  expressed in percentages.

Semiconductor silicon phototransducers with a p-n junction are used as radiation detectors, the electrical and dosimetric character of which are well known (Yu. B. Mandel'tsvayg; A. N. Krongauze and coauthors; F. I. Glezin and coauthors). For their use in a multichannel system it is necessary that the spread of the basic parameters -- sensitivity, energy dependence, internal resistance -- be a minimum. The initial choice of detectors with dimensions of 10 x 10 x 1 mm from a batch of 300 pieces was made on the basis of measurements with the aid of an avometer [ampere-volt-ohmmeter] of the values of the forward and back resistances. As investigations showed, for maintenance of zero of an amplifier operating in a compensating regime it is necessary that the magnitude  $R_{back}$  be not less than 50--60 kOhm.

After this, the energy dependence was studied of 10 detectors arbitrarily selected from a batch of detectors in the 13-120 e.v. range.

3/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

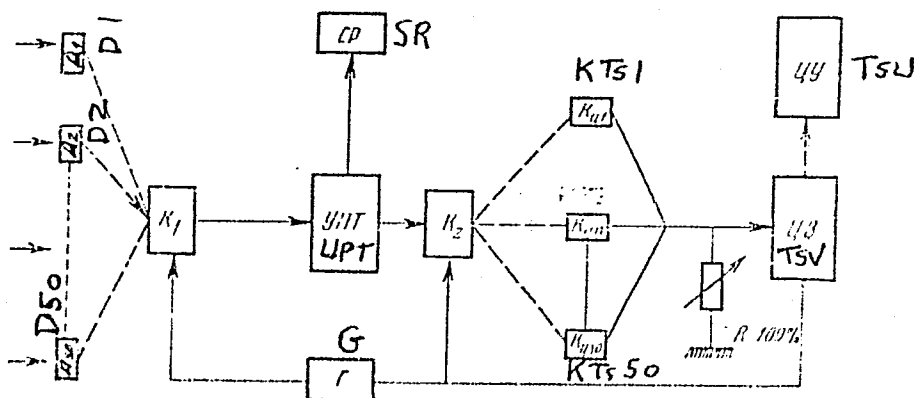


Fig. 1. Block Diagram Of Multichannel Dosimeter

4/15



USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

The results obtained show that the maximum spread does not exceed 20-30 percent. It practically did not affect the attenuation curves of Co60 measured with the aid of these detectors. The attenuation curves coincided with attenuation curves measured by the scintillation detector of the NS-200/B dosimeter with a precision on the order of 3 percent, which corresponds to data obtained in the work of V. K. Lyapidevskiy. The geometry of the detector in the form of a plate with dimensions of 10 x 10 x 1 mm is not optimum, which appears in the dependence of the sensitivity on the angle of incidence of the quanta emission. In order to improve the geometry, the plates were divided into two equal halves which then were superimposed one on the other (sensitive side inward) so that the over-all dimensions of the detector became equal to 10 x 5 x 2 mm. Electrically, these parts of the detector were connected in parallel, thanks to which the electrical parameters and the sensitivity of the new detector correspond to the original (up to cutting). The dependence of the response on the angle of incidence of the  $\gamma$  quanta during this did not exceed 5 percent (the analogous magnitude for the original plate was 25 percent).

The maximum spread of the detector was in sensitivity. The differential distribution of sensitivity is shown in Fig. 2 a and the integral in Fig. 2 b.

5/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

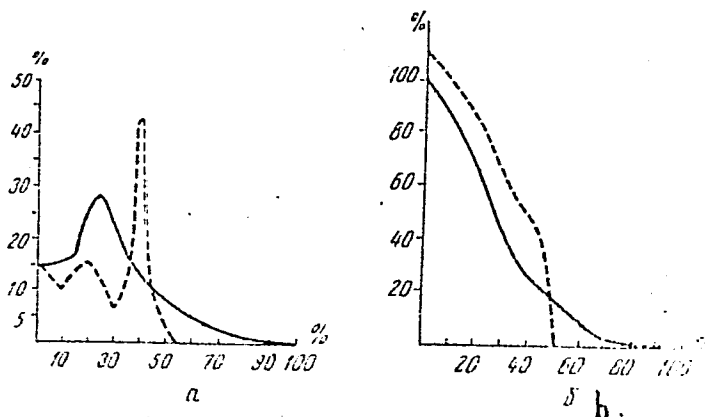


Fig. 2. Distribution of Detectors With Respect to Sensitivity  
a--Differential; b--Integral. Solid line up to "cutting of the detectors; dotted line, after.

6/15

- 89 -

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

<sup>60</sup>Co radiation was used in determining the sensitivity. The relative sensitivity (the response of the most sensitive detector is taken as equal to 100) is plotted on the X axis and the relative number of detectors (the overall number of detectors in a batch corresponds to 100) on the Y axis.

All detectors were equalized to a relative sensitivity of 40 percent. It is clear that during this it is possible to utilize those detectors, the relative sensitivity of which exceeds 40 percent. It is possible mechanically to reduce the sensitivity (e.g., by a decrease of the dimensions of the detector) and by electrical means. We used the latter method, for which correcting networks were introduced into the electrical circuit [tsep'] for the signals after amplification, with the aid of which it was possible smoothly to change the sensitivity to the necessary magnitude. As seen from Fig. 2 b, the relative number of detectors which were used during this did not exceed 25 percent (for a relative sensitivity of 40 percent). In order to increase the output of the detectors in a batch which are used, and the preliminary (up to electrical correction) equalizing of their sensitivity, the process described above of improving the geometry of the detectors was used. To accomplish this, the halves of detectors with a relative sensitivity greater than 40 percent were connected with halves of detectors with a relative sensitivity less than

7/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

40 percent, so that the sum of their relative sensitivities would amount to 40 percent. The corresponding distributions after these operations are shown in the dotted lines of Figs. 2 a and 2 b. It is seen that the output of detectors which are used increased up to 55 percent. Furthermore, the spread of the detectors with respect to sensitivity (see Fig. 2 a) was substantially decreased, which to a considerable degree contributed to a simplification of the electrical circuits for sensitivity control. After electrical connection the final spread of 50 selected detectors did not exceed 2 percent.

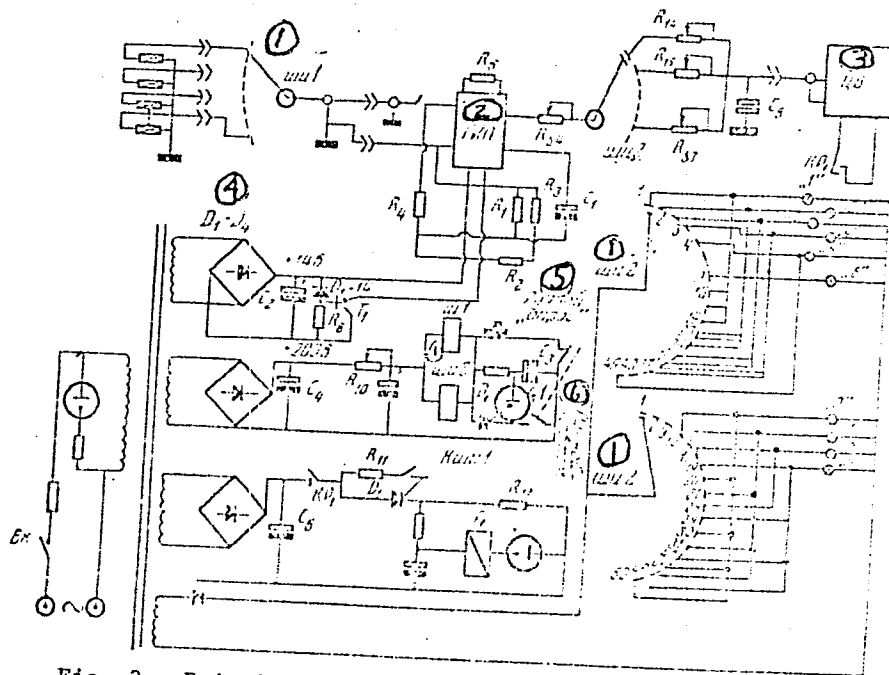
The detectors were placed at the ends of rods (at a depth of 3 mm) with a length of 30 cm and a diameter of 1 cm, made of tissue-equivalent mass M-3. Conductors with a cross section of 0.14 mm passed within the rods. The number of the detector was placed on the lateral face of the rod. For convenience in exploitation, all the detectors were united in groups of 10 pieces each, which are connected via releasable connections to the block of the  $K_1$  commutator, distributed in the immediate vicinity of the phantom.

The principal circuit and the external appearance of the multichannel dosimeter are shown in Figs. 3 and 4.

8/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45



9/15

Fig. 3. Principal Circuit Of Multichannel Dosimeter

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

Key to Fig. 3.

1. (SH)-1, -2 Step-by-step switch
2. Galvanometric induction converter
3. Digital voltmeter
4. Detectors
5. Manual interrogation
6. Manual-automatic

ShI-50/4 step-by-step switches were used as  $K_1$  and  $K_2$  commutators. Their triggering was accomplished by the thyristorized generator  $L_1$ , operating in a regime of energy pileup in the interval between pulses. The possibility is provided for of manual or automatic interrogation with frequency control. After the commutator  $K_1$  the signal enters a Type I-310 d-c amplifier which contains a Type 131M/3 galvanometric induction converter (GIP) an a-c amplifier, and a synchronous demodulator. The input resistance of the GIP does not exceed 1-2 ohm which makes it possible to assure realization of a short-circuit regime. From the GIP the signal proceeds via the commutator  $K_2$  to the correcting network which contains the variable resistors  $R_{14}$ - $R_{53}$ . Resistor  $R_{54}$  (100 10/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

percent R) is used during relative measurements. For an indication of the number of a detector being questioned, indicator digital panels were used, connected with the aid of the ShI-50/4 contacts, and giving in digital form the number of the detector being questioned. The results of the measurements were recorded with the aid of a Type ShCh1411M digital voltmeter, with which an output to digital printing in the code 2-4-2-1 was provided.

Structurally the multichannel dosimeter is made in the form of the block of detectors, the block of the commutator  $K_1$ , a principal block in which are located the commutator  $K_2$ , the d-c amplifier (UPT), the correcting network, and the control general G, the power supply block, and the digital voltmeter block.

The commutator  $K_1$  is located in the immediate vicinity of the phantom. The signals are transmitted with the aid of a coaxial cable approximately 20 m long. For convenience, in the principal block there was a supplementary pointer-type recorder (SR) (See Fig. 1) of the power of the radiation dose, connected to the output of the GIP.

11/15

USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

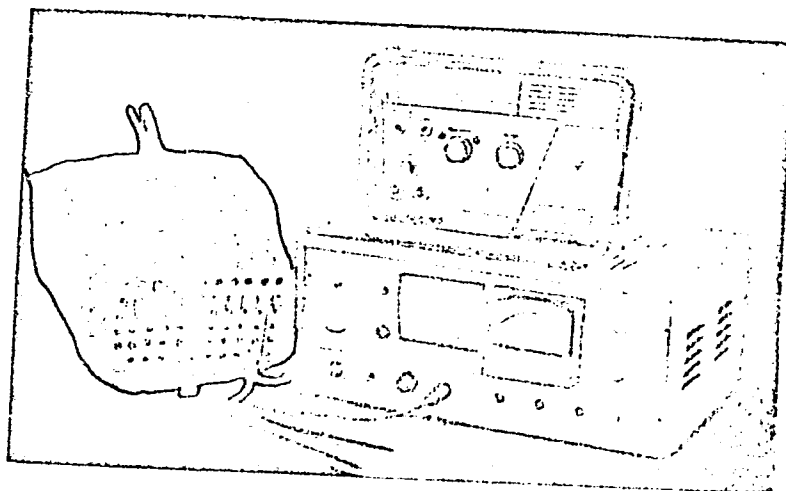


Fig. 4. Exterior View Of Multichannel Dosimeter

12/15



USSR

DENISENKO, O. N., et al., Meditsinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

The multichannel dosimeter can be used with any phantom, both liquid and solid. In our investigations a dosimetric phantom of a human thorax was used, prepared on the basis of this part of the skeleton fixed in Formalin. The thorax wall, the heart, liver, and diaphragm are fulfilled from the M-3 phantom mass (M. Tyubiana and coauthor). The trachea and esophagus are simulated with vinyl chloride tubes. The spinal column canal is a natural cavity with vinyl chloride tubes lead into it. In place of the arrangement of the lungs, a cavity is provided, with the anatomy and dimensions of the skeleton taken into account. The cavity can be filled with various tissue-like materials and ionizing radiation detectors can be introduced into it. On the side of the distal end of the phantom there are 50 cylindrical channels 1 cm in diameter in which rods with detectors can be placed. The direction of the channels coincides with the longitudinal axis of the phantom.

Thus the dosimetric phantom of a human thorax makes it possible wholly or partially to vary the composition of the substance filling the "lungs" cavity and to place detectors at any point of the phantom, including the "esophagus," "trachea," and the "spinal column channel."

Measurements performed on this phantom with the aid of the multichannel dosimeter showed that introduction of detectors into the phantom did not affect the dose field within the limits of error of the measurements.

USSR

DENISENKO, O. N., et al., *Meditinskaya Radiologiya*, Vol 18, No 2, 1973, pp 40-45

With the electronic stages taken into consideration the over-all error of measurements did not exceed 5 percent.

Conclusions A 50-channel dosimeter with semiconductor detectors of the "solar cell" type was developed. The principle of time sharing of the detector communication channels with the recording device is placed at the basis of the block diagram. The multichannel dosimeter makes it possible to conduct measurements on any phantom with the application of static methods of irradiation. It would be possible to use a block diagram with parallel "interrogation" of detectors for recording of the dose field with mobile methods of irradiation; however, for a large number of channels its creation encounters considerable difficulties. In spite of this it is possible to stress that transition to multichannel methods of recording dose fields is very promising and the development in question is only the first step in this direction.

Bibliography

KRONGAUS, Z. N., LYAPIDEVSKIY, V. K., FROLOVA, A. V., Physical Basis of Clinical Dosimetry, Moscow, 1969.

KRONGAUS, Z. N., GLEZIN, F. I., GRIGOR'YEVA, G. M., Medical Radiology, 1970, No 9, p 68.

14/15

USSR

DENISENKO, O. N., et al., Medit'sinskaya Radiologiya, Vol 18, No 2, 1973, pp 40-45

DZHONS, Kh. [?Jones, X.], Physics of Radiology, Moscow, 1965.

MANDEL'TSVAYG, Yu. B., Medical Techniques, 1968, No 2, p 44.

TYUBIANA, M., DYUTREKS, Zh., DYUTREKS, A., and others, Physical Basis of Radiation Therapy and Radiobiology, Moscow, 1969.

BIRKNER, R., Radiation Therapy, 1962, Vol 118, p 229.

BOCHKAREV, E. G., MIKHAYLOV, V. A., Medical Radiology, 1970, No 9, p 62.

DZHONS, Kh. [?Jones, X.], Physics of Radiology, Moscow, 1965.

Received 16 December 1971

15/15

USSR

UDC 615.849.015.3

DENISENKO, O. N., IL'ICHEV, B. V., and KOZLOV, V. A., Department of Roentgenology and Radiobiology, Institute of Medical Radiology, Academy of Medical Sciences USSR

"Effect of the Size of the Detectors on the Accuracy of Dose Field Determination"

Moscow, Meditsinskaya Radiologiya, No 1, 1970, pp 67-72

Abstract: The authors examine cases of different ratios  $\frac{l}{x_2 - x_1}$ , where  $l$  is the length of the detector and  $x_2 - x_1$  is the length of the investigated area of change in function of the dose field  $D(x)$ . They show that using a detector in which  $l > x_2 - x_1$  is equivalent to using a detector with an infinitely small length. The error is greater in the case of a detector with  $l < x_2 - x_1$  than with the infinitely small detector. The size of the detector is unimportant for several fields. The authors emphasize that in choosing the size of a detector, one must take into account both the error arising from its limited resolving power and the error caused by its limited sensitivity. They present an expression that takes into account the combined effect of these errors.

1/1

Acc. Nr: **AP0034769**

I

Ref. Code: UR 0241

PRIMARY SOURCE: Meditsinskaya Radiologiya, 1970, Vol 15,  
Nr 1, pp 67-73

THE EFFECT OF THE DETECTORS' SIZE ON THE ACCURACY OF THE DOSE  
FIELD DETERMINATION

Denisenko, O. N.; Il'ichev, B. V.; Kozlov, V. A.

Summary

An analysis of the effect produced by the detector's size on the resolution capacity of the measuring device for different dose distributions is given. An expression for the optimal choice of the detector's size is presented, which takes account of the effect of the error due to the limited sensitivity.

*D. n.*

V/

REEL/FRA

02

**19711479**

1/2 021 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--TRANSISTORIZED DOSIMETER OF LONG WAVE ROENTGEN RADIATION -0-  
AUTHOR-(03)-KGZLOV, V.A., DENISENKO, O.N., ILICHEV, B.V.  
COUNTRY OF INFO--USSR  
SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 4, PP 61-63  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--RADIATION DOSIMETER, TRANSISTOR, X RAY DETECTION, X RAY MEASUREMENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1990/0957 STEP NO--UR/0241/70/015/004/0061/0063  
CIRC ACCESSION NO--AP0109114  
UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--0900170

CIRC ACCESSION NO--AP0109114

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THE AUTHORS DESCRIBE A DOSIMETER WITH TRANSISTORIZED MONITORS ENDOWED WITH DIFFERENT ENERGY DEPENDENCES. THE ENERGY DEPENDENCE OF THE DOSIMETER DOES NOT EXCEED PLUS OR MINUS 3PERCENT IN THE RANGE FROM DELTA ONE HALF EQUALS 0.2 MMAL UP TO DELTA ONE HALF EQUALS 1.8 MMAL. FACILITY: OTDEL RENTGENOLOGII I RADILOGII INSTITUTA MEDITSINSKOY RADILOGII AMN SSSR.

UNCLASSIFIED

USSR

UDC 577.15.049

SUKHORUKOV, B. I., POLTEV, V. I., POLOZOV, R. V., IL'ICHEVA, I. A., Institute of Biological Physics, Academy of Sciences of the USSR, Pushchino-na-Oke

"Concerning a Possible Method of Finding Potential Mutagens and Cytostatics Based on Calculating the Energy of Intramolecular Interactions of DNA-Containing Analogs of Nitrogen Bases"

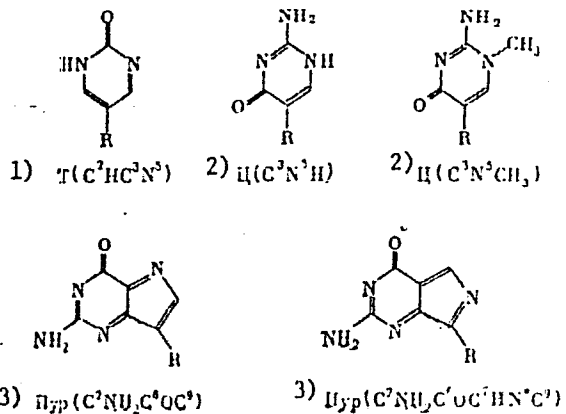
Moscow, Doklady Akademii Nauk SSSR, 1973, Vol 208, No 2, pp 443-446

Abstract: Semiempirical calculations of the energy of interaction of nitrogen bases were used to find potential cytostatics and mutagens. The calculation was based on consideration of analogs which do not appreciably distort the double helix in the DNA molecule. The total energy of interaction of bases T is assumed to be comprised of the energy of electrostatic E, induction H and dispersion F interaction, and the energy of short-range forces of repulsion V. Each term was computed in the atom-atom approximation, using a BESM-3M digital computer. Following are the most probable potential cytostatics (upper row) and mutagens (lower row):  
1/4



USSR

SUKHORUKOV, B. I., et al., Doklady Akademii Nauk SSSR, 1973, Vol 208, No 2, pp 443-446



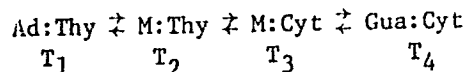
Legend: 1. Thymine; 2. Cytosine; 3. Purine

2/4

USSR

SUKHORUKOV, B. I., et al., Doklady Akademii Nauk SSSR, 1973, Vol 208, No 2, pp 443-446

The notation in parentheses give the atoms and atomic groupings which distinguish the given analogs from the indicated bases. The position of the atom in the ring is given by the superscript, and atoms outside the ring are recorded following the ring to which they are attached without a superscript. Numbering of ring atoms is such that desoxyribose is always attached in the third position of the analogs of pyrimidines, and in the ninth position of analogs of purines. Calculations showed that for all five compounds the average energies of interaction of the bases for Pur:Cyt and Pur:Thy pairs are comparatively close to each other and to the energy of interaction in DNA falling to the Ad:Thy pair. The scheme of transitions of standard pairs of bases under the influence of an analog which can replace both purines in a singular molecular form is given as follows:



where M is an analog of adenine and guanine, and  $T_1$ ,  $T_2$ ,  $T_3$  and  $T_4$  are the energies of interaction of the bases in DNA falling to the corresponding pairs of bases. The given analogs are potential mutagens which induce the 3/4

USSR

SUKHORUKOV, B. I., et al., Doklady Akademii Nauk SSSR, 1973, Vol 208, No 2, pp 443-446

transitions Ad:Thy→Gua:Thy more frequently than in the reverse direction. Other cases are possible for other ratios between energies. The ratio between these energies determines which base will probably be replaced by the analog, and in which direction this analog will induce transitions.

4/4

USSR

UDC 547.825

IL'ICHEV, Yu. Ye., ~~IL'ICHEV, I. Ye.~~, RUKHADZE, Ye. G., and TEREENT'YEV,  
Moscow State University

"Obtaining Alkylmercaptoethylpyridines"

Leningrad, Zhurnal Obshchey Khimii, Vol XL, No 12, Dec 70, p 2763

Abstract: A method was developed for obtaining alkylmercaptoethylpyridines (II) by alkaline decomposition of the salts of S-alkylisothiuronium in the presence of vinylpyridine. This method assures high yield of the desired product, but unfortunately produces a large number of S-alkylisothiuronium salts.

By using 2-Vinylpyridine, thiourea, and benzyl chloride, a 47.4% yield of benzylmercaptoethylpyridine was obtained; similar results were obtained with ethylmercaptoethyl-2-pyridine, using ethyl bromide instead of benzyl chloride, and here the yield was 50%.

1/1

USSR

UDC 541.49

IL'ICHEV, I. Ye., and TEREENT'YEV, A. P. (Deceased), Chair of Organic Chemistry

"Alkylpyridine Derivatives. Reaction of Pyridylethylated Amines with Aliphatic Epoxides"

Moscow, Vestnik Moskovskogo Universiteta, Vol 12, No 2, Mar-Apr 71, pp 238-239

Abstract: Ethylene oxide was passed through a methanol solution of monopyridyl-ethylmethanamine heated to 50-55°. The reaction mixture was heated for another 3 hrs, methanol was evaporated and the product -- N-Methyl-N-[2-(2 pyridyl)ethyl]-ethanolamine (I) -- was distilled under vacuum; its boiling point was 130-131.5°/1mm,  $n_D^{20}$  1.5264,  $d_4^{20}$  1.0484. (I) was converted to an acetate, b.p. 117-118°/0.5 mm,  $n_D^{20}$  1.4997,  $d_4^{20}$  1.0480. N-Ethyl-N-[2-(2-pyridyl)-ethyl]-ethanolamine, b. p. 108-109°/0.5mm,  $n_D^{20}$  1.5199,  $d_4^{20}$  1.0296 was similarly obtained; its acetate boiled at 123-125°/1mm,  $n_D^{20}$  1.4944,  $d_4^{20}$  1.0304. Essentially the same reaction was used for the preparation of N-methyl-N-[2-(2-pyridyl)ethyl]-propanol-2-amine, b.p. 128-130°/5mm,  $n_D^{20}$  1.5103  $d_4^{20}$  1.0112 and 1/2

- 41 -

USSR

IL'ICHEV, I. Ye. and TEREENT'YEV, A. P., Vestnik Moskovskogo Universiteta, Vol 12, No 2, Mar-Apr 71, pp 238-239

N-Ethyl-N-[2-(2-pyridyl)-ethyl]-propanol-2-amine, b.p. 110-112°/1.5 mm,  $n_D^{20}$  1.5058,  $d_4^{20}$  0.9996, their acetates having the following properties, respectively: b.p. 127-129°/1mm,  $n_D^{20}$  1.4924,  $d_4^{20}$  1.0235 and b.p. 118-120°/0.5 mm,  $n_D^{20}$  1.4901, and  $d_4^{20}$  1.0091. The reaction of pyridylethylmethylamine with epichlorohydrine gave 2,3-epoxy-N-methyl,N-[2-(2-pyridyl)-ethyl]-propylamine, b.p. 121-123°/2.5mm,  $n_D^{20}$  1.5184,  $d_4^{20}$  1.0422, and 2,3-epoxy-N-ethyl-N-[2-(2-pyridyl)-ethyl]-propylamine, b. p. 134-136°/4mm,  $n_D^{20}$  1.5124,  $d_4^{20}$  1.0269. N-[2-(2-pyridyl)ethyl]-ethanolamine, b. p. 139-140°/2mm was obtained by treating ethanolamine with 2-vinylpyridine in presence of HCl.

2/2

USSR

ILICHEV, N. N., KOROBEKIN, V. V., KORSHUNOV, V. A., MALYUTIN, A. A.,  
OKROASHVILI, T. G., and PASHININ, P. P., Physics Institute imeni P. N.  
Lebedev, Academy of Sciences USSR

"Superbroadening of Spectrum of Ultrashort Pulses in Liquids and Glasses"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15,  
No 4, 20 Feb 72, pp 191-194

Abstract: Experiments conducted by the authors showed that superbroadening of the spectrum of picosecond pulses at rather high radiation powers can be observed in practically any transparent dielectric. A neodymium self-mode-locking laser and two amplifier stages (length of active elements ~ 300 mm) were used in the experiments, permitting radiation with a total energy equal to 0.1-0.2 j in a train of 10-15 ultrashort pulses. ISP-51 and STE-1 type spectrographs were used to observe the spectral broadening. Liquids with various types of molecules and optical properties were used: carbon disulfide, nitrobenzene, benzene, toluene, isopropyl alcohol, carbon tetrachloride, water, and liquid nitrogen. Superbroadening of the spectrum was found in all these

1/2

USSR

IL'ICHEV, N. N., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 4, 20 Feb 72, pp 191-194

substances except CS<sub>2</sub> and nitrobenzene. The superbroadening effect was also observed in a number of glasses and crystals (in K-8, F-1, L-26, K2SS-7 glasses and in fused quartz and calcium tungstate). It is suggested that the observed superbroadening is due to strong laser phase modulation rather than four-photon interaction.

2/2

- 65 -



USSR

UDC 669.295.046.43

REYFMAN, E. D., IL'ICHEV, V. A., ZOTIKOVA, A. N., L'VIN, I. B.

"Mathematical Model of the Process of Chlorination of Titanium-Containing Materials in a Fluidized Bed"

Tr. Vses. N-i. i Proyechn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 196-200. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G212 by the authors).

Translation: Problems of mathematical modeling of processes of chlorination in a fluidized bed are presented. A mathematical model of the process is suggested for two basic technological modes. The adequacy of this model for processes occurring in actual apparatus in the mode of complete assimilation of Cl is demonstrated. The model developed allows automatic control systems to be developed for the process of chlorination of materials containing Ti in a fluidized bed. 2 figs.

1/1

USSR

UDC 669.295.053.4

VLADIMIROVA, A. M., IL'ICHEV, V. A.

"Processing of Titanium Tetrachloride Pulp in Thin Film Evaporation Apparatus"

Tr. Vses. N-i. i Proyechn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 201-208. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G220 by the authors).

Translation: Laboratory studies of the separation of a solid suspension from  $TiCl_4$  pulp by the evaporation method are performed. The technical product has a lower impurity content than following settling, and does not require additional purification to remove Al and Fe. A large laboratory film type evaporation apparatus is designed and manufactured. It is tested under laboratory conditions using artificial pulp and in the experimental shop of one of the plants using commercial pulp. The tests show that an apparatus of this design can be successfully used for processing of various types of  $TiCl_4$  for pulp, producing high quality technical product and a solid residue consisting of a dry powder. Necessary data are presented for planning of a pilot-scale apparatus. 2 figs; 5 tables.

1/1

- 43 -

USSR

UDC 669.295.046.43

IL'ICHEV, V. A., ZOTIKOVA, A. N., DROZHNEV, V. I.

"Specifics of Behavior of Petroleum Coke in Chlorination of Titanium-Containing Material in a Fluidized Bed"

Tr. Vses. N-i. i Proektn. In-ta. Alyumin., Magn. i Elektrokn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp 190-195. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 6211 by the authors).

Translation: In order to determine the influence of the reducer grain size on the technological indicators of the process of chlorination in a fluidized bed, laboratory and pilot plant tests were performed with various grain sizes. The tests were performed for two Ti-containing materials: Ti slag and  $TiO_2-SiO_2$  concentrate. The studies made it possible to determine the grain size of petroleum coke necessary to provide a high degree of extraction of Ti from the Ti-containing material with slight coke loss. 1 fig; 4 tables.

1/1

USSR

UDC 669.295.046.43

IL'ICHEV, V. A., ZOTIKOVA, A. N., KLYUCHNIKOVA, Ye. F.

"Chlorination of Flotation and Autoclave Titanium Concentrates in a Fluidized Bed"

Tr. Vses. N-i. i Proyechn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 186-189. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G210 by the authors).

Translation: A laboratory study was performed on the chlorination of flotation and autoclave concentrates and they were comparatively analyzed. The dependence of the rate of chlorination of three fractions of flotation and autoclave concentrates with up to 20% TiO<sub>2</sub> content on this content is linear. With identical content of TiO<sub>2</sub> at 800°, the rate of chlorination of flotation concentrate is 1.5 times higher than that of the autoclave concentrate. One reason for the increased chlorination ability of the flotation concentrate is the significant difference in grain size of rutile in the concentrates. 2 figs.

1/1

USSR

UDC 598.972:591.185.5

IL'ICHEV, V. D., VORONETSKIY, V. S., and GOLUBEVA, T. B., Moscow State University

"Sound Environment of the Long-Eared Owl and Spectral Sensitivity of Its Acoustic Nerve"

Moscow, Zoologicheskij Zhurnal, Vol 50, No 9, 1971, pp 1,358-1,368

Abstract: The sound environment of the long-eared owl consists of three components of unequal significance. The most important are the sounds emitted by objects of prey (squeaks and rusite of rodents), cries of nestlings and fledglings, and nuptial voices of adult owls. In order to perceive and locate these sounds, the owl's hearing must be very acute and highly discriminatory. Sounds of emergency, alarm, aggression, and other signals of communication, although also important, are easily perceptible. Sounds produced by trees, other plants, and nonbiological objects are of much lesser significance. The duration of biologically significant sounds is 0.05-0.90 sec, and the total frequency spectrum they cover ranges from 0.5 to 11.0 Khz. In the voices of adult owls, nestlings, and especially fledglings, the whole spectrum is broken into four to six frequency components separated by approximately equal intervals, due to which the voices have a harmonious quality. The

1/2

USSR

IL'ICHEV, V. D., et al., Zoologicheskii Zhurnal, Vol 50, No 9, 1971,  
pp 1,358-1,368

width of each component is 0.3-0.5 KHz in nestlings, 0.3-0.8 in fledglings, and 0.1-0.6 in adults, with intervals of 1.3-1.8, 0.8-2.0 and 0.2-0.5 KHz respectively. The voices of adult owls are spread over a narrower sound range than those of nestlings and fledglings. Records of action potentials from the auditory nerves have revealed that the cochlear receptors are most sensitive to sounds of 4-7 KHz. Those are the frequencies in which the owl is specialized to the highest degree (sounds emitted by rodents and fledglings). However, the spectra of all the biologically important sounds which have been investigated coincide with the owl's acute hearing range which includes frequencies up to 11 KHz.

2/2

- 81 -

USSR

UDC 591.185.5+591.582.2:59

ILICHEV, V. D., Moscow State University, Biology-Soil Faculty

"Voice and Hearing in the Acoustic Orientation System of Animals"

Moscow, Zhurnal Obshchey Biologii, Vol 32, No 3, May/Jun 71, pp 299-311

Abstract: The authors present a general review of the problem of the interrelation between voice and hearing in animals, which is of particular importance for the solution of location and signalization problems in animals, the use of acoustic repellents, sound-isolating mechanisms of evolution, and other problems of practical and theoretical significance. The interrelations of voice and sound in evolution are complex and manifold. As a phenomenon, they represent a fundamental biological correlation, ecologically they link systems which are structurally and physiologically independent into a single, biological complex, which assures the use of sound and sound communications in the most important life functions. Evolving as communication systems, sound and voice are at the same time species-distinguishing functions, serving as one of the mechanisms of the evolutionary process. The evolution of acoustic organs in the different systematic groups is considered to be of a mosaic character from the structural point of view (principle of mosaicity); however, the functional characteristics of hearing and voice, as well as their interrelations,

1/2

USSR

ILICHEV, V. D., Zhurnal Obshchey Biologii, Vol 32, No 3, May/Jun 71, pp 299-311

change in a specific direction, thereby reflecting the characteristics of the use of acoustic orientation and communication on various evolutionary levels. The interrelationships between sound and voice are characterized by a hierarchic multi-channel character, depending on the ecology and phylogenesis reached in the different systematic groups. The interrelationships are realized in three ways: organism-wise, population-wise, and biocoenotically. Several examples from the literature are treated in detail: for instance, the acoustic system of bats, for which echolocation plays such an important part in life; the characteristic voice spectrum and the threshold curve of the sound of the grass frog; the spectrum of the breeding cry of the bullfrog and the neuron distribution of the auditory nerve with respect to the optimum frequency; the special characteristics of biologically significant sounds and the hearing threshold curve of the big-eared owl; sonograms and spectrograms of the grasshopper *Drepanoxiphus modestus*, as well as the hearing threshold curve for this species. The author believes that research in this field should be actively continued to obtain further insight in the complex mechanisms involved and to discover other possible ecolocation channels, which may be of importance in different systematic groups.

2/2

- 69 -



USSR

UDC 577.44:598.97

IL'ICHEV, V. D., Ornithology Laboratory, Moscow State University

"Location of Sound Sources by Owls"

Moscow, Uspekhi Sovremennoy Biologii, Vol 70, No 1(4), Jul/Aug 70, pp 120-136

Abstract: Research on location of sound sources by owls is reviewed (53 references). It is emphasized that the high precision of location of sound sources by owls, which reaches  $1^{\circ}$ , is associated with a number of structural and functional characteristics of the auditory system, among which are a) enlarged ear folds and operculum, b) an assymetry of external parts of ears, c) air-filled cavities in the cranium that connect the tympanic chambers of the right and left ear, d) a large tympanic membrane with a laterally displaced attachment of the extracolumella to it, e) a well-developed umbo clipeoli, f) an elongated basilar membrane, g) an increased number of auditory neurons, and h) a complex inner differentiation of the auditory nuclei of the medulla oblongata. The specific characteristics of the auditory system of owls, which aid in the location of sound sources, vary with the mode of life of individual species and are more pronounced for nocturnal than diurnal owls and for owls that prey on rodents as compared with insect-eating owls. Preying on rodents at night requires the highest precision in determining the location of a

1/2

USSR

IL'ICHEV, V. D., Uspekhi Sovremennoy Biologii, Vol 70, No 1(4), Jul/Aug 70,  
pp 120-136

sound source. The hearing of owls that feed on rodents is attuned to sound frequencies corresponding to those of rodent voices. The mechanisms applied by owls in locating sources of sound vary with the ecological situation. The frequency spectrum characteristics of sound signals are apparently of importance in connection with this.

2/2

USSR

UDC 591.185+591.582.2:593.65

I  
IL'ICHEV, V. D., GURIN, S. S., TEKCHIN, A. N., and VORONETSNIY, V. S., Soil  
~~Biology Faculty~~, Moscow State University

"Biological Signals and Functional Characteristics of the Pigeon Acoustic System"

Moscow, Zhurnal Obshchey Biologii, No 3, 1970, pp 268-275

Abstract: The frequency range, spectral and amplitude characteristics, duration, time intervals, and front of courtship cooing, threat and fledgling signals in pigeons were studied. All of these parameters, except the spectral ones, show great variability. The relationship between the amplitude of the cochlear potentials and evoked medullar, mesencephalic, and hemisphere potentials, on the one hand, and the parameters of acoustic signals, on the other, were also studied. A comparison of the above-mentioned parameters of the biological signals with conditioned reflexes and other functional characteristics of the acoustic system in pigeons failed to disclose any significant correlation. The reason for this may lie in the nature of the ecology of the pigeon, whose acoustic orientation does not require these systems to be carefully adjusted to each other. For example, unlike some other birds, the pigeon does not need to perceive and locate low-frequency sounds, because its biological signals are normally used in conjunction with vision.

1/1

USSR

USSR 612.08:500.1

~~TRITONIN, V. D., GURIN, S. S., and TRICHIN, A. N., Moscow State University;~~

Electrophysiological characteristics of the avian auditory analyzer. I. Monocentric, Biencephalic, and Hemisphere related

Moscow, Izuchayva Tekhady Vyshey Shkoly. Biologicheskoye Nauch., No 1, 1970, pp 33-39

Abstract: A review of the literature on electrophysiology in studies of the auditory system in birds is presented. The electrophysiological characteristics and morphological data indicate that there are acoustic projections in the regions of the tectum and caudal mesencephalon, ovoid nucleus, dorsal portion of the lateral mesencephalic nucleus and, apparently, in the isthmus nuclei. The nature of the evoked potentials in these regions and their dependence on the parameters of the acoustic signal is described.

USSR

IL'ICHEV, V. S.

"Polyantagonistic Games"

Teoriya Igr [Games Theory -- Collection of Works], Yerevan, 1973,  
pp 181-185 (Translated from Referativnyy Zhurnal Kibernetika, No 10,  
1973, Abstract No 10V455)

Translation: The concept of a polyantagonistic game and a stable situation within such a game is defined. It is proven that the existence of stable situations is equivalent to the existence of optimal pure strategies in a certain related antagonistic game. A polyantagonistic game can be looked upon as a model of decentralized control under conditions of uncertainty. Conditions are presented under which centralization of control does not increase the win.

1/1

- 51 -

USSR

UDC: 51

IL'ICHEV, V. S.

"Conditions of Invariance of Certain Properties of the Bellman Function in Multiple-Step Antagonistic Processes"

Tr. Sev.-Zap. zauch. politekhn. in-ta (Works of the Northwest Polytechnical Correspondence Institute), 1971, No 14, pp 3-6 (from RZh-Kiber-netika, No 4, Apr 72, Abstract No 4V463)

Translation: The author considers a dynamic programming equation of the form

$$f_{k-1}(x_{k-1}, y_{k-1}) = F_k f_k(x_k, y_k),$$

where  $f_k(x_k, y_k)$  is the Bellman function, and  $F_k$  is an extremum operator of the form

$$F_k = \underset{\substack{x_k \in X_k(x_{k-1}) \\ y_k \in Y_k(y_{k-1})}}{\text{Val}} .$$

Conditions are established under which operator  $F_k$  preserves the continuity and convexity of the function  $f_k$ . A. Lyapunov.

1/1

USSR

UDC 621.791:669.245

YUSHCHENKO, K. A., KAKHOVSKIY, N. I., and STARUSHENKO, T. M., Institute of Electric Welding imeni Ye. O. Paton; ~~IL'ICHEV, V. YA.~~ Physicotechnical Institute of Low Temperatures, Academy of Sciences Ukrainian SSR; ZAKHAROV, A.I., Central Scientific Research Institute of Ferrous Metallurgy

"Weldability and Properties of Invar Weld Joints at Low Temperatures"

Kiev, Avtomaticheskaya Svarka, No 9, Sept 72, pp 39-42

Abstract: The purpose of this investigation was to develop the technology of welding Fe-Ni alloys (36N, 36NKh, and 39N) with a thickness up to 5 mm and to evaluate the weldability of Invar with a thickness up to 12 mm in order to obtain a strong and dense joint with the required mechanical and thermophysical properties in the 20 to -253°C interval. Chemical composition of the Fe-Ni alloys was (in %):

	C	Si	Mn	S	P	Ni	Cr
36N	0.032	0.23	0.43	0.009	0.008	36.1	----
36NKh	0.035	0.15	0.52	0.004	0.004	37.0	0.49
36N	0.034	0.19	0.50	0.008	0.009	39.9	----

Samples were submerged-arc welded with a nonconsumable tungsten electrode in argon, both with filler wire and without it, with AN-26 and AnF-5 fluxes.

1/2

YUSHECHENKO, K.A., et al., *Avtomaticheskaya Svarka*, No 9, Sep 72, pp 39-42

Low-temperature studies of the weld joints were carried out at the physicotchnical Institute of Low Temperatures, Academy of Sciences Ukrainian SSR, the Central Scientific Research Institute of Ferrous Metallurgy, and the Institute of Electric Welding. Analysis of the mechanical and thermophysical properties of weld joints at low temperatures where 36NGT, 36NGTCe, and 36NGCe filler wires were used showed that alloying with Ti and Mn produces a dense joint where the alloy strength is equal to that of the base metal of the seam and possesses high impact strength and ductility at  $-253^{\circ}\text{C}$ . Experimental studies of welded Invar (6 and 12 mm thick) showed that the use of 36NGT filler wire yields seams with defects (hot cracks). 6 figures, 2 tables, 8 bibliographic references.

2/2

- 43 -



USSR

UDC 620.172.251.1:669.14.018.8

BELYAKOVA, K. A., IL'ICHEV, V. YA., STARTSEV, V. I., and TAVER, YE. I., Physico-Technical Institute of Low Temperatures, Academy of Sciences

"Strength and Plasticity of VNS-17 Steel at Low Temperatures"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 3, 1971, pp 7-9

Abstract: A study was made of the mechanical properties of VNS-17 martensitic aging steel in the delivered state (hot rolled products) and its welded joints at temperatures to  $-269^{\circ}$  C. In the hot-rolled state VNS-17 steel has sufficient plasticity and is insensitive to acute notching at test temperatures from room temperature to  $-253^{\circ}$  C. In structural elements welded without filler metal or with basic composition wire, VNS-17 steel can be used to  $-196^{\circ}$  C. In the presence of an acute notch, the strength of the welded joints at  $-253^{\circ}$  C and  $-269^{\circ}$  C is greater than the strength of the steel at room temperature. The chemical composition of the investigated steel was 0.014% C, 0.08% Mn, 0.17% Si, 10.28% Cr, 0.14% Ni, 0.003% Ti, 0.07% Al, 2.1% Mo, 0.01% Zr, 0.002% B, 1.00% Cu, 0.007% S, and 0.01% P. 1/1

USSR

UDC 621.785.78.9:539.376:669.14.018.8

IL'ICHEV, V. YA., STARTSEV, V. I. and SHAPOVALOV, I. A., Physicotechnical  
Institute for Low Temperatures, Academy of Sciences Ukrainian SSR

"Creep of Kh18N10T Steel at Low Temperatures"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 2, 1972,  
pp 15-16

Abstract: The study on low-temperature creep involved Kh18N10T steel (0.1% C; 1.39% Mn; 0.67% Si; 18.79% Cr; 9.6% Ni; 0.7% Ti) at 77.2 and 4.2°K and various initial stresses. The creep curves at the above temperatures and stresses show three distinctive sections: initial deformation, non-steady state (transitory) deformation, and steady state of creep which proceeds at a fixed rate and is observed within 4.2 to 77°K as a function of stress and temperature. The study included creep under stepped loading conditions at 20 and 4.2°K. The stress increment was 6.8 kg/mm<sup>2</sup> and the hold time -- 1.5 hr. (3 illustrations, 1 bibliographic reference).

1/1

- 37 -

USSR

UDC 539.4

IL'ICHEV, V. YA., SKIBINA, L. V., STARTSEV, V. I., Physicotechnical Institute of Low Temperatures, Academy of Sciences UkrSSR, Khar'kov

"Change in the Mechanical Properties of Austenite Stainless Steels and Alloys Due to a Martensite Transformation at Low Temperatures"

Kiev, Problemy prochnosti, No. 8, Aug 71, pp 74-77

Abstract: The results of a study of the effect of deformation on martensite transformations in certain austenite stainless steels are presented. It is noted that at present there is no single viewpoint on the mechanism and kinetics of martensite transformations although the theory of defects in the crystalline lattice developed in recent years more or less satisfactorily describes the mechanism for the generation of a new phase in the deformation of the material. Martensite transformations and their effects on strength and plasticity were studied in steels of the type Kh18N7, Kh18N10, Kh18N15 and Kh18N20 at low temperatures and under various test conditions. It was shown that the amount of martensite arising as a result of the  $\gamma \rightarrow \alpha$ -transformation under cooling and deformation essentially depends on the composition of the

1/2

IL'ICHEV, V. YA., et al, Problemy prochnosti, No. 8, Aug 71, pp 74-77

steel and on the working conditions. The experiments showed that at a given temperature the amount of martensite depends only on the total degree of deformation and is independent of the time over which the deformation is achieved. The creep velocity increases with a rise in the stress level although the rate of creep should decrease with a rise in the martensite content since martensite plates are a preventative to the motion of dislocations and slow down creep. A comparison of steels Kh18N7 and Kh18N10 shows that martensite formed in cold working and martensite gradually arising in the sample through low-temperature deformation effect the mechanical properties of these steels in different ways. It is hypothesized that at large stresses there may occur shifts in low-carbon martensite and as a result the rate of creep increases. It is noted that these experiments are only a beginning and that further accumulation of experimental results is necessary.

2/2

- 67 -

Mechanical Properties

USSR

UDC 539.4.015

YUSHCHENKO, K. A., STARTSEV, V. I., IL'ICHEV, V. Ya., MON'KO, G. G.,  
LIVSHITS, L. A., KAPLAN, L. I., STEPANOV, G. A., and GRUDZINSKIY, B. V.,  
Kiev, Institute of Electric Welding imeni Ye. O. Paton, Academy of  
Sciences, UkrSSR

"Low-Temperature Properties of Austenitic Steels"

Kiev, Problemy Prochnosti, No 10, Oct 70, pp 113-115

Abstract: A study was made of the mechanical properties of some steels of industrial melts destined for use at temperatures down to  $-269^{\circ}\text{C}$ . A low carbon content was characteristic for the investigated steels, and some were also alloyed with nitrogen. The 21-16-8-N type stable-austenitic steel had the best strength properties and smallest reduction in plasticity and toughness at reduced temperatures.

1/1

USSR

UDC 620.172.251.1:669.14.018.8

BELYAKOVA, K. A., IL'ICHEV, V. YA., STARTSEV, V. I., and TAVER, YE. I., Physico-Technical Institute of Low Temperatures, Academy of Sciences

"Strength and Plasticity of VNS-17 Steel at Low Temperatures"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 3, 1971, pp 7-9

Abstract: A study was made of the mechanical properties of VNS-17 martensitic aging steel in the delivered state (hot rolled products) and its welded joints at temperatures to  $-269^{\circ}\text{C}$ . In the hot-rolled state VNS-17 steel has sufficient plasticity and is insensitive to acute notching at test temperatures from room temperature to  $-253^{\circ}\text{C}$ . In structural elements welded without filler metal or with basic composition wire, VNS-17 steel can be used to  $-196^{\circ}\text{C}$ . In the presence of an acute notch, the strength of the welded joints at  $-253^{\circ}\text{C}$  and  $-269^{\circ}\text{C}$  is greater than the strength of the steel at room temperature. The chemical composition of the investigated steel was 0.014% C, 0.08% Mn, 0.17% Si, 10.28% Cr, 9.55% Ni, 0.66% Ti, 0.07% Al, 2.1% Mo, 0.01% Zr, 0.002% B, 0.06% Ca, 0.007% S, and 0.01% P. 1/1

45 -

USSR

UDC

621.396.61.029.64

SHMILEVICH, M. S., SADYKOV, V. N., IL'ICHEV, Yu. I.

"On the Design of SHF Power Stabilizing Systems"

Tr. Novosib. elektrotekhn. in-ta (Works of the Novosibirsk Electrical Engineering Institute), 1970, vyp. 2, kn. 1, pp 119-127 (from RZh-Radiotekhnika, No 7, Jul 70, Abstract No 7B383)

Translation: The basic problem in designing closed static systems for automatic power control of SHF devices is providing the required precision in satisfying the condition of dynamic stability. A method of designing automatic power control systems is described which assures a static error within given limits. However, in addition to the static error, the total error of the system contains components which owe their existence to nonuniformity of the frequency response of the transmission factor of the directional coupler and the SHF detector, and the instability of the transmission factor of all elements in the feedback circuit. Improvement of output power stability requires not only a reduction in the static error of the system, but also an improvement in the uniformity of the frequency response in the working frequency range, as well as in the stability of the transmission factor for the given circuit elements. Bibliography of four titles. G. B.

1/1

USSR

UDC 547.825

IL'ICHEV, Yu. Ye., IL'ICHEV, I. Ye., RUKHADZE, Ye. G., and TERENCEV, YEV,  
Moscow State University

"Obtaining Alkylmercaptoethylpyridines"

Leningrad, Zhurnal Obshchey Khimii, Vol XL, No 12, Dec 70, p 2763

Abstract: A method was developed for obtaining alkylmercaptoethylpyridines (II) by alkaline decomposition of the salts of S-alkylisothiuronium in the presence of vinylpyridine. This method assures high yield of the desired product, but unfortunately produces a large number of S-alkylisothiuronium salts.

By using 2-Vinylpyridine, thiourea, and benzyl chloride, a 47.4% yield of benzylmercaptoethylpyridine was obtained; similar results were obtained with ethylmercaptoethyl-2-pyridine, using ethyl bromide instead of benzyl chloride, and here the yield was 50%.

1/1



Gyroscopic

USSR

UDC: 62-56

SLIV, E. I., BORISOV, Yu. A., ZOST, Z. G., IL'ICHEVA, A. D., Leningrad Institute of Precision Mechanics and Optics

"Errors of the Extremum Method of Finding the Meridian in Initial Orientation of Inertial Systems"

Leningrad, Izvestiya VUZov: Priborostroyeniye, Vol 16, No 8, 1973, pp 68-71

Abstract: The authors examine the errors involved in determining the position of a gyroplatform in the azimuth from the extremum of the azimuthal characteristic. It is shown that the expected accuracy of determining the gyroplatform position in the first approximation is higher than with gyrocompass determination since the procedural errors of the method are low and in principle can be reduced, accuracy is independent of the drift of the leveling gyros, and at the same time the constructional errors are the same as in the gyrocompass method.

1/1

1/2 CC9 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--SOLUBILITY OF CARBON DIOXIDE IN CHLORIDE MELTS -U-  
AUTHOR--(C2)-DEVYATKIN, V.N., ILICHEVA, O.N.  
COUNTRY OF INFO--USSR  
SOURCE--Zh. Fiz. Khim. 1970, 44(1), 253  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CARBON DIOXIDE, MELTEN CHLORIDE, FUSED SALT, SOLUBILITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3001/0459 STEP NO--UR/0076/70/044/001/0253/0253  
CIRC ACCESSION NO--A0126211  
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--20NDV76

CIRC ACCESSIGN NO--AP0126211

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SOLY. OF CO SUB2 IN MELTED  
NACL (I), KCL (II), AND CSCL (III) INCREASES LINEARLY WITH INCREASING CO  
SUB2 PARTIAL PRESSURE ACCORDING TO HENRY'S LAW. TEMP. DEPENDENCE OF THE  
SOLY. C FOLLOWS THE EQUATION C EQUALS C SUBO EXP(Q-RT) WHERE Q IS THE  
MOL. HEAT OF SOLN. AND C SUBO IS A CONST. THE EXPTL. VALUES OF Q (IN  
CAL) AND C SUBO (IN MOL. FRACTIONS TIMES 10 PRIMES) FOR I, II, AND III  
ARE: MINUS 5804, 36.1; MINUS 5047, 38.9; MINUS 6434, 108.4; RESP. NO  
INTERACTIONS BETWEEN THE SOLN. COMPONENTS WERE FOUND.

UNCLASSIFIED

IL'ICHEVA, R. F.

UFG 61.124/967.781.6447.287/001.01.10.10.10.10

DIREKTORAT (OF THE GOVERNMENT OF REPUBLIC OF BULGARIA) ...  
HERMAN SKOPOV (UNDER NORMAL CONDITIONS AND UNDER OTHER ...)  
Article by I. L. Vayfeld and R. F. Il'icheva, *Journal of Biological Rhythms*, Vol. 5, No. 5, 1970, pp. 56-67, submitted for publication 9 June 1971.

**Abstract:** It has been established that variations in the diurnal cycle of the histamine-diamine oxidase activity in the blood of healthy subjects living in the same place and time alone. Its considerable decline in the evening and its further decrease (to zero) at night indicates an overall influence of histamine at night. The level of histamine content tends to decrease at night. Changes in organismic cycles give rise to noticeable qualitative and quantitative changes in the mentioned parameters. The disturbance becomes more distinct under hypohyphic conditions. Variations in the diurnal cycle of histamine-diamine oxidase and histamine secretion rates are related not only to the strength of the but also to the initial state of the organism. The results of this study show the importance of taking the internal state of the organism into account when formulating work-sleep cycles.

A study of biogenic amines is of great importance in processes of regulation of the state of sleep and wakefulness.

The literature contains data indicating the participation of amines Il'icheva, R. F., Tomshin, G. N., Karslav, and B. Sh. Matlial in the work of Vayfeld, I. L., and others), serotonin (Dobrovitski, et al., *Biological Rhythms*, 1969, 1970), and also histamine (Dobrovitski, et al., N. I. Grashchenkov, et al.; I. L. Vayfeld, 1970) in regulating the sleep-wakefulness cycle.

This article gives the results of determinations of the content of histamine, the activity of diamine oxidase, the enzyme inactivating it, and the blood serotonin content in healthy human subjects. In some of these

JRS 5-7517  
15 Nov 72

USSR

IL'ICHEVA, S.

"Compounds Related to Diamond"

Riga, Sovetskaya Latvija, 1 Jan 73, p 3

Abstract: Adamantane is obtained from petroleum. Like diamond, it crystallizes into a double hexagonal system, with the carbon atoms positioned at the nodules of two cuboid grills inserted one into the other. Unlike diamond, a hydrogen atom is attached to each carbon atom. By replacing the hydrogen atoms with other atoms or radicals, adamantane derivatives are formed, including amino-adamantane (also called midantin) which is an effective drug against viral and bacterial infections. Midantane does not hinder viruses from entering the host cell but prevents them from producing viral nucleic acids inside the cell. Although the mechanism of action remains to be elucidated, experience has shown that midantane not only cures but also prevents influenza, other respiratory diseases, and parkinsonism. Rimantadane and other derivatives developed at the Institute of Organic Synthesis, Academy of Sciences Latvian SSR, are currently in the stage of clinical investigation.

1/1

I

USSR

IL'ICHEVA, S.

"The Wonders of Surgery"

Riga, Sovetskaya Latvija, 28 Mar 70, p 4

Abstract: The Riga Scientific Research Institute of Traumatology and Orthopedics has entered the work "Bone Homoplasty in Treating Patients with the Aftereffects of Traumas and Orthopedic Diseases" in the competition for the State Prize Latvian SSR. This work represents many years of research on tissue incompatibility by associates of the above institute's laboratories of Conservation of Tissues and Organs, Biochemistry, and Microbiology, and the Chair of Traumatology, Orthopedics, and Military Field Surgery of Riga Medical Institute. The names, affiliations, and contributions of these scientists are mentioned in the article.

1/1

- 76 -

AND016964

2R9019

AUTHOR-- IL, ICHEVA, S.

TITLE-- THE ELECTRONIC AID TO ASTROPHYSICISTS

NEWSPAPER-- SOVETSKAYA LATVIYA, JANUARY 27, 1970, P 2, COL 3

ABSTRACT-- THE INSTITUTE OF ELECTRONICS AND COMPUTER ENGINEERING OF THE LATVIAN ACADEMY OF SCIENCES HAS DEVELOPED THE "PPR-3K", A THREE-CHANNEL, REVERSING, RECALCULATOR. IT WAS DEVELOPED ON THE ORDER OF THE RADIOPHYSICAL OBSERVATORY OF THE LATVIAN ACADEMY OF SCIENCES AND HAS BEEN INSTALLED AT BALDONA. THE RESULTS OF WEAK SPECTRAL STUDIES ARE PRINTED OUT BY THE "TSPM-1" PRINTER.

THE LABORATORY OF DIAGNOSIS OF INTEGRAL SYSTEMS, DIRECTED BY CANDIDATE OF TECHNICAL SCIENCES V. F. BAUMGARTEN, IS GIVEN CREDIT FOR THE NEW APPARATUS.

//

19600092

4

*sw*

USSR

~~ID#~~ 612.27(23+251)

ALESHINA, T. P., BUT'YEVA, I. V., and IL'ICHEVA, YE. M., Department for Study of Health Resort Resources, Central Institute of Health Resort Medicine and Physicial Therapy

"Dynamics of the Weight of Oxygen in the Air on the Plans and in the Mountains"

Moscow, Voprosy Kurortologii, Fizioterapii i Lechebnoy Fizicheskoy Kul'tury, No 1, 1970, pp 58-63

Abstract: Analysis of the weight of oxygen in the air over a period of 10 years (meteorological data of the Moscow University Observatory) revealed a distinct seasonal pattern. The lowest values were recorded in July,  $269.9 \text{ g/m}^3$ , and the highest in January,  $301.4 \text{ g/m}^3$ . This index remained more or less the same in the spring and fall,  $278\text{-}286 \text{ g/m}^3$ . It decreased with increasing height of the locality. The mean monthly values were highest at the plains and low-mountain stations,  $30\text{-}35 \text{ g/m}^3$ , and lowest in high-mountain regions,  $16/5 \text{ g/m}^3$ . Among other relationships noted, the weight of oxygen was somewhat higher on sunny, rainless days than on mostly sunny days, but with short periods of precipitation during the day or at night. The weight

1/2



USSR

ALESHINA, T. P., et al., Moscow, Voprosy Kurortologii, Fizioterapii i Lechebnoy Fizicheskoy Kul'tury, No 1, 1970, pp 58-63

of oxygen also rose as the temperature dropped. The weight of oxygen is apparently influenced by climatic factors. For example, oxygen in the air of mountainous regions in the Caucasus was found to be 3-4 g/m<sup>3</sup> heavier than in the mountainous regions of Central Asia, when measured at stations situated at the same altitude.

2/2

- 108 -