

Acc. Nr: **AFC052334**

Ref. Code: *01000*

PRIMARY SOURCE: Fiziologichniy Zhurnal, 1970, Vol 16, Nr *2*,
pp *172-181*

**ON NEUROCHEMICAL MECHANISMS OF FUNCTIONAL ACTIVITY
OF LIMBICO-RETICULAR FORMATIONS**

F. P. Vedyayev

Department of Normal Physiology, Medical Institute, Kharkov

Neurochemical phenomena are of great importance in the integrative, regulating activity of the central nervous system.

Neurochemical differentiation of the brain areas and nuclear formations is observed. There exists a differentiated chemical sensitivity not only of brain areas, nuclear formations, i. e. brain structural systems (for example—reticular formation, limbic system) but also of functional reflex systems (2). The manifestation of the system reflex reactions and reactions of central origin may be inhibited or facilitated under the effect of adrenergic, serotonergic and cholinergic agents. The development of this problem, undoubtedly, creates real bases for modelling complex forms of behaviour by means of regular influence on neurochemical, mediator, synaptic apparatus of brain.

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REEL/FRAME

19820920

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Physiology

USSR

UDC 612.822.8

VEDYAYEV, F. P., Kharkov Medical Institute, Kharkov

"Some Aspects of Neurophysiology of the Brain Limbic System"

Kiev, Fiziologichnyy Zhurnal, Vol 18, No 4, Jul/Aug 72, pp 463-468

Abstract: Trends of theoretical and practical interest related to the function of the brain limbic system are discussed. Studies conducted during 1968-1972 at Kharkov Medical Institute indicate that a local irritation of some limbic formation evokes certain behavior reactions of an emotional nature which are accompanied by a wide spectrum of autonomic shifts. The emotional reactions of limbic origin involve the following reactions: (1) the systematic reverberation of excitation within the limbic system and neocortex; (2) motor reactions of a specifically behavioral nature; (3) changes in the blood circulation and respiration; (4) changes in the blood system; (5) changes in the dynamics of the stomach secretion; (6) endocrine reactions involving adrenal glands. Some of these reactions (blood system and adrenal glands) are described in detail. A relation between conditioned reflexes and the brain limbic system is discussed to some extent, including some experimental data. A first attempt was made to design a model of emotional stresses in animals (rats). Using this model, functional changes were studied in the limbic-neocortical and cardio-vascular systems, activity of adrenal glands and 1/2

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VEDYAYEV, F. P., *Fiziologichnyy Zhurnal*, Vol 18, No 4, Jul/Aug 72, pp 463-468

production of insulin in rats. The author reviews an extensive list of work on the subject and combines it with his own findings.

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USSR

UDC: 621.372.852.6

VEDYUSHKIN, G. A.

"Regions of Matching for a Three-Stub Impedance Transformer"

Tr. Sib. NII metrol. (Works of the Siberian Scientific Research Institute of Metrology), 1971, vyp. 12, pp 140-144 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6B189)

Translation: A graphic method is used to calculate the regions of matching of impedance transformers on superhigh frequencies. The nature of the variation in reduced admittance is determined as a function of the depth of immersion, number and diameter of the metal tuning stubs. Bibliography of seven titles. Resumé.

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1/2 032 UNCLASSIFIED
TITLE--RESISTANCE OF MINERAL PHASES AND STRUCTURAL COMPONENTS OF A SINTER
TO DESTRUCTION -U- PROCESSING DATE--13NOV70
AUTHOR--(021)-PIKULIN, S.A., VEGMAN, YE.F.
COUNTRY OF INFO--USSR
SOURCE--IZV. VYSSH. UCHEB. ZAVED., CHERN. MET. 1970, 13(1), 26-30
DATE PUBLISHED--70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--MINERAL, SINTERING FURNACE, CHEMICAL COMPOSITION, IRON,
SILICON DIOXIDE, CALCIUM OXIDE, ALUMINUM OXIDE, MAGNESIUM OXIDE, CRACK
PROPAGATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/0951 STEP NO--UR/0148/TC/013/001/0026/0030
CIRC ACCESSION NO--AT0105820
UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AT0105820
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CHEM. COMPN. OF THE SINTERS
USED WAS FE 49.9-52.0, FE₂O₃ 13.2-18.3, SiO₂ SUB2 9.2-12.7, CaO 12.6-14.6,
MgO 1.38-1.86, Al SUB2 O SUB3 1.3-1.5 PERCENT, AND BASICITY (CAO: SiO₂
SUB2) 1.02-1.43. THE CRACKS WERE STUDIED ON 107 MICROPARTS WITH
DIFFERENT PHASE COMPNS. FOR EVERY PART, THE AREA OF THE PHASE WAS DETD.
AS WAS THE LENGTH OF THE CRACKS IN THE PHASE. THE LEAST CRACK FORMATION
WAS FOUND IN DIFFERENT FORMS OF MAGNETITE IN COMPARISON WITH OTHER
MINERAL PHASES. THE CRACK FORMATION IN COARSE GRAINED MAGNETITE WAS
HIGHER THAN THAT OF FINE GRAINED.

UNCLASSIFIED

USSR

UDC 543.86:543.253

VEGNER, V. YA., STRADYN', YA. P., OZOL, YA. YA., and ARON, A. K.,
Riga Polytechnical Institute, Riga, Latvian Sovnarkhoz

"Characteristic Qualities of the Wave of Electrochemical Splitting of
the C-N Bond in 2-Alkylamino-2-alkylindandiones-1,3"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, Seriya Khimicheskaya,
No 2, 1970, pp 164-169

Abstract: The goal of this study was the refinement of the polarographic reduction of 2-aminoindandiones-1,3 (I), and attention was directed particularly to the characterization of the wave obtained on electrochemical splitting of the C-N bond. The properties of the first wave of polarographic reduction were studied. It was determined that (I) type of compounds give a two electron polarographic wave of the C-N⁺ bond splitting in aqueous alcohol solutions at pH range 2-12; the height of this wave was limited by the rate of diffusion of depolarizator molecules in the entire pH range studied. In strongly alkaline medium the wave of the C-N⁺ bond splitting disappears because of the

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VEGNERE, V. YA, et al, Izvestiya Akademii Nauk Latvyskoy SSR, Seriya Khimicheskaya, No 2, 1970, pp 164-169.

chemical decomposition of the molecules of aminocindandiones in solution. The C-N⁺ bond splitting wave is generated by salts as well as by free bases. When bases enter into the electrode reactions their molecules are first protonated on the electrode surface and the corresponding waves are of quasidiffusive character.

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USSR

UDC 539.4

MOLOCHIKOV, M. A., IVANENKO, A. A., VEGROV, A. N., SITNICHENKO, V. P., PULYAYEV-SKIY, V. A., KOVESHNIKOV, N. A.

"The Effect of the Stress Concentrator on Fatigue Strength in Male Cone Joints for Titanium Alloy Pipe"

Sb. nauch. tr. Kiev. in-t inzh. grazhd. aviatsii (Collection of Scientific Works of the Kiev Institute of Civil Aviation Engineers), 1971, vyp. 1, pp 78-81 (from RZh-Mekhanika, No 11, Nov 71, Abstract No 11V1112)

Translation: By testing samples of 7M titanium alloy pipe 12 x 1.5 for fatigue, it was demonstrated that stress concentration in the investigated joint is higher than the theoretically calculated concentration. When testing with a frequency of 200 hertz on a 10⁷ cycle base, the effective concentration factor was 3.2 with a fillet radius of 0.5 mm. The reduction in fatigue strength is ascribed to significant residual strains reaching 15% in the diameter transition zone.

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Acc. Nr:

AP0048810

Abstracting Service:

CHEMICAL ABST. 5170

Ref. Code:

UR0080

92962c Absorption spectrum of a bromide complex of copper-
 (II) in borosilicate glass. ~~Veinberg, P. A., Kaplin, V. A.~~
 (USSR). Zh. Prikl. Khim. (Leningrad) 1970, 43(1), 59-62
 (Russ). Cu(II) bromide complexes are used to stain borosilicate
 glass. The nature of the complex was studied by comparison of
 the absorption spectra in the glass and the spectra of Cu(II) com-
 plexes in soln. The glass studied was $1K_2O \cdot 5B_2O_3 \cdot 5SiO_2$,
 stained by CuO in the presence of excess KBr. KBr concn. was
 0-5 parts by wt./100 parts by wt. of glass. Prepn. of the glass
 is described. Variation of Br^-/Cu^{2+} is due to evapn. of Br^- and
 $Cu^{2+}-Cu^+$ equil. An increase in KBr concn. shifts this equil.
 toward Cu^+ . The absorption spectra of a series of glasses with
 varying KBr concn. were studied. Changes in intensity at 220,
 270, 330, 500, and 610 nm show the change from octahedral CuO
 to tetrahedral $(CuBr)_4^{2-}$. Values of absorption coeffs. differ in
 soln. and in the glass. Redn. of Cu^{2+} is followed by absorption
 intensity.
 Edward F. King

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ALS

REEL/FRAME
19800573

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USSR

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EINSTEIN, B. K.; GURSKAYA, G. V.; LOBANOVA, G. M. (Institute of Crystallography,
USSR Academy of Sciences)

"X-Ray Diffraction and Electron Microscope Study of Hexagonal Crystals of Catalase. II. X-Ray Study"

Moscow, Kristallografiya; July-August, 1971; pp 764-73

ABSTRACT: The authors present a method of the joint use of X-ray and electron microscope data for the study of the structures of crystalline proteins with large molecular weights. Based on this method, a Fourier synthesis with a resolution of 30 Å was obtained for hexagonal crystals of catalase without the use of isomorphous derivatives. The quaternary structure of the molecules and their position in an elementary cell were established from the synthesis.

The article includes 10 figures and one table. There are 14 references.

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USSR

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VEINSTEIN, B. K.; BARYNIN, V. V. (Institute of Crystallography, USSR Academy of Sciences)

"X-Ray Diffraction and Electron Microscope Study of Hexagonal Crystals of Catalase. I. Electron Microscope Study"

Moscow, Kristallografiya; July-August, 1971; pp 751-63

ABSTRACT: The three-dimensional structure of the hexagonal modification of catalase was determined by an electron microscope projection. The form and dimensions of a molecule were established. The orientation of the axes of symmetry of a molecule in a cell was found. It was shown that a molecule consists of four subunits, the centers of gravity of which form a tetrahedron.

The article contains 23 equations and 6 figures. There are 12 references.

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USSR

UDC: 533.92

VEKHOV, A. A., NIKOLAYEV, F. A., ROZANOV, V. B., Physics Institute imeni
P. N. Lebedev, Academy of Sciences of the USSR

"Investigation of the Space and Time Distribution of the Optical Density
of High-Current Discharges of Indium and Lithium"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 4, Jul/Aug 72 pp
728-731

Abstract: The space and time distribution of optical density of a high-current discharge plasma in lithium and indium vapors is studied by the method of absorption of a helium-neon laser beam (6328 Å, 10 mW). The plasma was produced by exploding wires in a vacuum with typical Z-pinch geometry. The wire diameter was 0.1 and 0.17 mm for lithium, and 0.17 mm for indium. A glass discharge chamber was used with an inside diameter of 10 cm. Electrode spacing was 14.5 cm. The current pulse was made up of two half-periods produced by introducing a total energy of 17 kJ into the chamber with 14 kJ of the total falling to the first half-period (70 μs). The optical density κl was determined from the relation

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VEKHOV, A. A. et al., *Teplofizika Vysokikh Temperatur*, Vol 10, No 4, Jul/Aug 72, pp 728-731

$$J = J_0 \exp(-\kappa l)$$

where J_0 , J are the fluxes of the quanta incident on the plasma and passing through the plasma respectively, κ is the coefficient of absorption, and l is the thickness of the absorbing layer. It was found that the optical density of a plasma filament is radially nonuniform with a maximum at a certain distance from the discharge axis. A model of discharge development is discussed according to which the plasma has a maximum temperature at the center of the discharge. The authors thank V. G. Bakayev for assisting with the experiment, and G. V. Mikhaylov for constructive criticism.

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1/2 018
 UNCLASSIFIED
 TITLE--POLARIZATION OF BANDS IN THE OPTICAL SPECTRA OF TRANSITION METAL
 COMPLEXES WITH ACCOUNTING FOR THE JAHN TELLER EFFECT -U-
 AUTHUR-(04)-TSUKERBLAT, B.S., VEKHTER, B.G., BERSUKER, I.B., ABLOV, A.V.
 COUNTRY OF INFO--USSR
 SOURCE--ZH. STRUKT. KHIM. 1970, 11(1), 102-7
 DATE PUBLISHED-----70
 SUBJECT AREAS--CHEMISTRY
 TOPIC TAGS--LUMINESCENCE SPECTRUM, EXCITED STATE, TRANSITION METAL,
 COMPLEX COMPOUND
 CENTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--2000/1658
 CIRC ACCESSION NO--AP0125280
 STEP NO--UR/0192/70/011/001/0102/0107
 UNCLASSIFIED

2/2 018

CIRC ACCESSION NO--AP0125280

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE THEORY OF POLARIZED LUMINESCENCE SPECTRA FOR COMPLEXES OF D SUB4H (TETRAGONAL) AND D SUB3D (TRIGONAL) SYMMETRY IS CONSIDERED. FOR TRANSITIONS FROM A NON DEGENERATE STATE TO A DEGENERATE STATE IF LIGHT IS POLARIZED ALONG (100), POLARIZED LUMINESCENCE IS OBSD., BUT IF LIGHT IS POLARIZED ALONG (111), LUMINESCENCE IS COMPLETELY DEPOLARIZED AND THE EXCITED STATE IS TETRAGONAL MIN. IF FOR LIGHT POLARIZED ALONG (100) LUMINESCENCE IS PARTIALLY POLARIZED, BUT FOR LIGHT POLARIZED ALONG (111) LUMINESCENCE IS COMPLETELY DEPOLARIZED, THE PRESENCE OF 2 BANDS REPRESENTING DEGENERATE STATES, THE EXCITED STATE HAS TRIGONAL MIN. FOR TRANSITIONS BETWEEN DEGENERATE STATES, THE PRESENCE OF 2 BANDS REPRESENTING MAGNETIC DIPOLE TRANSITIONS BETWEEN THE DEGENERATE STATES PROVES THE EXISTENCE OF TRIGONAL MIN. IN BOTH STATES. IN THE PRESENCE OF 1 BAND, LIGHT POLARIZED PARALLEL TO (100) WITH LUMINESCENCE PARTIALLY POLARIZED IN THE SAME DIRECTION IMPLIES TETRAGONAL AND TRIGONAL MIN. COMPLETELY DEPOLARIZED LUMINESCENCE IMPLIES TETRAGONAL AND TRIGONAL MIN. THESE RESULTS HOLD ONLY IN THE ADIABATIC APPROX. AND NEGLECT TUNNELLING BETWEEN EQUIV. CONFIGURATIONS. IF TUNNELLING OCCURS, THE LUMINESCENCE IS DEPOLARIZED.

FACILITY: INST. KHIM., KISHINEV, USSR.

UNCLASSIFIED

USSR

UDC 539.67

BEYLIN, V. M., VEKILOV, Yu. Kh., KADYSHEVICH, A. Ye., and KRASIL'NIKOV, O. M.

"Effect of Alloying An Electrically Active Addition on Phonon Relaxation in Certain Intermetallic Combinations"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials"), Moscow, Izd-vo "Nauka", 1970, pp 41-43

Abstract: It is shown that the observed ultrasonic absorption is determined by the interaction of an elastic wave with crystal lattice oscillations. Alloying by an electrically active addition leads to increased absorption. Evaluations of the effect of alloying on the absorption coefficient by using data on the effect of alloying on third-order constants are presented. 2 figures, 5 references.

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1/2 018

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--DETERMINING THE EFFECTIVE MASSES OF CURRENT CARRIERS IN STRONGLY ALLOYED SEMICONDUCTORS BY THE EFFECT OF CONDUCTION ELECTRONS HOLES ON

AUTHOR--(03)-BEYLIN, V.M., VEKILOV, YU.KH., KRASILNIKOV, O.M.

COUNTRY OF INFO--USSR

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SOURCE--LENINGRAD, FIZIKA I TEKHNIKA POLUPROVODNIKOV, VOL. 4, NO. 5, 1970, PP 912-914

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--GERMANIUM, SILICON SEMICONDUCTOR, GALLIUM ARSENIDE SEMICONDUCTOR, ELECTRON HOLE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/1452

STEP NO--UR/0449/70/004/005/0912/0914

CIRC ACCESSION NO--AP0136778

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136778

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTIVE MASSES OF THE DENSITY OF STATES OF CURRENT CARRIERS M SEXTILE SUBD IN STRONGLY ALLOYED SEMICONDUCTORS WERE DETERMINED WITH RESPECT TO THE TEMPERATURE DEPENDENCE OF THE EFFECT OF CONDUCTION ELECTRONS (HOLES) ON SEMICONDUCTOR ELASTIC CONSTANTS. M SEXTILE SUBD ARE DETERMINED FOR TROUGHS ON THE (111) AND (100) AXES IN N-GE, (100) IN N-SI, AND (000) IN P-SI AND P-GAAS. THE ACCURACY FOR THE DETERMINATION OF M SEXTILE SUBD IS NOT INFERIOR TO THE ACCURACY FOR THE DETERMINATION OF EFFECTIVE MASS IN A STRONGLY ALLOYED MATERIAL. THE MOST ACCURATE DIRECT METHOD OF DETERMINING EFFECTIVE MASS, THE METHOD OF CYCLOTRON RESONANCE, IS INAPPLICABLE TO STRONGLY ALLOYED SEMICONDUCTORS (THE CONDITION OF ST 1 REQUIRED FOR RESONANCE IS NOT SATISFIED), AND MASSES ARE USUALLY DETERMINED BY METHODS HAVING LOW ACCURACY. FOR THIS REASON IT IS OF INTEREST TO INVESTIGATE THE POSSIBILITY OF DETERMINING M SEXTILE BY ELASTIC CONSTANT DATA. THE AUTHOR'S METHOD PERMITS SENSING OF VARIATION OF M SEXTILE SUBD IN THE PRESENCE OF STRONG ALLOYING CAUSED BY THE NONPARABOLIC NATURE OF THE BANDS (P-GAAS, P-SI), AND IT ALSO PERMITS DETERMINATION OF EFFECTIVE MASSES IN UPPER SYSTEMS OF MINIMA. APPLICABILITY OF THE METHOD IS LIMITED TO SUBSTANCES IN WHICH THE EFFECT OF CONDUCTION ELECTRONS (HOLES) ON THE ELASTIC CONSTANT IS OBSERVED. VALUES OF EFFECTIVE MASSES ARE TABULATED FOR GERMANIUM, SILICON AND GALLIUM ARSENIDE. FACILITY: INSTITUTE OF STEEL AND ALLOYA, MOSCOW.

UNCLASSIFIED

1/2 039

TITLE--ELASTIC CONSTANTS OF STRONGLY DOPED N SILICON AND P GERMANIUM -U-
UNCLASSIFIED PROCESSING DATE--11SEP70

AUTHOR--BEYLIN, V.M., VEKILOV, YU.KH., KRASILNIKOV, O.M.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(3), 684-9

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--SILICON, GERMANIUM, DOPED ALLOY, HIGH PURITY METAL, METAL
ELASTICITY, ULTRASONIC EFFECT, INTERFEROMETER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1988/0655

STEP NO--UR/0181/70/012/003/0684/0689

CIRC ACCESSION NO--AP0105634

UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105634

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

ABSTRACT. ELASTIC CONSTS. OF PURE AND STRONGLY DOPED N-SI AND P-GE WERE MEASURED BY THE ULTRASOUND INTERFEROMETRIC METHOD AT 78-300DEGREEK. ALL THE ELASTIC CONSTS. (AND THEIR TEMP. DEPENDENCES) OF STRONGLY DOPED SPECIMENS DIFFER CONSIDERABLY FROM THE CORRESPONDING ELASTIC CONSTS. OF PURE SPECIMENS. IN THE CASE OF N-SI, THE TEMP. DEPENDENCE OF THE CONST. C PRIME CHANGES INTO AN OPPOSITE DEPENDENCE. VARIATION OF THIS ELASTIC CONST. IS PRODUCED BY THE SAME MECHANISM OF INTERVALLEY SCATTERING AS THE VARIATION OF THE ELASTIC CONST. C SUB44 IN N-GE. VARIATION OF C SUB44 IN N-SI IS DETD. BY THE SPLITTING OF THE SUB BANDS DELTA SUB1 AND DELTA SUB2 IN THE SHIFT. IN P-GE, VARIATION OF THE ELASTIC CONSTS. WITH DOPING IS RELATED TO THE EFFECT OF DEFORMATION ON THE DISPERSION OF HOLES. FROM THE COMPARISON OF THE EXPTL. DATA WITH THE CALCN., THE EFFECTIVE MASS WAS FOUND OF STRONGLY DOPED N-SI AND THE CONSTS. OF THE DEFORMATION POTENTIAL, SIGMA PRIME SUBU AND SIGMA SUBU. IN P-GE, THE DEFORMATION POTENTIAL CONSTS. B AND D WERE FOUND.

UNCLASSIFIED

USSR

UDC 621.315.532

BEYLIN, V. M., ~~VEKILOV, YU. KH.~~, KRASIL'NIKOV, O. M., Moscow
Institute of Steel and Alloys, Moscow, Ministry of Higher and
Secondary Specialized Education RSFSR

"Determining the Effective Masses of Current Carriers in Strongly
Alloyed Semiconductors by the Effect of Conduction Electrons
(Holes) on Elastic Constants"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970,
pp 912-914

Abstract: The effective masses of the density of states of
current carriers m_d^* in strongly alloyed semiconductors were
determined with respect to the temperature dependence of the
effect of conduction electrons (holes) on semiconductor elastic
constants. M_d^* are determined for troughs on the $\langle 111 \rangle$ and $\langle 100 \rangle$
axes in n-Ge, $\langle 100 \rangle$ in n-Si, and $\langle 000 \rangle$ in p-Si and p-GaAs.
The accuracy for the determination of m_d^* is not inferior to the
accuracy for the determination of effective mass in a strongly
alloyed material.
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USSR

BEYLIN, V. M., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970, pp 912-914

The most accurate direct method of determining effective mass -- the method of cyclotron resonance -- is inapplicable to strongly alloyed semiconductors (the condition of $wt \ll 1$ required for resonance is not satisfied), and masses are usually determined by methods having low accuracy. For this reason it is of interest to investigate the possibility of determining m^* by elastic constant data. The author's method permits sensing of variation of m^* in the presence of strong alloying caused by the nonparabolic nature of the bands (p-GaAs, p-Si), and it also permits determination of effective masses in upper systems of minima. Applicability of the method is limited to substances in which the effect of conduction electrons (holes) on the elastic constant is observed. Values of effective masses are tabulated for germanium, silicon and gallium arsenide.

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USSR

UDC 632.95

VEKIRCHIK, K. N., GUTSULYAK, B. M.

"Derivatives of Lepidinium as Regulators of the Growth and Development of Plants. V. Effect of (1-phenylquinoline-4)-n-dimethylaminostyrylchloride on Certain Beans"

Fiziol. aktivn. veshchestva. Resp. mezhved. sb. (Physiologically Active Substances. Republic Interdepartmental Collection), 1972, No 4, pp 105-108 (from RZh-Khimiya, No 2 (II), Feb 73, Abstract No 2N539)

Translation: Data are presented from a study of the effect of the preplant treatment of bean seed with a solution of (1-phenyl-quinoline-4)-n-dimethylaminostyrylchloride (I) on the physiological-biochemical processes and the harvest yield of the plants. As a result of treating the seed with a 10^{-6} molar solution of I there was a 12% increase in chlorophyll (a + b) content in the leaves of the plant in the flowering phase, the dry matter content increased by 1%, and the increase in yield was 8-14%.

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Optics & Spectroscopy

USSR

UDC: 535.14

VEKLENKO, B. A., Moscow Power Engineering Institute

"Propagation of Coherent Emission in Gases"

Tomsk, Izvestiya VUZov: Fizika, No 4(131), 1973, pp 40-45

Abstract: The author considers propagation of coherent monochromatic light of high amplitude in an atmosphere of alkali metal atoms. An expression is found for the index of refraction, which determines propagation of high-amplitude emission. Calculation is restricted to the two-level approximation, and spin effects are disregarded. It is assumed that the frequency of the light is close to the resonance value. Scattering of the light takes place due to transformation of coherent emission to incoherent emission. The corresponding cross sections are found, using the method of Green's functions. It is found that the scattered incoherent emission may have the frequency of the incident coherent light, and that emission cannot be classified as to type solely on the basis of frequency.

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172 021

TITLE--EFFECT OF SOME FACTORS ON THE CRYSTALLIZATION OF RUBBERS FROM CIS ISOPRENE RAW RUBBER -U- UNCLASSIFIED PROCESSING DATE--30OCT70

AUTHOR--(03)--RAKHMAN, M.Z., KOLYADINA, N.G., VEKSELMAN, YE.I.

COUNTRY OF INFO--USSR

SOURCE--KAUCH. REZINA 1970, 29(2), 9-10

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ISOPRENE, CRYSTALLIZATION, BUTADIENE STYRENE RESIN, FILLER, METAL OXIDE, ELASTOMER, CARBON BLACK, ZINC OXIDE, CALCIUM CARBONATE, SULFIDE/(U)U333 CARBON BLACK, (U)DG100 CARBON BLACK, (U)PM70 CARBON BLACK

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0456

CIRC ACCESSION NO--AP0119392

STEP NO--UR/0138/70/029/002/0009/0010

UNCLASSIFIED

2/2 021

CIRC ACCESSION NO--AP0119392

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF NONCRYSTG. BUTADIENE STYRENE RUBBER ADDITIVES, FILLERS, METAL OXIDES, AND TRANS ISOMER CONTENT IN CIS ISOPRENE RUBBER (I) ON THE CRYSTN. OF I ELASTOMERS WERE STUDIED. THE CRYSTALLIZABILITY OF I ELASTOMERS DECLINED WHEN THE TRANSISOMER CONTENT WAS LARGER THAN OR EQUAL TO 30PERCENT. I ELASTOMERS FILLED WITH CARBON BLACK U-333, DG-100, AND PM-70 WERE MORE READILY CRYSTALLIZABLE THAN ELASTOMERS FILLED WITH ACTIVATED CACO SUB3. THE CRYSTN. OF I ELASTOMERS WAS MOST INHIBITED IN THE PRESENCE OF ZNO, PRESUMABLY DUE TO THE INCREASED CONTENT OF POLYSULFIDE BONDS.

FACILITY: LENINGRAD. FILIAL NAUCH.-ISSLED. INST. REZIN, PROM., LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC: 615.849.66(047)

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VERSHIGORA, A.YE., Doctor of Medical Sciences, Kiev Scientific Research
Institute of Otolaryngology

"Actual Problems of Desensitization with Microbial Allergens. Review of the
Literature"

Kiev, Vrachebnoye Delo, No 3, 1970, pp 5-8

Abstract: This is a very broad review of the literature on autogenous and heterogeneous antigens used in the treatment of asthma and similar conditions, with various modifications of therapeutic methods. Some workers are successful with autogenous vaccine, while others claim that heterovaccine is more efficacious. The skin sensitivity test is still important. Subcutaneous inoculation is preferred, but intramuscular, intravenous, and intranasal methods are also used. In pediatrics, allergens are given orally. Whatever the route, the dose is increased gradually until ten times the initial dose is given. Side effects must be watched for and studied. Gamma-globulins reduce the hypersensitivity of reactions. Controls must be used to establish the efficacy of treatment, for sometimes placebos produce better results. Some treatments last two weeks, others two months, and some many years. This work calls for a thorough hematological study as to blocking agents, potentiators, inhibitors, individual idiosyncrasies, etc. The studies of more than one hundred workers in desensitization reviewed in this article show that the real problem is not yet solved.

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USSR

VEKSHTEYN, G. YA., RYUTOV, D. D., and SAGDEYEV, R. Z.

"Asymptotic Solution in the Problem of Anomalous Resistance of Plasma Without Collisions"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 60, No 6, Jun 71, pp 2142-2154

Abstract: The authors examine the problem of the time evolution of distribution functions of charged particles in a homogeneous plasma placed into an external electric field E. They showed that in the range $t \rightarrow \infty$ the distribution functions vary self-similarly and all velocities increase with time.

The authors established that in the case when the current is parallel to the external magnetic field, the directional velocity of the electrons v varies essentially the same as by free acceleration: $v = \alpha (eE/m)t$, where α is a numerical coefficient which is less than, but on the order of, unity.

If the current is perpendicular to the external magnetic field, then the "escape" phenomenon disappears and the ratio of the directional velocity of electrons to their thermal velocity becomes much less than unity.

USSR

VEKSHTEYN, G. YE., et al., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki,
Vol 60, No 6, Jun 71, pp 2142-2154

The authors support their discussion of self-similar variables mathematically and graphically (Figure 1). Their investigation of self-similar equations for a one-dimensional model is also supported mathematically and graphically (Figure 2) as is the case for the three-dimensional model.

Finally, the authors discuss in detail the anomalous resistance to the current perpendicular to the magnetic field. Figure 3 depicts the interaction between one-dimensional oscillations and electrons in the magnetic field.

The article contains 3 figures and a bibliography of 12 titles.

2/2

USSR

UDC 632.95.028,543.253

SUPIN, G. S., KLISENKO, M. A., and VEKSHTEYN, M. SH., All Union Scientific Research Institute of Chemical Plant Protective Agents and All Union Scientific Research Institute of the Hygiene and Toxicology of Pesticides, Polymers, and Plastic Materials

"Polarographic Determinations of the Residual Quantities of Fungicides Derivatives of Dithiocarbamic Acids"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 11, No 11 (121), 1973, pp 40-42

Abstract: The authors studied the conditions for polarographic determination of microquantities of taineb, polymarcine, polycarbazine, ferbam, tsiram, and ethylenethiuram disulfide in biological material. The analytical method has been reported in detail. The minimal quantity of pesticides determined by this method is 80 $\mu\text{g/ml}$ (for ground fruit $10^{-3}\%$, for fibers $10^{-2}\%$). In analyzing untreated material, the sensitivity drops by a factor of 10.

1/1

- 27 -

USSR

VEKSHTEYN, M. SH., KLISENKO, M. A.

UDC 632.95

"Chromatographic Separation of Dimethyl and Ethylene-bis-dithiocarbamates and Their Conversion Products"

Tr. 2-go Vses. soveshch. po issled. ostatkov pestitsidov i profilakt. zagryazneniya imi produktov pitaniya, kormov i vnesn. sredy (Works of the Second All-Union Conference on the Investigation of Pesticide Residues and Preventive Contamination of Food Products, Fodder and Environment), Tallin, 1971, pp 143-147 (from RZh-Khimiya, No 12, Jun 72, Abstract No 12N475)

Translation: Dimethyldithiocarbamates and ethylene-bis-dithiocarbamates are subjected to thin-layer chromatography on a reinforced layer of Al_2O_3 in various systems of solvents. In C_6H_6 , acetone, MeOH and a mixture of n-hexane- C_6H_6 -acetone (8:0.8:2), the magnitudes of R_f of compounds of the dimethyldithiocarbamate group decrease in the following series: S > tetramethylthiourea > TMGD > cyram > DEDTK DMA, and the mobility of the compounds of the ethylenebis-dithiocarbamate group increases in the series: cyneb (maneb, and so on) < ethylenethiourea < ethylenethiurammonosulphide < S. The compounds of the dimethyldithiocarbamate group are clearly separated by Al_2O_3 in the n-hexane- C_6H_6 -acetone system (8:0.8:2 or 10:1:2.5), and the ethylene-bis-dithiocarbamates in the C_6H_6 +DMA (9:1) system. The adsorption capacity of the investigated compounds

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USSR

VEKSHTEYN, M. SH., et al., Tr. 2-go Vses. soveshch. po issled. ostatkov pesti-
tsidov i profilakt. zagryazneniya imi produktov pitaniya, kormov i vnesh. sredy,
Tallin, 1971, pp 143-147

is discussed as a function of their structure and the specific molecular
interaction with the sorbent surface.

2/2

- 54 -

USSR

UDC: 632.95

VEKSHTEYN, M. Sh. and KLISENKO, M. A.

"Determination of Some Dithiocarbamates Colorimetrically and Polarographically"

V sb. Gigiyena primeneniya, toksikol. pestitsidov i klinika otravl. (Hygiene of the Use and Toxicology of Pesticides and Clinical Symptoms of Poisoning--Collection of Works), No 7, Kiev, 1969, pp 604-611 (from RZh-Khimiya, No 23, 10 Dec 70, Abstract No 23 N755 by I. A. Revel'skiy)

Translation: Acid hydrolysis of dithiocarbamates (DC) is carried out with 5 to 7 N H_2SO_4 to analyze the compounds in air and products of plant origin. The CS_2 released is determined colorimetrically from the product of its reaction with $(AcO)_2Cu$. The sensitivity of the method is 0.02 to 0.12 mg/kg, the error in determination 10%. Polycarbazine is determined from the iodine azide reaction in a MeOH-dimethylformamide medium (4:1). The metal salts of ethylene-bis-dithiocarbamic acid can be determined polarographically from the anion part of their molecules against a NaOH background with a sensitivity of 5 mg/kg. The method does not require preliminary purification of the extract.

1/1

Acc. Nr:

AP0044151

PRIMARY SOURCE:

Voprosy Pitaniya, 1970, Vol 29, Nr 1,
pp 56-61

Ref. Code: UR 0244

IDENTIFICATION AND QUANTIFICATION OF SOME
DIALKYLDITHIOCARBAMATES AND THEIR METABOLITES IN DIFFERENT
MEDIA OF VEGETABLE AND ANIMAL ORIGIN

Vekshteyn, M. Sh.; Klisenko, M. A.

Summary

A specific and sensitive methods for determination of dialkyldithiocarbamates (cyram, TMDT) and their metabolites (dimethylamine salt of dimethyldithiocarbamic acid, tetramethylthio-urea, sulfur), present simultaneously, is proposed. The procedure reposes upon chromatographic partition of the said compounds in a thin layer of aluminum oxide and in their quantification through ultra-violet spectroscopy. It is suitable for measuring residual amounts of the compounds in food stuffs and also in studying the dynamics and metabolism of these substances in various biological objects.

REEL / FRAME
19770632

2

1/2 039

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--EFFECT OF PLASTIC DEFORMATION AND RECOVERY ON THE MAGNETIC
PROPERTIES OF TRANSFORMER STEEL CRYSTALS -U-

AUTHOR--(05)-BRASHEVAN, G.A., VEKSLER, A.Z., DRUZHININ, V.V., MOLOTILOV,
B.V., NOVIKOV, V.F.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34 (12) 322-8

DATE PUBLISHED-----70

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

TOPIC TAGS--PLASTIC DEFORMATION, TRANSFORMER STEEL, METAL CRYSTAL, SHEET
METAL, MAGNETIC PROPERTY, MAGNETOSTRICTION, CRYSTAL DISLOCATION, ALLOY
COMPOSITION, METAL ROLLING, SILICON STEEL, HYDROGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1529

STEP NO--UR/0048/70/034/002/0322/0328

CIRC ACCESSION NO--AP0120310

UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--23OCT7

CIRC ACCESSION NO--AP0120310

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LARGE CRYSTALS CUT OUT FROM TRANSFORMER METAL SHEET, 0.35 MM THICK, REFINED IN H (850DEGREES, 4 HR) AND UNDER VACUUM (1100DEGREES, 4 HR) WERE STUDIED. AFTER REFINING, THE STEEL CONTAINED SI 2.9, C 0.004, N 0.005, AND S 0.003PERCENT. STUDIES OF THEIR MAGNETIC STRUCTURE (BY THE POWDER METHOD), AS WELL AS OF DISLOCATION DS. WERE MADE AT THE SAME SPOT OF THE SAMPLE. SP, CORE LOSSES, COERCIVE FORCE, H SUBC, AND MAGNETOSTRICTION WERE MEASURE. ROLLING IN THE (001) DIRECTION PRODUCED A STRUCTURE WITH A MUCH LOWER DISLOCATION D. THAN ROLLING IN THE (110) DIRECTION. HOWEVER, WITH SMALL DEFORMATIONS H SUBC (001) LARGER THAN H SUBC (110). THE SIMULTANEOUS ACTION OF STRESSES AND DISLOCATION DS. LED TO A CHANGE IN DELTA H SUBC. A LINEAR CORRELATION WAS NOTED BETWEEN H SUBC AND SP. CORE LOSSES. FACILITY: TSMICHM IM. BARDINA, MOSCOW, USSR.

UNCLASSIFIED

USSR

VEKSLER, G. S. ✓

UDC 621.311.6

"On The Use of Transistor Stacks in Ripple Filters with a Parallel Triode"

V sb. Elektron. tekhn. v avtomatike (Electronic Technology in Automation -- Collectica of Works), Vyp. 1, Moscow, "Sov. radio," 1969, pp 84-88 (from RZh--Elektronika i yeye primeneniye, No 3, Mar 70, Abstract No 3B647)

Translation: The parameters are considered of transistorized ripple filters with series and parallel transistors. A comparison is given of the parameters of ripple filters with the substitution of one transistor stack, consisting of two transistors. Formulas are obtained for calculation of ripple filters with stacks of transistors. It is experimentally confirmed that use of stacks of transistors, not noticeably changing the smoothing properties and the energy relationships in filters, makes it possible to decrease the capacitance of the capacitor by approximately 20--50 times. 2 ill. 1 table. 5 ref. Summary.

1/1

I/2 021

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--DYNAMICS OF ELECTROENCEPHALGRAM CHANGES IN RABBITS WITH THE BROWN PEARCE CARCINOMA UNDER COMBINED ZYMOBAN AND CYCLOPHOSPHANE TREATMENT -U-

AUTHOR-(02)-VEKSLER, I.G., TSAPENKO, V.E.

COUNTRY OF INFO--USSR

SOURCE--DOPOV. AKAD. NAUK UKR. RSR, SER B 1970, 32(2), 174-6

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CARCINOMA, ANTINEOPLASTIC DRUG, ELECTROENCEPHALOGRAPHY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/1017

STEP NO--UR/0442/70/032/002/0174/0176

CIRC ACCESSION NO--AT0121613

UNCLASSIFIED

2/2 021

CIRC ACCESSION NO--AT0121613

UNCLASSIFIED

PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RABBITS WITH BROWN PEARCE
CARCINOMA TRANSPLANTED I. M. AND TREATED WITH ZYMOSAN AND CYCLOPHOSPHANE
SHOWED MORE NORMAL ELECTROENCEPHALOGRAMS AND SMALLER DEVIATION FROM THE
INITIAL BIOELEC. ACTIVITY THAN ANIMALS TREATED ONLY WITH CYCLOPHOSPHANE.
FACILITY: KIIV. NAUK. DOSLID. INST. EKSP. KLIN. ONKOL. KIEV.
USSR.

UNCLASSIFIED

1/3. 031

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--ELECTROPHYSIOLOGICAL FEATURES OF THE NERVOUS SYSTEM WITH MALIGNANT
GROWTH AND SOME INFLUENCES ON IT -U-

AUTHOR--(04)-BALITSKIY, K.P., VEKSLER, I.G., TSAPENKO, V.F., KAPSHUK, A.P.

COUNTRY OF INFO--USSR

SOURCE--FIZIOLOGICHNIY ZHURNAL, 1970, VOL 16, NR 3, PP 345-350

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ELECTROPHYSIOLOGY, TISSUE TRANSPLANT, REPRODUCTIVE SYSTEM,
ELECTROENCEPHALOGRAPHY, ANTIEDPLASTIC DRUG, CARCINOMA

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1358

STEP NO--UR/0238/70/016/003/0345/0350

CIRC ACCESSION NO--AP0115330

UNCLASSIFIED

2/3 031

CIRC ACCESSION NO--AP0115330
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--16OCT70

ABSTRACT. THE INVESTIGATIONS SHOWED THAT DURING PROGRESSIVE GROWTH OF THE BROWN PEARCE CARCINOMA INOCULATED INTRATESTICULARLY AND, AS A RULE, RESULTING IN IRREVERSIBLE CANCINATION, THE ELECTROENCEPHALOGRAMS OF RABBITS DISPLAY TWO PHASES OF MAIN CHANGES PHASE OF RAISED ACTIVITY AND THAT OF DEPRESSION. WHILE IN RABBITS WITH CARCINOMA, INOCULATED HYPODERMICALLY AND INTRAMUSCULARLY, ONLY THE PASE OF RAISED ACTIVITY OF INDICES APPEARS. THEN THE ELECTROENCEPHALOGRAM NORMALIZES. THE INVESTIGATION SHOWED, THAT THE RABBITS WITH THE BROWN PEARCE CARCINOMA, TRANSPLANTATED INTRAMUSCULARLY AND GREATED WITH CYCLOPHOSPHAN MORE LOWER AND THE DIFFERENCE FROM THE INITIAL ELECTROENCEPHALOGRAM IS SMALLER, THEN THE ANIMALS, TREATED ONLY WITH CYCLOPHOSPHAN IN THE SAME DOSAGE. THE RESEARCHES PRESENTED SHOW THAT THE DEVELOPMENT OF A TUMOUR PROCESS IS ACCOMPANIED BY A FREQUENCY DECREASE OF THE AFFERENT IMPULSION WHICH IS RECEIVED IN THE CENTRAL NERVOUS SYSTEM FROM THE REGION OF THE TUMOUR DEVELOPMENT. AT THE TUMOUR RESOLUTION THE FREQUENCY OF THE AFFERENT IMPULSION IS RESTORED TO THE INITIAL VALUE; AT THE IRREVERSIBLE DEVELOPMENT OF THE TUMOUR THE DROP OF FREQUENCY CONTINUES UP TO ANIMAL DEATH. THE INVESTIGATION INDICATES THAT THE NATURE AND STAGE OF THE TUMOURIOUS PROCESS HAVE A SUBSTANTIAL EFFECT ON THE FUNCTIONAL STATE OF VARIOUS DIVISIONS OF THE NERVOUS SYSTEM. THE DYNAMICS OF THE CHANGES IN THE ELECTROENCEPHALOGRAM IS, TO A CERTAIN EXTENT, AN EVIDENCE OF THE NATURE OF THE COURSE OF THE MALIGNANT PROCESS.

UNCLASSIFIED

373 031

CIRC ACCESSION NO--AP0115330

UNCLASSIFIED

PROCESSING DATE--16OCT70

ABSTRACT/EXTRACT--THE DEVELOPMENT OF THE TUMOUR AFFECTS THE CHARACTER OF

THE AFFERENT IMPULSATION. FACILITY: LABORATORY OF PATHOGENESIS

OF TUMOURS, RESEARCH INSTITUTE OF EXPERIMENTAL AND CLINICAL ONCOLOGY,

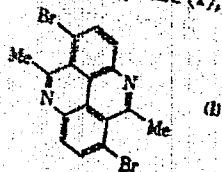
KIEV.

UNCLASSIFIED

Acc. Nr: **AP0045159** - Abstracting Service:
- CHEMICAL ABST.

Ref. Code:
LR0409

90341a Nucleophilic mobility of a bromine atom in 1,6-dibromo-5,10-dimethyl-4,9-diazapyrene. Alam, L. V.; Veksler, K. V.; Efros, L. S. (Leningrad. Tekhnol. Inst. im. Leningrad. U.S.S.R). Khim. Geterotsikl. Soedin. 1970, (1), 133-4 (Russ). Heating 21.8 g 5,5-dibromo-2,2-bis(acetamido)diphenyl with 217 g AlCl₃ and 46.4 g NaCl 8 hr at 250° gave 8% 1,6-dibromo-5,10-dimethyl-4,9-diazapyrene (I), m. 275-7° (decompn.)



which with piperidine 5 hr at 180° in a sealed tube gave yellow 1-piperidinyl-8-bromo-5,10-dimethyl-4,9-diazapyrene, m. 175-8° (decompn.). Ir and uv spectra are given. G. M. Kosolapoff

REEL/FRAME
19780059

1/2 013
 UNCLASSIFIED
 PROCESSING DATE--13NOV70
 TITLE--MATHEMATICAL STATISTICAL OPTIMIZATION OF THE PROCESS FOR PREPARING
 DRUGS. II. OPTIMIZATION OF A PROCESS FOR PREPARING NOVOCAINЕ -U-
 AUTHOR--(03)-SEROVA, N.A., VEKSLER, M.A., MARKOVA, YE.V.
 COUNTRY OF INFO--USSR
 SOURCE--KHIM.-FARM, ZH. 1970, 4(3), 35-7
 DATE PUBLISHED-----70
 SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
 TOPIC TAGS--ANALGESIC DRUG, DRUG INDUSTRY, CHEMICAL SYNTHESIS, MATHEMATIC
 ANALYSIS
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--3004/0555
 CIRC ACCESSION NO--AP0131178
 STEP NO--UR/0450/70/004/003/0035/0037
 UNCLASSIFIED

2/2 013

CIRC ACCESSION NO--AP0131178
ABSTRACT/EXTRACT--(U) GP-C-

UNCLASSIFIED

PROCESSING DATE--13NOV70

ABSTRACT. NOVOCAINE BASE (I) WAS PREPD. BY REACTION OF P-H SUB2 NC SUB6 H SUB4 CD SUB2 NA (II) WITH CLICH SUB2) SUB2 NET SUB2 (III). THE BASE WAS CONVERTED TO I.HCL AND WEIGHED. YIELDS WERE BASED ON II AND FACTORS STUDIED WERE DURATION OF REACTION (X SUB1), TEMP. (X SUB2), EXCESS OF II (X SUB3), AND CONC. (X SUB4) OF II IN WT. PERCENT; 16 EXPTS. WERE MADE IN RANDOM ORDER AND RESULTS PUT IN MATRIX FORM, $Y = B_0 + B_1 X_1 + B_2 X_2 + B_3 X_3 + B_4 X_4$. BASE LEVEL $X_1 = 60$, $X_2 = 60$, $X_3 = 4$, $X_4 = 60$, $X_1 X_2 = 60$, $X_1 X_3 = 4$, $X_1 X_4 = 60$, $X_2 X_3 = 4$, $X_2 X_4 = 60$, $X_3 X_4 = 4$. PRELIMINARY EXPTS. AND RESULTS GIVEN IN (EPSILON SUBJ), $X_1 = 15$, $X_2 = 10$, $X_3 = 4$, $X_4 = 3$, WERE CHOSEN FROM PRELIMINARY EXPTS. AND RESULTS GIVEN IN THE LITERATURE. WITH THESE VALUES, THE CALCD. COEFFS. OF REGRESSION ARE $B_0 = 60.85$, $B_1 = 0.62$, $B_2 = 0.72$, $B_3 = 1.36$, $B_4 = 2.99$. STATISTICAL ANAL. OF EXPTL. RESULTS SHOWED AN AV. QUADRATIC ERROR OF ONLY 1.72 PERCENT. GOOD YIELDS OF I DEPEND MAINLY ON A DECREASE IN CONC. OF II AND AN INCREASE OF ITS EXCESS DURING REACTION. TEMP. HAD LITTLE INFLUENCE BUT COULD BE RAISED. LOWEST YIELD OF I WAS 52.7 PERCENT, HIGHEST 71.5, LITERATURE 38. A YIELD UP TO 77.3 PERCENT WAS ATTAINED DURING 3 ADDNL. EXPTS. FOR TEST OF ADEQUACY OF THE LINEAR MODEL BY THE STEEP ASCENT METHOD.

FACILITY: VSES. NAUCH.-ISSLED. KHIM.-FARM. INST. IN. ORDZHONIKIDZE, MOSCOW, USSR.

UNCLASSIFIED

1/2 013

UNCLASSIFIED

PROCESSING DATE--02OCT70
OPTIMIZE THE PREPARATION

TITLE--USE OF MATHEMATICAL STATISTICAL METHODS TO OPTIMIZE THE PREPARATION
OF TECHNICAL METHOXYCARBONYLSULFONYLGUANIDINE AT THE ISOMERIZATION

AUTHOR--(03)-VEKSLER, M.A., ZASOSOV, V.A., MARKOVA, YE.V.

COUNTRY OF INFO--USSR

SOURCE--KHIM.-FARM. ZH. 1970, 4(2), 33-6 ✓

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--ISOMERIZATION, METHOXY COMPOUND, THIOL, STATISTICAL ANALYSIS,
ORGANIC SALT, AMMONIA, CHEMICAL REACTION RATE, GUANIDINE, CYANAMIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REF/FRAME--1993/0536

STEP NO--UR/0450/70/004/002/0033/0030

CIRC ACCESSION NO--AP0113427

UNCLASSIFIED

2/2 013
CIRC ACCESSION NO--AP0113427 UNCLASSIFIED PROCESSING DATE--02OCT70
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TWO SERIES OF EXPTS. WERE RUN,
INVOLVING 10 AND 14 TESTS, ON ISOMERIZATION OF THE NH SUB4 SALT OF
METHOXYCARBONYLSULFONYLCYANAMIDE (I) TO
METHOXYCARBONYLSULFONYLGUANIDINE (II). WITHOUT A SOLVENT THE OPTIMUM
YIELD (92.3PERCENT) OF II WAS OBTAINED BY MAINTAINING I AT 182DEGREES
FOR 378.0 MIN WITH STIRRING. FACTORS AFFECTING THE YIELD OF II IN THE
PRESENCE OF ETHYLENE GLYCOL (III) AS SOLVENT WERE REACTION TEMP., TIME,
AND THE I:III RATIO. THE MAX. YIELD (72.5PERCENT) WAS OBTAINED AT THE
I:III RATIO OF 0.85 REACTION TEMP. FOR 160DEGREES, AND REACTION TIME 100
MIN. THE OPTIMUM CONDITIONS FOR BOTH REACTIONS WERE DETERMINED BY
EMPLOYING THE BOX AND WILSON METHOD OF EXPT. PLANNING. A STATISTICAL
ANAL. OF THE RESULTS IS REPORTED.

UNCLASSIFIED

USSR

VEKSLER, N. D., NIGUL, U. K., PUKK, R. A., Tallin

"On an Algorithm for Fourier Series Calculation of Echo Signals From Elastic Spherical Objects in an Ideal Fluid"

Moscow, Mekhanika Tverdogo Tela, No 6, Nov/Dec 70, pp 71-83

Abstract: An algorithm based on expansion in a Fourier series is proposed for calculating echo signals from elastic spherical objects. Spherical objects of five types are considered: 1) a hollow elastic sphere with a filler, 2) an empty hollow elastic sphere, 3) a solid elastic sphere, 4) a spherical cavity filled with some other fluid, and 5) an absolutely rigid sphere (the last two are treated as limiting cases). The solid and hollow spheres are described by equations from the linear theory of elasticity, and the medium and filler are treated as ideal compressible liquids. It is assumed that a source located in the medium emits a centrally symmetric pulse. The basis for the mathematical model is the algorithm proposed by R. Hickling and

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- 99 -

USSR

VEKSLER, N. D., et al, Mekhanika Tverdogo Tela, No 6, Nov/Dec 70,
pp 71-83

developed in articles published in the Journal of the Acoustic Society of America between 1962 and 1968 (from Vol 34, No 10 to Vol 44, No 3). This algorithm starts with construction of a stationary echo signal produced by an infinite sinusoidal transmission which is then treated as a spectral characteristic function and used in the case of a finite sinusoidal transmission for constructing the solution of the pulse problem by means of a Fourier integral. Modifications of this algorithm are proposed which improve the precision and efficiency of calculations aimed at finding governing principles which will make it possible to identify objects from echo signals.

2/2

USSR

UDC 621.772.4.620.17

VEKSLER, Ye. Ya., Candidate of Technical Sciences, Kiyevenergo
"On the Stability of 12Kh1MF Heatproof Steel in Continuous
Operation"

Moscow, Teploenergetika, No 6, Jun 71, pp 62-64

Abstract: The metal of more than 600 hot-rolled steam pipes of 12Kh1MF steel was investigated during a continuous industrial process of 108 thousand hrs duration, at working temperatures of 500-570 °C, and stresses of 4.4-7.4 kg/mm². The character of structural changes during operation was found to depend mainly on the initial steel condition. The heat-resisting properties represent the most responsive characteristic reflecting structural changes which result in changes of rupture strength. The latter are discussed by reference to diagrams showing dependences on the microstructure of the change of rupture strength and hot-hardness, the hot-hardness changes in operation at 545 °C and stresses of 7.4 kg/mm², and the growth of residual deformation on creep and volume density of dislocations in operation at 570 °C

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USSR

VEKSLER, YE. YA., Teploenergetika, No 6, Jun 71, pp 62-64

and stresses of 5.0 kg/mm². The highest structural stability of steel 12Kh1MF with initial microstructure of ferrite and intermediate phase was found for the condition after normalization and temper. The 12Kh1MF steel is considered to possess a long-term operational stability at working temperatures of 500-570 °C and stresses of 4.4-7.4 kg/mm². Three illustr., three biblio. refs.

2/2

USSR

UDC 669.14:548.7

LYSAK, L. I., VEKSLER, YE. YA., and GINZBURG, YE. S., Institute of Metal Physics, Academy of Sciences UkrSSR

"Investigation of the Relationship Between the Structure and Properties of Heat-Resistant 12Kh1MF Steel"

Kiev, Metallofizika, No 32, 1970, pp 69-79

Translation: This paper presents the results of an investigation of the metal of steam pipes made of 12Kh1MF steel in the as-delivered condition to study the relationship of the structure and properties of this steel, as well as in connection with a discussion of the possibility of a reliable operation of chromium-molybdenum-vanadium steels in power installations of high pressure and of high-unit capacity.

The investigation was conducted on the material of more than 600 hot-rolled pipes and showed the inhomogeneity of the metal of pipes from 12Kh1MF steel in the microstructure and properties, which was connected with the deviations of the actual conditions of the heat treatment of pipes from those recommended.

1/2

USSR

LYSAK, L. I., et al., Metallofizika, No 32, 1970, pp 69-79

A relationship of the microstructure, as well as of the thin crystal structure, with the short-term mechanical and heat-resistant steel properties, was established. It was shown that the optimum combination of heat-resistant and mechanical steel properties in tests of short duration corresponds to a homogeneous structure of the products of intermediate transformation and ferrite, and that the embrittlement of pipe metal upon heat treatment observed in a number of cases was due to the reversible reduction in the impact toughness of steel over the range of tempering temperatures of 600°C.

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USSR

UDC 622.011.43

YERZHANOV, ZH. S., and VEKSLER, YU. A.

"Creep and Destruction of Rock During Omnidirectional Compression"

Kiev, Fiz. Svoystva Gorn. Porod pri Vysok. Termodinam. Parametrakh -- Sbornik (Physical Properties of Rock in the Presence of High Thermodynamic Parameters -- Collection of Works), Naukova Dumka, 1971, pp 187-190 (from Referativnyy Zhurnal, Mekhanika, No 2, Feb 72, Abstract No 2V774 by G. M. Sheft r)

Translation: An analysis is given of the results of experiments on the creep and destruction of tubular samples 90-100 mm high with external and internal diameters of 74 and 44 mm, to the external surface of which is applied a uniformly distributed pressure, the value of which was as high as 600 kg/cm². The duration of the experiments comprised on the average 400-500 hours. Shifting of the internal contour u of the sample was determined according to the formula

$$u = 2.3 \frac{P_0 r_0}{E} \left(\int_0^t \frac{d\tau}{T} \right)^{0.85}$$

where P₀ is the external pressure, r₀ is the internal radius of the sample, E is the modulus of elasticity, T is the relaxation time, t is the duration of

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USSR

YERZHANOV, ZH. S., And VEKSLER, YU. A., Fiz. Svoystva Gorn. Porod. pri Vysok. Termodynam. Parametrakh -- Sbornik, Naukova, Dumka, 1971, pp 187-190

loading. Consideration is given to cases where the value of T is related to time in accordance with an exponential law. A formula determining the longevity of a rock sample is obtained. A graph of the relationship of the longevity logarithm to the activation energy in the pulse of destruction is presented.

USSR

UDC: 620.185

BOGACHEV, I. N., VEKSLER, Yu. G., SOROKIN, V. G., Sverdlovsk

"Influence of Supersonic Gas Streams on the Structure and Heat Resistance of Metal Alloys"

Izvestiya Akademii Nauk SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

Abstract: The influence of a high-speed airstream on the heat resistance of metal materials was studied on an installation allowing testing of erosion resistance, short-term creep, strength and thermal fatigue over a broad range of temperatures and airstream velocities. The dynamic interaction of metals and alloys with high-velocity gas streams at high temperatures has a significant influence on the properties, composition and structure of the metal surface due to the corrosive and erosive influence of the gas stream. The disruption of the stability of the material surface under dynamic loading conditions leads to significant changes in the mechanical properties in comparison with standard tests: the creep resistance under thermal cycling, strength and ductility all decrease. As the gas stream velocity and test temperature increases, these effects also increase.

Prediction of the durability and operational reliability of parts working in contact with high velocity gas streams should be based on the results of

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USSR

Bogachev, I. N., Veksler, Yu. G., Sorokin, V. G., Izvestiya Akademii Nauk
SSSR, Metally, No 4, Jul-Aug 73, pp 139-143.

determination of mechanical characteristics under conditions as close as
possible to usage conditions.

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USSR

Titanium

UDC: 620.172.2

VEKSLER, Yu. G., VAYNSHTEYN, A. A., SOROKIN, V. G., Ural Polytechnic Institute, Sverdlovsk

"Concerning Dynamic Creep of OT-4 Alloy"

Kiev, Problemy Prochnosti, No 9, Sep 72, pp 76-78

Abstract: The authors study the influence of random stresses on the short-term creep properties of OT-4 titanium alloy in high-velocity airflows. Creep curves are approximated by using the hypothesis of aging with inclusion of the statistical characteristics of random stresses. The accuracy of the approximation is evaluated.

1/1

USSR

Refractory Materials

BOFACHEV, I. N., VEKSLER, YU. G., and KARASYUK, YU. A., Ural Polytechnical Institute

"Features of Cavitation Fracture in Refractory Metals and Alloys"

Novokuznetsk, IzVUZ-Chernaya Metallurgiya, No 6, 1971, pp 111-116

Abstract: Refractory metals with a b.c.c. lattice and alloys based on these metals are used extensively in the manufacture of pipelines and pump parts for the transfer of molten metal heat carriers in nuclear power engineering. A study was made of the features of deformation and fracture of refractory metals and refractory metal-based alloys under conditions of cavitation-erosion action. It was found that for one and the same refractory metal with a b.c.c. lattice the cavitation resistance and nature of fracture, kinetics, and depth of strengthening the surface layer depend on the condition of the metal (cast of powder metal). The character and magnitude of this difference depends on the nature of the metal as well as the size and distribution of micropores in the powder-metal material. The relatively high cavitation resistance of tungsten has been linked with its high strength properties. For an alloy of molybdenum with 47% Re the combination of high initial strength and hardness with intensive strengthening in the initial period of

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USSR

BOGACHEV, I. N., et al., IzVUZ -- Chernaya Metallurgiya, No 6, 1971,
pp 111-116

testing gives it a significantly higher resistance in comparison with tungsten. For powdered molybdenum and especially tungsten, the primary start of fracture at the grain boundaries was characteristic. In the case of a significant magnitude of micropores (powder-metal niobium), nucleation fractures are involved. For cast molybdenum and niobium a significant plastic deformation of the surface precedes failure. In contrast to molybdenum, primary fracture of the grain boundaries is not observed in niobium. Five figures, one table, 12 bibliographic references,

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USSR

UDC 620.193.5

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Ural Polytechnical
Institute imeni S. K. Kirov

"Interrelation Between Oxidation and Creep of Nickel, Cobalt and
Iron"

Moscow, Zashchita Metallov, Vol 7, No 1, Jan-Feb 71, pp 28-31

Abstract: The authors studied the short-term creep of nickel, cobalt, and Armco iron in different environments (vacuum, air, high-speed airstream) at 650°. It was found that short-term creep characteristics depend significantly on the environment, the effect of which differs for the metals studied. Oxidation processes may increase or decrease creep resistance. The creep resistance of nickel is higher in air than in vacuum, that of iron much lower, while cobalt takes an intermediate position. The creep resistance of the metals, especially iron, is lower in high-speed airstreams than in a vacuum or a stationary air environment.

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USSR

UDC 539.376

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Sverdlovsk

"Study of Temporary Creep of Alloy OT-4 in High-Speed Air Flows in the Presence of Aerodynamic Oscillations"

Moscow, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

Abstract: This article contains a description of a device and a procedure for determining the mechanical properties and erosion resistance of metallic materials in high-speed air flows. The role of the vibrations occurring in the samples under various test conditions is also analyzed.

The proposed procedure was used to estimate the properties of materials operating in contact with a high-speed gas or air flow, in particular, for materials subject to aerodynamic heating. Under these conditions, the materials are subject not only to static but also to variable stresses as a result of aerodynamic forces whose role and significance in creep resistance has not been studied. The variable stresses from the aerodynamic forces have a random nature and constitute a complicated complex with different frequency and amplitude which can vary within broad limits depending on the test conditions and the

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USSR

BOGACHEV, I. N., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970, pp 137-142

properties of the material. OT-4 titanium alloy was used as the test material, and the tests were run in stationary air ($M = 0$) and in a high-speed air flow at $M = 0.94, 1.3, \text{ and } 1.6$. The investigated temperature range was $475-600^{\circ}\text{C}$. The angle of attack was varied from 15 to 90° . A constant load of 8 kg/mm^2 was used in all cases. The oscillation frequency of the sample under all the test conditions in the high-speed air flow was within the limits of $2,300-2,600$ per second. In the investigated temperature range all the creep curves for the high-speed air flow go higher than in the stationary air environment. The creep rate in the steady state stage in the air flow is higher in all cases, and its increase is sharper when the temperature is raised. The time before rupture is reduced sharply, and earlier occurrence of both the steady creep stage and the third creep stage is observed. The strain to rupture was reduced by approximately 3-4 times. Metallographic investigations showed that the development of rupture begins by the formation of erosion pitting basically along the grain boundaries, which with time form microcracks and pores. Final rupture occurs by selective rupture of the individual microvolumes of the alloy.

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USSR

BOGACHEV, I. N., et al, Izvestiya Akademii Nauk SSSR -- Metally, No 5, 1970,
pp 137-142

Results of a statistical study of the random stresses caused by aerodynamic oscillations of the samples under various test conditions are presented, and some laws of variation of the characteristics of the distribution as a function of the flow velocity, angle of attack, and temperature are revealed. It is pointed out that the effect of vibrations on the behavior of OT-4 alloy during creep is less significant than the corrosion-erosion effect of the high-speed air flow on the surface of the material.

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UDC: 620.172.2

USSR

VEKSLER, Yu. G., SOROKIN, V. G., PALEYEVA, S. Ya., Sverdlovsk

"Study of Short-Term Creep In High-Speed Air Streams Considering Variable Loadings Resulting From Vibration"

Kiev, Problemy Prochnosti, No 11, 1970, pp 74-77

Abstract: The short-term creep of type OT4 titanium alloy is studied at 500°C under a loading of 8 kg/mm². The short-term creep of VZH98 heat-resistant alloy is also studied at 1000°C with a loading of 4 kg/mm² in a nonmoving air medium and in a high-speed stream. The influence of the velocity of the stream and angle of attack on short-term creep of the alloys is studied. It is determined that an increase in the velocity of the air stream from M = 0.94 to M = 1.6 for specimens of OT4 alloy at 500°C and from M = 0.7 to M = 1.6 for specimens of VZH98 alloy at 1000°C causes an acceleration of creep and a decrease in the total time to rupture as a result of the increase in the corrosion-erosion influence of the stream. The deformation at rupture is decreased by 2-2.5 times in comparison with tests in nonmoving air. An increase in the angle of attack at constant velocity (M = 0.94) accelerates creep as a result of the increase in the mean static value of the stress component.

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Analysis and Testing

USSR

UDC 620.10:539.376

BOGACHEV, I. N., VEKSLER, YU. G., and SOROKIN, V. G., Ural Polytechnical Institute

"Short-Lived Creep of Metals and Alloys under Aerodynamic Heating"

Moscow, IVUZ Chernaya Metallurgiya, No 4, 1970, pp 142-147

Translation: A description is given of short-lived creep tests on metals and alloys under conditions of dynamic contact with high-speed air flows. A device was used which permitted the tests to be conducted in a broad range of temperatures and loads. Short-lived creep testing of nickel, cobalt, armco iron, alloys OT-4, VZh-9B, and El43B, and steel Kh18N9T in the temperature interval from 500 to 1000°C shows that the characteristics of creep during tests in high-speed air flows differ considerably from analogous characteristics obtained under static conditions. Their changes are related to the thermal and corrosion-erosion action of the flow as well as to varying stresses which originate in the sample under the effect of aerodynamic forces.

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USSR

UDC 669.24:620.17

V
BOGACHEV, I. N., VERSLER, YU. G., SEGAL', V. M., and SOROKIN, V. G., Ural
Polytechnical Institute imeni S. M. Kirov

"Mechanism of Deformation of Nickel Surface in High-Velocity Air Streams"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 29, No 6, Jun 70, pp 1210-1214

Abstract: A study is made of the fine structure of nickel tested on an aerodynamic device at an air flow velocity of 1.6 M in a broad range of temperatures and testing times. At low testing temperatures, a considerable increase in the density of imperfections of the crystal lattice is observed, and grain crushing takes place on the surface of the specimen. The structure contains a large quantity of erosion pittings, and deformations, according to the shape of the slip trace, occur nonuniformly in the metal. With an increase in the testing temperature, the material hardens primarily because of intensive breaking down of grains, and with an increase in the time of dynamic recovery takes place which may lead to a recovery of the deformed material. An increased testing temperature is followed by a high rate of recovery and by a recrystallization of the deformed layer. A qualitative model of the flow of the processes of hardening-recovery in the surface layers of nickel during its deformation in a high-speed air stream is presented. The authors thank R. S. Shklyar for valuable discussion of the results of the work.

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USSR

✓ UDC: 669.14.018.45:620.193

GOLUBEV, V. I., BOGACHEV, I. N., and VERSLER, Yu. G., Ural Polytechnic Institute

"Study of the Cavitation-Erosion Resistance of Stainless and Heat-Resisting Steels in Lead-Bismuth Melts"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 8, 70, pp 123-126

Abstract: The objective of this study was to assess the effect of Si and Mo on the cavitation and erosion resistance of austenitic stainless steels in Pb-Bi melts as compared to Khl8N10T and Khl8N14 steels without additional alloying, as well as the effect of heat treatment on the stability of heat-resisting steels. It was found that the cavitation and erosion resistance of steels and alloys in Pb-Bi melts is determined by their chemical composition and the method of heat treatment. Cavitation and erosion failure of the metal's surface occurs following deformation and strengthening. The subsequent softening caused by internal ruptures in the grain, cracks, and separation of individual microvolumes sets in when the metal's ability to strengthen is exhausted. The addition of Si and Mo, alone with increasing the heat resistance, corrosion resistance, and plastic and strength limits, increases the resistance to plastic deformation of the surface layers on exposure to cavitation. The decrease in the resistance of steel in bismuth-rich melts is proportional to both the extent and depth of the strengthened zone.

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- 44 -

1/2 022

UNCLASSIFIED

PROCESSING DATE--02OCT70

TITLE--SHORT TERM CREEP OF NICKEL IN A HIGH SPEED AIR FLOW -J-

AUTHOR--(05)--SOROKIN, V.G., BOGACHEV, I.N., VEKSLER, YU.G., LESNIKOV, V.P.,
FILIPPOV, M.A.

COUNTRY OF INFO--USSR

SOURCE--METALLOVED. TERM. OBRAB. METAL. 1970, (3), 2-5

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--NICKEL, CREEP RESISTANCE, AIR FLOW, OXIDE FILM, CRYSTAL
DISLOCATION PHENOMENON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/1935

STEP NO--UR/0129/70/000/003/0002/0005

CIRC ACCESSION NO--AP0108264

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--02OCT70

2/2 022
CIRC ACCESSION NO--AP0108264
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. AT 700-800DEGREES THE RESISTANCE TO CREEP OF TECHN. PURE NI IS HIGHER WHEN TESTED IN AIR THAN WHEN TESTED IN VACUUM. THIS IS DUE TO THE STRENGTHENING INFLUENCE OF AN OXIDE FILM WHICH PREVENTS THE EMERGENCE OF DISLOCATIONS ONTO THE FREE SURFACE. IN A FAST AIR FLOW THE CREEP OF NI IS STRONGLY ENHANCED BY THE CORROSIVE EROSION ACTION. THE TIME TO RUPTURE IS SHORTENED.

89

UNCLASSIFIED

Nickel

USSR

UDC 669.24:620.172.251.2

SOROKIN, V. G., BOGACHEV, I. N., VEKSLER, YU. G., LESNIKOV, V. P. and
FILIPPOV, M. A.

"Short-Time Creep of Nickel in a High-Velocity Air Stream"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 3, 1970, pp 2-5

Abstract: Short-time creep of nickel in a vacuum, in a medium at rest, and in a high-speed air stream ($M = 1.6$) was experimentally investigated at $700-800^{\circ}\text{C}$ under a stress of $2-4 \text{ kg/mm}^2$. Experiments were conducted on samples made of technically pure NP-I nickel in an aerodynamic wind tunnel intended for investigating tensile strength, short-time creep, and erosion resistance metals and alloys, at high temperatures and at air stream velocities up to Mach 4. The magnitude of deformation and time were counted from the time of sample heating up to a given temperature. The heating time was 30 ± 5 sec. The results show that at $700-800^{\circ}\text{C}$ the creep resistance of technically pure nickel in air is higher than in vacuum. In a high-velocity air stream the creep increases sharply as a result of the corrosion-erosion effect of the air stream. 2 figures, 1 table, 7 references.

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UDC: 51:330.115

USSR

VEKSLINA, E. I.

"Problem of Minimizing the Time for Completing a Set of Jobs in the Case of Limited Resources"

V sb. Mat. metody v ekon. (Mathematical Methods in Economics--collection of works), vyp. 7, Riga, "Zinatne", 1971, pp 71-87 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V662)

[No abstract]

1/1

1/2 010
 TITLE--SINGULAR INTEGRAL EQUATION SYSTEMS AND CERTAIN BOUNDARY VALUE
 PROBLEMS -U-
 AUTHOR--~~VEKUA, N.P.~~ ✓
 COUNTRY OF INFO--USSR
 SOURCE--(SISTEMY SINGULYARNYKH URABENINY I NEKOTORYYE GRANICHNYYE ZADACHI.
 IZD. VTOR. PERER. I DOP.) MOSCOW, NAUKA, 1970, 379 PP
 DATE PUBLISHED-----70
 SUBJECT AREAS--MATHEMATICAL SCIENCES
 TOPIC TAGS--MONOGRAPH, BOUNDARY VALUE PROBLEM, INTEGRAL EQUATION, COMPLEX
 NUMBER, LINEAR DIFFERENTIAL EQUATION
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--3003/1251
 CIRC ACCESSION NO--AN0130249
 UNCLASSIFIED
 PROCESSING DATE--13NOV70
 STEP NO--UR/0000/70/000/000/0001/0379

2/2 010

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AM0130249

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PREFACE TO THE SECOND EDITION 8. PREFACE BY N. I. MUSKHELISHVILI TO THE FIRST EDITION 10. CHAPTER I THE GILBERT BOUNDARY VALUE PROBLEM FOR SOME UNKNOWN FUNCTIONS AND ITS APPLICATION TO SYSTEMS OF SINGULAR INTEGRAL EQUATIONS 11. II THE GILBERT BOUNDARY VALUE PROBLEM WITH DISCONTINUOUS COEFFICIENTS FOR SEVERAL UNKNOWN FUNCTIONS AND SYSTEMS OF SINGULAR INTEGRAL EQUATIONS WITH DISCONTINUOUS COEFFICIENTS 90. III APPLICATIONS AND GENERALIZATIONS 162. IV SOME BOUNDARY VALUE PROBLEMS AND SYSTEMS OF SINGULAR INTEGRAL EQUATIONS WITH DISPLACEMENT 206. V GENERALIZATION OF THE GILBERT PROBLEM 273. VI CERTAIN LINEAR INTEGRO DIFFERENTIAL EQUATIONS AND DIFFERENTIAL BOUNDARY VALUE PROBLEMS OF THE THEORY OF THE FUNCTION OF A COMPLEX VARIABLE 312. VII SOME APPLICATIONS IN THE MECHANICS OF A CONTINUOUS MEDIUM 352. CITED LITERATURE 372. RUSSIAN ALPHABET 372. LATIN ALPHABET 379. THE AUTHOR TOOK ACTIVE PART IN THE DEVELOPMENT OF THE THEORY OF SYSTEMS OF SINGULAR INTEGRAL EQUATIONS AND BOUNDARY VALUE PROBLEMS OF THE THEORY OF FUNCTIONS OF A COMPLEX VARIABLE FOR SEVERAL UNKNOWN FUNCTIONS. THE MONOGRAPH REPRESENTS A COMPLETED WHOLE AND IN A CERTAIN SENSE BRINGS TO AN END A NUMBER OF WORKS IN THIS DIRECTION.

UNCLASSIFIED

USSR

UDC 801:51

VEL'BITSKIY, I. V., YUSHCHENKO, Ya. L.

"Linguistic Approach to the Process of Teaching Algorithmic Languages and Work on Computers"

Primeneniye Tsifr. Vychisl. Mashin Dlya Obuch. Programmir, [Application of Digital Computers for the Teaching of Programming--Collection of Works], Kiev, 1970, pp 64-69, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V698).

No Abstract.

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UDC 8.74

USSR

VEL'BITSKIY, I. V., MEYTUS, V. YU., YUSHCHENKO, YE. L.

"M-Formalisms and their Application to Operation Systems"

V sb. Teoriya yazykov i metody postroyeniya sistem programmir. (Language Theory and Methods of Constructing Programming Systems--collection of works), Kiev-Alushta, 1972, pp 22-30 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V427)

Translation: A study was made of the problem of applying the formalisms of M-systems to describe operation systems. The M-systems are a method of giving a representation of a language in another combining certain properties of grammars and the converters. The arbitrary M-system which converts the language L_{Σ} into the language L_{Δ} solves the following problems: first, it recognizes that an arbitrary word of the input belongs to the language L_{Σ} ; secondly, during the recognition process it carries out a syntactic analysis of this word; thirdly, at the output it constructs the word in the language L_{Δ} into which the input word had to be transmitted for representation defined by the M-system. In the general case the M-system comprises p input tapes on which the word in the L_{Σ} language is written, q output tapes on which the word in the L_{Δ} language is written during the operating process and a set of tagged rules. It is noted that the introduction of several input tapes arises from the fact that in many

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USSR

VEL'BITSKIY, I. V., et al., Teoriya yazykov i metody postroyeniya sistem program-
mir., Kiev-Alushta, 1972, pp 22-30

practical applications it is convenient to give the input information in different ways — input it at each step in parallel and not in series, for example, the program and the initial data for the input information and the control input, and so on. The same thing also pertains to several output tapes on which the pattern of the word is written from L_2 . Each rule includes the following elements: 1) the tag for the given rule; 2) instructions regarding operations of reading from the input tapes and writing on the output tape; 3) instructions regarding operations with the internal memory elements of the M-system; 4) the set of tags of admissible rule-receivers. Various types of memories (for example, cartridge, counter, reel, and others) with admissible operations on them and conditions of their executionability can be used as the internal memory elements. The bibliography has 12 entries.

2/2

UDC 539.214;539.374

USSR

SITNIKOV, Ye. I., GANAGO, O. A., VEL'BOY, V. F.

"Study of the Stress-Deformation State of Cylindrical Stamps Considering Rigidity of the Bottom"

Sb. nauch. tr. Chelyabinsk. politekhn. in-ta (Collection of Scientific Works of Chelyabinsk Polytechnical Institute), 1972, No. 111, pp 63-69 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V477)

Translation: Stamps having an opening in the bottom portion and a rigidity of this portion commensurable with the rigidity of the wall are considered. Analysis of the stress-deformation state is made by a variation method considering rigidity of the bottom. 5 ref.

UNCLASSIFIED

PROCESSING DATE--18SEP70

1/2 020

TITLE--THE JOINT ACTION OF MONATOMIC PHENOLS IN WATER BODIES -U-



AUTHOR--VELORE, I.A.

COUNTRY OF INFO--USSR

SOURCE--GIGIYENA I SANITARIYA, 1970, NR 3, PP 10-14

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--TOXICOLOGY, PHENOL, WHITE RAT, WATER POLLUTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1985/0456

STEP NO--UR/0240/70/000/003/0010/0014

GIRC ACCESSION NO--AP0100934

UNCLASSIFIED

PROCESSING DATE--18SEP70

UNCLASSIFIED

2/2 020

CIRC ACCESSION NO--AP0100934
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE PAPER DEALS WITH THE JOINT ACTION OF RHO CRESOL AND BETA NAPHTHOL. THEIR PERMISSIBLE LEVELS IN WATER WERE LIMITED BY THEIR SANITARY TOXICOLOGIC EFFECT THAT WAS DETERMINED IN A CHRONIC TEST CARRIED OUT OVER ALBINO RATS. BESIDES THE AUTHOR DESCRIBES THE EFFECT OF MONOATOMIC PHENOLS, WHOSE STANDARD LEVELS ARE DETERMINED BY THE NOXIOUS EFFECT PRODUCED ON THE ORGANOLEPTIC PROPERTIES OF WATER. THE LATTER ACQUIRED A SMELL AS A RESULT OF CHLORINATING THE SOLUTION OF THESE SUBSTANCES IN WATER. THE FINDING WAS THAT THE JOINT EFFECT OF BOTH KINDS OF MONATOMIC PHENOLS, WHOSE STANDARD LEVELS WERE DETERMIND BY THEIR NOXIOUS EFFECT ON THE ORGANOLEPTIC PROPERTIES AND ACCORDING TO THEIR SANITARY TOXICOLOGIC EFFECT, WAS A SUMMATION OF THEIR EFFECTS.

UNCLASSIFIED

EAST EUROPE

Inorganic Compounds

ROMANIA

UDC 543.3

TUCHEL, N., and VELEA, S., Faculty of Pharmacy, Medical-Pharmaceutical Institute, Bucharest

"From the Abnormal Structure of "Normal Water" to a New Modification, Polymerized Water"

Bucharest, Farmacia, No 2, Feb 73, pp 65-77

Abstract: The paper review the literature on "polymerized Water" with the formula $(H_2O)_n$. The physical properties of this "modified water" are significantly differentiated: congelation point at $-40^{\circ}C$, high density (1.4 g/ccm), higher index of refraction, low vapor pressure, and stability at $500^{\circ}C$. Polymerized water appears to behave as a polyelectrolyte in which base structural units are formed by a very solid bond between O-H-O iso-electronic centers with the $F-H-F^{-}$ ion. On the basis of vibration spectra and by analogy, the distances O...O should be approximately 2.3 \AA and the bond energy between 30 and 50 kcal for each bond and between 60 and 100 kcal for each unit. Various theories on the structure of polymerized water are discussed; the structure of water with atoms of oxygen from molecules making up a hexagonal unit (D. Werner), the structure consisting of monomers and masses (Nemethy and 1/2

ROMANIA

TUCHEL, N., and VELEA, S., Farmacia, No 2, Feb 73, pp 65-77

Scheraga), polymer chains with multiple ramifications and structure diaphragm (Lipincott), and the theories of Frank, Wen, and Pauling. The possible uses of polymerized water in the chemical industry and in the area of nuclear reactors are mentioned. Emphasis is placed on the water as essential factor in biological systems and as ideal solvent.

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UNCLASSIFIED PROCESSING DATE--13NOV70
021
TITLE--PROTECTION AGAINST UNDESIRABLE COATINGS IN NICKEL PLATING -U-
AUTHOR--(03)-RYABCHENKOV, A.V., VELENITSINA, V.I., ALEKSEEVA, L.N.
COUNTRY OF INFO--USSR
SOURCE--GER. OFFEN. 1,802,348
DATE PUBLISHED--23APR70
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR
TOPIC TAGS--NICKEL PLATING, METAL COATING, CHEMICAL PATENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1994/1984 STEP NO--GY/0000/70/000/000/0000/0000
CIRC ACCESSION NO--AA0115783
UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0115783

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PROTECTION AGAINST UNDESIRABLE COATINGS WAS ACHIEVED BY ANODIC PASSIVATION OF THE OBJECT WHICH SHOULD BE NI PLATED. DURING THE ANODIC PASSIVATION THE CATHODE WAS IMMERSSED INTO AN ALK. SOLN. LOCATED IN A POROUS CERAMIC BEAKER FOR SEPN. FROM THE ELECTROLYTE. FACILITY: CENTRAL SCIENTIFIC RESEARCH INSTITUTE OF TECHNOLOGY AND MACHINE BUILDING.

UNCLASSIFIED

Biophysics

USSR

UDC 547.953.2

ZILBER, YU. A., DUBUR, G. YA., KUMSAR, K. K., and VELENA, A. KH., Order of Labor Red Banner, Institute of Organic Synthesis, Academy of Sciences, Latvian SSR

"The Effect of Antioxidants on the Peroxidation of Bimolecular Phospholipid Membranes"

Riga, Izvestiya Akademii Nauk Latviyskoy SSR, No 6(287), 1971, pp 80-82

Abstract: A study was made of possibilities of protecting biological membranes with synthetic peroxidation inhibitors from the adverse effect of oxidation. Protection from oxidation ensures preservation of the structure and function of the membranes and regulates their permeability and enzymatic reactions. Lecithin was used to prepare phospholipid micelles. Micelles were prepared from purified lecithin in 0.15 M KCL solution (15% lecithin per ml), shaken mechanically for 30 minutes, and left overnight at 4°C. All changes in the concentration of dissolved oxygen were determined by the polarographic method in a glass-cell with a rotating platinum electrode, at 45°C,

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USSR

ZILBER, YU. A., et al., Izvestiya Akademii Nauk Latvyskoy SSR, No 6(287), 1971, pp 80-82

and recorded on EPP-093 automatic recorder. Hemoglobin in a concentration of $2 \cdot 10^{-5}M$ was used as catalyst for the oxidizing processes. Antioxidants were 2,6-di-(tert-butyl)-4-methylphenol (1) and 2,2,4-trimethyl-1,2-dihydroquinoline (2). The results showed that phospholipid micelles in the presence of hemoglobin catalyst utilize oxygen intensively. The compound (1) in concentration of $1 \cdot 5M$ inhibits the utilization of oxygen two times, and the compound (2) -- almost four times.

- 2 -

Organometallic Compounds

USSR

UDC 542.91:547.1'119:547.412.732

KOPAYEVICH, Yu. L., VELEN'KIX, G. G., MYSOV, Ye. I., GERMAN, L. S., and KNUNYANTS, I. L., Institute of Element-Organic Compounds, Academy of Sciences USSR

"Derivatives of Bis(pentafluoroethyl)arsenous Acid"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, 1, Jan 73, pp 121-122

Abstract: The reaction of ethanol with $(C_2F_5)AsF$ (I) results in the formation of small amounts of the corresponding ester. In the presence of SiO_2 , however, the yield of $(C_2F_5)_2AsOC_2H_5$ is significantly increased. The hydrolysis of I leads to the formation of $(C_2F_5)AsOAs(C_2H_5)_2$; and the subsequent reaction with diethylamine to $(C_2F_5)_2AsN(C_2H_5)_2$. Reaction of (I) with phenylmagnesium bromide leads to the formation of $(C_2H_5)_2AsC_6H_5$. Syntheses, elemental composition, and mass spectrometric and NMR data are given for the compounds generated.

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UDC 519.217

VELEVA, P. I.

"Determination of Optimal Input Flow for One Queueing System"

Mat. Vopr. Upr. Proiz-vom. Vyp. 2 [Mathematical Problems of Production Control, No. 2 -- Collection of Works], Moscow, Moscow University Press, 1970, pp 158-164
(Translated from Referativnyy Zhurnal Kibernetika, No 4, April, 1971, Abstract No. 4, V49 by .u. Gromak).

Translation: A one-channel queueing system receives an irregular Poisson flow of requests with instantaneous intensity $a(s)$. A request arriving at moment t is accepted for servicing with probability $p(t)$, requests not accepted for servicing (with probability $1-p(t)$) are lost. The time of servicing of one request has an arbitrary distribution function. This work solves the problem of selecting the instantaneous intensity $a(s)$, $0 \leq s \leq T$, in order to maximize the mean number of calls serviced up to moment T .

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USSR

UDC 559.23

KOZLOVSKAYA, V.M., KHVOSTIKOVA, V.D., VELEZHEV, D.K., YEFREYENKO, G.A.

"Structure And Composition Of Films Prepared By Electron Beam Decomposition Of Molybdenum Hexacarbonyl"

Tr. Mosk. in-ta elektron. mashinostr. (Works Of The Moscow Institute Of Electrical Machine Building), 1972, Issue 20, pp 100-107 (from RZh:Elektronika i yeye primeneniye, No 7, July 1972, Abstract No 7A256)

Translation: Deposition of films was performed by electron-beam decomposition of molybdenum hexacarbonyl in Type ELUPO equipment. Electronmicroscope and electron diffraction studies were conducted as well as mass-spectrum analysis of films with an impurity, and the presence of molybdenum carbide in the films was established. M.V.

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Acc. Nr.: AP0042553

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Determining Coefficients of Reaction Rates

(Abstract: "Possibility of Determining the Coefficients of Reaction Rates from Ionospheric Data," by I. A. Krinberg, B. N. Velichanskiy, N. N. Klimov and Yu. F. Solov'yev, Siberian Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation; Moscow, Geomagnetizm i Aeronomiya, Vol X, No 1, 1970, pp 84-89)

One of the methods for determining the coefficients of rates of reactions transpiring in the ionosphere is the processing of curves of the diurnal variation of electron concentration $n(t)$. In earlier studies it was shown that as many as six coefficients could be determined. However, there are many other secondary reactions which have not yet been taken into account. In this paper an effort is made to clarify the degree of reliability of the values of the coefficients of reaction rates determined using the $n(t)$ curve and what is the maximum possible number of coefficients which can be determined. The analysis shows that as a result of the quasistationary nature of the process of appearance and neutralization of charges and the presence of fluctuations of electron concentration by using the curve of the diurnal variation of electron concentration $n_e(t)$ at altitudes of 100-200 km it is possible to determine only some algebraic

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combinations A_{ij} of the coefficients of the reaction rates α_i and γ_j .
However, for determining the coefficients α_i and γ_j themselves it is
necessary to use additional relations.

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UDC: 621.373:535(206.1)

BYKOVSKIY, Yu. A., VELICHANSKIY, V. L., MASLOV, V. A., and SMIRNOV, V. L.

"A Method for Increasing the Coherence of Pulsed, Semiconductor Laser Radiation"

Leningrad, Optika i Spektroskopiya, vol 32, No 3, 1972, pp 621-623
Abstract: This brief communication investigates the possibility of compensating the increase in wavelength of a pulsed laser due to heating of the active region through the pressure created by a barium zirconate piezoceramic element. For short pulses, the temperature increase and the laser wavelength increase are proportional to the square root of the time. But with application of pressure to the injection laser, the radiation spectrum shifts toward the short wavelengths. Consequently, the applied pressure can compensate the temperature change of the laser radiation wavelength during a pulse of the injection current, thus resulting in an improved time coherence of the laser. The design of a diode containing the piezoceramic element is shown. Experiments performed by the authors are described. They acknowledge their gratitude to Yu. P. Zakharov for the specimens and to V. V. Nikitin for his useful comments.

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USSR

UDC 621.375.9:535

BYKOVSKIY, Yu. A., VELICHANSKIY, V. L., GONCHAROV, I. G., MASLOV, V. A.,
NIKITIN, V. V.

"Pulsed Semiconductor Laser Used as a High-Resolution Spectroscope"

Leningrad, Optika i Spektroskopiya, No. 3, Mar 71, pp 508-510

Abstract: A method is proposed for graduating a pulsed laser-spectroscope in the optical range with the aid of a Fabry-Perot interferometer. It is pointed out that a unique combination of properties of semiconductor lasers make them promising for high-resolution spectroscopy. The radiation of semiconductor lasers covers a wide spectral range due to a large selection of materials, and any semiconductor laser evenly retunes its frequency with a change in temperature or pressure within the limits permissible for lasers of other types. Also, the line width of a semiconductor laser is sufficiently small; for example, the ratio $\Delta\nu/\nu = 10^{-9}$, where $\Delta\nu$ is the line width and ν is the basic frequency, for injection lasers of GaAs and $Pb_{0.88}Sn_{0.12}Te$. In this work a pulsed GaAs scanning semiconductor laser was used to observe absorption at the resonance absorption line in cesium-133. The nature in the change of the length of the genera-

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BYKOVSKIY, Yu. A., et al, Optika i spektroskopiya, No. 3, Mar 71, pp 508-510

tion wave of the laser with time was investigated in order to graduate the spectroscopy and be able to measure the frequency interval between absorption lines and the width of these lines. A block diagram of the calibration device is shown. The radiation of the laser diode forms into a parallel beam into which the Fabry-Perot interferometer is placed with a resolution of $5 \cdot 10^5$. The distance between absorption lines and their width are functions of the position of the lines on an oscillogram relative to the beginning of the pulse, and this is related to the nonlinear dependence of the wavelength of the laser radiation on time. The reason for this is that generation modes of the laser are determined by the optical length of its resonator. The pulsed excitation mode leads to a nonlinear variation of the increase in temperature of the active region of the injection laser with time. This produces a change in the refractive index of the active medium which basically determines the change in the generation wavelength. The distance between absorption lines was 9.2 ± 0.1 GHz, corresponding to a value obtained by radiospectroscopy methods.

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V Lasers and Masers

UDC: 621.315.592

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BYKOVSKIY, Yu.A., VELICHANSKIY, V.L., GONCHAROV, I.G., and MASLOV, V.A.

"Using the Fabry-Pérot Resonator for Stabilizing Injection Laser Frequency"
Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 4, 1970, pp 685-689

Abstract: This paper is the continuation of an earlier one written by the same four authors (ZhETF, 57, 1109, 1969) in which they gave preliminary results in stabilizing semiconductor laser frequencies by an external resonator. The present article gives the detailed results of investigating the spectral characteristics and the frequency stabilization of injector lasers through the Fabry-Pérot interferometer. The lasers under test were operated in the continuous regime, and their spectral characteristics were studied as a function of the injection current, which determines the active region temperature under steady-state conditions. The laser radiation spectrum was first investigated on a DFS-12 spectrograph with a resolution of about 1 Å to select specimens were GaAs with a length and width of 50 to 200 microns, prepared by the liquid epitaxy method. To guarantee continuous operation, the lasers were placed in a cryostat in a nitrogen atmosphere, with the p and n parts made in contact with the cooling element. Threshold currents ranged

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BYKOVSKIY, Yu.A., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 4, 1970, pp 685-689

from 150 to 500 ma depending on the quality of the specimen and its dimensions. The oscillation wavelength at the threshold covered a range of 8625 to 8715 Å for the various diodes. A block diagram of the frequency stabilizing equipment is given. The authors thank V.V. Nikitin for his comments and Yu.P. Zakharov for preparing the lasers.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ON ANALYSING THE RESULTS OF EXPERIMENTAL INVESTIGATION AND CLINICAL OBSERVATIONS THE AUTHOR HAS COME TO THE CONCLUSION ON THE NECESSITY OF SINGLING OUT TWO STAGES IN THE ACUTE PANCREATITIS TREATMENT: ELIMINATION OF THE ACUTE FIT AND A CONCLUSIVE THERAPY. THE ARTICLE HAS GIVEN SOME RECOMMENDATIONS ON THE ACUTE PANCREATITIS CONCLUSIVE THERAPY AND THE CONTROL TESTS, DEFINING THE PATIENT'S RECOVERY. FACILITY: KAFEDRA OBSHCHEY KHIRURGII VITEBSKOGO MED. INST.

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VELICHENKO, V.V.

ЛРЛС 54729
17 DEC 71

UDC 519.95+517.933

ON THE STRUCTURE, CONTROLLABILITY, AND SYNTHESIS OF INVARIANT SYSTEMS

Article by V. V. Velichenko, Moscow Physicotechnical Institute, Dolgoprudnyy, Moskovskaya Oblast', Moscow, Doklady Akade-
mii Nauk SSSR, Russian, Vol. 200, No 5, 1971, pp 1044-1047

The development of methods for synthesizing invariant systems occupies an important place in the problem of invariance. In this work, the method of determinant equations suggested in [2] is used to solve the problem of synthesizing invariant equations.

1°. Conditions of invariance. Let the n-dimensional system of equations $\dot{x}(t) = Ax(t) + Bu(t)$ which are subject to the influence of the vector of external disturbances $u(t)$, and the function $f = \Phi(x, t)$ be given. We will call system (1), in the given area $A \in \mathbb{R}^n \times t$, $\Phi \in \mathbb{R}^m \times t$, invariant for v (or strongly invariant [3]) if the values $\Phi(x(t), t)$ of function (2) are independent of disturbance $u(t)$ on its trajectories.

It is assumed that the following conditions are fulfilled in A: $\Phi(x, t)$ is continuously differentiable for x and t ; there exists a disturbance $u(t) = \bar{u}(t)$ for which $f(x(t), t) = \bar{f}$ is continuously differentiable for x and t n times; $\bar{u}(t)$ is piecewise-continuous along any trajectory of disturbance $u(t)$; $\bar{u}(x, t) \neq 0$.

Let us construct the sequence of functions

$$\bar{u}_k = \Phi_k(x, t) = (V_k \bar{u}_k, f(x, \bar{u}_k, t)) + \partial \bar{u}_k / \partial x \quad (k = 0, \dots, n-1) \quad (3)$$

and determine for it the matrix

$$[\partial^2 \bar{u}_k / \partial x_i \partial x_j] = \partial^2 \bar{u}_k(x, t) / \partial x_i \partial x_j \quad (4)$$

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