"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

CHEMICAL HUSBANDRY

(12)

JPRS 60575 17 Jan 73

UDC: 547.46

THE CHEMICAL SYNTHESIS AND APPLICATIONS OF AMINO ACIDS

[Article by Doctor of Chemical Sciences V. M. Belikovi Moscow, Vestnik Akademii Nauk SSSR, Russian, No 8, August 1973, pp 33-39]

Proteins of all organisms from the virus to man consist of 24 amino acids which on the basis of their biological value are divided into the replaceable (the organism can itself synthesize them for the construction of proteins at an adequate rate) and the irreplaceable (it cannot synthesize them and must obtain them from outside in the form of food). Each protein contains a definite quantity of each amino acid. If in a consumed protein there is none or little of any irreplaceable amino acid, the protein of the organism will not be constructed. From this arises the need for balancing of the ration, that is, the addition to low-valued proteins of lacking amino acids, which leads to an increase of their nutrient value.

On the diagram on the following page, casein -- a nutrient animal protein -- was taken as a standard. The crosshatched part of each column corresponds to the nutrient value of the natural protein in PEC (protein effectiveness coefficient) units. The addition of a certain quantity of lysine, the first limiting amino acid, to the product leads to a sharp increase of nutrient value, and the addition of a second limiting amino acid increases the nutrient value to the level of animal proteins.

Balancing is widely used in agriculture, especially in animal husbandry. According to the data of M. F. Tomme and F. Thachev, the inclusion of 0.2-0.5% lysine to the ration of young pigs and chicks permits reducing the consumption of fodder protein by 25% and increasing productivity of the animals by 10-13%. Generalizing the results of research of both Soviet and foreign authors, S. D. Shestakov calculated that when the production of 20,000 tons of lysine per year has been organized it is possible to obtain an additional 1.2 million tons of meat

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USSR

UDC: 621.317.41

TKACHEV, I. L.

"Magnetic Permeability for Magnetization Pulses and Its Measurement"

V sb. Radioelektron. v nar. kh-ve SSSR, Ch. 2 (Radioelectronics in the National Economy of the USSR, Part 2--collection of works) Kuybyshev, 1970, pp 169-175 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A387)

Translation: For cores with nonrectangular hysteresis loops, the most complete dynamic magnetic characteristic is pulsed magnetic permeability (PMP), taking into account the conservative and consumptive factors. To measure and control the PMP, instruments can be developed with various characteristics and different functions on the basis of PMP converter-sensors in the electric signal. A system of such converters and their basic characteristics are presented. Bibliography of two. E. L.

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USSR

UDC 539.374;539.214

TKACHEV, I. V.

"Calibration of Capacities by Internal Pressure"

Tr. Voronezh. tekhnol. in-ta (Works of Voronezh Technological Institute), 1972, Vol. 19, No. 1, pp 27-35 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V489)

Translation: A theory is presented for obtaining residual stresses in capacities by internal pressure. The results were obtained on the basis of the theory of small elastic-plastic deformations for a material with linear reinforcement. An experimental determination of residual stresses by the electric etching method supports the calculated values. Corrosion tests showed the large resistance of samples from vessels in which residual stresses were taken by the described method as compared with control samples. 12 ref. Author's abstract.

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1/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--THE EFFECT OF THE ELECTROMAGNETIC STRUCTURE OF HADRONS ON THE VALUE OF THE PI PRIME NEGATIVE P YIELDS NE PRIME POSITIVE E PRIME NEGATIVE

AUTHOR-(02)-TARASOV, A.V., TKACHEV, L.G.

COUNTRY OF INFO--USSR

SOURCE--JINR-P2-4970 DEP. CFSTI 1970 18P

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--STRONG NUCLEAR INTERACTION, PION PROTON INTERACTION, RESONANCE ABSORPTION, DIFFERENTIAL CROSS SECTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/2171 STEP NO--UR/0000/70/000/000/0018/0018

CIRC ACCESSION NO--AT0127535

UNCLASSIFIED

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

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CIRC ACCESSION NO--AT0127535 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DIFFERENTIAL CROSS SECTION FOR THE PROCESS PI PRIME NEGATIVE P YIELDS NE PRIME POSITIVE E PRIME NEGATIVE NEAR THE 33 RESONANCE IS CONSIDERED. IT IS SHOWN THAT THIS CROSS SECTION IS ESPECIALLY SENSITIVE TO THE VALUE OF THE ELECTRIC PROTON RADIUS. FACILITY: JOINT INST. FOR NUCLEAR RESEARCH, DUBNA USSR.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC 669.18-147:621.746

RUTES, V. S., Doctor of Technical Sciences, CHIGRINOV, M. G., Candidate of Technical Sciences, ASKOL'DOV, V. I., Candidate of Technical Sciences, BALLAD, E. R., Engineer, and TKACHEV, P. N., Engineer, Central Scientific-Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Formation and Migration of Non-Metallic Inclusions During Continuous Steel Pouring"

Moscow, Stal', No 10, Oct 70, pp 895-897

Abstract: A high-melting ZrO_2 tracer is introduced into the inwall to clarify the principal sources of admission of non-metallic inclusions during continuous steel pouring -- the inwall of the intermediate ladle, the residue of the furnace slag, and also slag which forms as a result of secondary oxidation of molten metal. An intensive flow of metal into the intermediate ladle, determined by the falling stream, makes flotation of inclusions difficult. These flows can be weakened at a sufficiently high level of metal -- on the order of 600-650 mm -- in the intermediate ladle.

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USSR

UDC 621.315.592

ALEKSANDROVA, G. A., VIL'KOTSKIY, V. A., DOMANEVSKIY, D. S., TKACHEV, V. D.

"Cathode Luminescence of Epitaxial Gallium Arsenide"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 2, 1972, pp 311-315

Abstract: The edge and impurity (1.5-0.35 electron volts) cathode luminescence spectra of gas epitaxial layers of gallium arsenide of different degrees of perfection were investigated. The variations in the spectral distribution of the cathode luminescence and the relative intensity of the individual emission bands were analyzed as functions of the current carrier mobility. With a decrease in mobility the intensity of the edge cathode luminescence decreases. Redistribution of the intensity between the radiation peaks at 0.8 and 0.56 electron volts accompanied by a shift of the 0.56 electron volt band to the 0.63 electron volt region is observed. The causes of the observed variations are discussed.

The properties of epitaxial GaAs are determined only by the concentration of the oxygen participating in the formation of the crystal defects. One of the factors determining the concentration of this "structurally active" oxygen can be total perfection of the substrate material. Good correlation is always observed between the cathode luminescence spectra of the films and the substrate.

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USSR

UDC 537.311.3:546.18'681

PIVOVAROV, V. Ya., and TKACHEV, V. D.

"Energy Spectrum of Radiation Damages in Expitaxial N-Type Gallium Phosphide"

V sb. Radiats. fiz. nemat. kristallov (Radiation Physics of Nonmetallic Crystals -- Collection of Works), Vol 3, Part 2, Kiev, "Nauk. dumka," 1971 pp 3-10 (from RZh--Elektronika i yeye primeneniye, No 10, October 1971, Abstract No 10B54)

Translation: The energy spectrum is investigated of local levels in epitaxial n-type gallium phosphide introduced by fast reactor neutrons. During the time of irradiation, the temperature of the specimens did not exceed 70° C. All the specimens were irradiated by an integral flow of 2, 10^{17} cm^{-2}. The spectra of photoconductivity and transmission were plotted at room temperature and 90° K and the temperature dependence of electrical conductivity in the interval 80 – 300° K. After irradiation, resistance in all the specimens increased, but the type of conductivity remained. The relative change of resistance depended on the initial concentration of free electrons. After irradiation a strong increase was observed of absorption in the region of energies from 0.7 – 0.9 ev up to 2.3 ev, and with $h\nu < 0.7$ ev absorption in the irradiated crystals decreased, which is connected with a decrease of the concentration of free electrons. A comparison of the energy spectra of the levels in irradiated and non-irradiated crystals showed that in irradiated material the energy spectrum of

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PIVOVAROV, V. Ya., and TKACHEV, V. D., Radiats. fiz. nemat. kristallov (Radiation Physics of Nonmetallic Crystals -- Collection of Works), Vol 3, Part 2, Kiev, "Nauk. dumka," 1971, pp 3-10 (from RZh--Elektronika i yeye primeneniye, No 10, October 1971, Abstract No 10B54)

the defects is considerably richer. Photoconductivity after irradiation is principally increased in the region of energies $<$ 2 ev which is accounted for by the increase of concentration of imperfections of the lattice which gives a deep energy level in the forbidden band. 4 ref. I.I.

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3

USSR UDC 621.382.2.002:535.376

VIL'KOTSKIY, V.A., DOMANEVSKIY, D.S., LITVINOV, V.L., LOMAKO, V.M., NOVOSELOV, A.M., ZAACHEV, V.D., UKHIN, N.A.

"Optical And Electrical Properties Of Irradiated GaAs Diodes (Annealing)"

V sb. Radiats. fiz. nemet. kristallov (Radiation Physics Of Nonmetallic Crystals--Collection Of Works), Vol 3, Part 2, Kiev, "Nauk.dumka," 1971, pp 44-49 (from RZh--Elektronika i yeye primeneniye, No 10, October 1971, Abstract No 10B205)

Translation: The effect was investigated of isochronous annealing on the spectra of radiative recombination of n-GaAs p-n junctions irradiated by fast reactor neutrons. An analysis of the results obtained makes it possible to conclude that during neutron irradiation, the decrease of lifetime is determined by the regions of disorder which are effective centers of nonradiative recombination. 3 ill. 6 ref. N.S.

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UDC 621.382.2

DOMANEVSKIY, D.S., LIBOV, L.D., LITVINOV, V.L., LOMAKO, V.M., NOVOSELOV, A.M., RAVICH, V.N., TKACHEV, V.D., UKHIN, N.A.

"Effect Of Radiation On Gallium Phosphide P-N Junctions"

V sb. Radiats. fiz. nemet. kristallov. T.3. Ch.2. (Radiation Physics Of Nonmetallic Crystals. Vol. 3, Part 2--Collection Of Works), Kiev, "Nauk.dumka," 1971, pp 50-53 (from RZh--Elektronika i yeye primeneniye, No 12, Dec 1971, Abstract No 12B534)

Translation: The p-n junctions were obtained by the method of liquid epitaxy with n-GaP. The epitaxial p-region was doped with C_2 and Zn. Irradiation was done with reactor neutrons and also electrons with 28 Mev energy at temperatures above 50° C. The current-voltage characteristics and the electroluminescent spectra were investigated at room and nitrogen temperatures. After irradiation, the forward branch of the current-voltage characteristics is shifted to the region of smaller voltages (the lifetime of minority carriers is decreased) and subsequently with an increase of the flux -- to the side of the larger voltages (increase of the resistivity of the initial material). After irradiation the intensity of all the spectral bands of electroluminescence are decreased. The

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DOMANEVSKIY, D. S., et al., Radiats. fiz. nemet. kristallov, T.3. Ch.2. (Radiation Physics Of Nonmetallic Crystals. Vol. 3, Part 2--Collection Of Works), Kiev, "Nauk. dumka," 1971, pp 50-53 (from RZh--Elektronika i yeye primeneniye, No 12, Dec 1971, Abstract No 12B534)

intensity of the red band with a flux decreased approximately 1.5 times more slowly that the green. The spectral composition of the radiation changed after irradiation. The results presented indicate that the change of the electrical and optical characteristics of GaP p-n junctions after irradiation have the same character as in the case of GaAs p-n junctions. 3 ill. 1 tab. 4 ref. I.M.

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USSR UDC: 621.382.2

LITVINOV, V. L., LOMAKO, V. M., TKACHEV, V. D., and UKHIN, N. A.

"Recombination Radiation Mechanism in Strongly Alloyed GaAs p-n Junctions"

Leningrad, Fizika i tekhnika poluprovodnikov, Vol 4, No 12, 1970, pp 2236-2240

Abstract: There are two explanations of the nature of the movable band observed in strongly alloyed p-n junctions under the application of small bias voltages: one is the model of diagonal tunneling; the other the model of filled zones. The authors investigate these two possible mechanisms by estimating their contribution through the use of their different dependence on the life time of the current carriers. In the experiments described, two types of p-n junction were investigated. The first was developed by the diffusion of zinc in n-type GaAs alloyed with Te; the second by melting tin into p-type GaAs alloyed with Zn. Volt-ampere characteristics and recombination radiation spectra of the two types were measured and plotted at 80 and 300° K before and after irradiation by high-speed neutrons. Immovable bands sometimes observed simultaneously were also studied. The authors express their gratitude to V. P. Smilg for his useful comments.

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UDC 621.382.2

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DOMANEVSKIY, D. S., LITVINOV, V. L., LOMAKO, V. M., SMILGA, V. P., TKACHEV, V. D., UKHIN, N. A., Belorussian State University imeni V. I. Lenin, Minsk

"Radiation Changes in the Voltage-Current Characteristics of Heavily Doped Gallium Arsenide PN Junctions"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 8, Aug 70, pp 1425-1431

Abstract: An investigation is made into the change in electrical characteristics of heavily doped gallium arsenide PN junctions under the effect of irradiation in a mixed (neutron-gamma) field of a reactor and fast electrons with an energy of 28 MeV. In many specimens tunnel transitions are detected in the initial state with the participation of defect levels in the forbidden band. Emission brings about an increase in excess current due to the introduction of radiation defects which produce closely situated levels throughout the entire forbidden band. An increase was observed in the density of states in the tails of the bands due to activation of the electrically inactive part of the dopants under the effect of radiation. In the case of high radiation intensities, there is an increase in excess current in narrow PN junctions due to the disordered regions which appear in the junction.

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Acc. Nr AP0101688 Abstracting Service: CHEMICAL ABST. 6-70 Ref. Code UR0449

115923g Radiation perturbation in copper-doped gallium arsenide. Papeiko, A. S.; Radovskii, E. E.; Stel'makh, V. F.; Tkachev, V. D. (Beloruss. Gos. Univ. im. Lenina, Minsk, USSR). *Fiz. Tekh. Poluprov.* 1970, 4(1), 142-4 (Russ). The effect of radiation with fast reactor neutrons (10^{12}-3×10^{17} neutrons/cm^2) on the properties of GaAs doped with Cu was studied. The single crystals were grown by directed crystn. ($n_0 = 1.2 \times 10^{17}$/cm^3, $\mu = 3300$ cm^2/V-sec) and were purified by floating zone melting ($n_0 = 8.5 \times 10^{13}$/cm^3, $\mu = 4400$ cm^2/V-sec). Diffusion of Cu was carried out at 800° from electro-deposited surface layers under equil. pressure of As vapor. The exptl. and theoretical curves for the electron concns. in the original GaAs specimens, subjected to floating zone melting, as a function of temp., indicated the presence of 2 main donor levels. Photocond. measurements showed the deep level to be at E_c − 0.25 eV. This level may well be assocd. with inherent structural lattice defects arising during floating zone melting. After 2 hr diffusion of Cu, low-resistance *p*-type specimens were obtained. The relation between the concn. of holes and the temp., and also the data on photocond. spectra indicate the presence of a basic acceptor level, $E_A = E_V + 0.15$ eV, assocd. with the 1st ionization state of Cu, i.e. Cu^-. After irradn. of such specimens at 10^{16} neutrons/cm^2 the photocond. spectra exhibited the levels $E_c - 0.14$, $E_c - 0.4$, $E_c - 0.67$, $E_c - 0.75$, $E_a + 0.4$, $E_v + 0.3$, $E_v + 0.2$, and $E_v + 0.15$ eV, assocd. with residual and radiation-induced disturbances of the structure. The relation between

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the hole concn. and the temp. indicates the high degree of compensation of the Cu^- acceptor. ($E_v + 0.15$ eV.) On irradn. of a specimen obtained by directed crystn. at 10^{16} neutrons/cm^2 under the same conditions as for the above specimens, a transition from *n*-type to *p*-type GaAs is obsd. Another illustration of the conversion of *n*-type GaAs doped with Cu into *p*-type material is given by the change in sp. resistance of specimens of various impurity levels on increasing the neutron flux. This change is probably due to an increase in the concn. of elec. active components in the Cu.

F. N. Standen

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Coatings

USSR

UDC 620.171.3:678.744.743

TKACHEV, V. I., BEYDER, E. YA., LITVIN, A. K., GUDIMOV, M. M., AND SOSHKO, A. I., All Union Scientific Research Institute of Aviation Materials, Moscow, Physico-Mechanical Institute Academy of Sciences UkrSSR, L'vov

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 5, 1973, pp 102-103

Abstract: The optimum conditions for the heat treatment of steel, before applying a polyethylene coating to increase its fatigue strength in an aggressive corrosive medium, were investigated on 30KhGSNA steel specimens, one part of which was coated with polyethylene. The composition of the coated specimens was selected so as to eliminate the effect of the coating, i.e., that the lasting quality of coated and uncoated specimens in air was the same. The investigation results are analyzed by reference to tabulated data, showing the longevity of coated and uncoated specimens in air, 30% NaCl, and in normal H_2SO_4, at low and high tempering temperatures, and diagrams of the effects of tempering temperatures on two coefficients characterizing the influence of the medium on the longevity relation in cycles of coated and uncoated specimens. The investigations demonstrated that poly-

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TKACHEV, V. I., et al., Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 5, 1973, pp 102-103

ethylene coatings of high density increase the corrosion-fatigue strength of 30KhGSNA steel specimens in aggressive media; this increase is most effective in acid media. The most protective effect of polyethylene coating was found on hardened and low-temperature annealed specimens. Two figures, one table, eight bibliographic references.

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USSR

UDC 669.017:539.56:669.788

KARPENKO, G. V., LITVIN, A. K., TKACHEV, V. I., and SOSHKO, A. I., Physico-mechanical Institute, Academy of Sciences Ukrainian SSR, L'vov

"Problem on the Mechanism of Hydrogen Brittleness"

L'vov, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 4, 1973, pp 6-12

Abstract: The article consists of an examination of Soviet and non-Soviet works dealing with hydrogen brittleness of metals in conjunction with studies by the authors on the effect of hydrogen in steels U8A and 2Kh13. The authors' interpretation of hydrogen "embrittlement" is based on the general theory of the effect of a medium on mechanical properties, with consideration of the specific (for hydrogen) temperature relationship of interaction with a metal; it makes it possible to explain the unmonotonous curve of the temperature relationship of strength properties, intensification of hydrogen brittleness at the minimum rate of deforming (caused by the time function of the chemosorption process), and other experimental facts which are not explained in known hypotheses. According to the authors the phenomenon of hydrogen brittleness should be examined as a mechanicochemical effect of selective microplastification of metal caused by chemosorption of hydrogen which is activated by stresses. 2 figures, 36 bibliographic references.

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USSR UDC 620.17

TKACHEV, V. I., ROMANIV, A. N., KRIPYAKEVICH, R. I., LITVIN, A. K., Physico-Mechanical Institute of the Ukrainian SSR Academy of Sciences, L'vov

"Device for Low-Cycle Fatigue Testing of Metals in an Atmosphere of Hydrogen and other Gases at Augmented Temperatures"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 8, No 2, 1972, pp 91-93

Abstract: The VTP-1 device is introduced which was designed and manufactured for low-cycle fatigue testing of flat specimens by pure bending at temperatures to 700° C in an atmosphere of hydrogen and other gases and also in a vacuum. The device was built on the basis of the IP-2 [V. I. Tkachev, et al., FKhMM, No 2, 1966] designed for low-cycle testing of metals in liquid media at room temperature. The basic assemblies include the following: a working chamber, a hydraulic drive for the loading system, a vacuum section with a forepump and diffusion pump, furnace transformers for heating the sample, a module for controlling the drive and vacuum section, a furnace temperature-regulating module, and a tank with the gases used to create the required atmosphere in the working chamber. The operation of these various assemblies is described. The design of the drive permits creation of hard or soft loading. The device is automated so that when testing at high temperatures in a vacuum with rupture of the specimen the oil supply to the slide valve system is cut off, and the piston

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KHACHEV, V. I., et al., Fiziko-Khimicheskaya Mekhanika Materialov, Vol 8, No 2, 1972, pp 91-93

stops in the position it was in at the time of rupture. The diffusion pump and furnace heating are shut off simultaneously. The device then automatically steps through a shutdown and safety program.

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USSR UDC 539.434.539.219.1

KARPENKO, G. V., KUSLITSKIY, A. B., MIZETSKIY, V. L., ZLOTNIKOV, S. A., TKACHEV, V. I., SHIL'NIKOVA, G. K., and BEREZHKO, B. I., L'vov, Leningrad

"Effect of the Composition of Nonmetallic Inclusions on the Fatigue Limit of Steel 20"

Moscow, Izvestiya Akademii Nauk SSR, Metally, No 1, Jan-Feb 1970, pp 104-108

Abstract: Qualitative investigations were made of programmed amounts of impurities in steel. In connection with this, experiments were conducted on the formation in steel of non-metallic inclusions of a given chemical composition: plastic silicates, alumina and high-alumina alumosilicates, semi-brittle silicates, and titanium nitrides. It is shown that the composition of non-metallic inclusions has a significant effect on the fatigue limit of the steel. Of the four types of inclusions studied, the most damaging proved to be plastic unsaturated silicates and titanium nitrides; silica inclusions were the least damaging. The principal negative role of non-metallic inclusions results in the appearance of considerable residual stresses owing to the difference in the physical properties of the inclusions and the metal matrix. These stresses are formed in the metal during unavoidable technological heating and cooling, even before external forces are applied.

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1/2 031 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--INFLUENCE OF COATINGS ON THE LOW CYCLE FATIGUE OF STRUCTURAL STEEL IN CORROSIVE MEDIA -U-

AUTHOR-(04)-TKACHEV, V.I., KUSLITSKY, A.B., KRIPYAKEVICH, R.I., MIKHEYEV, A.A.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKHAN. MAT., 1970, 6, (2), 98

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--FATIGUE STRENGTH, PROTECTIVE COATING, STRUCTURAL STEEL, SEA WATER CORROSION, ELECTRODEPOSITION, PHOSPHATE, CADMIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1830 STEP NO--UR/0369/70/006/002/0098/0098

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2/2 031 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0129198

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LOW CYCLE FATIGUE OF STRUCTURAL STEEL SAMPLES COATED WITH A VARIETY OF MATERIALS WAS STUDIED IN CORROSIVE MEDIA (3PERCENT NACL SOLUTION OR SIMULATED SEA WATER). OF ALL THE ELECTRODEPOSITED COATINGS STUDIED, THE MAX. FATIGUE LIFE WAS ACHIEVED FOR PHOSPHATED SAMPLES AND THE MIN. FOR CD PLATED MATERIAL. THIS DIFFERENCE WAS ATTRIBUTED TO THE FACT THAT H PENTRATED INTO THE METAL IN THE LATTER CASE DURING ELECTRODEPOSITION.

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

1/2 025 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--EFFECT OF THE TECHNOLOGY OF MANUFACTURING ,ALLOY, STEELS ON THE LOW CYCLE FATIGUE IN VARIOUS MEDIA -U-

AUTHOR-(05)-KUSLITSKY, A.B., KRIPYAKEVICH, R.I., TKACHEV, V.I., KOKOTAYLO, I.V., STAROVOYTOV, YU.A.

COUNTRY OF INFO--USSR

SOURCE--FIZ. KHIM. MEKHAN. MAT., 1970, 6, (2), 96-97

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--STEEL PRODUCTION, ALLOY MELTING, VACUUM ARC FURNACE, OPEN HEARTH FURNACE, ELECTROSLAG MELTING, INDUCTION FURNACE, CHROMIUM NICKEL STEEL, FATIGUE STRENGTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1829 STEP NO--UR/0369/70/006/002/0096/0097

CIRC ACCESSION NO--AP0129197

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

2/2 025 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0129197

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF THE TECHNOLOGY OF MELTING CR,NI STEELS (OPEN HEARTH, INDUCTION MELTING, VACUUM ARC, AND ELECTROSLAG) ON THE LOW CYCLE FATIGUE OF THE CORRESPONDING GRADES IN VARIOUS WORKING MEDIA (AIR, SALT SOLUTIONS, ETC.) WAS STUDIED. IN GENERAL, VACUUM ARC AND MORE PARTICULARLY ELECTROSLAG REMELTING GREATLY INCREASED THE FATIGUE LIFE OF THESE GRADES UNDER SERVICE CONDITIONS.

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC 620.10

STASENKO, I. V., TKACHEV, V. V.

"Restricted Twisting and Bending of Thinwall Pipe of Nonlinearly Elastic Material"

Izvestiya Vysshikh Uchebnykh Zavedeniy, Mashinostroyeniye, No 1, 1972, pp 5-10.

ABSTRACT: The article states the problem of determination of secondary normal stresses in the zone of a rigid flange with combined bending and twisting of a thinwall tube of a nonlinearly elastic material. The solution produced is based on application of basic assumptions accepted for the calculation of stresses involved in restricted twisting of thinwall shapes.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC:621.771.8

GOLOVANENKO, S. A., MEANDROV, L. V., USTIMENKO, V. A., TKACHEVA, A. V., and CHERVYAKOVA, V. V.

"Mechanical Properties of Steel + Nickel and Steel + Monel Bimetals"

Spetsial'nyye Stali i Splavy [Special Steels and Alloys--Collection of Works], No 77, Metallurgiya Press, 1970, pp 164-170

Translation: The strength and plasticity characteristics of bimetals were determined during tensile testing in the 20-1200°C temperature interval and impact testing between -60 and +20°C.

In the hot-rolled state, steel + nickel and steel + monel bimetals have mechanical properties as good as the properties of the base layer (steel), while their impact toughness is significantly better.

The dependence of adhesion strength of the layers on degree of deformation and state of the contact surface is obtained. 4 figures; 3 biblio. refs.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

1/2 015 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--SYSTEM OF PHYSIOLOGICAL COMMUNICATION: HYPOPHYSIS ADRENAL CORTEX TROPIN -U-

AUTHOR-(02)-VOYTKEVICH, A.A., TKACHEVA, G.A.

COUNTRY OF INFO--USSR

SOURCE--USP. SOVREM. BIOL. 1970, 69(1), 142-57

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--RNA, ACTH, CORTICOSTEROID, ADRENAL CORTEX

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0449 STEP NO--UR/0221/70/069/001/0142/0157

CIRC ACCESSION NO--AP0137540

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

EFFECTS OF INCREASED CONCNS. OF ACTH ON THE ADRENAL CORTEX ARE SIMILAR TO BUT NOT IDENTICAL WITH EFFECTS OF INCREASED CONCNS. OF NADPH. ACTH INCREASES THE CONCN. OF RNA IN THE ADRENAL CORTEX. DATA CONCERNING THE EFFECT OF ACTH ON THE RATE OF INCORPORATION OF LABELED AMINO ACIDS INTO THE PROTEINS OF THE ADRENAL CORTEX ARE CONTRADICTORY. SOME OTHER POSSIBLE MECHANISMS OF ACTION OF ACTH ARE MENTIONED. FACILITY: INST. MED. RADIOL., OBNINSK, USSR.

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

1/2 021 UNCLASSIFIED PROCESSING DATE--16OCT70

TITLE--EFFECT OF ACTH ON THE DISTRIBUTION AND METABOLISM OF SULFUR CONTAINING PROTEINS IN THE ADRENAL CORTEX -U-

AUTHOR-(03)-TKACHEVA, G.H., TSODIKOVA, L.B., MOLOTKOV, O.Y.

COUNTRY OF INFO--USSR

SOURCE--PROBL. ENDOKRINOL. 1970, 16(2), 78-83

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ADRENAL CORTEX, PROTEIN METABOLISM, ORGANIC SULFUR COMPOUND, ACTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/0256 STEP NO--UR/0502/70/016/002/0078/0083

CIRC ACCESSION NO--AP0117508

UNCLASSIFIED

2/2 016 UNCLASSIFIED PROCESSING DATE--04DEC70

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

CIRC ACCESSION NO--AP0137540

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REVIEWING PRESENT EVIDENCE ON THE WAY IN WHICH ACTH INCREASES THE SYNTHESIS

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

2/2 021 UNCLASSIFIED PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0117508

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DISTRIBUTION OF S CONTG. PROTEINS IN THE RAT ADRENAL CORTEX INCREASED FROM THE ZONA GLOMERULOSA TO THE ZONA RETICULARIS. SINGLE AND PROLONGED (10 DAY) ADMINISTRATION OF ACTH (3 UNITS-100 G DAILY) DID NOT AFFECT THE LEVEL IN THE ZONA GLOMERULOSA BUT INCREASED IT IN THE ZONA RETICULARIS AND ZONA FASCICULATA. DURING PROLONGED ACTH ADMINISTRATION THE STIMULATION WAS GRADUALLY REPLACED BY A DECREASED PROTEIN LEVEL. FACILITY: LAB. NEIROENDOKRINOL., INST. MED. RADIOL., OBNINSK, USSR.

UNCLASSIFIED

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

1/3 028 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--USE OF FUTUROLOGICAL AND SOCIOLOGICAL METHODS IN WORKING OUT LONG TERM FORECASTS OF SCIENTIFIC RESEARCH IN EPIDEMIOLOGY -U-

AUTHOR-(03)-SUMAROKOV, A.A., SHAKHANINA, I.L., TKACHEVA, M.N.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, SOVETSKOYE ZDRAVOOKHRANENIYE, RUSSIAN, NO 6, 1970, SUBMITTED 13 JANUARY 1970, SIGNED TO PRESS 3 MAY 1970, PP 7-13

DATE PUBLISHED--13JAN70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--EPIDEMIOLOGY, PUBLIC HEALTH, BASIC SCIENCE PLANNING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3005/1923 STEP NO--UR/0753/70/000/006/0007/0013

CIRC ACCESSION NO--AP0133774

UNCLASSIFIED

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

2/3 028 UNCLASSIFIED

CIRC ACCESSION NO--AP0133774 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT THE PRESENT TIME, WHEN THE ROLE OF SCIENCE AS A PRODUCTIVE FORCE IS GENERALLY RECOGNIZED, SUBSTANTIATED PLANNING OF RESEARCH SERVES AS ONE OF THE MOST IMPORTANT ELEMENTS IN THE UNIFIED STATE POLICY THAT ENSURES NOT ONLY SCIENTIFIC PROGRESS, BUT SOCIAL PROGRESS AS WELL. THE PROPERLY COMPILED PROSPECTIVE PLAN, ONE THAT TAKES SPECIFIC CONDITIONS INTO ACCOUNT, IS A POWERFUL LEVER AFFECTING THE DEVELOPMENT OF ANY BRANCH OF SCIENCE AND DETERMINING ITS TENDENCIES AND RATE OF DEVELOPMENT. IT IS THE PLAN THAT IS EXPECTED TO ENSURE CONCENTRATION OF SCIENTIFIC MANPOWER AND RESOURCES ON THE DECISIVE LINES OF RESEARCH AND, EQUALLY IMPORTANT, TO IMPROVE THE FORMS OF RESEARCH ORGANIZATION SO AS TO GUARANTEE A MAXIMUM RESULT FROM SMALLEST POSSIBLE EXPENDITURES IN THE SHORTEST TIME. SHORT TERM PLANNING OF SCIENTIFIC RESEARCH (QUARTERLY AND ANNUAL), WHICH HAS BEEN PRACTICED IN THE SOVIET UNION FOR ALMOST TWO DECADES, DOES NOT MEET TODAY'S REQUIREMENTS. THE RAPID DEVELOPMENT OF PRESENT DAY SCIENCE AND THE VOLUMINOUS DATA, IN A NUMBER OF CASES PASSING THE LEVEL OF RESEARCH THAT HAS BEEN PLANNED, IMPOSE IN THEIR TURN AN IMPERATIVE NEED TO USE INCREASINGLY REFINED METHODOLOGICAL APPROACHES IN LONG TERM PROSPECTIVE PLANNING. IT IS THEREFORE NO ACCIDENT THAT THE DECREE OF THE CC CPSU AND THE COUNCIL OF MINISTERS USSR ENTITLED "MEASURES TO IMPROVE THE EFFICIENCY OF THE WORK OF SCIENTIFIC ORGANIZATIONS AND TO ACCELERATE USE OF THE ACHIEVEMENTS OF SCIENCE AND ENGINEERING IN THE NATIONAL ECONOMY" GIVES AN IMPORTANT PLACE TO THE PROBLEMS OF IMPROVING PLANNING.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

3/3 028 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0133774

ABSTRACT/EXTRACT--IN PARTICULAR, THE IMPORTANCE OF PROSPECTIVE (FOR A 10-15 YEAR PERIOD OR MORE) PROBLEM PLANNING OF RESEARCH IS EMPHASIZED ONCE AGAIN. COMPILATION OF SUBSTANTIATED LONG TERM RESEARCH PROGRAMS IS NOT ONLY RESPONSIBLE WORK, BUT IT IS ALSO VERY COMPLEX AND REQUIRES EXHAUSTIVE INFORMATION ABOUT THE STATUS (DEGREE OF STUDY) OF A SPECIFIC PROBLEM IN THE PAST AND AT PRESENT NOT ONLY IN THE SOVIET UNION, BUT ALSO ABROAD. IN ADDITION, RATIONAL PLANNING IS ONLY POSSIBLE IF THE DIRECTION TAKEN BY THE PROBLEM AND THE RATES OF DEVELOPMENT ARE SCIENTIFICALLY PREDICTED. FACILITY: CENTRAL SCIENTIFIC RESEARCH INSTITUTE OF EPIDEMIOLOGY.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

1/2 014 UNCLASSIFIED

TITLE--RARE BASES IN ANIMAL DNA -U- PROCESSING DATE--23OCT70

AUTHOR-(03)-VANYUSHIN, B.F., TKACHEVA, S.G., BELOZERSKIY, A.N.

COUNTRY OF INFO--USSR

SOURCE--NATURE LONDON 1970, 225(5236), 948-9

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--DNA, MAMMAL, REPTILE, AMPHIBIAN, MOLLUSCA, INSECTA, SPONGE, CHEMICAL COMPOSITION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0233 STEP NO--UK/0000/70/225/000/0948/0949

CIRC ACCESSION NO--AP0119229

UNCLASSIFIED

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

2/2 014

UNCLASSIFIED

CIRC ACCESSION NO--AP0119229 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PRESENT KNOWLEDGE OF THE SPECIFICITY OF DNA METHYLATION IN ANIMAL CELLS IS SCANTY AND CONTRADICTORY. THE CONTENT OF 5 METHYLCYTOSINE (I) IN THE DNA FROM 16 ANIMALS BELONGING TO MAMMALIA, REPTILIA, AMPHIBIA, OSTECHTHTES, ECHINEDERMATA, MOLLUSCA, COELENTERATEA AND PORIFERA WAS DETD. G PLUS C PLUS I MOLES-100 MOLES RANGED FROM 44.8 (LIVER OF TESTUDO HORNSFIELDY (TURTLE)) TO 38.5 (SUBERTIES DOMUNCULA (SPONGE): WHOLE ANIMAL). I VARIED FROM 0.5-2.0 MOLES-100 MOLES DEPENDING ON THE SPECIES. THE MORE DISTANT THE SPECIES TAXONOMICALLY, THE GREATER WAS THE DIFFERENCE OF PROPORTION OF I IN THEIR DNA. ATTEMPTS TO FIND N PRIME6 METHYLADENINE IN DNA HYDROLYZATES BY PAPER CHROMATOG. OR UV SPECTROSCOPY FAILED. I SEEMS TO BE THE ONLY RARE BASE PRESENT CONSISTENTLY IN ALL ANIMAL DNA.

FACILITY: LAB. BIOORG. CHEM., MOSCOW STATE UNIV., MOSCOW, USSR.

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USSR

UDC 535.215.12+621.382.28

LITOVCHENKO, V. G., SERBA, A. A., GORBAN', D. N., MOSKAL', D. N., IVANOVA, T. P., TKACHIK, V. P., PROKUROV, A. V.

"Use of an Optoelectronic Converter based on a Metal-Dielectric-Semiconductor Photovaricap in a Dosimetric Device"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No 5, 1971, pp 108-113

Abstract: A study was made of the basic characteristics of a new type of semiconductor voltage modulator using a surface metal-dielectric-semiconductor photovaricap as the active element. The theoretical analysis of the physical phenomena determining the operation of the MDS photovaricaps and also some experimental results of studying their characteristics were presented previously [V. G. Litovchenko, et al., Elektronnaya tekhnika, Series 2, No 1, 96, 1967; V. G. Litovchenko, et al., Radiotekhnika i elektronika, Vol 12, No 1, 76, 1967].

An optoelectronic modulator of constant and low-frequency voltages from high-resistance sources was developed on the basis of an MDS photovaricap and a light diode. The modulator is characterized by high-frequency parameters (10^5-10^7 hertz), high input impedance (> 10^{12} ohms), small size and weight. Experimental data were obtained which illustrate the operation of the MDS photovaricap in the optoelectronic modulator, in particular, combined with the

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

LITOVCHENKO, V. G., et al., Poluprovodnikovaya tekhnika i mikroelektronika, No 5, 1971, pp 108-113

ionization chamber. The application of these optoelectronic modulators permits an increase in their modulation frequency by several orders (by comparison with mechanical dynamic capacitors) and, therefore, use of ordinary alternating voltage amplifiers instead of electrometric input cascades.

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Source: JPRS 60517
13 Jan 73

Geology/Oil Exploration

CHERNIGOVSHCHINA OIL BASIN NEEDS MORE EXPLORATION

[Excerpts from article by senior drilling foreman A. I. Murzy, senior drilling foreman A. A. Pavlyuchenko, S. V. Tsechishin, chief geologist of Chernigoneftegazrazvedka Trust and Ukrainian SSR Distinguished Geologist; A. A. Bilyk, candidate of geological and mineralogical sciences, I. M. Lisovets, secretary of the party Committee of the Chernigovneftegaz Administration and T. T. Gonta, geologist and special correspondent; "A Repetition of the Past"; Kiev, Rabochaya Gazeta, Russian, 4 October 1972, p 2]

The trailblazers of the earth's interior -- drillers, prospectors, explorers, and scientists -- are again discussing an urgent problem: why is it that exploratory work at Chernigovshchina does not yield tangible results and oil recovery is reduced? How can these difficulties be overcome and liquid-fuel recovery increased? -- The Economics Club.

The Limits of the Problem

In 1971 the Economics Club of Rabochaya Gazeta's editorial board held a visiting meeting in Priluki jointly with Ukrneft' Association and the Ukrainian SSR Ministry of Geology. The question then concerned mainly the lag in work on geological exploration for oil in Chernigovskaya Oblast, as a result of which the discovery of new fields of liquid fuel had been held back and explored reserves had not been increasing to the extent required.

Two years have since passed, but the situation still has not changed for the better. Therefore a second visiting meeting of the Economics Club of Rabochaya Gazeta's editorial board was held in Priluki. It was conducted jointly with the Chernigovskaya Obkom and the Priluki Gorkom of the Communist

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC 621.396.967

NOVOSELOVA, N. V., TKACHUK, A. A.

"Using a Radar Installation to Measure the Altitudes of Meteors"

Radiotekhnika. Resp. mezhved. nauch.-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1971, vyp. 1, pp 18-25 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11G47)

Translation: The paper describes the procedure and results of an airplane flight around antennas in the Khar'kov radar complex. A functional diagram of the flight is given as well as the radiation pattern of an antenna in the horizontal plane. The narrow width of the radiation pattern of the antenna is utilized to determine the angle of elevation of a reflecting point from the mirror-image condition when the coordinates of the radiant are known. Errors in altitude determination are ±8 km for existing errors in radiant coordinates and radiation pattern width. The altitude distribution of meteors is given by months for 1968 measurements. Four illustrations, bibliography of 7 titles. Resumé.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC 621.396.967

KASHCHEYEV, B. L., DELOV, I. A., DUBNIK, B. S., TKACHUK, A. A.

"A Radar Set for Studying Faint Meteors"

Radiotekhnika. Resp. mezhved. nauch.-tekhn. sb. (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1971, vyp. 16, pp 11-18 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11G45)

Translation: The paper describes a set of radar equipment with the capacity for registering reflections from meteor trails with a linear electron density down to 10^{11} electrons/meter. The equipment has been successfully used for a period of three years. A schematic diagram is given as well as specimens of photographic registrations. Two illustrations, bibliography of eight titles. Resumé.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

UNCLASSIFIED

TITLE--MECHANISM OF ELECTRICAL CONDUCTIVITY IN A CESIUM IODIDE CRYSTAL -U-

PROCESSING DATE--27NOV70

AUTHOR-(03)-PASHKOVSKIY, M.V., SPITKOVSKIY, I.M., TKACHUK, A.D.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(5), 1317-22

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--ELECTRIC CONDUCTIVITY, CESIUM, IODIDE, CRYSTAL, CRYSTAL IMPURITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1824

STEP NO--UR/0181/70/012/005/1317/1322

CIRC ACCESSION NO--AP0130654

UNCLASSIFIED

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

CIRC ACCESSION NO--AP0130654 UNCLASSIFIED PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TEMP. DEPENDENCE WAS INVESTIGATED OF ELEC. COND. OF CSI SINGLE CRYSTALS CONTG. COMBINED CATIONIC AND ANIONIC IMPURITIES, AS WELL AS THE EFFECT OF HIGH TEMP. ANNEALING IN VACUUM AND IN O ON THE COND. OF CSI WITH CATIONIC IMPURITIES, AND THERMAL CYCLE ON SPECIMENS WITH ANIONIC IMPURITIES. THE RESULTS CAN BE WELL EXPLAINED IN TERMS OF AN ANIONIC MECHANISM OF COND. IN CSI.

FACILITY: L'VOV. GOS. UNIV.IM. FRANKO, LVOV, USSR.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

TKACHUK, B.V., KOBAL', A.A.

UDC 621.382.002

"On The Possibility Of Using Thin Films Of Silicon Dioxide Prepared In A Glow-Discharge For Production Of Low-Temperature Semiconductor Devices"

Elektron. tekhnika. Nauch.-tekhn.sb. Kriogen. elektronika (Electronics Technology. Scientific-Technical Collection. Cyrogenic Electronics), 1971, Issue 1(3), pp 163-166 (from RZh:Elektronika i yeye primeneniye, No 10, Oct 1971, Abstract No 10B366)

[No abstract]

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APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

Microelectronics

UDC 621.59:621.315

TKACHUK, B.V., LAURS, YE.P., MIKHAL'CHENKO, V.I., PEROVA, L.V.

"Thin Polysilicone Films--New Insulating Material For Cyrogenic Electronics"

Dielektriki. Mezhved. nauch. sb. (Dielectrics. Interdepartmental Scientific Collection), 1972, Issue 2, pp 65-68 (from RZh:Elektronika i yeye primeneniye, No 8, August 1972, Abstract No 8A70)

Translation: Polysilicone films with a volume resistivity of 4 . (10^{14}-10^{15}) ohm. cm, a breakdown strength of 2 . 10^6 V/cm, a dielectric constant of 2.7--4.5, and a loss angle of (2.5 - 4.5) . 10^{-3} are prepared by polymerization of organo-silicon compounds in a glow-discharge plasma. The effects were studied of the conditions of preparation and the changes of temperature from room temperature to 4.2° K on the dielectric properties of polysilicone films. Conclusions are drawn concerning their suitableness for use as insulating layers and protective coatings during production of large integrated circuit. 2 ill, 7 ref. Summary

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Organometallic Compounds

USSR

UDC 678.84;539.531:621.3.011.5

TKACHUK, B. V., PEROVA, L. V., and KOLOTYRKIN, V. M., Scientific Research Physicochemical Institute imeni L. Ya. Karpov

"Dielectric Properties of Organosilicon Films and the Effect of γ-Radiation on Their Structures"

Moscow, Vysokomolekularnyye Soyedineniya, Vol 13, No 4, Apr 71, pp 828-832

Abstract: The dependence of dielectric properties of thin polysiloxane films on the conditions of their polymerization was studied. It was shown that the dielectric constant ε and the tangens of dielectric loss angle log σ are independent of the polymerization period; an increase in the density of the discharge current leads to an increased dielectric permeability. It was noted that at low temperatures the methylsiloxane polymer films exhibit a maximum relaxation value of tan σ. If the zone discharge is carried out in an argon atmosphere, the relaxation maximum shifts to higher temperatures. The effect of γ-radiation on the structure of thin organosilicon polymer films was studied by IR-spectroscopy; the films were prepared from hexamethyldisiloxane and ethyl(vinyl, ethynyl)silanes with a general formula $(C_2H_5)_3SiR$, where R = CH_2CH_3, $CH{:}CH_2$, $C{:}CH$. It was shown that polymer films γ-irradiated

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

TKACHUK, B. V., et al., Vysokomolekularnyye Soyedineniya, Vol 13, No 4, Apr 71, pp 828-832

with doses up to 250 Mrad underwent no structural changes. Doses in the range 250-400 Mrad caused a relative decrease in the number of methyl groups and an appearance of oxygenated groups such as CO and OH; the macromolecules became more crosslinked.

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1/2 023 UNCLASSIFIED

TITLE--PREPARATION OF SINGLE CRYSTALS AND STUDY OF THE CADMIUM IODIDE STANNOUS IODIDE SYSTEM BY FUSIBILITY AND ELECTRICAL RESISTANCE METHODS

PROCESSING DATE--11SEP70

AUTHOR--BELOTSKIY, D.P., NADTOCHIY, V.F., TKACHUK, L.F.

COUNTRY OF INFO--USSR

SOURCE--UKR. KHIM. ZH. 1970, 36(1) 30-3.

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--CHEMICAL SYNTHESIS, SINGLE CRYSTAL, ELECTRIC CONDUCTIVITY, GRAPHIC TECHNIQUE, SEMICONDUCTOR MATERIAL, IODIDE, TIN COMPOUND, CADMIUM COMPOUND

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CIRC ACCESSION NO--AP0107798

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CIRC ACCESSION NO--AP0107798 PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CDI SUB2, SNI SUB2 AND MIXTS. WERE PREPD. BY REACTION OF THE METAL OR METAL MIXT. AND I SUB2 IN SEALED AMPULS. THE AMPULS WERE HEATED IN TWO OVENS, ONE ABOVE AT A SOMEWHAT LOWER TEMP. AND A LOWER ONE AT A HIGHER TEMP. THE TEMPS. AND REGIME OF HEATING VARIED WITH THE METAL. SINGLE CRYSTALS WERE OBTAINED BY ZONE CRYSTN. THE CDI SUB2, SNI SUB2 SYSTEM HAS A EUTECTIC AT 70 MOLE PERCENT SNI SUB2, M. AT 305DEGREES. THE SOLY. OF TEMP. IS THAT OF SEMICONDUCTORS. GRAPHS ARE GIVEN AND ALSO GRAPHS OF RESISTANCE AGAINST COMPN. WHICH CHANGES MARKEDLY WITH THE PHASES PRESENT.

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UDC: 541.13

BELOTSKIY, D.P., NADTOCHIY, V.F., and TKACHUK, L.F., Chernovtsy State University Chernovtsy, Ministry of Higher Education Ukrainian SSR

"Production of Single Crystals and Investigation of the System CdI_2-SnI_2 by Fusibility and Electroresistance"

Kiev, Ukrainskiy Khimicheskiy Zhurnal, Vol 36, No 1, Jan 70, pp 30-33

Abstract: Using the Bridgeman method of directed crystallization the authors obtained monocrystalls of cadmium and tin iodides and their mixtures. The fusibility diagram was plotted from data obtained from thermal analysis. This diagram showed simple eutectics and a limited range of solid solutions. On the basis of temperature function and specific resistance data the authors showed that all fused materials had semiconducting properties. The resistance isotherms were typical of materials with limited solubility of the components and exhibited inflection points corresponding to phase separations of solid solution - mechanical mixture.

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TKACHUK, S. G.

"Local Limit Theorems Considering Great Deviations in the Case of Limiting Stable Rules"

Izv. AN UzSSR. Ser. Fiz.-Mat. N. [News of Academy of Sciences UzSSR. Physics-Mathematical Sciences Series], 1973, No 2, pp 30-33 (Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract No 9V12)

Translation: Let ξ_j, $j = 1, 2, \ldots$, be independent, identically distributed random quantities with distribution function $F(x)$, belonging to the area of normal attraction of the stable rule $G_\alpha(x)$ with index α. We will consider that either $0<\alpha<1$, or $1<\alpha<2$. In this latter case, we assume $M\xi_1=0$. We form the sum $\zeta_n = \xi_1 + \ldots + \xi_n$; suppose further $P_n(x,y) = P\{x \le \zeta_n < x + y\}$. This work presents the following results

Theorem 1. Suppose as $x \to \infty$, $0<c<y = o(x)$

$$P_1(x,y) \sim \frac{\alpha y P\{\xi_1 \ge x\}}{x} \qquad (1)$$

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TKACHUK, S. G., Iav. AN UzSSR. Ser. Fiz.-Mat. N., 1973, No 2, pp 30-33

Then where $xn^{-1/\alpha} \to \infty$, $0<c<y = o(x)$

$$P_n(x,y) \sim \frac{n\alpha y P\{\xi_1 \geq x\}}{x} \sim yn^{-1/\alpha} g_\alpha(xn^{-1/\alpha}),$$

where $g_\alpha(x) = G'_\alpha(x)$.

Theorem 2. Suppose random quantity ξ_1 has density $p_1(x)$ and as $x \to \infty$, $p_1(x) \sim cx^{-(1+\alpha)}$. Then where $xn^{-1/\alpha} \to \infty$,

$$p_n(x) \sim np_1(x) \sim n^{-1/\alpha} g_\alpha(xn^{-1/\alpha}),$$

where $p_n(x)$ is the density of the sum ζ_n.

Theorem 3. Suppose random quantity ξ_1 takes on only integer values and as $m \to \infty$, $P\{\xi_1=m\} \sim cm^{-(1+\alpha)}$. Then where $mn^{-1/\alpha} \to \infty$, $P\{\zeta_n=m\} \sim nP\{\xi_1=m\} \sim n^{-1/\alpha} g_\alpha(mn^{-1/\alpha})$.

2/2 Author's view

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USSR

UDC 577.153.3

BOLDYREV, A. A., PETUKHOV, V. B., PUTOV, V. B., SPIKKINA, G. D., and TKACHUK, V. A.

"Role of Acetylcholine and Imidazole-Containing Dipeptides in the Control of Cation Transport Through Muscle Membranes"

Ukrainskiy Biokhimicheskiy Zhurnal, Vol 43, No 1, 1971, pp 125-135

Abstract: Acetylcholine in the neuromuscular apparatus has an additional function to its synaptic effect: it acts on the enzymatic properties of extrasynaptic muscular membranes, sarcolemma and sarcoplasmatic reticulum. The effect of acetylcholine in combination with imidazole-containing compounds was studied. In particular, experimental data were collected on the effect of imidazole on contractile activity and the end plate potential of a nerve-muscle preparation from a frog, during rhythmic stimulation of a nerve. Experiments were conducted to determine the dependence of ATP-ase activity of heart muscle sarcolemma in a rabbit on the Na^+ : K^+ ratio, the effect of addition of $CaCl_2$ and EGTA [ethyleneglycol-bis(β-aminoethyl-ether'N,N-tetraacetate] on the hydrolysis rate of ATP and acetyl phosphate of cardiac sarcolemma and the skeletal muscle; the dependence of inhibition of Ca^{2+}-ATP activity on the concentration of acetylcholine or buffer

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BOLDYREV, A. A., et al., Ukrainskiy Biokhimicheskiy Zhurnal, Vol 43, No 1, 1971, pp 125-135

solution; and the effect of acetylcholine on Ca^{+} transport in a preparation of sarcoplasmatic reticulum of a rabbit in the presence of acetylcholine. Fatigue or blocking of neuromuscular transmission by competing toxins is reduced and eliminated by imidazole-containing dipeptides. As a result, an increase in amplitude of the end plate potential is observed and its transformation into an action potential is facilitated. Intensified, spontaneous bioelectrical activity at the myoneural junction. Enzymatic activity of sarcolemma and sarcoplasmatic reticulum transport ATP-ase is inhibited by acetylcholine but enhanced by imidazole and its derivatives. The synergistic effect of both dipeptides and acetylcholine is a more complete inhibition of active ion transport. Experimental data are reported on some mechanisms for the transfer of sacolemma excitation to the contraction process. Under the effect of acetylcholine, there may be a change in cation transfer. It is assumed that acetylcholine in combination with imidazole-containing dipeptides regulates the intensity and direction of cation transport through muscular membranes.

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Analysis and Testing

USSR

UDC 669.3:535.533.35

LOBODYUK, V. A., TKACHUK, V. K., and KHANDROS, L. G., Institute of Metal Physics, Academy of Sciences Ukrainian SSR

"Gamma'-Phase Crystal Morphology in a Cu-Al-Ni Alloy"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 33, No 2, Feb 72, pp 339-345

Abstract: A copper-base alloy containing 14.1% Al and 5% Ni with and M_s point close to room temperature was investigated with the aid of an electron microscope. It was found that the martensite crystals consist of two parts found in a twinned interrelationship where the twinning plane was (121) for the gamma'-phase. The crystal structure (thin twins, stacking faults) form simultaneously with the crystal formation. Between the $beta_1$- gamma'phase the following orientation relationship can be observed: $(101)_{\beta_1} // (001)_{\gamma}$, $[010]_{\beta_1} // [010]_{\gamma}$. Seven figures, 9 bibliographic references.

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USSR

UDC: 669.3.536.425

LOBODYUK, V. A., TKACHUK, V. K. and KHANDROS, L. G., Institute of Physics of Metals

"Martensite Transformation in Thin Films of Copper-Aluminum-Nickel Alloy"

Sverdlovsk, Fizika metallov i metallovedeniye, Vol 33, No 1, Jan 72, pp 137-143

Abstract: The growth and substructure formation of the γ' phase elastic crystals in thin films of a copper alloy with 14.1% Al and 5% Ni have been studied. The γ'-phase crystals in thin films are most commonly platetet-shaped, which is, apparently, advantageous for their growth and interaction with the surrounding matrix. There is no crystal growth in sections with a high dislocation density. To generate martensite crystal growth under the influence of stresses, the dislocations must be arranged in specific slip planes rather than chaotically. Ahead of the growing martensite phase crystals one observes a dislocation movement "leading" the trans-formation front which is most likely related to stresses with maximum values at the peak of the martensite crystsl. Unlike similar phenomena

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LOBODYUK, V. A., et al, Fizika metallov i metallovedeniye, Vol 33, No 1, Jan 72, pp 137-143

observed in twinning, there were no defects (dislocations or twins) in the initial β_1 phase near the growing crystals (along the interphase boundaries). This may be attributed to the fact the crystal growth occurs in a thin film. 5 illustrations, 10 bibliographic references

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USSR

TKALACH, O. B., SHUL'GINA, L. A. UDC: 8.74

"A Program for Solving Net-Point Problems With Integer Resources"

Leningrad, Perspektivy razvitiya i effektivn. elektroenergetich. mashin i sistem--sbornik (Prospects for Development and Effectiveness of Electric Power Machines and Systems--collection of works), "Nauka", 1973, pp 144-150 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V659 by the authors)

Translation: The paper describes a program for solving net-point problems with regard to integer resources of the "executive" type compiled in "Inzhener" autocode for the "Minsk-22" computer. Questions of cutting down computation time are briefly considered. Examples are given of time expenditures for solving these net-point problems.

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UDC 533.6.011.5:532.529.5

SALTANOV, G. A., TKALENKO, R. A.

"Supersonic Two-Phase Flow Over a Wedge"

Moscow, Mekhanika zhidkosti i gaza, No. 2, Mar/Apr 72, pp 83-88

Abstract: The equations describing the flow between the surface of a wedge and a shock wave as given by Krayko and Sternin and the characteristics method developed for flows of a mixture of a gas with particles of different kind in nozzles are used to study supersonic two-phase flow over a wedge. It is noted that one encounters such a flow in calculating flow around blades of the last stages of condensation turbines and in studying the motion of aircraft in cloudy conditions. In the latter case there occurs a change in the wave structure and interference picture of the flow around the aircraft that can lead to uncalculated modes of motion, in addition to erosion of the leading edges of the wing profiles. It is shown that the general picture of gas flow between the front of a shock wave and the surface of a wedge is qualitatively similar to the picture of flow upon the breakdown of thermodynamic equilibrium in a gas, such as vibrational relaxation and nonequilibrium chemical reactions. This picture

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SALTANOV, G. A., TKALENKO, R. A., Mekhanika zhidkosti i gaza, No. 2, Mar/Apr 72, pp 83-88

consists of a relaxation zone behind the front of the shock wave in which balancing of the velocities and temperatures of the gas and the particles and the entropy layer close to the surface of the wedge occurs.

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USSR

TKALENKO, V. G., AMARSKAYA, A. P., KOLODYAZHNYY, Yu. V., SADEKOV, I. D., MINKIN, V. I., and OSIPOV, O. A., Rostov-on-the-Don State University

UDC 547.279

"Synthesis and Physical Chemical Properties of Aromatic and Heterocyclic Derivatives of Tellurium. V. Investigation of the Complex Formation of $TeCl_4$ With Schiff's Bases"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 9, Sep 73, pp 1943-1947

Abstract: Novel complex compounds of $TeCl_4$ with benzalanilines and β-hydroxynaphtalanilines have been synthesized. On the basis of IR spectroscopic study of these complexes the conclusion was reached as to the localization of the coordination bond in azomethine molecules. It has been shown that the equimolecular complexes are energetically more feasible and their structures have been discussed. The heats of complex formation reactions are correlated with the substituent constants in the aldehyde (σ^+) and aniline (σ^o) nuclei of the azomethine molecules.

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USSR

GORCHAKOVA, L. I., TKALICH, O. B.

"Study of a Simple Algorithm for Solution of Network Problems with Integer Resources"

Perspektivy Razvitiya i Effektivn. Elektroenergetich. Mashin i Sistem [Prospects for Development and Effectiveness of Electric Power Machines and Systems -- Collection of Works], Leningrad, Nauka Press, 1973, pp 150-159 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V577, by the authors).

Translation: A network problem is stated with integer values of resources and duration of operations. The simplest approximate method is studied for solution of network problems of this type.

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USSR

UDC: 681.333

TKALICH, O. B.

"A Device for Solving PERT Problems"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 4, Feb 71, Author's Certificate No 292165, Division G, filed 1 Aug 68, published 6 Jan 71, p 132

Translation: This Author's Certificate introduces a device for solving PERT problems, e. g. of the "actuator" type. The device contains a controllable job duration generator, a controlled generator of the durations of job reserves, a controlled date generator, a cadence generator, a counter of job or reserve durations, a date counter, a completion counter, a board for display and storage of information, logic circuits and selector switches. As a distinguishing feature of the patent, the device is designed for determining the time parameters of jobs, and also for finding the distribution of resources and the length of the critical path for the job complex. The output of the controlled date generator is connected to the input of the date counter and to the input of the job or reserve duration counter. The outputs of the job or reserve duration counter and the date counter are connected to the inputs of the logic circuits of completion coincidences. The

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TKALICH, O. B., USSR Author's Certificate No 292165

outputs of these coincidence circuits are connected to the input of the completion counter, whose outputs are connected to the input of the cadence generator. The output of the cadence generator is connected to the input of the completion counter, whose first output is connected to the input of the date counter. Connected between the second output of the completion counter and the output of the date counter are logic coincidence circuits for jobs, reserves, resources and deadlines. The outputs of these coincidence circuits are connected to the signal and storage elements of the display board and to the resource counters.

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USSR

KALICH, O. B.

UDC 518.5:681.3.06

"Determination of Cost Curve of Project Using Special Electrical Model"

Kontrol', Upr. I Peredach. Inform., [Testing, Control and Transmission of Information--Collection of Works], Leningrad, Nauka Press, 1970, pp 116-122, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V669 by the author).

Translation: The problem is studied in the network statement, when each operation of a complex corresponds to two quantities: Its duration and a certain cost function. The possibility is demonstrated of solving this problem by an electrical model consisting of sources of current, voltage and diodes. The power developed inspections of the equivalent electrical circuit determines the corresponding solutions.

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USSR

TKALICH, P. P., All-Union Scientific Research Institute of Fiber Crops

UDC 632.952:632.7.78

"The Effectiveness of Methyl Bromide Against Hemp Leaf Roller Moths"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 10, No 5, 1972, pp 30-32

Abstract: Leaf roller moths reduce both the quantity and quality of the hemp harvest, as well as the harvest of seeds. Experiments using methyl bromide for leaf roller moth control were conducted at the Cherkassy hemp seed station and at the author's institute in Glukhov, Sumskaya Oblast. A total of 1,900 tons of seed were disinfected in all, and the optimal method involved fumigation at a temperature of 10-15° C 2-6 months before planting. Forty to forty-five grams of methyl bromide were used per cubic meter of chamber, even distribution of gas was accomplished by ventilation, 30-60 minutes of each 3 hours, then the seeds were decontaminated by 24-hour ventilation with water heating of the chamber. It was determined that seed sprouting was reduced 1-3% (with an allowed deviation of plus or minus 4%), and approximately 14.75 mg/kg bromide residue was deposited. Both of these side effects were considered insignificant in view of increased yields of hemp and improved quality. Fumigation at 10-15° C, with 40-45 grams of methyl bromide per cubic meter of the chamber, was recommended 2-6 months

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TKALICH, P. P., Khimiya v Sel'skom Khozyaystve, Vol 10, No 5, 1972, pp 30-32

before planting. Gasification should be continued for 18 hours, degasification for 24 hours.

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USSR

UDC:533.601.1

USTIMENKO, B. P., TKATSKAYA, O. S., YERSHIN, Sh. A.

"Some Results of Investigation of the Aerodynamics of a Twisted Gas Flame"

Probl. Teploenerg. i Prikl. Teplofiz. [Problems of Thermal Power Engineering and Applied Heat Physics -- Collection of Works], No 9, Alma-Ata, Nauka Press, 1973, pp 91-99 (Translated from Referativnyy Zhurnal Aviatsionnyye i Raketnyye Dvigateli, No 11, 1973, Abstract No 11.34.42, from the resume)

Translation: The regularities of development of turbulent twisted flames are studied with various values of the twisting parameter ($0.08 \geq S \geq 0.51$) and wake parameter ($0 \leq m \leq 1.0$). The axial and tangential velocity fields, excess static pressure field and excess temperature field are presented in detail. The results of experiments for a slightly twisted flame are compared with calculated values using the method of the equivalent problem from the theory of heat conductivity and agreement is good. 7 Figures; 4 Biblio. Refs.

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USSR

KIKVIDZE, Z. A., TKEMALADZE, N. T., CHAVCHANIDZE, V. V.

"Methods of Delineation of a Pattern by Means of Computers"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Patter Recognition and Graph Theory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 49-56 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V695 by V. Mikheyev)

Translation: Methods of solution of the following problem are studied. Suppose $\theta=\{\theta_i\}$ is a finite set of objects, in which the subdivision into classes of equivalence by condition R is defined. By R we mean similarity, i.e., objects with same nomenclature are considered to be equivalent or to be included in the same class. In this case, θ becomes the union of the intersecting classes $\theta=\bigcup_k S_k$, while the set of such classes is a factor-set in relationship to equivalence R. One and only one element of set θ/R corresponds to each element of set , but not vice versa. For each element $\theta_i \in \theta$, condition R allows us immediately to determine class δ_k, of which

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KIKVIDZE, Z. A., TKEMALADZE, N. T., CHAVCHANIDZE, V. V., Nekotor. zadachi raspoznavaniya obrazov i teorii grafov, Tbilisi, Metsniyereba Press, 1972, pp 49-56

θ_i is a representative, since each object corresponds the class of its nomenclature. Two methods of construction of θ/R by computer are presented.

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USSR

KURIDZE, M. V., TKEMALADZE, N. T.

UDC: 519.1

"On a Problem of Constructing a Tree With Two End Vertices and Minimum Length"

Tbilisi, Nekotor. zadachi raspoznavaniya obrazov i teorii grafov--sbornik (Some Problems of Pattern Recognition and the Theory of Graphs--colllection of works), "Metsnereba", 1972, pp 74-80 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V393 by I. Sigal)

Translation: The paper deals with the problem of constructing a tree on a set of trees $T = \{T_i\}$, $i = 1, 2, \ldots, k$, and on a set of isolated vertices $t = \{t_j\}$, $j = 1, 2, \ldots, m$. In order to construct a tree in the given problem without adding new vertices, it is necessary and sufficient to add $m+k-1$ edges without forming cycles. The paper poses the problem of constructing a tree such that the sum of the lengths of the added edges is a minimum.

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USSR

TKEMALADZE, N. T.

UDC: 519.1

"On Problems of Arranging Parameters"

Tbilisi, Nekotor. zadachi raspoznavaniya obrazov i teorii grafov--sbornik (Some Problems of Pattern Recognition and the Theory of Graphs--collection of works), "Metsnereba", 1972, pp 37-48 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V353 by Ye. Gonin)

Translation: For arranging a finite set of parameters P_i with values q_{ij} the author proposes using the relations of preference $\succ$ and equivalence $\sim$ introduced on the set of values of the parameters. Specifically, it is assumed that $P_\nu \succ P_\mu \Leftrightarrow \forall\alpha,\ \beta\,(q_{\nu\alpha} \succ q_{\mu\beta}) : P_\nu \sim P_\mu \Leftrightarrow \forall\alpha,\ \beta\,(q_{\nu\alpha} \sim q_{\mu\beta})$. The relation $\succsim$ is also introduced as intermediate between $\succ$ and $\sim$, but not as the disjunction of these relations (and this is done imprecisely). As one of the procedures for arranging the set M_i of values q_{ij} of parameters it is proposed that specialists construct groups of these values and assign to each q_{ij} the number m_{ij} -- the maximum of the volumes of groups containing q_{ij}; in the case where two m_{ij} are equal it is recommended that

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TKEMALADZE, N. T., Nekotor. zadachi raspoznavaniya obrazov i teorii grafov, "Metsnereba", 1972, pp 37-48

the minimum volumes of groups be used for them. In order to unite several sequences of the given parameters arranged by preference, it is proposed that the arithmetic averages of the numbers $K_\alpha = \sum_{i=1}^{t} r_{\alpha i} \bar{k}_{\alpha i}$ be used where t is the number of transitions in the sequence α from the first to the given parameter, $\bar{k}_{\alpha i}$ is equal to 1, 0, 1/2 for relations $\succ, \sim, \prec$ respectively, $r_{\alpha i}$ is a coefficient which expresses the degree of preference among adjacent parameters as given by specialists.

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TKEMALADZE, N. T., KURIDZE, M. V.

UDC: 519.1

"On a Problem of Constructing a Plane Connected Graph"

Tbilisi, Nekotor. zadachi raspoznavaniya obrazov i teorii grafov--sbornik (Some Problems of Pattern Recognition and the Theory of Graphs--collection of works), "Metsnereba", 1972, pp 68-73 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V392 by I. Sigal)

Translation: The authors consider an arbitrary finite graph G(V,E) where V is the set of vertices and E is the set of edges. The vertices of the graph $v_i \in V$ are points in a plane with coordinates (x_i, y_i), and the edges are segments of straight lines connecting the vertices of the graph. It is required to isolate the subset of vertices $V^* \subseteq V$ and to construct a plane connected graph $G^*(V^*,E^*)$ such that G^* has a unique finite bound, i. e. G^* is an elementary cycle; the resultant bound includes all vertices of the set $V \setminus V^*$ and its edge is a convex multiple-angle cycle. To solve this problem the authors use the well known algorithm of constructing a convex shell of a finite set of points $\{v_i\}$. this shell is a convex polygon of minimum perimeter, each vertex of which coincides with one

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TKEMALADZE, N. T., KURIDZE, M. V., Nekotor. zadachi raspoznavaniya obrazov i teorii grafov, "Metsnereba", 1972, pp 68-73

of the points from $\{v_i\}$, while all other points from $\{v_i\}$ fall inside the constructed polygon.

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USSR

CHAVCHANIDZE, V. V., TKEMALADZE, N. T.

"Installments Method for Estimation of Parameters of Objects"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Pattern Reconigition and Graph Tehory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 18-30 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V694 by V. Mikheyev)

Translation: The finite set of parameters $P=\{P_j\}$, $j=1, 2, \ldots, n$, is studied, characteristizing object θ_i, $i=1,2, \ldots, m$. It is assumed that there is an algorithm for identification of the objects, written according to the installments method. $P_j:P_j \in P$ is considered a basic parameter (i.e., a parameter, any value of which from the set $\theta=\{\theta_i\}$, $i=1,2,\ldots,m$ sets apart a set θ' in which the number of elements $m'<m$. According to the installments method, if the values of parameter $P_j \in P$, given in two mappings of objects θ_i and θ_x agree, the installment $\phi_i>0$ is written with possible change of these values -- introduction of possible change $\phi_j'>0$, while otherwise, we write the installment $\overline{\phi}_j>0$.

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CHAVCHANIDZE, V. V., TKEMALADZE, N.T., Nekotor. zadachi raspoznavaniya obrazov i teorii grafov, Tbilisi, Metsniyereba Press, 1972, pp 18-30

When the installments of all parameters $P_j \in P$ are established, the parameters themselves are estimated for solution of the problem of identification of the objects. In order to make the decision of identity of objects θ_i and θ_x, the identity installment Φ, i.e., the sum of the installments used in the investigation of all parameters $P_j \in P$, is compared with the limiting installment Φ_0. A method is described for estimating parameters in this sense, i.e., a method of establishment of the installments of parameters in the limiting installment Φ_0.

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USSR

CHAVCHANIDZE, V. V., TKEMALADZE, N. T.

"Method of Installments in the Problem of Identification of Objects"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Pattern Recognition and Graph Theory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 5-17 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V693 by V. Mikheyev)

Translation: An installments method is studied for solution of the following problem of identification of objects. A finite set of objects of the same class $\theta=\{\theta_i\}$, $i=1,2, \ldots, m$, is given. Each object is characterized by a certain set of parameters $P=\{P_j\}$, $j=1,2, \ldots, n$. The set of all possible values of parameter P_j is represented by Q_j. It is considered that a number of elements for all sets $Q_1, Q_2, \ldots, Q_n$ is the same. The value of the jth parameter of the ith object is represented as Q_{ij}. The set of specific values of parameters $\overline{Q}_i=q_{i1}, q_{i2}, \ldots, q_{in}$, where q_{ii} Q_i, q_{i2} Q_2, ..., q_{in} Q_n, is one of the specific realizations of object θ_i and

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CHAVCHANIDZE, V. V., TEKMALADZE, N. T., Nekotor. zadachi raspoznavaniy obrazov i teorii grafov, Tbilisi, Metsniyereba Press, 1972, pp 5-17

is called a message concerning object θ_i. Each object θ_i can be represented by a set of specific realizations $\theta_{ii}, \theta_{iz}, \ldots, \theta_{i\mu}$. This means that μ different messages can be produced concerning object θ_i. The problem is that of identification of realizations $\tilde{\theta}_{ix}$ with one of the realizations of the objects $\theta_1, \theta_2, \ldots, \theta_m$. 18 Biblio. Refs.

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USSR

TKEMALADZE, N. T.

"One Method of Evaluation of Characteristics"

Nekotor. zadachi raspoznavaniya obrazov i teorii grafov [Some Problems from Pattern Recognition and Graph Theory -- Collection of Works], Tbilisi, Metsniyereba Press, 1972, pp 57-62 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V692 by V. Mikheyev)

Translation: The following problem is studied. Suppose $Q=\{q_1, q_2, \ldots, q_n\}$ is a finite set of characteristics, in which set Q' of subsets $Q_j \subset Q$, j=1, 2, ..., m is constructed, unambiguously defining the corresponding patterns $s_1, s_2, \ldots, s_l \in s (l \leq m)$. Thus, each Q_j is a description (transform) of pattern s_i, while each s_i corresponds to more than one description, composed using the characteristics from set Q. Sets $Q_1, Q_2, \ldots, Q_m$ reflect the learning transforms. Q' must be constructed so that all possible descriptions $\forall s_i : s_i \in s$ are elements of Q'. It is noted that $\forall q_\nu : q_\nu \in Q$ can be looked upon

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Tbilisi, Metsniyereba Press, 1972, pp 57-62

either as a quantitative or as a qualitative characteristics of the corresponding pattern. If $\forall q_\nu : q_\nu \in Q$ is a quantitative characteristics, the space of characteristics can be looked upon as a Euclidian space with Euclidian metrics. Having the metrics, it is easy not only to compare characteristics with each other, but also to estimate. However, since $\exists q_\nu : q_\nu \in Q$, which is not a quantitative characteristic, it is very difficult introduce a metrics for the space of characteristic Q. A method is suggested for estimating the characteristics of set Q, allowing this difficulty to be overcome.

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USSR

TKEMALADZE, N. T.

UDC 8.74

"A Procedure for Introducing a Quantitative Characteristic for Evaluating Attributes"

Soobshch. AN GruzSSR (Reports of the Georgian SSR Academy of Sciences), 1972, Vol 66, No 3, pp 557-560 (from RZh-Kibernetika, No 12, Dec 72, Abstract No 12V514)

Translation: A criterion is proposed for evaluating a set of attributes in which a set of subsets is constructed which uniquely define the patterns corresponding to them. The "length" of the attribute with respect to the pattern is taken as such a criterion, and the distance between the attributes is taken as the criterion for evaluating the similarity of the attributes. The procedure for calculating the "length" of the attribute and the distance between attributes is described. It is noted that by calculating the distance between the training images of one and the same pattern, it is possible to define the limiting distance which offers the possibility of establishing to what pattern the tested image belongs.

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USSR

UDC 547.944/945

TKESHELASHVILI, E. G., ISKANDAROV, S., MUDZHIRI, K. S., and YUNUSOV, S. YU., Institute of Pharmacolofy imeni I. G. Kutateladze, Georgian Academy of Sciences, and Red Banner of Labor Institute of Plant Chemistry, Georgian Academy of Sciences

"Alkaloids of Leontuce Smirnovii"

Tashkent, Khimiya Prirodnykh Soyedineniy, No 4, 1971, pp 539-540

Abstract: Leontuca Smirnovii (Berberidaceae family), widely distributed in the Georgian SSR, is a very rich source of alkaloids, chloroform extraction of the root mass yielding 4%. Paper and thin-layer chromatography have revealed the presence of eight different alkaloids in this plant.

The authors were able to separate chemically three of these alkaloids from the oots of L. S., belonging to the diphenyl, pavine and quinolizidine groups. Treating a chloroform extract with 5% sulfuric acid produced grayish sulfate crystals, which charred above 360°C; direct comparison of the melting points of mixed samples and infrared spectra of the base with those of taspine, established the identity of the two.

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UNCLASSIFIED

TITLE--STRUCTURE AND PROPERTIES OF BERYLLIUM BRONZE MICROALLOYED WITH MAGNESIUM -U-

PROCESSING DATE--11SEP70

AUTHOR--TKHAGAPSOYEV, KH.G., RAKHSHTADT, A.G., PASTUKHOVA, ZH.P., KARPOV, A.G.

COUNTRY OF INFO--USSR

SOURCE--METALLOVED. TERM. OBRAB. METAL. 1970, (2), 19-24

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--BRONZE, BERYLLIUM CONTAINING ALLOY, MAGNESIUM CONTAINING ALLOY, ALLOY DESIGNATION, X RAY ANALYSIS, ELECTRIC RESISTANCE, MECHANICAL PROPERTY/(U)B2 BERYLLIUM BRONZE, (U)BNT19 BERYLLIUM BRONZE

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CIRC ACCESSION NO--AP0106077 UNCLASSIFIED PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COLD ROLLED B2 AND BNT1.9 BE BRONZES CONTG. MG 0.05-0.10, AND P 0.02-0.1PERCENT (B2 BRONZE ONLY), AND THOSE WITHOUT MG AND P WERE QUENCHED FROM 780-820DEGREES AND AGED AT 280-360DEGREES FOR 0.5-10 HR. DISTRIBUTION OF TI, NI, AND MG WAS DETD. BY THE X RAY ANAL., AND THE AGING KINETICS WAS STUDIED BY DETG. CHANGES OF HARDNESS, ELASTIC LIMIT SIGMA SUB0.002, AND ELEC. RESISTANCE. THE RELAXATION STABILITY WAS DETD. BY THE LONGITUDINAL BEND TESTS AT 10 PRIME4 CYCLES, 65 AND 45 KG-MM PRIME2, AND UNDER STATIC LOAD OF 55 KG-MM PRIME2 AT 20 AND 100DEGREES, FOR 3500 AND 150 HR, RESP. ADDN. OF MG SMALLER THAN OR EQUAL TO 0.1PERCENT SIGNIFICANTLY IMPROVES MECH. PROPERTIES OF BRONZES. THE SIGMA SUB0.002 INCREASED FROM 58-63 FOR BRONZE WITHOUT MG TO 73-8 KG-MM PRIME2 FOR THE ONE CONTG. MG, THE FINAL DEFORMATION DEGREE AFTER 10 PRIME4 CYCLES DECREASED FROM (5-6.3) TIMES 10 PRIME NEGATIVE3 TO (2.5-2.6) TIMES 10 PRIME NEGATIVE3PERCENT AT 65 KG-MM PRIME2, AND FROM (1.72-2.9) TIMES 10 PRIME NEGATIVE3 TO (1.17-1.4) TIMES 10 PRIME NEGATIVE3PERCENT AT 45 KG-MM PRIME2, AND THAT UNDER THE STATIC STRESS OF 55 KG-MM PRIME2 DECREASED FROM (4.8-5.65) TIMES 10 PRIME NEGATIVE3 TO (2.34-2.42) TIMES 10 PRIME NEGATIVE3PERCENT AT 20DEGREES, 3500 HR, AND FROM 8 TIMES 10 PRIME NEGATIVE3 TO 4.2 TIMES 10 PRIME NEGATIVE3PERCENT AT 100DEGREES, 150 HR. MG INCREASES DISPERSITY AND HOMOGENEITY OF THE BRONZE STRUCTURE. THE MEAN ALPHA SOLID SOLN. GR. IN DIAM., MEASURED AFTER 15 MIN OF HEATING AT 720-820DEGREES AND QUENCHING, DECREASED FROM 0.03 TO 0.025 MM AT 720DEGREES AND FROM SIMILAR TO (0.08-0.09) TO SIMILAR TO (0.065-0.07) MM AT 820DEGREES.

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CIRC ACCESSION NO--AP0106077 UNCLASSIFIED PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--THESE EFFECTS ARE ATTRIBUTED TO THE ADSORPTION OF MG ON THE INTERPHASE SURFACES AND AT THE GRAIN BOUNDARIES. NO CHANGES OF ELEC. RESISTANCE AND NEGLIGIBLE ONES OF HARDNESS WERE OBSD. FURTHERMORE, IT WAS CALCD. THAT P INCREASES THE AGING ACTIVATION ENERGY OF THE B2 BRONZE AT 280-360DEGREES FROM 24-6 TO 32-5 KCAL-MOLE. P ATOMS FORM COMPLEXES WITH VACANCIES AND DIMINISH THEIR MOBILITY. THE QUENCHING FROM 770DEGREES AND AGING AT 320DEGREES FOR 6 HR IS RECOMMENDED AS THE OPTIMUM HEAT TREATMENT OF THE BNT1.9 AND B2 BRONZES - CONTG. MG. J. PIETKIEWICZ.

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USSR

UDC: 539.210.2:537.311

SEVERDENKO, V. P., LABUNOV, V. A., TKHAREV, Ye. Ye., and KAZANTSEV, A. P.

"The Two-Temperature Method for Determining the Parameters of the Potential Barrier in Tunnel Metal-Dielectric-Metal Structures"

Tomsk, Izvestiya VUZ--Fizika, No 5, 1973, pp 145-147

Abstract: This brief communication proposes a method for measuring the height of potential barriers in asymmetrical MDM tunnel structures and for determining the barrier heights at the dielectric-metal junction interfaces. The authors claim the advantages of high precision and short measurement time for their method. A mathematical analysis is given, beginning with the Stratten equation for the voltampere characteristic of tunnel structures (R. Stratten, J. Phys. Chem. Solids, vol 23, p 1177. 1962).

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USSR

TKHAREV, Ye. Ye. and FEDOROV, F. I., Minsk Radiotechnical Institute

"Partial Wave Analysis on the Basis of Complex Vector Parametrization"

Moscow, Teoreticheskaya i Matematicheskaya Fizika, Vol 7, No 3, Jun 71, pp 322-331

Abstract: Using the base of a complex vector parametrization of the Lorentz group, the authors give a partial analysis of one- and two-particle states. By interpreting the transformations of the small group, within the framework of such an approach, as rotations in the respective complex three-dimensional space of parameters of this group, the authors find it is possible to conveniently construct states of a two-particle system with certain values of the total moment and its projections. On this basis they expand the scattering matrices over partial waves. Beginning with unitary representations of the Poincaré group, wherein they present a theorem covering such case, the authors continue on to analyzing the one-particle state and the two-particle state. In each instance they support their findings mathematically. The article contains a bibliography of 12 titles.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC 517.544

TKHELIDZE, M. G., Computer Center, Academy of Sciences, Georgian SSR

"The Schwartz Method of Solving the Dirichlet Problem for One System of a Particular Type of Second-Order Differential Equations"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 63, No 3, Sep 71, pp 545-548

Abstract: The author shows the feasibility of using the Schwartz method for integration of a system of equations

$$\sum_{i,k=1}^{n-1}{}^{i,k\neq t} a_{tt}(x)(u''_{x_i x_t}+u''_{x_k x_t})+a_n(x)u''_{tx_n x_n}+\sum_{i,k=1}^{n-1}{}^{i,k\neq t\ i\neq k} a_{t,t+1}(x)(u''_{x_i x_k}+$$

$$+u''_{x_t x_k})+\sum_{i,k=1}^{n-1}{}^{i,k\neq t} b_{t,t+1}(x)(u'_{x_i}+u'_{x_k})+\sum_{i=1}^{n-1} b_{tt}(x)u'_{tx_t}+b_n(x)u'_{tx_n}+$$

$$+\sum_{i=1}^{n-1} c_t(x)u_t=0\ (t=1,\ldots,n-1),\ (x=x_1,x_2,\ldots,x_n) \qquad (1)$$

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TKHELIDZE, M. G., Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 63, No 3, Sep 71, pp 545-548

for all $x \in D$. He proves that the problem can be replaced by a Dirichlet problem for one homogeneous, elliptic-type, second-order partial differential equation. The author uses two theorems: (I) A region of space is given and the solution to system (1) must be found under certain boundary conditions, from which solution to the problem there follows the existence of a solution to problem

$$\sum_{i,k=1}^{n} A_{ik}(x) u''_{x_i x_k} + \sum_{i=1}^{n} B_i(x) u'_{x_i} + C(x) u = 0 \qquad (4)$$

under other boundary conditions. (II) From the uniqueness of the solution to the problem there follows the uniqueness of the solution to the other problem, for the boundary condition $u|_S = \varphi$, where

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UDC 517.544

TKHELIDZE, M. G., Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 63, No 3, Sep 71, pp 545-548

$$A_{ii} = \sum_{l=1}^{\substack{l\neq i\\ n-1}} a_{il}, \quad A_{ni} = 0, \quad A_{nn} = a_n \quad (i = 1, 2, \ldots, n-1),$$

$$A_{ik} = \sum_{l=1}^{\substack{i\neq k \quad i,k\neq l\\ n-1}} a_{il,\,l+1}, \quad C = \sum_{l=1}^{n-1} c_l, \quad B_n = b_n$$

$$B_i = \sum_{l=1}^{\substack{l\neq i\\ n-1}} b_{l,\,l+1} + \sum_{l=1}^{n-1} b_{il}, \quad \varphi = \sum_{l=1}^{n-1} \varphi_l, \tag{5}$$

and vice versa. The article contains 3 bibliographic entries.

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"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC 612.741+154.2

VINOGRADOVA, O. L., KOTS, Ya. M., RODIONOV, I. M., and TKHOREVSKIY, V. I., Chair of Human and Animal Physiology, Soil Biology Faculty, Moscow State University; Chair of Physiology, State Central Institute of Physical Culture; and Department of Labor Physiology, Institute of Labor Hygiene and Occupational Diseases, Academy of Medical Sciences SSSR, Moscow

"Independence of an Emotionally Induced Increase in Muscle Work Capacity From the Blood Flow Through Working Muscles"

Leningrad, Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 5, 1973, pp 781-788

Abstract: Measurements were made on young human subjects instructed to compress the handle of a fist dynamometer for as long as possible while performing mental calculations of mathematical problems presented at 3-sec intervals, with the time allowed for each problem indicated by light flashes and the beat of a metronome. The results revealed that emotional excitation increases the endurance of working muscles by about 50% on the average and accelerates blood flow through resting muscles (plethysmographic measurement). However, there is no increase in blood flow through the working muscles when the force of contraction is 60% of the maximum force that can be generated voluntarily. Similarly, the endurance of working muscles is increased by 40% and 30%

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VINOGRADOVA, O. L., et al., Fiziologicheskiy Zhurnal SSSR imeni I. M. Sechenov, Vol 59, No 5, 1973, pp 781-788

respectively when the effort is only 30% of the maximum but an increase in blood flow is prevented by partial occlusion of the brachial artery or the flow is arrested by complete occlusion of that vessel. The emotionally induced cholinergic discharge by the sympathetic system not only causes vasodilation in resting muscles but also stimulates glycolysis, production of lactic acid, and activation of phosphorylase. It is therefore concluded that the emotionally induced increase in muscle capacity to do static work is due to an augmented anaerobic metabolism in muscle tissue and is independent of the blood flow prevailing in the working muscles.

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USSR UDC 612.744+612.825.4

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BERDINA, N. A., KOLENKO, O. L., KOTS, YA. M., KUZNETSOV, S. P., RADIONOV, I. M., SAVCHENKO, A. P., and TKHOREVSKIY, V. I., Department of Human and Animal Physiology, Biology-Soil Faculty, Moscow State University; Physiology Department of Roentgenology and Radiology, First Moscow Medical Institute; Physiology of Work Section, Institute of Industrial Hygiene and Occupational Diseases, Academy of Medical Sciences USSR, Moscow

"Efficiency and Blood Supply of Skeletal Muscles During Emotional Stress Induced by Mental Arithmetic"

Leningrad, Fiziologicheskiy Zhurnal SSR imeni I. M. Sechenova, No 4, 1971, pp 546-555

Abstract: Emotional stress arizing from mental addition and subtraction produced in most human subjects an increase in the volumetric blood flow rats (by 85% on the average) in resting muscles of the forearm. When mental arithmetic was combined with voluntary muscular exertion (on a squeeze dynamometer) or isometric contraction of the antebrachial muscles elicited by electric stimulation of the nerve, muscular performance increased by 46 and 155%, respectively. This happened in only those subjects in whom mental

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USSR

BERDINA, N. A., et al., Fiziologicheskiy Zhurnal SSR imeni I. M. Sechenova, No 4, 1971, pp 546-555

arithmetic intensified the blood flow in resting muscles. Intraarterial injection of atropine markedly slowed the increase in rate of blood flow in resting muscles due to mental arithmetic. It also reduced the length of time exertion on the squeeze dynamometer could be sustained. Stress-induced muscular efficiency is ascribed to increased blood flow not in the working muscles but in the resting muscles as a result of change in muscle metabolism brought about by the sympathetic nervous system.

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JPRS 58208
6-73

5

XIV-8. STUDY OF THE MORPHOLOGY OF THE GROWTH OF EPITAXIAL FILMS BY THE ELECTRON DIFFRACTION METHOD

[Article by R. I. Polodin, S. B. Svechnikov, N. M. Torchun, Yu. A. Tkhorik, Yu. M. Shwaffa, Kiev; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 200]

In this paper it was demonstrated that the electron-microscope study of the film surface by the replica method can turn out to be inadequate to obtain unique conclusions regarding the morphology and mechanical growth of a film. The most complete information about the growth process is given by the complex use of electron diffraction and electron microscopy in different stages of growth beginning with thicknesses of several tens of atomic layers. The application of the indicated methods to the study of epitaxial films of germanium on substrates of silicon and gallium arsenide permitted detection of the morphological peculiarities of the film growth.

THORIK, Yu. A.

APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8"

"APPROVED FOR RELEASE: 09/01/2001 CIA-RDP86-00513R002203320001-8

USSR

UDC: 539.216.22:546.289

KLIMENKO, A. P., MATVEYEVA, L. A., TKHORIK, Yu. A., CHERNAYA, N. S., Institute of Semiconductors, Academy of Sciences of the UkrSSR

"Investigation of Vacuum Condensates of Germanium on Insulating Substrates"

Kiev, Poluprovodnikovaya Tekhnika i Mikroelektronika, Resp. Mezhved. Sb., No 7, 1972, pp 41-47

Abstract: A comprehensive study is made of the electric (conductivity and Hall effect over a broad temperature range), optical (infrared spectrum in the 5-15 μ region and the natural absorption edge), surface (stationary and impulse field effects) and structural properties of germanium films on semi-insulating gallium arsenide and ferroelectric $Ba_xSr_{1-x}TiO_3$. An investigation is made of the influence which certain technological factors, the thickness of the film and the type of substrate have on its above mentioned properties. The authors discuss the possibility of existence of an impurity band formed by deep acceptor levels in germanium films.

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KLOCHKOV, V. P., GRIGOR'YEV, O. N., POLUDIN, V. I., SOLDATENKO, N. N., TORCHUN, N. N., and TKHORIK, Yu. A.

"Preparing and Investigating Germanium-Silicon Heterosystems"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No. 6, 1971, pp 24-30

Abstract: Experiments are described for investigating the heteroepitaxial growth and quality of germanium films deposited on silicon substrates by a molecular beam in a vacuum. The results obtained by these experiments are compared with those found earlier in experiments with Ge-GaAs systems used as models of heterojunctions made of semiconductor pairs with very similar crystallographic parameters, such as Ge-GaAs, or very different parameters, such as Ge-Si. The method of diffraction of fast electrons in reflection and electron microscopy, as well as double crystal spectrometry and x-ray topographical pictures by the Berg-Barrett method are used. The temperature of the silicon substrates varied from 240 to 800° C and the condensation rate from 3 to 4000 Å per second. The vacuum was maintained in the limits of 1 to 5·10-5 mm Hg and the film thickness varied from tens of angstroms to tens of microns. The authors are connected with the Semiconductor Institute, Ukrainian Academy of Sciences.

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KLOCHKOV, V. P., GRIGOR'YEV, O. N., POLUDIN, V. I., SOLDATENKO, N. N., TORCHUN, N. M., TKHORIK, YU. A.

"Obtaining and Studying the Germanium-Silicon Heterosystem"

Kiev, Poluprovodnikovaya tekhnika i mikroelektronika, No 6, 1971, pp 24-30

Abstract: A study was made of the heteroepitaxial growth and degree of perfection of germanium films deposited from a molecular beam in a vacuum on substrates made of silicon. The previously obtained results for the Ge-GaAs system [A. P. Klimenko, et al., Protsessy rosta i struktura monokristallicheskikh slovev poluprovodnikov, Part 1, Nauka Press, Novosibirsk, 478, 1968] are presented for comparison. The indicated systems were used as models of heterojunctions in which the semiconductor pairs are either very close with respect to crystallographic parameters (Ge-GaAs) or these parameters are essentially different (Ge-Si). The crystal structure, mechanism of nucleation and growth and structural defects are studied. The mechanism of occurrence of twins in the germanium films on (100) silicon is discussed. On GaAs substrates in the initial stages of nucleation there is a tendency toward the formation of flat (platelike) nuclei, the tangential growth rate of which turns out to be appreciably higher than the normal growth rate. The germanium films have a

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