

USSR

UDC: 533.657/.661.013

ALEKSANDROV, G. V., KUZMAK, G. Ye.

"On Calculating the Static Stability of Aircraft at Large Angles of Attack"

Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of Central Aero-hydrodynamics Institute), 1972, 3, No 1, pp 38-44 (from RZh-Mekhanika, No 5, May 72, Abstract No 5B402)

Translation: The authors consider the problem of calculating the static stability of an airplane for various positions of the center of gravity. A formula is derived which relates the increment in the aerodynamic moment to the increment in the aerodynamic force and the position of the meta-center. Most emphasis is given to the case where the range of angles of attack considered includes supercritical angles. It is shown that in such cases, the zone of positions of the center of gravity at which the aircraft is stable over the entire range of angles of attack under consideration is either limited or completely nonexistent. In the case of limited dimensions of this zone, an attempt to increase the static stability of the craft by shifting its center of gravity forward as is done for small angles of attack may lead to the reverse effect. Resumé.

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USSR

UDC 621.315.1027.89

ALEKSANDROV, G. N., Doctor of Technical Sciences, Professor, Leningrad Order of Lenin Polytechnic Institute imeni M. I. Kalinin

"Problems of Long-Distance Electric Power Transmission"

Minsk, Izvestiya vysshikh uchebnykh zavedeniy, Energetika, No 8, 1972, pp 3-7

Abstract: The need for expansion of the long-range electric power transmission lines in the USSR and the problems involved in doing this are discussed. The specific territorial and natural conditions of the Soviet Union make it expedient to create overhead DC electric power transmission lines to several thousands of kilometers long with a carrying capacity to 10-25 gigawatts per circuit. This carrying capacity is provided with a rated voltage of 1,200-2,000 kv which will become possible in the next decades.

The carrying capacity of the lines can also be increased by phase convergence on the lines and increase in the splitting radius of the wires. For the actual structural designs of the electrodes on the electric power transmission lines, the electric strength of the line and substation insulation is appreciably higher than was assumed earlier. Measures are also needed to limit the biological effect of the electric field of the power lines by restricting the territory along the lines with exceptionally high field intensities.

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UDC 539.26

USSR

GUSEV, A. I., ALEKSANDROV, G. G., and STRUCHKOV, Yu. T., Institute of Metal Organic Compounds, Academy of Sciences USSR

"Crystalline and Molecular Structure of Hydrido-Formiato-tris-(triphenylphosphine)ruthenium (II) -- (II)Ru(OOCH)(PPh₃)₃"

Moscow, Zhurnal Strukturnoy Khimii, Vol 14, No 4, Jul/Aug 73, pp 685-691

Abstract: The x-ray structural analysis was carried out of the complexes (H)Ru(OOCH)(PPh₃)₃ which crystallized in monoclinic syngony $a = 20.272$, $b = 14.260$, $c = 20.944 \text{ \AA}$, $\beta = 122^\circ 46'$, $Z = 4$. The Ru atom exhibits a highly skewed octahedral coordination. The formate ligand is coordinated by two O atoms, one of which -- O (1) -- is located trans to the hydride H atom, which could not be identified by x-ray. The distance Ru-O(1) of 2.29 Å is greater than the distance R-O(2) of 2.23 Å to the second oxygen atom, trans located to the P (3) of the triphenylphosphine ligand. The distance Ru-P(3) of 2.274 Å in its turn is considerably smaller than the distance Ru-P(1) and Ru-P(2) 2.350 and 2.364 Å to the P atoms of the other two triphenylphosphine ligands in trans position to each other.

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2/2 024

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0130991

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS SHOWN THAT THE PULSED VOLTAGE REGULATOR OF THE STABILIZER CAN BE REPRESENTED APPROXIMATELY AS A CONTINUOUS LINEAR STABILIZER ELEMENT, WHILE THE FAST RESPONSE PULSE WIDTH MODULATOR, DEPENDING ON THE OPERATING REGIME, CAN BE REPRESENTED AS A LINEAR INERTIAL ELEMENT OR AS A RELAY ELEMENT WITH PURE RANDOM DELAY. THE EQUATION OF STABILIZER DYNAMICS FOR SMALL INCREMENTS OF THE INPUT VOLTAGE IS PRESENTED AND THE FACTORS WHICH INCREASE THE STABILIZATION FACTOR IN THE STEADY STATE REGIME ARE DISCLOSED. THE OPERATING REGIME OF THE STABILIZER WITH STEP FUNCTION CHANGE OF THE INPUT VOLTAGE IS EXAMINED. EXPRESSIONS ARE WRITTEN FOR THE MAXIMAL DYNAMIC INSTABILITY (FOR ONE TIME COMMUTATION OF THE LOAD OR PART OF THE LOAD) AND FOR THE DYNAMIC PULSATION OF THE OUTPUT VOLTAGE (FOR PERIODIC LOAD COMMUTATION). THE BASIC THEORETICAL ASSUMPTIONS AND RELATIONS ARE CONFIRMED EXPERIMENTALLY.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--DYNAMIC CHARACTERISTICS OF PULSED DC VOLTAGE STABILIZERS WITH PULSE
WIDTH REGULATION -U-
AUTHOR--(02)-ALEKSANDROV, E.I., SIVAKOV, A.R.

COUNTRY OF INFO--USSR

SOURCE--ELEKTRICHESTVO (ELECTRICITY), 1970, NO 1, PP 60-65

DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--VOLTAGE STABILIZER, PULSE WIDTH MODULATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3004/0258

STEP NO--UR/0105/70/000/001/0060/0065

CIRC ACCESSION NO--AP0130991

UNCLASSIFIED

USSR

UDC 669.71.472(088.8)

ALEKSANDROV, D. P.

"Electrolyzer Cover With Multi-Section Electrodes for the Production and Refining of Aluminum"

USSR Author's Certificate No 258608, Filed 11/03/68, Published 17/04/70, (Translated from Referativnyy Zhurnal-Metallurgiya, No 2, 1971, Abstract No 2 G156 P)

Translation: To improve the sealing of an electrolyzer and increase the heat resistance of the cover, the gas collector is made as a tube with wedge-shaped intake slits and is articulated to the gas exhaust tube, while the rotating covers of the inclined planes are equipped with additional side covers and made of a heat-resistant material.

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USSR

UDC 669.71.472(088.8)

ALEKSANDROV, D. P.

"Aluminum Electrolyzer Gas Evacuator"

USSR Author's Certificate No 269494, Filed 31/05/65, Published 28/07/70
(Translated from Referativnyy Zhurnal-Metallurgiya, No 2, 1971, Abstract
No 2 G154 P)

Translation: To assure more complete trapping of gases and to decrease the size and metal content of an electrolyzer gas evacuator, the latter is equipped with a second gas trap stage consisting of an even-pumping collector closed around the entire perimeter of the anode. The second stage is connected to a gas collector consisting of tilting gates articulated to the anode jacket of the electrolyzer by means of tubes and air lines with intake apertures distributed evenly over the area of the liquid anode layer. The collector system is combined with the metal structure of the anode jacket of the electrolyzer, and the telescopic electrical insulating connection of the second stage gas evacuator is combined with the nonmoving line of the gas purification device by electrical insulating rings fastened by flanges to the nonmoving tube.

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5 PPS 592CS
6-73

ALEKSANDROV, D.N.

I-8. STATISTICS OF THE INITIAL STAGE OF THE FORMATION OF THE CRYSTALLIZATION CENTERS

[Article by D. N. Aleksandrov, B. I. Kiyarov, Novosibirsk, Nevesthinsk, III Sibirskiy nauchnyy tsentr, Poluprovodnikovyye Kristally, Perm, Kuzbass, 1971, June, 1971, p.10]

In thermodynamic and fluctuation theory, the formation of the crystallization centers is considered as a random process. Therefore, the complete quantitative description of the crystallization laws requires knowledge of the corresponding statistical-probability characteristics reflecting the effect of the external factors and the characteristic features of nucleation. The further development of the mathematical theory of the nucleus formation process as a random process has been carried out. Considering the basic principles of the theory of stochastic processes, the theory of procedural statistics and the thermodynamic theory of nucleus formation, a study was made of the statistical laws of homogeneous and heterogeneous nucleation of the solid phase in supercooled melts and supersaturated solutions.

A probability theory analysis is performed of the type of distribution function of the waiting time for the appearance of the first crystallization center in the procedure of experimental research with one and many samples. In the case of variable and constant supersaturation, in the presence of heterogeneity in the melt, nonstationarity and the nonisothermal nature of the process. The effect of the mechanism of nucleus formation on the type of distribution function and also the dependence of the kinetic parameters of the process defined from the distribution function of the incubation periods of crystallization on the external conditions are discussed. The investigated mathematical models are compared with the experimental data with respect to nucleus formation statistics and solutions and melts of different substances.

USSR

UDC: 621.372.41

ALEKSANDROV, B. V., PYATOSHIN, P. M.

"A Device for Precision Tuning of Evacuated Quartz Resonators"

USSR Author's Certificate No 269236, filed 15 Nov 63, published 30 Oct 70
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6V447 P)

Translation: A device is proposed for precision tuning of evacuated quartz resonators. The device contains a thermostatically controlled cabinet for accommodation of the resonators being tuned, a unit for applying voltage to an auxiliary electrode introduced into the evacuated resonator tank, a frequency meter, and an actuating unit. For the purpose of automatically controlling the direction of adjustment and automatically connecting the next resonator to the tuning module, the frequency meter is made in the form of three discriminators connected in parallel, the inputs of the discriminators being connected to a mixer which combines the frequency of the reference oscillator with that of an oscillator stabilized by the resonator being tuned, while the discriminator outputs are connected to a mismatch indicator switch and an adjustment polarity switch connected to the actuating unit which is equipped with a commutator for the resonators located in the thermostatically controlled cabinet.

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USSR

BANAS, F. P., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, 1971, pp 6-11

fibers. The width of the transition zone is approximately ten times greater for molybdenum fibers than for tungsten fibers. The solubility of molybdenum in both matrices is considerably higher than that of tungsten. The degree of dissolution of tungsten fibers is considerably lower in the VZh98 matrix containing tungsten than in the tungsten-free KhN78T matrix. The solubility of molybdenum fibers is approximately the same in both matrices. The regularities of the interdiffusion between fibers and matrix in nickel-chromium materials reinforced with molybdenum and tungsten fibers make it possible to select the fiber diameter and the thickness of the outer protective layer of the matrix in relation to the required temperature and service life.

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USSR

BANAS, F. P., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, 1971, pp 6-11

W, 56% Ni, 1% the balance) are used as the matrix material, 0.2-0.5-mm-diameter molybdenum and tungsten wire gauze as the reinforcement. The described method permits the fabrication of compact materials.

A white unetched zone is formed at the "fiber-matrix" interface. This zone apparently is a solid solution of chromium based on the intermetallides WNi_4 and $MoNi_n$. The hardness of the zone is greater than that of the fiber and matrix. The distribution of tungsten, molybdenum, nickel, and chromium along the width of the transition zone shows that the total interdiffusion depth can be characterized by the width of the white unetched zone. The rate of interdiffusion between fibers and matrix is stabilized in 250 hours for tungsten fibers and 500 hours for molybdenum

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USSR

UDC 69-419.4:669.24'26'28'27

BANAS, F. P., GAYDUK, V. V., NATAPOV, B. S., ~~ALEKSANDROV, B. V.~~,
and YEFIMENKO, L. N., Zaporozh'ye Machine Building Institute

"Nichrome-Molybdenum, Tungsten Composites"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8,
1971, pp 6-11

Abstract: The article describes a process for obtaining composite sheet material based on nickel-chromium alloys reinforced with refractory metals and their alloys in the form of unidirectional wires and different types of gauze. Packs of alternating sheets of the matrix and reinforcing fibers with superimposed wire contour frame undergo isothermal hot pressing in a vacuum chamber. During pressing the wire contour frame seals the pack, which permits subsequent rolling of the pressed material in air at 1100-1150° C. Scale-resistant sheet alloys KhN78T (EI435) (20% Cr, 78% Ni, 1% Fe, 1% the balance) and VZh98 (29% Cr, 14%

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Single Crystals

USSR

UDC 669.791:539.382

PUSTOVALOV, V. V., VERSHININA, V. V., TSIVINSKIY, S. V., and ALEKSANDROV, B. N.,
Physics Technical Institute of Low Temperatures, Academy of Sciences UkrSSR

"Plastic Deformation of Mercury Single Crystals"

Moscow, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 991-998

Abstract: Plastic deformation of mercury single crystals was studied by recording the extension curve at 77.3, 4.2, and 1.4-1.6°K. It was demonstrated that crystals of mercury have high plasticity down to very low temperatures (1.5-4.2°K). At 4.2 and 1.5°K, a multistage hardening curve was observed, which does not differ in principle from crystals with a different crystalline structure.

272 014

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0137648

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RATIO OF THE NO. OF ALPHA
DECAYS TO THE NO. OF SPONTANEOUS FISSIONS OF PRIME252 CF IS 31.34 PLUS
OR MINUS 0.08. FROM THIS RATIO A HALF LIFE OF 8.5 PLUS OR MINUS 0.4 YR
WAS FOUND FOR THE SPONTANEDUS FISSION OF PRIME252 CF.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--HALF LIFE OF CALIFORNIUM 252 SPONTANEOUS FISSION -U-
AUTHOR--(05)-ALEKSANDROV, B.M., BAK, M.A., BOGDANOV, V.G., BURGORKOV, S.S.,
SOLOVYEVA, Z.I.
COUNTRY OF INFO--USSR A
SOURCE--AT. ENERG. 1970, 28(CT). 361-2
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY
TOPIC TAGS--HALF LIFE, CALIFORNIUM ISOTOPE, NUCLEAR FISSION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/0563 STEP NO--UR/0089/70/028/000/0361/0362
CIRC ACCESSION NO--AP0137648
UNCLASSIFIED

Radiation Chemistry

USSR

UDC 543.544.6:546.79

VDOVENKO, V. M., KRIVOKHATSKIY, A. S., BELOV, L. M., and ALEKSANDROV, B. M.

"Some Problems of the Chromatographic Purification and Preparation of Sources of Transplutonium Elements"

Leningrad, Radiokhimiya, Vol 16, No 4, 1973, pp 534-542

Abstract: Distribution of americium, curium, and californium has been determined between alcoholic solutions containing HCl and strongly alkaline anion exchange resin Dowex-1x4. Strong adsorption of TPE has been observed with distribution coefficients of 10^5 - $3 \cdot 10^6$, while admixtures of aluminum, magnesium, calcium, copper(II) and iron(III) were practically untouched. The process of electrolytic isolation of californium from weakly acidic solutions has been studied at various pH values, variable cathode current density and time of electrolysis. Optimal conditions have been selected for a two stage isolation of californium and one stage deposition of berkelium from weakly acidic solutions directly on metallic plates, yielding layers of satisfactory quality.

USSR

UDC 669.14.018.298:620.178.324

ALEKSANDROV, B. I., and MEMELOVA, YE. G.

"Fatigue Strength of 12Kh2N4VA Steel After Heat and Chemical-Heat Treatment"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 3, 1971, pp 51-53

Abstract: A study was made of the effect of various types of heat and chemical-heat treatment on the fatigue strength of 18Kh10N2VA steel under axial loads with different cycle asymmetry. Vibration machines were used which permitted axial loads P_m to 6,500 kg and P_a to ± 5000 kg to be obtained with a frequency of 1,300-2,500 cycles per minute. Limiting stress diagrams with asymmetrical axial loading cycles and the distribution of residual stresses in rings made of 18Kh2N4VA steel are presented. These diagrams permit selection of the optimal surface hardening for machine parts operating under axial loads. The mechanism of the effect of the axial is discussed briefly.

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* 2/2 030

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0102294

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE STRESS CONCENTRATION IN THE VICINITY OF AN ELLIPSOIDAL CAVITY IN A TRANSVERSELY ISOTROPIC BODY, USING SOLUTIONS TO PROBLEMS OF ELASTICITY THEORY FOR A TRANSVERSELY ISOTROPIC ELLIPSOID OF REVOLUTION. A NUMBER OF AXISYMMETRIC PROBLEMS CONCERNING THE STRESS CONCENTRATION AROUND AN ELLIPSOIDAL CAVITY ARE CONSIDERED, INCLUDING THE PROBLEM OF THE EFFECT OF AN ELLIPSOIDAL CAVITY ON A PURE BENDING FIELD AND THE PROBLEM OF THE STRESSED STATE IN THE VICINITY OF A CAVITY IN A TRANSVERSELY ISOTROPIC BODY UNDER CONDITIONS OF UNIAXIAL TENSION AT INFINITY PERPENDICULAR TO THE AXIS OF ROTATION.

UNCLASSIFIED

.1/2 030 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--CERTAIN PROBLEMS CONCERNING THE STRESS CONCENTRATION AROUND AN
ELLIPSOIDAL CAVITY IN A TRANSVERSELY ISOTROPIC BODY -U-
AUTHOR-(02)-ALEKSANDROV, A.YA., VOLPERT, V.S.

COUNTRY OF INFO--USSR

A

SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, MEKHANIKA TVERDOGO TELA, JAN.--FEB.
1970, P. 115-121
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--STRESS CONCENTRATION, STRESS ANALYSIS, ELASTICITY THEORY,
AXISYMMETRIC BODY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FKAME--1986/0244

STEP NO--UR/0484/70/000/000/0115/0121

CIRC ACCESSION NO--AP0102294

UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--20NOV70

AIRC ACCESSION NO--AT0126311

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIN COATINGS (40-50 MU) OF OPTICALLY SENSITIVE MATERIAL ED-6M ON CAST IRON AND STEEL SPECIMENTS WERE STUDIED. BY DEFORMING THE COATED METALS, THE ACCUMULATION OF DEFORMATION AS WELL AS FORMATION AND DEVELOPMENT OF MICROCRACKS AT STRESSES BOTH LARGER AND SMALLER THAN THE CREEP LIMIT WERE OBSD. THE STRENGTH OF THE COATING WAS CONSIDERABLY IMPROVED BY GLUING IT TO THE SPECIMENT BY MEANS OF AN EPOXY GLUE AND THEN PRESSING. THE GLUED ON COATING ALLOWED DEFORMATIONS OF 4-6PERCENT WHTOUT ANY NOTICEABLE CHANGE IN THE COATING. FACILITY: NOVOSIBIRSK. INST. INZH. ZHELEZNODOROZH. TRANSP., NOVOSIBIRSK, USSR.

UNCLASSIFIED

1/2 039 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--USE OF PHOTOELASTIC COATINGS TO STUDY THE EARLY STAGES OF THE
FATIGUE FAILURE OF METALS -U-
AUTHOR-(C3)-ALEKSANDROV, A.YA., KRASNOV, L.A., KUSHNEROV, V.A.
COUNTRY OF INFO--USSR A
SOURCE--DOKL. AKAD. NAUK SSSR, 1970, 191(2), 319-22
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR
TOPIC TAGS--FATIGUE STRENGTH, PHOTOELASTICITY, CAST IRON, METAL CRACKING,
MICROCRACK, METAL STRESS, OPTIC SENSOR, METAL CREEP, METAL DEFORMATION,
MATERIAL FAILURE/(U)EDGM OPTICALLY SENSITIVE MATERIAL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0564 STEP NO--UR/0020/70/191/002/0312/0322
CIRC ACCESSION NO--AT0126311
UNCLASSIFIED

AP0043772

not experience coulomb relaxation. The solutions obtained are employed for analyzing photomagnetic oscillations of the Gurevich — Firsov type experimentally observed by Shalyt and coworkers in the ultra-quantum case [7]. It is shown that the oscillations are due to interaction between photoelectrons and optical phonons and simultaneously with equilibrium electrons. (The oscillations are absent in a pure semiconductor). The oscillation depth may be of the order of unity. The restriction on the equilibrium electron density in a magnetic field, for which the oscillation depth is maximal, is obtained.

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19770180

bdh

Acc. Nr: AP0043772

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy
Fiziki, 1970, Vol 58, Nr 3, pp 1062-1074

ENERGY DISTRIBUTION OF PHOTOELECTRONS
IN A QUANTIZED MAGNETIC FIELD AND PHOTOMAGNETIC
OSCILLATIONS OF THE GUREVICH — FIRSOV TYPE

A. S. Aleksandrov, V. F. Yezhin

Relaxation of nonequilibrium electrons produced in a semiconductor by light is considered for the case of a quantized magnetic field. The kinetic equation for the energy photoelectron distribution function when the electrons interact with optical phonons and equilibrium electrons can be reduced to a set of algebraic equations with shifted arguments. The small parameter in this case is the quantity η which is the ratio of the Fermi energy (or temperature for nondegenerate) equilibrium electrons to the Larmor frequency $\hbar\Omega$ (ultra-quantum case). An exact solution of the algebraic set of equations for the distribution function with small quantum numbers is found. The characteristic relaxation times in a magnetic field are calculated for electron-electron interaction. It is shown that electrons with energies smaller than $\hbar\Omega$ in general do

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REEL/FRAME
19770179

21

USSR

UDC 669.716:621.787.2

ZAKHAROV, M. F., ALEKSANDROV, Yu. N., ALEKSANDROV, A. S., and SIN'KO, P. P.

"Experience in the Implementation of Conveyer System Production of Shapes of the AD31 Alloy"

Metallovedeniye Splavov Legkikh Metallov-Sbornik, Moscow, "Nauka", 1970, pp 149-155, resume

Translation: Some construction characteristics of the equipment of the first conveyer production line in the USSR for pressing and working shapes of easily deformable alloys and also the experience of its technological implementation are discussed. Three figures, five bibliographic references.

USSR

UDC 669.2:621.774.38

SHCHEGOLEVATYKH, V. D., ALEKSANDROV, A. S., ZAKHAROV, M. F., and ALEKSANDROV, Yu. N.

"Study of the Influence of Pressure on the Strength of Seams Produced by Press Welding"

Moscow, Tsvetnyye Metally, No. 11, Nov 70, pp. 66-71

Abstract: Of the many factors influencing the quality of press welding, the most important are the degree of plastic deformation and the hydrostatic pressure. A method is briefly described for testing the strength of press-welded joints, which was used to study press-welded joints in AV alloy and Al. Graphs illustrate the influence of pressure on weldability of the alloy and the pure metal. It is found that aluminum is more suitable for press welding than the alloy.

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ILLEGIBLE

USSR

UDC 621.372.001

ALEXANDROV, A.S., YELISEIN, V.F., NEVSKAY, P.L.

"Optical and Electrical Properties of Doped Semiconductors in Strong Electromagnetic Field"

Kvantovaya elektronika (Quantum Electronics), Moscow, No. 10, 1977, pp. 2122-2127

Abstract: A theoretical investigation of the optical and electrical properties of doped semiconductor films in a strong electromagnetic field is of interest in connection with studies of semiconductor lasers and also in connection with experiments with respect to transmission of signals under conditions of strong radiation. In the present work, on the basis of a consideration of the generation of a form in terms of the absorption line of a doped semiconductor field and the electrical conductivity of doped semiconductors with a three-level population distribution in a strong electromagnetic wave, the effect of the presence of a strong nonresonant wave with a frequency in the region of the spectral absorption. A calculation of the experimental results for a strong electromagnetic field, with impurity scattering taken into account, is carried out because of the effect of the field (without taking account of the effect of the magnetic field) in the region of smaller frequencies. $\alpha \propto \omega^2$

USSR

RYABCHIKOV, I. V., et al, Stal', No 2, Feb 71, pp 134-136

A diagram showing a device for introducing the magnesium into the molten metal is given.

USSR

UDC 669.168:669.162.2

RYABCHIKOV, I. V., GARYAYEV, S. G., PODOL'SKIY, T. V., ALEKSANDROV, A. P.,
and ZAKHARCHENKO, E. V.

"Silicothermal Method for Obtaining Ferrosilicocalcium and Magnesium Alloys
Based on It"

Moscow, Stal', No 2, Feb 71, pp 134-136

Abstract: This paper describes experiments performed in making alloys of ferrosilicocalcium and magnesium by the silicothermal method, which has the advantages of permitting the mechanization and automation of alloying processes in closed furnaces. The experiments were performed in an electric furnace of 1200 kVA power and a closed furnace of the SKB-6063 type at voltages of 60-85 and 89 volts respectively, and a current of 6.5 and 13 kA. The furnace charge was 65-75% ferrosilicates, lime, calcined dolomite, baryte ore, silicoaluminum production slag, and fluorspar. The experimental alloys showed that the concentration of magnesium and calcium in the melt depends primarily on the proportion of the charge components, the order in which they are loaded into the furnace, the electrical specifications, and the amount of electrical energy consumed per ton of charge.

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USSR

ALEKSANDROV, A. P., and BREDIKHIN, V. I., Optika i Spektroskopiya,
Vol 30, No 1, Jan 71, pp 72-74

photon absorption cross section value: $\Sigma = (1.6 \pm 0.5) \cdot 10^{-51}$
cm⁴.sec./phot.

The authors thank V. N. GENKIN for useful discussions.

USSR

ALEKSANDROV, A. P., and BREDIKHIN, V. I., Optika i Spektroskopiya, Vol 30, No 1, Jan 71, pp 72-74

result includes only the following measurements: the duration of the light pulse, its spatial structure and energy. The article includes a block diagram of the experiment. Stable operation of the laser in a single transverse and longitudinal mode is assured by using a high-quality ruby rod and a special cavity. Q-switching is accomplished by a bleachable filter. The two-photon absorption cross-section was measured for a solution of anthracene in cyclohexane at a concentration of $1.5 \cdot 10^{18} \text{ cm}^{-3}$. The measurement process consists of two stages: viz., measuring the fluorescence of the substance during its two-quantum absorption and measuring the fluorescence of anthracene during its single-photon excitation. Three series of measurements for a solution of anthracene in cyclohexane gave the following two-

USSR

UDC 539.194

~~ALEXANDROV~~, A. P., and BREDIKHIN, V. I.

"Measurement of Absolute Value of Two-Photon Absorption Cross Section for Anthracene Molecules"

Leningrad, Optika i Spektroskopiya, Vol 30, No 1, Jan 71, pp 72-74

Abstract: The article suggests an original technique to overcome the difficulties involved in making absolute measurements of the values of the two-photon absorption cross-section of molecules. A high-power ruby laser is used, generating a single transverse (zero-order) mode under giant pulse conditions. This significantly increases the accuracy of finding the quantum flux density. The second laser harmonic is used as the source for single-photon comparison signal excitation, which assures practical agreement between the geometry of the experiment and the signal time characteristics as well as relative ease of comparing the intensity of the excitation sources and subsequent fluorescence. The end

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- 89 -

USSR

ALEKSANDROV, A. P., et al., Optika i Spektroskopiya, Vol 29, No 6, Dec 70, pp 1064-1069

C_{nh} , S_n , D_n , D_{nd} , D_{nh} with $n \geq 2$ remain constant in atom substitutions on the isolated axis of molecular symmetry α , coinciding with the principal axis α of the inertia tensor.

3. The partial derivatives $\frac{\partial I_{A_i}}{\partial q}$ and constants $t_{\delta_i \beta_i}$ of molecules belonging to the point groups C_n , C_{nv} , C_{nh} , S_n , D_n , D_{nd} , D_{nh} with $n \geq 3$ and V_d remain constant in atom substitutions on the isolated axis of symmetry α , coinciding with the principal axis α of the inertia tensor.

2/2

USSR

UDC 539.194.01

ALEKSANDROV, A. P., ALIYEV, M. R., and ALEKSANYAN, V. T.

"Isotopic Relations Between Centrifugal Expansion Constants of Polyatomic Molecules"

Leningrad, Optika i Spektroskopiya, Vol 29, No 6, Dec 70, pp 1064-1069

Abstract: The article formulates a number of general relations between the centrifugal expansion constants of polyatomic molecules of the product rule and sum rule type. Relations are obtained for a number of particular cases which are important in practice. The following conclusions are stated:

1. Isotopic substitution of an atom in the center of gravity of a molecule leaves unchanged the values of all derivatives $\frac{\partial I_{\alpha\alpha}}{\partial q}$, $\frac{\partial I_{\alpha\beta}}{\partial q}$ and the corresponding τ -constants.
2. The partial derivatives $\frac{\partial I_{\alpha\alpha}}{\partial q}$ and constants $\tau_{\alpha, \alpha, \alpha, \alpha}$ of molecules belonging to the point groups C_n , C_{nv} , $I/2$

US:

PETROS'YANTS, A. M., Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 315-323

It is anticipated that from now to the year 2000 construction of new thermal power stations will have stopped, with the main emphasis on the development of fast neutron reactors, while building of thermal neutron reactors will continue at a decreasing rate. It is also anticipated that the application of nuclear power will be extended beyond the production of electricity to the production of heating, refrigeration, chemicals, and finally, to desalinization of sea water.

USSR

PETROS'YANTS, A. M., Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 315-323

The tank-type reactors, operating at present in Central Russia, Kola Peninsula, the Caucasus, and the Ukraine, have their main tanks and covers built of steel. They operate on one and two circuits, with water brought to boiling in the active part and steam produced in steam generators.

Canal-type reactors with graphite moderators were first built in 1954. They now usually operate with super-heated steam. Their main advantages over the tank-type reactors consist in the use of zirconium instead of steel and in possessing higher unit power and a more efficient use of fuel up to 18,000 Mw·day/ton. They are also safer, as their active zone is split into individual channels. Their main disadvantage consists in greater size and consequently higher cost. These are the areas where improvement is anticipated.

Canal-type reactors are better suited for adaptation to work with fast neutrons, the main area of anticipated development of Soviet nuclear engineering. An intensive research is now being conducted in this field, with some experimental reactors and small pilot plants having already been built and operating. It is expected that after 1985 the whole European part of the country will have only the fast neutron type reactors.

2/3

USSR

PETROS'YANTS, A. M., ALEKSANDROV, A. P., DOLLEZHAL', N. A., and LEYPUNSKIY, A. I. (State Committee on the Use of Atomic Energy in the USSR)

"Prospects for the Development of Nuclear Power in the USSR"

Moscow, Atomnaya Energiya, Vol 31, No 4, Oct 71, pp 315-323

Abstract: According to a talk presented at the Fourth UN Conference on the Use of Atomic Energy for peaceful purposes, the USSR is well furnished with natural sources of energy, particularly in view of the new discoveries of coal, petroleum, and natural gas, but the location of sources of energy does not coincide with the location of industrial centers, the main users of power. With an anticipated increase in the rate of use of power of 7 to 8% per year, it is expected that such regions as the European or Central Ural part of the country will soon require additional sources of atomic power for producing electricity.

It is anticipated that emphasis will be placed, in the first stage of development, on the reactors with thermal neutrons, followed later by reactors with fast neutrons, as the second stage of development. Reactors of two types are at present in existence and are being considered for future development: the tank-type and the canal-type reactors.

1/3

USSR

UDC 539.194.01

KOTAYEV, D. I., ALEKSANDROV, A. P.

"Using Statistical Methods and Computers in Analyzing the Band Structure of Diatomic and Linear Multiatomic Molecular Spectra. I. Computation of Constants"

Leningrad, Optika i Spektroskopiya, Vol 33, No 5, Nov 72, pp 862-866

Abstract: A program is drawn up for computing molecular constants from the aggregate of wave numbers of branches of one or more bands in the electron and vibrational spectra of diatomic and linear multiatomic molecules. This program enables the use of statistical criteria for numbering lines, selecting the degree of the approximating polynomial, etc. In addition, a modification of the method of orthogonal Chebyshev polynomials is proposed for processing Raman sums and differences of the form $R(J-1) + P(J)$, and some of the peculiarities of this method are considered. The authors thank A. A. Mal'tsev, V. T. Aleksanyan, and M. R. Aliyev for constructive criticism.

1/1

USSR

UDC: 539.194

ALEKSANDROV, A. P. and KATAYEV, D. I.

"Using Statistical Methods and the Electronic Computer to Analyze the Rotatory Structure of Diatomic and Linear Polyatomic Molecular Spectra"

Leningrad, Optika i Spektroskopiya, December 1972, pp 1079-1084

Abstract: Although calculations of molecular constants from the rotating structure of spectra by the method of least squares as made on computers have become common, few statistical evaluations of the errors in the results have been made, and the literature is practically devoid of statistical criteria for determining the optimal number of constants that can be computed and for checking the compatibility of heterogeneous data. The purpose of this paper is to fill these gaps. It explains the principles the authors used to compute rotational-oscillatory molecular constants of HCl^{35} and gives the results of these computations in the form of two tables. The question of the real accuracy of the computed data is considered. Appreciation is expressed to V. T. Aleksanyan, M. R. Aliyev, V. M. Tatevskiy, and A. A. Mal'tsev for their comments.

1/1

USSR

ALEKSANDROV, A. P., Optika i Spektroskopiya, Vol 34, No 1, Jan 73, pp 60-63

The author thanks V. T. ALEKSANYAN and M. R. ALIYEV for their interest in the work and discussion, and L. S. MAYANTS for valuable critical remarks in discussing the manuscript.

2/2

- 89 -

Optics & Spectroscopy

USSR

UDC 539.194.01

ALEKSANDROV, A. P.

"Transformation Properties of Coriolis Coupling Constants for Polyatomic Molecules"

Leningrad, Optika i Spektroskopiya, Vol 34, No 1, Jan 73, pp 60-63

Abstract: The article considers the transformation properties of the total $(3N - 6) \times (3N - 6)$ (N is the number of atoms in the molecule) matrices of the Coriolis coupling constants ξ_j^α and the matrices C^α where there are arbitrary rotations and reflections of the selected Cartesian coordinate system. A matrix transformation scheme is proposed which, as applied to molecules of the spherical- and symmetric-top type, makes it possible to overcome the difficulties involved in selecting the orientation of degenerate coordinate components. An example is given of the planar molecule AB_3 of the point symmetry group D_{3h} , with ξ -constants found for the molecule $B^{11}F_3$.

USSR

ALEKSANDROV, A. P., and NARODNITSKIY, G. YU., Ukr. resp. nauch.-tekhn. konf., posvyashch. 50-letiyu metrol. sluzhby USSR, 1972 -- sb, pp 212-213

the rough surface's shape and average level. If $z(x)$ is the function describing the shape of a two-dimensional rough surface, with x being the coordinate corresponding to the surface's direction of motion and z being the vertical coordinate that is calculated from the surface's average level, then the coordinate of the nearest point x can be found from the equation $\frac{d^2 z(x)}{dx^2} = \frac{x_0 - x}{H + z(x)}$

where x_0 = coordinate of the receiving and emitting system; H = vertical distance from the surface's average level to the receiving and emitting system. We obtain ΔL , the difference in the distances from the receiving and emitting system to the nearest point and to the point on the surface that is vertically above the system, from the equation

$$\Delta Y = [H + z(x_0)] - \sqrt{(x - x_0)^2 + (H + z(x))^2}.$$

The method described above is used to find errors in the measurement of the shape of two-dimensional sinusoidal and trochoidal surfaces, which are of interest in the solution of a number of oceanographic problems.

2/2

USSR

UDC 531.717.2.035

ALEKSANDROV, A. P., and NARODNITSKIY, G. YU.

"Errors in Measuring the Shape of Rough Surfaces, Using the Ranging Method and an Undirected Receiving and Emitting System"

Khar'kov, Ukr. resp. nauch.-tekh. konf., posvyashch. 50-letiya metrol. sluzhby USSR, 1972 -- sb. (Ukrainian Republic Scientific and Technological Conference Honoring the 50th Anniversary of the Ukrainian SSR's Metrological Service, 1972 -- Collection of Works), 1972, pp 212-213 (from Referativnyi Zhurnal -- Metrologiya i Izmeritel'naya Tekhnika, No 2, 1973, Abstract No 13.32.385)

Translation: One method of measuring the shape of rough moving surfaces is the ranging method, which consists of irradiating the surface with a pulse signal. The time function of the distance from the measuring system to the surface is then measured along a vertical; this shows the elevation of the surface at a point, as determined by the time lag of the return impulse. The return impulse's starting point is determined by the nearest point on the surface, which corresponds to the shortest emitter-surface-receiver path. In the general case, the distance to the nearest point does not coincide with the distance along the vertical, and the difference between these distances is a function of time and the surface's shape that determines the error in measuring $1/2$

2/2 021 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0127446
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COM. TURBINE OILS (CONTG. 0.1 OR 0.8PERCENT S) UNDERGO SUBSTANTIAL CHANGES AS A RESULT OF CONTACT WITH H SUB2 O AT 90DEGREES, E.G., THE ACID NO. INCREASES (FROM 0.0 TO 0.2 OR 0.8 MG KOH-G, FOR THE OILS CONTG. 0.8 OR 0.1PERCENT S, RESP.), THE OILS BECOME CORROSIVE WITH RESPECT TO MANY METALS, AND METALLIC SOAPS ARE FORMED (AND DISSOLVE IN THE OIL) UPON CONTACT WITH METALS; SUCH PHENOMENA ARE RESPONSIBLE FOR THE AGING OF THE OILS IN ACTUAL SERVICE. THE CORROSION RATE OF STEEL IN SUCH AGED OILS, WITH INITIAL S CONTENTS OF 0.1 OR 0.8PERCENT, REACHES 42.87 OR 151.81 G-M PRIME2 (THE TEST DURATION WAS 70 HR IN THE LOW S AND 304 HR IN THE HIGH S OIL), RESP. THE HIGHER CORROSION RATE IN THE AGED HIGH S OIL, IN SPITE OF ITS LOWER ACID NO., IS ATTRIBUTED TO THE FORMATION OF LARGER AMTS. OF WATER SOL. CORROSIVE ACIDS; THE SLOWER OXIDN. OF THE HIGH S OIL IS ATTRIBUTED TO THE PRESENCE OF ANTIOXIDANT ADDITIVES. THE CORROSION RATES OF NONFERROUS METALS (BRONZE, BRASS, BABBITT) IN THE AGED OILS IS QUITE LOW, E.G., BETWEEN 1.3 AND 8 G-M PRIME2, FOR THESE TEST TIMES. THE ADDN. OF AN OXIDN. INHIBITOR (IONOL) TO THE LOW S OIL DID NOT REDUCE THE CORROSIVENESS OF THE OIL AFTER AGING, IN SPITE OF A SUBSTANTIAL DECREASE IN THE DEG. OF OXIDN. OF THE OIL. FACILITY: VYSES. TEPLOTEKH. INST., MOSCOW, USSR.

UNCLASSIFIED

1/2 021 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--AGING AND CORROSIVE ACTION OF TURBINE OILS IN THE PRESENCE OF WATER
-U-
AUTHOR-(04)-IVANOV, K.I., LUZHETSKIY, A.A., ALEKSANDROV, A.N., SEREGINA,
L.SH.
COUNTRY OF INFO--USSR
SOURCE--TEPLOENERGETIKA 1970, 17(2), 62-7
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--CHEMICAL STABILITY, TURBINE OIL, CHEMICAL COMPOSITION,
CORROSION RATE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3001/2073 STEP NO--UR/0026/70/017/002/0062/0067
CIRC ACCESSION NO--AP0127446
UNCLASSIFIED

Acc. Nr: **AP0053459** - Abstracting Service: **A 5170** Ref. Code: **4R0366**
 CHEMICAL ABST.

110708f Unsaturated sulfones containing fluorine. VIII. Polyfluoroalkyl vinyl sulfones. Aleksandrov, A. M.; Yagupol'skii, L. M. (Inst. Org. Khim., Kiev, USSR). *Zh. Org. Khim.* 1970, 6(2), 249-54 (Russ). Irradn. of $CF_3SCl-H_2C=CHCl$ gave 2 isomers $CF_3SCH_2CHCl_2$ (I) and $CF_3SCHClCH_2Cl$, sepd. by gas chromatog. Oxidn. of I with H_2O_2 gave only $CF_3SO_2CH_2CHCl_2$, but with $KMnO_4$, $CF_3SO_2CH_2CHCl_2$ (II) was obtained. Dehydrochlorination of II with NEt_3 gave $CF_3SO_2CH:CHCl$ which is a powerful alkylating agent and it reacted with piperidine, 4- C_6H_4SH (in the presence of NEt_3), or Na_2S to give, resp., 1-trifluoromethylsulfonyl-2-piperidinoethylene, $CF_3SO_2CH:CHSC_6H_4Cl-4$, or $(CF_3SO_2CH:CH)_2S$ (III). Oxidn. of III with CF_3CO_2OH gave $(CF_3SO_2CH:CH)_2SO_2$. Heating a mixt. of $CF_2ClCFCISCl$ with $H_2C=CH_2$ at 100° in an autoclave gave $CF_2ClCFCISCH_2CH_2Cl$, which was oxidized with CrO_3 to $CF_2ClCFCISO_2CH_2CH_2Cl$ (IV). Dehydrochlorination of IV with NEt_3 gave $CF_2ClCFCISO_2CH:CH_2$, which is also an alkylating agent; it reacted with chlorides to give $CF_2ClCFCISO_2CH_2CH_2NHC_6H_4Cl-4$ and $CF_2ClCFCISO_2CH_2CH_2SC_6H_4Cl-4$, which was oxidized to $CF_2ClCFCISO_2CH_2CH_2SO_2C_6H_4Cl-4$. CPJR

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REEL/FRA
19830484

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USSR

UDC: 621.376.56

ALEKSANDROV, A. M., BATETSKIY, N. V., MISHCHENKO, I. N., PODD'YAKOVA, V. N.,
SAPRONOV, Yu. S.

"A Device for Shaping Series-Coded Signals"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obrantsy, tovarnyye znaki,
No 5, Feb 71, Author's Certificate No 293292, Division G, filed 21 Oct 68,
published 15 Jan 71, p 177

Translation: This Author's Certificate introduces a device for shaping series-coded signals of length N . The device contains shift registers and cadence pulse generators. As a distinguishing feature of the patent, the number of digital places in the shift register is reduced by connecting two shift registers in a matrix circuit, one of the registers consisting of n digital places, while the other consists of N/n places. The output of each of the digital places in the second register is connected to those inputs of digital places in the first register where the "ones" of the code to be generated must be recorded for a given group of symbols of length n . The first register operates on a cadence frequency of f , and the second on a frequency of f/n .

1/1

2/2 010

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136227

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RATE OF THE MOL. IODINE INHIBITED OXIDN. OF CUMENE (RH) INITIATED BY AZODIISOBUTYRONITRILE (I) INCREASES LINEARLY WITH O PARTIAL PRESSURE. THUS, THE CHAIN BREAKING IS DUE TO THE REACTION OF IODINE WITH R (AND NOT RO SUB2) RADICALS. THE RATIO OF REACTION RATE CONSTS. $k(R + I_{SUB2})$ OVER $k(R + O_{SUB2})$ APPROXIMATELY EQUAL TO 0.45 AT 75DEGREES. IODINE IS REGENERATED FROM THE INTERMEDIATE RI MAINLY BY PEROXY RADICALS AND ALSO BY O.
FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--INHIBITION OF THE INITIATED OXIDATION OF CUMENE BY MOLECULAR IODINE
-U-
AUTHOR--(03)-ALEKSANDROV, A.L., SAPACHEVA, T.I., DENISOV, YE.T.
COUNTRY OF INFO--USSR
SOURCE--ZH. FIZ. KHIM. 1970, 44(4), 1122-4
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--OXIDATION INHIBITION, CUMENE, IODINE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3007/0793 STEP NO--UR/0076/70/044/004/1122/1124
CIRC ACCESSION NO--AP0136227
UNCLASSIFIED

USSR

UDC: 51:801

ALEKSANDROV, A. L.

"High-Speed Syntax Analyzer for Semantically Free Grammars"

Sb. rabot Vychisl. tsentra Mosk. un-ta (Collected Works of the Computing Center at Moscow University), 1971, vyp. 17, pp 13-17 (from RZh-Kibernetika, No 5, May 72, Abstract No 5V599)

Translation: It is proved that for each deterministic semantically free grammar there exists a deterministic automaton which recognizes this grammar with magazine memory and linear operating time. However, it is known that every deterministic automaton with magazine memory operates on linear time (Zakharov, V. N., "Upper Estimate of the Operating Time of a Deterministic Magazine Automaton", Kib. sb., 1971, 8, pp 135-139).

2/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0129471
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CORROSION RESISTANCE OF FE-NI ALLOYS AND THEIR RESISTANCE TO CORROSION CRACKING IN NaOH WERE STUDIED IN RELATION TO THE NI CONTENT. INCREASING THE NI CONTENT UP TO 26PERCENT RAISED THE GENERAL CORROSION RESISTANCE OF THE ALLOYS. FURTHER INCREASING THE NI CONTENT HAD LITTLE EFFECT ON THIS. THE RESISTANCE TO CORROSION CRACKING WAS GOVERNED BY THE INFLUENCE WHICH THE NI EXERTED ON THE STRUCTURE AND DUCTILITY OF THE ALLOYS. ALLOYS WITH A MARTENSITIC STRUCTURE HAD A LOW CRACKRESISTANCE, WHILE FERRITIC AND AUSTENITIC STRUCTURE LAY AT THE OPPOSITE EXTREME.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--CORROSION RESISTANCE AND RESISTANCE TO CORROSION CRACKING OF IRON
NICKEL ALLOYS IN CONCENTRATED ALKALI SOLUTIONS -U-
AUTHOR--ALEKSANDROV, A.G. *A*
COUNTRY OF INFO--USSR
SOURCE--FIZ.-KHIM, MEKHAN., MAT., 1970, 6, (2), 45-48
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--CORROSION CRACKING, CORROSION RESISTANT METAL, SODIUM
HYDROXIDE, NICKEL ALLOY, IRON ALLOY, AUSTENITE, MARTENSITIC STEEL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3003/0215 STEP NO--UR/0369/70/006/002/0045/0048
CIRC ACCESSION NO--AP0129471
UNCLASSIFIED

USSR

UDC 621.385.64(034.8)

ALEXANDREY, A.G., PUSHKAREV, A.G.

"M-Type Device"

USSR Author's Certificate No 274237, filed 9 July 69, published 29 Sept 70
(from REh--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 4A158)

Translation: The design is proposed of a coaxial magnetron which contains a cooling device close to a laminar resonant system. The device contains cooling ducts located along the cylindrical walls of the stabilizing coaxial resonator between the slits for coupling this resonator with the laminar resonator of the system. E.G.

1/1

USSR

UDC 621.791.927:669.15-194

MILICHENKO, S. L., ALEKSANDROV, A. G., PIN'KOVSKIY, I. V., Zaporozh'ye
Machine Building Institute

"Erosion Resistance of Surfaced Steels in the Nickel-Titanium-Aluminum
System with Ageing Martensite"

Kiev, Avtomaticheskaya Svarka, No 8, Aug 1972, pp 55-58.

Abstract: The hydraulic erosion wear resistance of metal surfaced with electrode materials based on alloys such as 18 Ni-Co-Mo-Ti with low cobalt content, as well as high-strength cobalt-free alloys in this system was studied. The erosion resistance of the surfaced metal was estimated on the basis of the weight loss of specimens tested on an impact erosion test stand. The erosion resistance of surfaced metal with ageing martensite was found to be determined by the quantity of martensite in the structure and its hardening during ageing. Cobalt-free surfaced metal with ageing martensite structure had high hardness and erosion resistance following ageing, equal to the erosion resistance of aged nickel-cobalt-molybdenum surfaced metal with high cobalt content.

1/1

USSR

UDC: 621.317.3(088.8)

KARAU'NIK, M. Ye., MAKEYEV, V. I., ALEKSANDROV, A. F., LEBEDEV, B. M.,
METELITSIN, I. V., PLATONOV, F. V., FEDIN, V. F.

"A Device for Measuring the Electrical Parameters of Piezoelectric Resonators"

USSR Author's Certificate No 264547, filed 5 Jul 68, published 17 Jun 70
(from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1A315 P)

Translation: It is pointed out that conventional devices for measuring the electrical parameters of piezoelectric resonators do not allow for direct measurement of piezoelectric current. In the proposed device there is a special coil with an auxiliary indicator whose scale is graduated in piezoelectric current values. The resonator to be tested is placed inside the coil. E. L.

1/1

USSR

UDC: 537.873.01

ALEKSANDROV, A. P., RUZOVNIROV, A. A., RUMHADZI, A. A., and
~~SEVER'YANOV, V. V.~~

"Average force Acting on a Non-Isothermic Plasma in a High-Frequency Field"

V sb. Voopr. fiz. nizkotemperaturn. plazmy (Problems in the Physics of Low-Temperature Plasmas -- collection of works) Linsk, "Nauka i tekhn." 1970, pp 144-148 (from RZh-Mekhanika, No. 2, Feb 71, Abstract No. 2543)

Translation: The problem of the interaction of a high-frequency field with a plasma is considered on the basis of the model of two-fluid hydrodynamics. The average force acting on the plasma is represented as a surface and volume force. It is shown that, at low frequencies of the field, the surface force is much greater than the volume force; at frequencies close to the Langmuir frequency for ions, the volume force is comparable with the surface force. Author's abstract

1/1

USSR

ALEKSANDROV, A. D., Doklady Akademii Nauk SSSR, Vol. 190, No. 3, 21 Jan 70,
pp 502-505

spheres from A_n are mapped onto the corresponding sets in A'_n , and conversely.
Then g is affine.

Card 2/2

USSR

ALEKSANDROV, A. D., Academician

"Mappings of Families of Sets"

Moscow, Doklady Akademii Nauk SSSR, Vol. 190, No. 3, 21 Jan 70, pp 502-505

Abstract: Certain problems of affine mappings are explored. Let A_n, A_m' be affine spaces ($n \geq 1$), M be a bounded set in A_n , and f be a mutually single-valued mapping of A_n on A_m' with the following property: The map of any set $t(M)$ obtained from M by any parallel translation is $t'(M')$ obtained by a translation from the set $M' = f(M)$, and transversely, any $t'(M')$ is a map of a certain $t(M)$. The problem is to investigate what is the nature of the mappings f : any affine mapping of A_n on A_n' will be a mapping f for some M , but what other mappings f exist for one or another given M ? The following theorem is given: Let translationally invariant metrics be given in spaces A_n, A_n' so that the unit sphere S in A_n is not a quasi cylinder. Let g be a mutually single-valued mapping of A_n on A_n' for which either unit spheres, open unit spheres, or unit

Card 1/2

AP0040888

A

REF. Code
UR0:03

PRIMARY SOURCE: Avtomatika i Telemekhanika, 1970, Nr 1, pp 105-11.

CONSTRUCTION OF AUTO-OSCILLATORY ADAPTIVE SYSTEM
WITH VARIABLE STRUCTURE

A. D. ALEKSANDROV, L. S. VALKOV, M. G. GAVRILIN,
L. YA. MALEN'KIY, N. V. SABUROV, V. S. KHABAROV

One of the methods of constructing an adaptive system of control in the class of systems with variable structure is considered. There is suggested a method of the synthesis of the algorithm of the re-adjustment of the adapting device for an autooscillatory system, the re-adjustment based on the application of the method of harmonic linearization. The results of the theory are illustrated with examples.

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19750627

2/2 009

UNCLASSIFIED

PROCESSING DATE--0000CT70

CIRC ACCESSION NO--AT0049300

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CERTAIN PROBLEMS OF AFFINE MAPPINGS ARE EXPLORED. LET A SUBN, A SUBM PRIME BE AFFINE SPACE IN IS GREATER THAN OR EQUAL TO 1), M BE A BOUNDED SET IN A SUBN, AND F BE A MUTUALLY SINGLE VALUED MAPPING OF A SUBN ON A SUBM PRIME WITH THE FOLLOWING PROPERTY: THE MAP OF ANY SET T(M) OBTAINED FROM M BY ANY PARALLEL TRANSLATION IS T PRIME (M PRIME) OBTAINED BY A TRANSLATION FROM THE SET M PRIME EQUALS F(M); AND TRANSVERSELY, ANY T PRIME (M PRIME) IS A MAP OF A CERTAIN T(M). THE PROBLEM IS TO INVESTIGATE WHAT IS THE NATURE OF THE MAPPINGS F; ANY AFFINE MAPPING OF A SUBN ON A SUBN PRIME WILL BE A MAPPING F FOR SOME M, BUT WHAT OTHER MAPPINGS F EXIST FOR ONE OR ANOTHER GIVEN M? THE FOLLOWING THEOREM IS GIVEN: LET TRANSLATIONALLY INVARIANT METRICS BE GIVEN IN SPACES A SUBN A SUBN PRIME SO THAT THE UNIT SPHERE S IN A SUBN IS NOT A QUASI CYLINDER. LET G BE A MUTUALLY SINGLE VALUED MAPPING OF A SUBN ON A SUBN PRIME FOR WHICH EITHER UNIT SPHERES, OPEN UNIT SPHERES, OR UNIT SPHERES FROM A SUBN ARE MAPPED ONTO THE CORRESPONDING SETS IN A SUBN PRIME, AND CONVERSELY. THEN G IS AFFINE.

UNCLASSIFIED

1/2 009 UNCLASSIFIED PROCESSING DATE--0900770
TITLE--MAPPINGS OF FAMILIES OF SETS -U-
AUTHOR--ALEKSANDROV, A.D.
COUNTRY OF INFO--USSR *A*
SOURCE--MOSCOW, DOKLADY AKADEMII NAUK SSSR, VOL. 190, NO. 3, 21 JAN 70, PP
502-505
DATE PUBLISHED--21JAN70

SUBJECT AREAS--MATHEMATICAL SCIENCES
TOPIC TAGS--SET THEORY, MAPPING

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1980/1116 STEP NO--UR/0020/70/190/003/0502/0505
CIRC ACCESSION NO--AT0049300
UNCLASSIFIED

USSR

ALEKSANDROV, A. D., Doklady Akademii Nauk SSSR, Vol 197, No 5, 1971, pp 991-~~994~~

for any $X \in G$ the set $f(C_X)$ is obtained from $f(C)$ by the transfer $0' \rightarrow f(X)$, where $0' = f(0)$; 2) the closure of the cone projecting the set $f(C)$ from the point $0'$ has a strict plane of support in it, or $f(G)$ has internal points in the subspace $A'_r \subset A'_m$ stretched to $f(C)$, and the open $V \subset G$ exists such that $f(V)$ is bounded.

Some lemmas and corollaries to the above theorems are also proved. Arguments for the case in which $G \neq A_n$ are not presented.

USSR

ALEKSANDROV, A. D., Doklady Akademii Nauk SSSR, Vol 197, No 5, 1971, pp 991-994

where g is the affine mapping of A_n into A_m' , and every d_i is an into homeomorphism of A_n transforming the rays parallel to L_i into such rays and constituting parallel transfer in each plane parallel to P_i (here, inasmuch as f is defined in G , the right-hand side of (2) is bounded by G ; the order of the mapping d_i in (2) is immaterial: they commute). Conversely, any mapping in the form of the right-hand side of (2) will be the mapping f . Here, $f(C) = gt(C)$, where t is the transfer. Thus, $f(C)$ is always the affine form of C .

C is a cone in the affine space A_n with the apex O ; that is, the set of points formed by the rays originating at O . It is assumed that C is not contained in a plane and \bar{C} (the closure of C) has a strict plane of support; that is, supporting and not having other common points except O with \bar{C} . C_X denotes the set obtained from C by the parallel transfer $O \rightarrow X$. G is the domain in A_n such that $O \in G$ and for any $X \in G$, $C_X \subset G$; f is the one-to-one mapping of G into the affine space A_m' having the properties: 1)
2/3

Higher Algebra & Geometry and Topology

USSR

UDC 513.82

ALEKSANDROV, A. D., Academician

"Mapping Families of Cones"

Moscow, Doklady Akademii Nauk SSSR, Vol 197, No 5, 1971, pp 991-994

Abstract: The following two theorems are proved:

Theorem 1. The mapping f is affine except for the case in which the plane $P(0 \in P)$ and the ray L exist such that

$$C = Z \cup (C \cap P), \quad (1)$$

where Z is formed by open rays parallel to L originating at points belonging to P .

Theorem 2. If the cone C allows a total of k representations (1) with the pairs $P_1, L_1, \dots, P_k, L_k$, then

$$f = g d_1 \dots d_k, \quad (2)$$

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USSR

ALEKSANDROV, A. D., Doklady Akademii Nauk SSSR, Vol 211, No 6, 21 Aug 73, pp 1
pp 1257-1260

specialized forms, but it is proven again here because no references could be located.

The theorem is then used for the proof of two further theorems.

Definitions: G is the group of movements of the space R , transitive on the set of all half lines; h_0 is a one-to-one mapping of R to itself; H is a group generated by g (member of G) and h_0 ; A and B are points in R ; H_A is the conjunction of all h -members of H with $h(A) = A$; $H_A(B)$ is the set of all $X = h(B)$ with h -members of H_A .

Theorem: if h_0 is continuous, is not f , and preserves the quality of distance, then $H_A(B) = R/(A)$ for a pair A, B .

Theorem: if R is a Euclidean or Lobachevski space and $H_A(B)$ is bounded for some pair A, B , then h_0 preserves the equality of distances; the same is true in a spherical R if the diameter of $H_A(B)$ is less than the diameter of R for some pair A, B .

Two other theorems, essentially versions of theorem 1 with different conditions, are also proven.

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USSR

UDC 513.82

ALEKSANDROV, A. D., Academician

"On Mappings Which Preserve Congruence"

Moscow, Doklady Akademii Nauk SSSR, Vol 211, No 6, 21 Aug 73, pp 1257-1260

Abstract: The following theorem is proved for Euclidean, Lobachevski, and spherical spaces (it can also be extended to Riemann spaces), including infinite spaces.

It is given that a set M_0 which is bounded in some space R contains at least two points and (if R is spherical) has a diameter less than one-half the diameter of R . It is given, further, that f is a mapping of R to R' such that if M is a set congruent with M_0 , then $f(M)$ is congruent with $f(M_0)$; and conversely, if N is congruent with $f(M_0)$ then $f^{-1}(N)$ is congruent with M_0 , where $f^{-1}(N)$ is the complete inverse image of N . Then the mapping f preserves the equality of distance and, thus, congruence for all sets.

The author notes that this is not a new theorem, particularly in more

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USSR

UDC 621.362.2

ANDRIANOVA, T. N., ALEKSANDROV, A. A., OKHOTIN, V. S., PANINA, Z. I.,
RAZUMEYCHENKO, L. A.

"Investigation of Semiconductor Systems Based on Sb_2Se_3 in the Molten State"

Tr. Mosk. energ. in-ta (Works of the Moscow Power Engineering Institute),
1970, vyp. 75, pp 192-196 (from RZh-Elektrotehnika i Energetika, No 1,
Jan 71, Abstract No 1A159)

Translation: An investigation is made of the effect of various elements on the structure of antimony selenide in the molten state. The kinematic viscosity and density of melts of Sb, Se, Zn, Cu, Ga, In, Te and Sn in antimony selenide were measured. The change in structure of melts of 80 at.% Sb_2Se_3 + 20 at.% Ga and 80 at.% Sb_2Se_3 + 20 at.% Sn takes place over a narrow temperature interval of $\Delta t \approx 50^\circ K$, while the structure of a melt of 80 at.% Sb_2Se_3 + 20 at.% In varies continuously over the entire temperature interval from 950 to $1300^\circ K$. Two illustrations, bibliography of two titles. A. Kh. Cherkasskiy.

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U.S.S.R.

SMIRNOV, V.G., et al, *Kuznetsko-Krasnopol'skoye Proletariatskoye Uchebnoye Vuzovskoye Uchebnoye Zavedeniye*, 1971, 1972, pp 18-19

transition zone was not observed. The hardness of the surface layer did not change. X radiographic sections established that the thickness of the titanium gas-saturated layer did not exceed 0.05 mm. To obtain high-quality welded joints, it is first necessary to clean the titanium surface with an abrasive disk.

USSR

A

UDC: 611.974

SMIRNOV, V.S., DANILEVSKIY, O.F., ALEXANDROV, A.A., KISEL, N.S., KOSILOV, V.I.,
and ZOR'KIN, YE.F.

"Stamping of Thin Two-Layer Steel-Titanium Sheets"

Moscow, *Remontno-Ispravitelnyye Protovedeniya, No. 1, 1963, pp. 1-7*

Abstract: The Izhor'skiy Plant (Leningrad) has developed a technique with 900-, 1000-, and 1600-mm diameters by the hot stamping of titanium sheets 10-20 mm thick. The bimetallic steel-titanium sheets were obtained by hot rolling. In the hot stamping of bimetallic steel-titanium sheets, the selection of billet heating conditions is very important. Heating of the steel-titanium bimetal, generally, leads to a growth of the width of the transition zone between the layers and increased porosity, thus resulting in a lowered quality. In heating the bimetallic billets, no material titanium oxide scale should be permitted, owing to the difficulty of removing it from the surface. If the billet heating temperature before stamping does not exceed 1100°C, a noticeable growth of the transition diffusion zone between the layers occurs. At the same time, the metal possesses adequate plasticity. Good surface quality is obtained in the stamped products. The technique, conditions, and equipment for the hot stamping of the bottoms are described. Investigations of specimens of thin various sections of the bottoms showed that heating and stamping under the conditions given do not worsen the bimetal properties. An increase in the thickness of the

USSR

SMIRNOV, V. S., et al, Tsvetnyye Metally, No 3, 1973, pp 56-57

appeared on the side surfaces at any rolling temperature. The plasticity maximum of beryllium rolled in molybdenum lining was shifted toward lower temperatures compared with rolling without linings. The average metal pressure on rolls decreased from 28 to 10 kg/mm² when samples were heated from 650 to 950°C. The average deformation rate of beryllium during rolling amounted to 10 sec⁻¹. The friction coefficient of beryllium rolled in vacuum increased with temperature and reached 0.5 at 950°C.

USSR

UDC 669.725:621.77

SMIRNOV, V. S., YAKOVLEV, V. P., and ALEKSANDROV, A. A.

"Rolling of Beryllium in Vacuum"

Moscow, Tsvetnyye Metally, No 3, 1973, pp 56-57

Abstract: Commercially pure (1.2-1.4% BeO) beryllium samples heated to 550-950°C were rolled in vacuum ($2 \cdot 5 \cdot 10^{-5}$ mm Hg) on a reversing rolling mill with a rolling rate of 0.1-0.76 m/sec. First cracks appeared on samples when the reduction in area reaches 3-5% and a complete rupture was followed when the reduction in area was higher. Individual samples heated to 850°C sustained the reduction in area up to 30% without rupturing when rolled with 0.76 m/sec. However, the majority of samples were badly deformed when rolled with 0.76 m/sec. Cracks appeared on both the contact and side surfaces of samples during rolling. When a preliminary heating temperature was low, cracks appeared at first on side surfaces, but samples heated to 900°C developed cracks on contact surfaces with rolls. This was attributed to a very rapid cooling of the surface layer of metal contacted with cold rolls. In order to eliminate it, molybdenum lining 2 mm thick was used on both sides of the samples; the lining was heated together with the samples. Rolling of samples in molybdenum lining did not produce any cracks on the contact surfaces. Cracks and ruptures in this case

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USSR

ALEKSANDROV, A.

"Venom Against Diseases"

Moscow, Leninskoye Znamya, 11 Feb 71, p 4

Abstract: Snake venom is a valuable raw material from which therapeutic drugs are made. The Tallin Chemical Pharmaceutical Plant is manufacturing Viprosal, an ointment against rheumatic fever, and Vipraksin, a medicine against polyarthritis, out of snake venom. Tashkent pharmacists have obtained Lecetoko, an effective coagulant out of snake venom. This natural substance is being investigated for the presence of other therapeutically useful compounds. The demand for snake venom is perennially increasing, and therefore snakes in Uzbekistan are protected by law and many are being raised in special nurseries.

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USSR

ALEKSANDROV, A., Nauka i Zhizn', No 4, 71, pp 89-91

air over crops protects them from hot, dry winds, drought, dust storms, and so forth. It is stated that one hectare of land will require 15-20 cubic meters of aerosol sprinkling per day during "critical periods," and 900-1,000 cubic meters for the 60 or so days in a normal season when sprinkling will be needed. This reduces water expenditures 3-6-fold over ordinary irrigation. Aerosol sprinkling can also protect crops during frost and cold, by creating a snow coating, 20 centimeters deep with a density of 0.2 grams per cubic centimeter, which will maintain soil temperature at not lower than -1°C .

BIOLOGY

Agriculture

USSR

ALEKSANDROV, A., Professor and Scientific Secretary, Moscow Agricultural Academy imeni K. A. Timiryazev

"Aerosols In Agriculture"

Moscow, Nauka i Zhizn', No 4, 71, pp 89-91

Abstract: Projected population growth, in the USSR and worldwide, makes intensive development of agriculture on the limited land available crucial. Similarly, the limited water supply must be used more economically to be capable of handling intensified agricultural production. The author notes that calculations have shown that, in twenty years, there will not be sufficient water for industry, human needs, and agriculture in the heavily populated areas of the USSR. Industry must cut back on water use, he says, and more water must be purified and recycled; but agriculture faces a major task here too, and aerosol sprinkling is one possible solution, the "most progressive," in the author's opinion. This refers specifically to devices which create and release tiny drops, 50-150 microns in size, of water into the air over crops. The article explains in detail the growing processes of plants and their reliance on water, how a high level of humidity in the

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USE

ALEXANDROV, G. N. et al., Soviet Union, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

located in the gap of a permanent magnet whose poles are in the center of the spheres.

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Optical

USSR

UDC: 537.3.074.3

ALEKSAKOV, G. N., KOL'TSEV, I. M., MAMAYEV, V. I., BOZOV, V. G., Moscow
"Order of the Red Banner of Labor" Engineering Physics Institute

"A Precision Reflecting Device"

Moscow, Otkrytiya, Izobreteniya, Progressivnyye Otkrytiya, Tekhnicheskyye Izobreteniya, No 2, Jan 72, Author's Certificate No 324600, Division 6, filed 3 Dec 71, published 23 Dec 72, p 148

Translation: This Author's Certificate introduces a reflecting device for coding graphic information which contains a scanning mirror with electromagnetic drive, and an interferometer device for measuring the placements of the scanning beam. As a distinguishing feature of the patent, construction is simplified, the overall dimensions of the device are reduced, and accuracy is improved by fastening the scanning mirror at a point support and making the optical reflections of the interferometer in the form of triple prisms located on the scanning of the scanning mirror, while the support axis of the drive and axis of the prisms are mutually perpendicular rectangles fastened to the mirror in an in-

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ALEKSAKHIN, R.M.

Biological
Sci.

[Faint, mostly illegible text, possibly a list or index of names and titles, arranged in several columns.]

RESEARCH AND DEVELOPMENT

1950-1955

USSR

ALEKSAKHIN, R. M., Zhurnal Obshchey Biologii, No 4, 1972, pp 508-510

in the Mediterranean. In addition to data on 10 seas in the Mediterranean basin and results of experiments on a wide range of matters elucidating the migration of artificial radionuclides in the ocean, the book includes a log of the expedition that describes visits to scientific centers, contacts with foreign specialists, and working conditions. Attention is focused largely on the accumulation of the major radioactive fission products (Sr^{90} and Cs^{137}) by marine plants and animals.

USSR

ALEKSAKHIN, R. M.

"An Important Contribution to Radioecology"

Moscow, Zhurnal Obschey Biologii, No 4, 1972, pp 508-510

Abstract: A favorable review of two monographs which assess the advances in the study of marine radioecology made by Soviet scientists and discuss the problems that require further investigation. The first book Morskaya radioekologiya (Marine Radioecology), edited by G. G. Polikarpov (Naukova Dumka Publishing House, Kiev, 1970), is divided into three parts: (a) methods of research in marine radioecology and statistical analysis of the experimental data; (b) data relating to the patterns of absorption and accumulation of the major artificial radionuclides by marine sediments and hydrobionts; (c) regional radioecology of various parts of the ocean (including the Black, Azov, Caspian, Mediterranean, Red, and Central American seas) with a description of the distribution of some radioactive fission products (mainly Sr⁹⁰). The second book Radioekologicheskiye issledovaniya Sredizemnogo morya (Radioecological Studies on the Mediterranean Sea) by G. G. Polikarpov et al. (Naukova Dumka Publishing House, Kiev, 1970) sums up the results of the 10 years' cruising of the R/V Akademik A. Kovalevskiy
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The degree of accumulation of radionuclides in organisms depends on the character of the temperate hydroclimatic conditions, by hydrocompositional, is proven by study of the results of the experiment with the isotopes of cesium and strontium in the soil and in the plants. It is noted that the concentration of cesium and strontium in the plants is higher in productive than in protective forests, and the results of the experiment are in agreement with the data of other authors (B. G. Pevsman, 1967). B. G. Pevsman explained the larger ratio of cesium in the organisms of certain species of plants on the basis of the complete entry of the plants of radiation of radionuclides into the stable isotopes of cesium from water and the denitrification of cesium has an unusual specific activity. At the same time, it was established that the degree and alimentary entry of radionuclides and nutrient elements into the organisms of plants and animals and conditions of feeding of the hydrobiota are also the physicochemical properties of the element (A. A. Stepanov, 1967; A. A. Kulev, and D. P. Marenzhtsinov).

A series of reports was devoted to the distribution and redistribution of radionuclides by components of ecosystems: cesium, water - mineral salts (N. V. Kalyayev, 1967), radionuclides in fresh waters (N. V. Kalyayev, 1967), radionuclides in the soil (A. P. Marenzhtsinov, V. V. Piskunov, and others). The results of field observations and laboratory experiments agree in showing that with water runoff the amount of cesium does not exceed 1% of the stocks of a water-accumulating system. Entrapment is higher in humid regions, where the soil and cesium are sorbed in the soil cover less strongly than in an arid zone.

Considerable attention was given to the effect of gamma radiation of radionuclides, which constitutes one of the central

ALEKSAKHIN, R.M.

Biological Sciences

THE RADIOBIOLOGY OF AQUATIC ORGANISMS
(Symposium in Brief)

Article by Candidate of Biological Sciences R. M. ALEKSAKHIN,
Moscow, Levinskii Akademicheskii Nats. SSR, Russian Fed., ~~USSR~~
June 1972, pp 121-122

Marine and freshwater radioecology is a rapidly developing branch of contemporary science which investigates the features of the migration of radioactive substances in the biosphere and the effect of ionizing radiations on aquatic plants and animals. The results of work on the radiobiology of organisms were summed up at an all-union symposium conducted upon the initiative of the Scientific Council for Radiobiology of the AS USSR and the Institute of Biology of the AS Latvian SSR and held in Riga on 18-20 April. At the symposium over 20 reports were discussed and over 100 specialists from institutes and departments of a number of union republics participated in the discussion.

Opening the symposium, the Vice President of the AS Latvian SSR P. I. Valieskain noted the growing importance of radioecological investigations in connection with the ever-increasing effect of man on his environment. That work is called upon to play an important role, in particular, in the matter of expansion of the peaceful use of nuclear energy and the construction of new atomic power plants foreseen by the Directives of the 24th Party Congress.

One of the main directions of that area of sciences is connected with the accumulation of radioactive by hydrobionts. Besides study of the characteristics of the assimilation by aquatic organisms of the principal long-lived radioactive fission products ⁹⁰Co and ¹³⁷Cs, in recent years investigations have been conducted of the absorption by hydrobionts of radionuclides

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20 Oct 72

USSR

ALEKSAKHIN, R. M., *Ekologiya*, No 6, 1972, pp 104-106

non-isotopic analogs Sr and Ca in reef-forming corals. Yu. B. Kholina presented the results of experimental studies on the forms in which Mn^{54} , Co^{60} , Cu^{64} , and Ce^{144} are found in samples of oceanic water.

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USSR

ALEKSAYKHIN , R. M., Science Council for Radiobiology, Academy of Sciences USSR

"Results of and Prospects for Research on the Radioecology of Aquatic Organisms"

Moscow, Ekologiya, No 6, 1972, pp 104-106

Abstract: An All-Union Symposium on the Radioecology of Aquatic Organisms (Riga, 18-20 April 1972) sponsored by the Institute of Biology, Latvian Academy of Sciences, heard 62 papers dealing with the following subjects: (a) entry of artificial radionuclides into bodies of salt and fresh water; (b) distribution and migration of radionuclides in aquatic biocenoses under natural and experimental conditions; (c) modes of penetration of radionuclides into aquatic organisms; (d) effect of ionizing radiation from radionuclides incorporated into hydrobionts or present in water on plants and animals; (e) methods. At an expanded meeting of the Science Council for Radiobiology held in the Vernadskiy Institute of Geochemistry and Analytical Chemistry (3 April 1972), L. M. Khitrov discussed the most important tasks of radiobiology and radioecology in connection with the general radiogeochemistry of the ocean. In another report, he described the behavior of Sr⁹⁰ and its stable isotopes and

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USSR

ALEKSAKHIN, R. M., Ekologiya, No 1, 1973, pp 104-105

very long half-life times (284.5 days and 5.26 years respectively). Analysis and conceptualization are concentrated on three systems: soil as solvent, soil and plant, and the soil and plant cover of natural biogeocenoses. Both books are well organized, easily readable, and of value not just to radio-ecologists but to all biologists interested in ecological problems.

USSR

ALEKSAKHIN, R. M., Forestry Laboratory, Academy of Sciences USSR (Reviewer)

"Deystviye Ioniziruyushchikh Izlycheniy na Edologicheskkiye Sistemy" (The Effect of Ionizing Radiation on Ecological Systems) by F. A. Tikhomirov, Moscow, Atomizdat, 1972, 176 pp, and "Radioaktivnyye Izotopy v Sisteme Pochva-Rasteniy" (Radioactive Isotopes in the Soil-Plant System) by I. V. Polchanova and N. V. Kulikov, Moscow, Atomizdat, 1972, 86 pp

Sverdlovsk, Ekologiya, No 1, 1973, pp 104-105

Abstract: Tikhomirov's book is the first extensive treatise concerning the biological effects of ionizing radiation on biogeocenoses. The first part deals with the migration of synthetic radioparticles, their distribution over vegetation-covered areas and entry into plants and animals, and dosimetry. In the second part, the author discusses the biological effects on individual organisms, communities, and biogeocenoses. Special attention is given to forest radioecology for the reason that trees have a very low resistance to radiation and absorb large quantities of beta rays, and destruction of forests causes considerable secondary ecological disorders. The second book summarizes long-term investigations of the circulation of Fe^{59} , Co^{60} , Y^{91} , and Ce^{144} between the soil and plants, with consistent follow-up on yttrium and cerium which have 1/2

USSR

ALEKSAKHIN, R., and SHEVCHENKO, V., Genetika, Vol 7, No 5, 1971, pp 174-176

At the closing meeting, the symposium participants approved its decisions unanimously. Remarking on the exceptional importance and timeliness of the symposium, it was stressed that there is a need for broader and deeper research to define existing ideas about quantitative assays of the genetic danger to mankind of low doses of ionizing radiation.

The participants commented on the obvious inadequacy of research on radiation genetics of mammals pursued at the present time in the Soviet Union and they observed that for progress in this extremely important area of biological research it is imperative to expand and deepen research as soon as possible. More work on investigation of the genetic and somatic sequelae of irradiation and on definition of the radiation doses permissible for man is needed. Much attention should also be devoted to development of studies of the genetic sequelae of radioactive contamination of the biosphere, especially water.

The symposium participants approved several concrete proposals for implementation of the decisions made. The next meeting on evaluation of the genetic effect of small doses of ionizing radiation was to convene in March 1971.

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cenoses. Papers delivered by the Institute of General Genetics USSR Academy of Sciences (Moscow) described an increase in radioresistance of natural populations of different species exposed for a long time to high concentrations of $Sr^{90} + Y^{90}$ radionuclides, and in particular in populations of *Chlorella* (V. A. Shevchenko, A. YA. Alekseyenok, and D. R. Pyatyshev), and wild herbaceous plants (L. V. Cherezhanova, R. M. Aleksakhin, and YE. G. Smirnov). Ye. M. Tishchenko reported finding increased radioresistance in the bone marrow cells of northern red backed voles which had lived for a long time in regions with a high concentration of $Sr^{90} + Y^{90}$, as compared to control animals. Experimental data on the deleterious effect of Sr^{89} β -irradiation on timber (pine) in the case of radioactive fallout on the tree tops were submitted in the paper of L. V. Cherezhanova (Institute of General Genetics, USSR Academy of Sciences, Moscow), V. P. Yulanov, F. A. Tikhomirov (Moscow State University), and R. T. Karabanya (Institute of Applied Geophysics, Main Administration of the Hydrometeorological Service, Moscow).

S. A. Famelis (Institute of Plant and Animal Ecology, Ural Department of the USSR Academy of Sciences, Sverdlovsk) reported on the effect of low doses of gamma irradiation (ranging from 15 to 30 r) on *Limnaea stagnalis* embryos at three stages of embryonic development.

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talked about the genetic effect of internal and external chronic irradiation. N. D. Zuyeva discussed the effect of $Sr^{90} + Y^{90}$ on potato development and harvest.

N. P. Rogatykh (Institute of General Genetics, USSR Academy of Sciences, Moscow) analyzed some of the patterns of radiostimulation. S. I. Yarmonenko (Institute of Experimental and Clinical Oncology, USSR Academy of Medical Sciences, Moscow) talked about the stimulating effect of irradiation on HeLa cell cultures, as manifested by acceleration of the cell division cycle. The report of F. V. Sushkov (Institute of Biomedical Problems, USSR Ministry of Health, Moscow) also discussed radiostimulation of cell division in tissue cultures under the effect of chronic gamma irradiation.

T. N. Ratner (Institute of Cytology and Genetics, Siberian Department of the USSR Academy of Sciences, Novosibirsk) and Yu. I. Gregaize (All-Union Scientific Research Institute of Physicotechnical and Radiotechnical Measurements, Moscow Oblast) discussed the difficulties encountered in assaying absorbed doses in experiments using small doses.

There was extensive discussion of issues dealing with investigation of genetic sequelae of chronic irradiation of natural populations and bio-

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of Marine Fishing and Oceanography, Moscow) and G. G. Polikarpov (Institute of Biology of the Southern Seas, Ukrainian Academy of Sciences, Sevastopol') reported on the results of investigation of the genetic effect of Sr⁹⁰ on the embryonic stage of fish development and the methodological aspects of studying the effect of low doses of radiations on fish. The results of experimental studies on these subjects were also submitted in the papers of G. G. Polikarpov, V. G. Tsytsugina, D. S. Parchevskaya (Institute of Biology of the Southern Seas, Ukrainian Academy of Sciences, Sevastopol'), I. A. Shekhanova, L. B. Klyashtorin, V. L. Pechkurenkov, I. G. Telysheva (All-Union Scientific Research Institute of Marine Fishing and Oceanography, Moscow), and G. L. Pokrovskaya (Institute of General Genetics, USSR Academy of Sciences, Moscow).

At the symposium, much attention was devoted to analysis of genetic and somatic effects of small doses of ionizing radiation on agricultural plants. M. A. Pitirimova and N. F. Batygin (Institute of Agricultural Physics, VASKhNIL, Leningrad) reported on the effect of gamma radiation on different stages of barley plant ontogeny. A. A. Kaplan and I. S. Kaplan (Moscow State University) and V. V. Khvostova (Institute of Cytology and Genetics, Siberian Department of the USSR Academy of Sciences, Novosibirsk)

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the cells of male mice (M. G. Domshlak, L. K. Ramayya, and M. D. Pomerantseva), on comparative evaluation of genetic radiosensitivity of sex cells of male mice exposed to x-rays at the embryonic age of 16 days and in the first 24 hours after birth (U. T. Fazylov), and a survey of the results of recent studies of the mutagenic effect of small doses of radiation on mammals (H.D. Pomerantseva).

A. N. Sirotkin and V. T. Kruglov (All-Union Institute of Experimental Veterinary Science, USSR Ministry of Agriculture, Moscow) discussed the effect of external irradiation and incorporated $Sr^{90} + U^{235}$ radionuclides on the peripheral blood of cattle (cows).

Papers from the Institute of Biophysics, USSR Academy of Sciences (Moscow) discussed comparative radiosensitivity of various somatic and genetic cells of different lines of mice (O. P. Domareva and T. I. Dmitriyeva), results of experiments on the correlation between the genetic effect and dose fractionation (Z. I. Muzhdin, G. A. Chudinovskaya, and O. N. Kitayeva), and some aspects of the protective effect of β -mercaptoethylamine on the genetic level (I. S. Kurnishkov).

Papers on the effect of ionizing radiations on fish embryos prompted lively discussion. I. A. Shekahnova (All-Union Scientific Research Institute
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T. P. Tsessarskaya and T. M. Zukhbaya (Institute of Biomedical Problems, USSR Ministry of Health, Moscow) reported the results of cytogenetic studies of dogs exposed to chronic gamma irradiation (25-150 r in one year). Yu. K. Kudritskiy and R. I. Bikkulov (Institute of Radiation Hygiene, RSFSR Ministry of Health, Leningrad) called attention to the important role of the age of experimental animals and dosage in cytogenetic and somatic lesions due to chronic irradiation of mice.

Ya. L. Glembotskiy (Institute of General Genetics, USSR Academy of Sciences, Moscow) discussed the results of experiments involving chronic irradiation of male gametes of *Drosophila melanogaster* at different stages of spermatogenesis.

The paper of G. P. Pargenov (Institute of Biomedical Problems, USSR Ministry of Health, Moscow) dealt with analysis of the combined effect of ionizing radiation and spaceflight factors. He observed that today we can refer to the practical importance of the potential genetic effect of small doses of irradiation.

The team headed by M. D. Ponerantseva (Institute of General Genetics, USSR Academy of Sciences, Moscow) submitted papers on the results of experimental research on the effect of x-ray irradiation and fast neutrons on

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Ya. L. Glenbotkiy (Institute of General Genetics, USSR Academy of Sciences, Moscow), in an introductory report mentioned the considerable difficulties involved in investigating the genetic effect of small doses of radiation, first of all in experimental studies. He also stated this important problem has not been investigated enough.

The effect of x-rays on the chromosome system of human peripheral blood, during diagnostic examination of the stomach was the subject of the paper of A. I. Kuznetsov (Institute of Radiation Hygiene, USSR Ministry of Health, Leningrad). P. A. Borodkin (Institute of Biology, Komi Branch of the USSR, Academy of Sciences Syktyvkar) discussed the lasting changes in blood cell chromosomes observed upon karyological examination of individuals exposed to occupational irradiation. V. I. Teterin (Tomsk Medical Institute) reported the changes in mitotic activity of bone marrow cells as the result of chronic irradiation of cultures in a dose of 6-12 r/day.

The paper of Ya. I. Koskalev and I. K. Petrovich (Institute of Biophysics, USSR Ministry of Health, Moscow) reported data on the somatic effect of small doses of ionizing radiation on female Wistar rats following single exposure to doses of one to 400 r.

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"Report on Symposium entitled 'Evaluating the Genetic Effects of Small Doses of Ionizing Radiation'"

Moscow, Genetika, Vol 7, No 5, 1971, pp 174-176

Abstract: In view of the practical and theoretical importance of the genetic aspect of the effect of small doses of ionizing radiation, the Scientific Council on Radiobiological Problems of the USSR Academy of Sciences and the Institute of General Genetics, USSR Academy of Sciences held a symposium from 9 to 15 March 1970, in Mozzhinka (near Moscow), dealing with the advances made and future prospects of scientific research on this subject. Forty papers were delivered at this symposium, and representatives participated from 29 organizations of the USSR Academy of Science, academies of sciences of some Union republics, from the USSR Ministry of Health, RSFSR Ministry of Health, VASKhNIL (All-Union Academy of Agricultural Sciences imeni V. I. Lenin), and some others.

Academician V. M. Klechkovskiy, of VASKhNIL, Vice-Chairman of the Scientific Council on Radiobiological Problems, delivered the opening remarks.

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2/2 015 UNCLASSIFIED PROCESSING DATE--27NOV70
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMOCOUPLES FOR MEASURING LOW
TEMPS. CONTAIN A POS. CU THERMOCOUPLE LEG. TO EXPAND THE RANGE OF
MEASURABLE TEMPS. UP TO 300DEGREE SK, THE NEG. THERMOCOUPLE LEG WAS MADE
FROM AN ALLOY CU 0.01-0.5PERCENT FE ALLOY.

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SHEPELYAKOVSKIY, K. Z., YEMEL'YANOVA, L. G., ALEKSAKHIN, G. F.

"Selection of Optimal Modes of Induction Heating for Hardening as a Function of Initial Structure"

Sb. Tr. Mosk. Vech. Metallurg. In-t [Collected Works of Moscow Permanent Institute for Metallurgy], 1972, No 12, pp 424-429 (Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No 81866, by the authors).

Translation: Modes of induction heating are studied for the initial structures of steels with various degrees of differentiation, characterized quantitatively. It is demonstrated how the heating mode must be changed to produce optimal structure and properties. 2 figures, 2 tables, 3 biblio. refs.

Acc. Nr.: AR0055221

developed by the Institute of Mining Mechanics and Technical Cybernetics imeni M. M. Fedorov. This principle may be used as the basis for construction of a group of indicator devices in which the simplest element is a pneumatic BM blinker designed for visual indication of the presence or absence of a pneumatic signal and for indicating the position of the actuating elements of machines and mechanisms. A more complex indicator element is the ITsP-2m digital display unit which is designed for construction of digital display modules in pneumatic systems of automatic monitoring and control. The advantages of display elements of this type lie in the extreme simplicity of assembly and repair. The use of such display facilities in construction of the panels and boards on facilities for monitoring and remote control of mining machines leads to miniaturization of boards and panels which contain a large number of indicators. Stand tests of the display facilities have confirmed their operability at a compressed air pressure of $1.4 \pm 10\%$ kg/cm². Two illustrations. G. A.

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ALEKSA, A. K.

JPRS 50533

"Pneumatic Indicator Facilities"

V sb. Pneymat. sredstva avtomatich. uprav. mashin (Pneumatic Facilities for Automation of Mining Machinery), Donetsk, "Donbass", 1969, pp 62-85 (from Elek-Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 1, Jan 70, Abstract No 1A395)

Translation: A new principle of pneumatic signal indication has been

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ALEKSA, A. K., V sb. Pnevmat. sredstva avtomatiz. gorn. mashin, Donetsk, "Donbass", 1969, pp 82-85 (from RZh-Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 1, Jan 70, Abstract No 1A395)

repair. The use of such display facilities in construction of the panels and boards on facilities for monitoring and remote control of mining machines leads to miniaturization of boards and panels which contain a large number of indicators. Stand tests of the display facilities have confirmed their operability at a compressed air pressure of $1.4 \pm 10\%$ kg/cm². Two illustrations. G. A.

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