

USSR

UDC 621.372.5

SHEIN, A. G., STAROSTENKO, V. V.

"Study of Coupled Transmission Lines with Identical Phase Propagation Constants and Different Damping Constants"

Radiotekhnika. Resp. mezhved. nauchno-tekhn. sb (Radio Engineering. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 15, pp 111-114 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A149)

Translation: The method of associated waves is used to study coupled transmission lines with identical phase propagation constants and different damping constants. Analysis shows that for certain values of the line parameters, complete transfer of power from one line to the other is possible. The experimental results can be useful when analyzing processes occurring in traveling wave tubes, backward wave tubes, directional couplers, coupled spirals, and so on. There are 2 illustrations and a 5-entry bibliography.

1/1

- 25 -

1/2 037 UNCLASSIFIED PROCESSING DATE--20NDV70
TITLE--THERMODYNAMICS OF A HIGHLY NONIDEAL PLASMA --U--
AUTHOR--(02)--NORMAN, G.E., STAROSTIN, A.N.
COUNTRY OF INFO--USSR
SOURCE--TEPLOFIZ. VYS. TEMP. 1970, 8(2), 413-38
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--EQUATION OF STATE, COMPUTER APPLICATION, THERMODYNAMICS,
MODEL, LOW TEMPERATURE PLASMA, NONUNIFORM PLASMA
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1412 STEP NO--UR/0294/70/008/002/0413/0438
CIRC. ACCESSION NO--AP0133364
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2/2 037

UNCLASSIFIED

PROCESSING DATE--20NDV70

CIRC ACCESSION NO--AP0133364

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SURVEY IS GIVEN TO ANALYZE CRIT. AND SYSTEMATICALLY THE AVAILABLE APPROXNS. ON DENSE PLASMA, WITH EMPHASIS ON LOW TEMP. PLASMA (10^3 -- 10^5 DEGREE SK). THE SIMPLER MODEL APPROXNS. ARE EVALUATED TO STUDY STRONGLY INTERACTING COULOMB PARTICLE SYSTEMS. THE GENERAL FORM OF THERMODYNAMIC QUANTITIES IS CONSIDERED, WHICH FOLLOWS FROM THE UNIFORM COULOMB POTENTIAL IN CLASSICAL AND QUANTUM STATISTICS. THE APPLICABLE CHARACTERISTICS OF THERMODYNAMIC FUNCTIONS IN A WEAKLY NONIDEAL PLASMA ARE TREATED. THERMODYNAMIC INSTABILITIES, BOTH FAST AND SLOW, QUANTUM EFFECTS IN FREE CHARGE INTERACTIONS, EQUATIONS OF STATE AND THE POSSIBILITY OF LAYER SPEN. OF DENSE PLASMA INTO PHASES, THE PHASE DIAGRAMS, THE EXISTENCE OF CRIT. PCINTS, THE POSSIBLIITY OF THE OVERCOOLED METASTABLE STATE OF DENSE PLASMA, COMPUTER TREATMENTS OF STRONG INTERACTION OF COULOMB SYSTEMS AND NONIDEAL PLASMA, REGIONS OF APPLICABILITY OF VARIOUS APPROXNS. AND CALCN. METHODS IN DENSE PLASMA THEORY, AND THE RESULTS OF EXPTL. INVESTIGATION OF THE EQUATION OF STATE OF A HIGHLY NONIDEAL PLASMA ARE DISCUSSED. 108 REFS. FACILITY: INST. VYS. TEMP., MOSCOW, USSR.

UNCLASSIFIED

STAROSTIN, A.N.

COMBUSTION GAS-LASER PUMPING

JPRS 57080
2 January 1973

Article by Corresponding Member of the AS USSR V. P. Vasiliev, A. N. Starostin, and V. V. Vasiliev. In his biography, A. N. Starostin, Uchenye Zapiski Kazanskogo Universiteta Seriya Fiziko-Matematicheskie Nauki, 1972, pp 126-131.

The concept of excitation of CO₂ lasers [1] (by an external field and an ionization source) has been not only an effective tool for study of the working mechanism of the laser but also a promising method of exciting generation in large volumes of gas at a high pressure.

The use of powerful ionization sources (heavy-current accelerators and pulsed reactors [2,3]) permits creating the prerequisites for the flow of volume discharge. However, as has been shown below, such a discharge proves to be unstable. That instability has an oscillating ionization character. It has been analyzed in [4] with respect to stationary diffusive filaments. In [5] an attempt was made to analyze such instabilities with respect to pulsed volume discharges. In that case the authors erroneously interpreted the system of hydrodynamic equations under conditions where the time of development of the instability is less than the time of establishment of the stationary state, which is determined by the thermal conductivity of the gas. (Such an approach was justified in the case of stationary discharge [6]). We have analyzed the development of an external electric field when the heat-transfer time is much greater than the ionizing time.

Let us examine filamentary fluctuation of the gas density parallel to an electric field which is assumed to be constant. Let the characteristic dimension of inhomogeneity satisfy the conditions

$$L \ll r_{De} \quad (1)$$

STAROSTIN, A. N.

JPRS 59474
10 July 1973

5

THEORY OF STREAMER BREAKDOWN

Article by A. I. Zakharenko, I. G. Parshitskiy, V. D. Pliginskii, A. V. Rodina, P. N. Zhuravskiy, Zhurnal Prikladnoy Matematiki i Teoreticheskoy Fiziki, Russian, No 1, 1973, signed to press 24 July 1972, pp 56-65

The development of the successive theory of streamer breakdown of a gas requires examination of transport of the ions of ionizing in the direction of uniformed gas in an electric field, depending on the form of streamer, which is governed, in turn, by the transport mechanisms [1-3]. In such form this problem is very complex, and the theory proceeds along the path of analysis of various qualitative streamer models [4].

It is assumed in [4] that the velocities of the streamers traveling toward the anode and cathode are determined by the drift rate of electrons. The mechanism of propagation of an anode-bound streamer is considered to be the development of an avalanche from the leading edge of a electrons traveling toward the anode. On the cathode-side electrons are formed ahead of the front of the cathode-bound streamer because of transfer of emission from the ionized zone [1]. It is shown in [5] that direct photoionization is ineffective because of the short path of the quanta, and a mechanism of development of a cathode-bound streamer, related to associative ionization of excited atoms, is proposed. These atoms are formed by far-traveling resonance photons from the wings of the spectral line.

A linear relationship between the velocity of streamers and their length turned out to be a very interesting prediction of theory [4]. This dependence was confirmed in experiments on streamer breakdown, initiated at the center of the discharge gap in spark chambers [6, 7]. At the same time, the velocity of the "breakdown wave" for streamers, developed from avalanches initiated at one of the electrodes, remains constant with satisfactory accuracy in intervals of length of the order of 1 m .

A qualitative theory that permits computation of the velocity of an anode-bound streamer in the case when velocity does not depend on length is formulated in this article. Since the diffusion coefficient of excited

- 1 -

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1/2 033 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PECULIARITIES OF THE INTERPRETATION OF X RAY PHOTOGRAPHS OF
AUSTENITIC STEELS -U-
AUTHOR--(05)--DOLGIY, A.A., VOLKOV, A.S., STAROSTIN, A.P., MIKITAS, A.P.,
PANOV, A.YE.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, SVARCCHNOYE PROIZVODSTVO, NO 3, 1970, PP 36-37
DATE PUBLISHED-----70

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

TOPIC TAGS--AUSTENITIC STEEL, BIBLIOGRAPHY, WELD DEFECT, X RAY TECHNIQUE,
RADIOGRAPHIC JOINT INSPECTION, RADIOGRAPHY

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DOCUMENT CLASS--UNCLASSIFIED
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STEP NO--UR/0135/70/000/003/0036/0037

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2/2 033

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123275

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT HAS BEEN ESTABLISHED THAT APPARENT DARKENING OF THE FILM OBSERVED UPON X RAYING OF WELDS IN AUSTENITIC STEEL ARE FREQUENTLY A RESULT OF THE OVERHEATING OF THE WELD AND NOT THAT OF THE PRESENCE OF DEFECTS IN IT.

UNCLASSIFIED

USSR

UDC 539.3

NEMIROVSKIY, YU. V. and STAROSTIN, G. I. (Novosibirsk)

"Zero-Moment Coupling of Reinforced Shells of Rotation"

Moscow, Mekhanika Tverdogo Tela, No 5, 1973, pp 73-86

Abstract: In this paper, axisymmetric problems of the realization of a zero-moment stressed state in composite shells of rotation are dealt with by effecting changes in the rigidity of the shell as a result of selection of the laws of reinforcement of each sector, or by selecting the laws of distribution of the thickness at sectors, as well as by means of selecting stiffening rings and force factors acting upon them. The reasoning is illustrated by examples. Problems having to do with the realization of a zero-moment state in coupled shells as a result of changing the configuration of the shell or by means of supplementary loads upon the surface of the shell are to be dealt with by the authors in subsequent papers.

4 figures. 3 tables. 7 references.

1/1

USSR

UDC 539.3

NEMIROVSKIY, Yu. V., and STAROSTIN, G. I., Novosibirsk

"Momentless Reinforced Axisymmetrical Shells"

Moscow, Izvestiya Akademii Nauk, Mekhanika Tverdogo Tela, No 3, May-Jun 72,
pp 82-91

Abstract: The general problem of realization of a momentless stressed condition in axisymmetrically loaded and fixed reinforced shells of revolution is divided into four categories as follows. 1). Determination of the form of the meridian by which the momentless condition in the shell is realized under the action of given forces and by known distribution of the thickness of the shell and the assigned character of the axisymmetrical anisotropy. 2). Determination of the type of load effecting a momentless condition in the shell of revolution of given geometric form and by assigned thickness distribution and character of reinforcement (anisotropy and heterogeneity). 3). Determination of the rule of thickness distribution by which the momentless stress condition in the shell of revolution with given axisymmetrical external loads and given reinforcement rule is realized. 4). Search for the rule of additional reinforcement guaranteeing a momentless axisymmetrical stressed condition for the shell of revolution of given geometric form, loaded with assigned axisymmetrical loads and possessing assigned rules of thickness, anisotropy, and heterogeneity

1/2

USSR

NEMIROVSKIY, Yu. V. and STAROSTIN, G. I., Izvestiya Akademii Nauk, Mekhanika Tverdogo Tela, No 3, May-Jun 72, pp 82-91

changes. Some composite problems are discussed, e.g. the possession of a momentless condition in the shell at the expense of a joint change of the shell geometry or thickness and the character of reinforcement. Four illustr., thirty one formulas, fourteen biblio. refs.

2/2

104

STAROSTIN, I. A.

automation

TECHNICAL TRANSLATION

75TC-HT-23-485-71

ENGLISH TITLE: AUTOMATIC CONTROL OF FORGING PROCESSES

FOREIGN TITLE: АВТОМАТИЧЕСКОЕ УПРАВЛЕНИЕ ПРОЦЕССАМИ
ШИПРОВОК

AUTHOR:

A. Ya. Shoptala and I. A. Starostin

ADDITIONAL

SOURCE: Leningrad: Izdatel'stvo "Mashinostroyeniye",
1969

Translated for 75TC by ACSJ

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0-2

6/24/71

USSR

UDC: 535.373.2

GROSS, Ye. F. (Deceased), STAROSTIN, N. V., SHEPILOV, M. P., and SHEKHMANET'YEV, R. I.

"Spectroscopic Investigation of Energy Levels of Bielectrons or Biholes in a Bismuth Iodide Crystal"

Moscow, Izvestiya Akademii Nauk SSSR--Seriya Fizicheskaya, No 4, 1973, pp 885-890

Abstract: This article is the continuation of work begun in an earlier paper (Gross, Ye. F, et al, Pis'ma ZhETF, 13, 1971, p 320) describing experimental research into exciton states in BiI₃ crystals in which a hydrogen-like series of resonance lines of radiation and absorption originating in the shortwave rather than the longwave spectral region was discovered. The results of further experimental work along this line are discussed in the present paper. The authors assert that the basic results of the experimentation can be interpreted if it is assumed that this series of lines is connected with a special type of optical transition in semiconductors, a transition between two electron zones, or two hole zones; it can be considered as a direct interzone transition
1/2

USSR

UDC: 535.373.2

GROSS, Ye. F., et al, Izvestiya Akademii Nauk SSSR--Seriya fizi-
cheskaya, No 4, 1973, pp 885-890

accompanying the formation of a bielectron or bihole by analogy with the formation of an exciton for the case of ordinary zone-zone transitions between an upper valent zone and the conductivity zone. Absorption and luminescence spectra of the inverse series in BiI_3 crystals are shown. It is noted that, with better crystals and the use of a high-dispersion spectrometer, the terms of the inverse absorption series at temperatures of $1.6-4.2^\circ \text{K}$ have doublet structures and a prediction made on the basis of the theory has been experimentally verified.

2/2

- 48 -

USSR

UDC: None

GROSS, Ye. F. (Deceased), STAROSTIN, N. V., SHEPILOV, M. P., and SHEKHMAMET'YEV, R. I.

"Fine Structure of the Energy Levels of a Bielectron or Bihole in a BiI_3 Crystal"

Leningrad, Fizika Tverdogo Tela, vol 14, No 7, 1972, pp 1942-1947

Abstract: From the experimental discovery of an inverted series of hydrogen-like lines in BiI_3 crystals, it has been concluded that the phenomenon was caused by the formation of a bielectron a system of twin charged particles, electrons, or holes, with antiparallel spins. Further experimentation was conducted by the men named above, and the results of that experimentation are given in this paper. Included also are theoretical investigations into the spectroscopic characteristics of the two types of twin particles in poorly symmetrical BiI_3 crystals. Experimentally, it was found that in a DFS-13 spectroscope with a dispersion of about 24/mm the BiI_3 spectrum had a fine structure and some of its lines were doublets, the distance between the doublet components varying inversely as the quantum number. The experiments

1/2

USSR

GROSS, Ye. F. (deceased), et al., Fizika Tverdogo Tela, vol 14, No 7, 1972, pp 1942-1947

of the present paper also used more perfect crystals. In the theoretical part of the paper, the authors obtain an expression for the energies of the doublet components which indicates that the doublet splitting of the d-bielectron or bihole decreases with increasing line number according to the relation $1/n^2$. This agrees with the experimentally observed variation. The authors, members of the A. A. Zhdanov State University of Leningrad and the A. F. Ioffe Physico-Technical Institute of Leningrad, express their gratitude to N. Drugova, who participated in the experiments.

2/2

- 54 -

BIOLOGY
Agriculture

USSR

STAROSTIN, S. G., VNIISKhSPGA, Doctor of Agricultural Sciences

"Technology and Effectiveness of Aerial Spraying"

Moscow, Zashchita Rasteniy, No 4, 1971, pp 30-32

Translation: Airplanes and helicopters are among the most important machines used in the Soviet Union to control crop pests, diseases, and weeds. Their use has grown especially during the past 10 years. For example, 38,000,000 hectares were treated from the air in 1965 compared with 48,000,000 hectares in 1970. This amounted to about 50% of all the efforts made in the USSR to control pests, diseases, and weeds.

Aerial spraying is the principal method employed and it now accounts for over 75% of the work done in this field. Its popularity is due to several advantages that it has over dusting, specifically, its high and stable effectiveness. The established rules must be followed if the spraying is to be safe (observance of the proper height and speed of flight, clear signaling among those engaged in the work, maintenance of the correct rates of dispersal of the pesticide and working liquid, proper width of area to be treated, and such agrotechnical considerations as times of treatment, size of drops, density with which the plant surfaces are to be covered, and so forth).

1/8

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

The technology of aerial spraying is pretty much the same whether it is done from an airplane or helicopter. The spraying is done close to the ground (5 to 6 m above the crops). The air space between the machine and ground complicates the transport of the drops and fine particles of the pesticide to the crops, especially in the layer next to the ground. More rapid settling is promoted by the aerodynamic forces created by the flight of a plane and especially a helicopter, whose lifting rotor drives down large masses of air at a considerable velocity, thereby facilitating the transport of the drops of pesticide to the crops being treated. The average velocity of such a stream from Soviet agricultural helicopters when hovering ranges from 8 to 11 m/sec, with the maximum 20 m/sec (from an airplane only 3.5 to 6 m/sec). If the horizontal velocity of the helicopter is increased, the rate of descent of the air masses and angle of slope of the stream to the ground surface decrease. The angle of slope of the dust-air stream from an MI-4s helicopter moving at 10 to 15 km/hour is 75 to 80°, 45 to 50° at 20 to 30 km/hour, 15 to 20° at 60 km/hour, and 5° at 120 km/hour, i.e., the same as from an AN-2 plane.

The air currents formed behind a moving plane or helicopter can be regarded as a "blast" that directs the stream of pesticide drops and improves their transport to and penetration of plantings and crops. The height of the

2/ 8

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

flight is very important. The optimum distance between the spraying devices and the crops to be sprayed is 5 m. This height ensures an adequate swath, uniform distribution of the pesticide, and minimum waste. When the plane or helicopter is closer to the ground, the drops are not evenly distributed and the swath is narrower. When the plane or helicopter is higher up, the quality of the spraying is poorer and more of the pesticide is lost. Thus, according to the State Research Institute of Civil Aviation, in spraying an orchard from an AN-2 plane, changing the height of the flight from 5 to 10 m results in an almost 20% loss of pesticide and marked decrease in the effectiveness of treatment.

When a helicopter is used, the intensity of the action of the stream of air and liquid on the crops depends on both the height and velocity of the flight. When orchards and vineyards are sprayed from MI-1 and KA-15 helicopters, the height should be 5 m and the velocity 25 to 30 km/hour and in the case of field crops 5 m and 60 km/hour. With an MI-2 or KA-26, both of which have a large flight weight and drive the air downward at great speed, the same effect is achieved from a height of 7 to 8 m, but at 5 m the speed can be increased.

The great range of helicopter velocities and powerful air stream help

3/8

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

to satisfy the increased agrotechnical demands made on spraying. For example, any of the Soviet helicopters can easily create a stream of air and liquid of 5 to 6 m/sec at the tree crowns.

Since the sprayed liquid covers a distance of 5 m or more before reaching the ground and the drops are affected by the turbulence arising during flight, the total width of the swath covered by Soviet airplanes and helicopters is 60 to 70 or even 100 m. To ensure more uniform distribution of the pesticide, the field is usually sprayed 2 or 3 times over a swath 30 to 40 m wide. When a potato crop, for example, is sprayed from an AN-2 plane covering a swath of 30 m, the variational factor characterising the uniformity of distribution of the pesticide on the field ordinarily does not exceed 35%.

Agrotechnical demands on spraying were worked out in general form long ago. Only a few additions and corrections have been made since then to take into account the variety of working conditions and latest technology.

The quality of spraying is characterized by the size and number of drops sprayed per unit of volume and after settling per unit of area. A fine spray ensures a thicker and more uniform covering of the surfaces. Large drops use too much of the liquid, quickly run off the plants and if trapped on the leaves may burn them.

4/8

- 2 -

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

According to the present classification (adopted by the Scientific and Technical Council of the Ministry of Agriculture USSR in 1963), there is small-drop spraying (average diameter of the drop 50 to 150 microns), medium-drop or ordinary spraying (151 to 300 microns), and large-drop spraying (over 300 microns). In an aerosol the drops are smaller than 50 microns.

Modern airplanes and helicopters can spray drops of any size to control crop pests, diseases, and weeds.

The prescribed drop size and rate of consumption of the liquid in the spraying apparatus are regulated by changing the size of the openings and the number of sprayers functioning. Sprayers with small openings are used to obtain a fine spray. For example, with a battery of sprayers 5 x 5 mm in cross section at the mounting rods of an An-2 plane, the average volume diameter of drops of water is 290 microns, while with the same number of sprayers 1 x 5 mm in cross section the diameter of the drops is 140 microns. In a KA-26 helicopter when the openings of the sprayers are 1 mm in diameter, the average diameter of the drops is 125 microns; when they are 5 mm in diameter, it is 212 microns. In the case of sprayers of small cross section, the consumption of working liquid decreases considerably while the number of drops formed increases.

The fineness of a spray is determined not only by the size of the

5/8

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

openings in the sprayers but by change in pressure in the pump and bars. If the number of functioning sprayers is decreased, the pressure rises and the liquid is more finely divided. For example, in spraying the common beet pest with polychlorpinene at a rate of consumption of the working liquid of 25 l/ha using 28 sprayers 1 x 25 in cross section, the diameter of the drops averages 117 microns. The surface tension of the liquid is another important factor. A fine spray increases the thickness of the network of drops and ensures their better retention on the plants. It is stated in the literature that the pesticide solution remains three times longer on the surface of leaves after the spraying of small drops (about 100 microns in diameter) than after the spraying of larger drops (about 500 microns in diameter).

Low-volume small-drop aerial spraying (25 to 50 l/ha) is recommended in the great majority of cases to control crop pests and diseases. It provides a fairly thick network of drops and a high degree of effectiveness. Large-drop spraying is used to apply fungicides to crops.

It has long been known that there is a relationship between the thickness of the deposit of pesticide (or density of the network of drops on the plants) and the effectiveness of the procedure. In recent times this relation-

6/8

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

ship was made more concrete for a great many pests so that the possible effectiveness of a spraying can be estimated from the extent to which the drops cover the surface. According to the data of the All Union Institute of Plant Protection, the State Research Institute of Civil Aviation, and VNIISKhSFGA, effective aerial spraying of wheat with chlorophos or metaphos to control chinch bugs and larvae requires a network of at least 40 drops per cm^2 with an average drop diameter of about 100 microns. Approximately the same network, according to the data of the Ukrainian Institute of Plant Protection, is needed when spraying polychlorpinene to control the common pest bug. When there were fewer than 20 drops per cm^2 , no more than 30% of the bugs died.

When spraying is done from an AN-2 plane or KA-15, MI-1, MI-2, or KA-26 helicopter at the rate of 25 l/ha, an even thicker network of drops (up to 90 to 100 per cm^2) can be achieved.

Besides the above technical conditions which guarantee the high effectiveness of aerial spraying, observance of the proper technology is also of great importance. Above all, spraying should be done at the right time (i.e., from the agrotechnical point of view) and when the weather conditions are favorable (permissible wind velocity no more than 4 m/sec and absence of ascending air currents). The plane or helicopter should fly at the lowest permissible height (5 to 6 m) and strictly follow signals from the ground.

7/8

USSR

STAROSTIN, S. G., Zashchita Rasteniy, No 4, 1971, pp 30-32

Particular attention should be paid to the preparation and careful filtering of the working solutions in order to prevent the sprayers from becoming clogged. Very high quality work requires low-volume spraying. All these conditions are well known.

In organizing chemical treatment of crops and plantings, one must take into account the possibility of using other machines along with planes. Only the proper combination of aviation and ground technology plus careful treatment of each infested plot, including its edges, can ensure the high, stable technical, and economic effectiveness of chemical control of crop pests, diseases, and weeds.

8/8

STAROSTIN, V. I.

JPRS 55341
6 MAR 72
UIC: 611.73.014.477-064-019

STRUCTURAL AND CYTOCHEMICAL CHANGES IN THE RAT'S SKELETAL MUSCLES ASSOCIATED WITH RESTRICTED MOBILITY

(Article by V.V. Portucalov, Ye.I. Il'ina-Kakuyeva, V.I. Starostin, K.D. Rokh-lerica, E.F. Savik; Institute of Developmental Biology, USSR Academy of Sciences, Moscow; Leningrad, Akhiv Anatomii, Gistologii i Embriologii, Russian, No 11, 1971, submitted 19 January 1971, pp 82-91)

The problem of hypokinesia and hypodynamia now goes far beyond the framework of special issues in cosmonautics and clinical practice. In the last decade it has gained broad social significance. Indeed, with the development of technology and mechanization of industry the working and living conditions for large groups of people in developed nations are changing appreciably. There are fewer and fewer applications for the muscular component in man's endeavors.

Diminished muscular activity leads to a large number of changes in systems that do not appear to be related to locomotor functions. There is a change in synthesis of catecholamines, aldosterone, electrolyte balance is impaired, etc. Restricted muscular activity of man related to prolonged immobilization or strict bed rest is always associated with development of atrophy of skeletal muscles and demineralization of bone tissue. Clinicians are well aware of the fact that strict bed rest leads to changes in cardiac function, development of orthostatic hypotension, it is instrumental in development of venous thrombosis, chronic pneumonia, pulmonary embolism, urelithiasis, and many other pathological conditions. We also know that in the case of hypokinesia and hypodynamia there is prevalence of inhibitory processes over excitatory ones in the central nervous system, etc.

Thus, even a mere listing of the effects of limited motor activity shown that it is important to maintain man's motor activity at a specific level in order to keep many of the body's functions within normal range.

The objective of the present investigation was to determine the nature of structural and cytochemical changes in some skeletal muscles of the hind legs as related to different durations of hypokinesia and hypodynamia.

1/2 027 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--CHANGES IN THE MUSCLE FIBERS OF THE SOLEUS MUSCLE DURING
HYPOKINESIS -U-
AUTHOR-(03)-STAROSTIN, V.I., PORTUGALOV, V.V., ILINAKAKUYEVA, YE.I.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 1215-17
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--HYPODYNAMIA, MUSCLE PHYSIOLOGY, HISTOCHEMISTRY, ADENOSINE
TRIPHOSPHATE, ENZYME ACTIVITY, GLYCOGEN
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
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CIRC ACCESSION NO--AT0121365
UNCLASSIFIED

2/2 027

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PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0121365

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

ABSTRACT. IN EXPTS. WITH MATURE MALE RATS
 SUBJECTED HYPOKINESIS BY CAGING IN 3 DIRECTIONS IT WAS SHOWN THAT THE
 SOLEUS MUSCLE CHANGES IN THE COURSE OF 15-60 DAYS SO THAT FIBERS FORM IN
 IT THAT ARE SIMILAR TO THE TARGET FIBERS DESCRIBED BY RESNIC AND ENGEL
 (1967). THESE CHANGES ARE NOT TYPICAL OF THE FAST MUSCLES SUCH AS IN
 THE LEG CALF. EVIDENTLY THE PECULIARITY OF STRUCTURE OF THE SOLEUS
 MUSCLE IS LARGELY RESPONSIBLE FOR THIS RESULT. THE FIBERS LOSE THEIR
 POLYHEDRAL FORM AND INCREASE IN VOL. AND ON THE HISTOCHEM. DETECTION OF
 OXIDIZING ENZYMES IN THESE FIBERS A VOLUMINOUS PPT. OF DIFORMAZAN IS
 OBSERVED. IN THESE FIBER REGIONS THE ACTIVITY OF ATPASE IS BELOW NORMAL
 AND GLYCOGEN DISAPPEARS FROM SUCH FIBERS. THE PPT. OF DIFORMAZAN IS
 ASCRIBED TO ACCUMULATION OF MITOCHONDRIAL MATTER IN THESE FIBERS ALONG
 WITH SUDANOPHILIC MATERIALS. FACILITY: INST. MED.-BIOL. PROBL.,
 MOSCOW, USSR.

UNCLASSIFIED

USSR

S

Physiology

UDC 591.862 + 576.343

STAROSTIN, V. I., PORTUGALOV, V. V., and IL'INA-KAKUYEVA, E. I., Institute of Medical-Biological Problems, Moscow (Reported by the Academician V. D. Timakov)

"Changes in Muscle Fibers of the Soleus Muscle During Hypokinesia"

Moscow, Doklady AN SSSR, Vol 190, No 5, 1970, pp 1,215-1,217

Abstract: Immature male rats were placed in special cages designed to limit their mobility for 15, 30, and 60 days. After 15 days, the cross sections showed considerable enlargement of muscle fibers, which had lost their polygonal form. Diformazan precipitated during determination of oxidative enzymes in the central zone of many fibers, the myofibrillar apparatus became "diffuse," and glycogen disappeared from the fibers. At later stages the muscle fibers diminished. Around the 30-day period glycogen in the fibers increased, concentrating in the central zone. Concurrently the activity of glycogensynthetase increased and that of phosphorylase A and B decreased. The area of formazan precipitation diminished and even disappeared. Towards 60 days, some reversal of the above processes took place. Some muscle fibers were destroyed -- they showed no enzyme activity and no glycogen. The atrophy and the sclerotic processes in the muscles continued to progress. The authors conclude that restriction of movement leads to the formation of a type of "target-fibers" in Soleus muscle, similar to those occurring during myopathy of diverse etiology.

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UDC 678.643.01:53

USSR

LI, P. Z., STAROSTIN, V. N., FILIPPENKO, D. M., TARASOV, YE. V., and GORBUNOV, V. N.

"Glass-Textolite Based on Compositions Containing 4-Vinyl-1,2-epoxy-cyclohexane"

Moscow, Plasticheskiye Massy, No 10, 1970, pp 14-15

Abstract: In an attempt to develop materials capable of prolonged exposure to high temperatures, compositions containing 4-vinyl-1,2-epoxycyclohexane (VECH), dioxide of the dicyclopentadiene (DODCP), ED-5 resin and maleic anhydride (MA) were studied. The materials were subjected to a short and long term exposure to high temperatures. Data on thermomechanical properties, weight loss on heating, dielectric permeability and maximum strength on static bending are reported graphically. On the basis of experimental results materials composed of 12.1 VECH + 48.3 DODCP + 39.6 MA or 9.3 VECH + 23.2 DODCP + 23.2 ED-5 + 43.3 MA can be used for prolonged periods at 250°C temperature, while the composition consisting of 16.2 VECH + 48.9 ED-5 + 34.9 MA can be used at 200°C for extended periods.

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- 105 -

Acc. Nr:

AP0041518

Abstracting Service:
CHEMICAL ABST.

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4-70

Ref. Code:

UR0078

83474t Effect of the structure of some phenols on the extraction of rubidium and cesium. Rodionova, G. S.; Alekseeva, V. V.; Starostin, V. V. (USSR). *Zh. Neorg. Khim.* 1970, 15(1), 176-8 (Russ). Rb and Cs were extd. from pH 12-13 solns. by alkyl or aryl-substituted phenols. The distribution coeff. (*D*) depended on the structure of phenols, nature of solvent, and pH of soln. At pH 12.5, with kerosine as solvent and *M* concn. of extg. agents, *D* for Cs were (phenol, *D*): 2-(α -methylbenzyl)-4-chlorophenol, 85.9; 2-(α -methylbenzyl)-4-methylphenol, 20.3; 2-*sec*-butyl-4-methylphenol, 0.087; *m*-nonylphenol, 3.0. Values of *D* for 8 phenols at pH 12 and 13 and for sepn. of Cs and K, Cs and Rb, and Rb and K are given. Cs can be extd. selectively from solns. contg. large excess of K, Na, or Rb.

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REEL/FRAME

19751386

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CIRC ACCESSION NO--AP0124401
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. KINETIC DATA WERE PRESENTED FOR THE DECOMP. OF THE TITLE ACID (I) RUN IN THE TEMP. RANGE 67-90DEGREES EITHER ALONE OR WITH ADDITIVES SUCH AS ACOH, C SUB6 H SUB6, ISO-PRGH, OR I DI-ME ESTER. IN ACOH THE RATE CONST. FOR DECOMP. OF I HAD THE FOLLOWING VALUES (K TIMES 10 PRIMENEGATIVE5 SEC PRIMENEGATIVE1): 75DEGREES 3.98, 80DEGREES 7.23, 85DEGREES 10.87, 90DEGREES 22.5; ITS DI-ME ESTER GAVE THE VALUES OF 3.7, 7.13, -, AND 22.48 UNDER THESE CONDITIONS AND ITS RATE OF DECOMP. WAS APPRECIABLY LOWER IN C SUB6 H SUB6. EPR SPECTRA WERE SHOWN FOR THE SPECIMENS OF I SUBJECTED TO UV ILLUMINATION AT LOW TEMPS. ALONE OR IN ACOH. DECOMP. OF I BY THE THERMAL ROUTE IN ACOH OR C SUB6 H SUB6 WAS FIRST ORDER IN RESPECT TO THE PEROXIDE. IN UV LIGHT THE RADICAL NATURE OF THE REACTION WAS CONFIRMED. REACTION SCHEMES WERE PROPOSED. FACILITY: INST. ORG. KHIM. IM. ZELINSKOGO, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.391:519.27

STAROSTIN, YU. N.

"Signal/Noise Ratio Estimate of the Quality of Wide-Band Communications Systems with Noiselike Signals"

Radioelektronika v nar. kh-ve SSSR. Ch.1 -- V sb. (Radio Electronics in the National Economy of the USSR. Part 1 -- collection of works), Kuybyshev, 1970, pp 112-123 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A43)

Translation: When calculating the "deviation criterion" it was demonstrated that the signal/noise ratio at the receiver input $\geq N$ at the output of the autocorrelation wide-band signal receiver coincides with an accuracy of up to 10-15 percent with the ratio for the autocorrelation narrow band signal receiver. This ratio is 3 decibels higher at the coherent receiver output band at the autocorrelation receiver output. If an additive mixture of wide-band signals, white noise and sinusoidal noise is fed to the autocorrelation receiver input at $h^2 > 1.0$ and $h_n^2 = \text{const}$, the communications systems for wide band signals give a gain in the signal/noise ratio relative to narrow band signal systems. There is 1 illustration and a 6-entry bibliography.

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- 122 -

USSR

UDC: 573.953+574.917

KLYASHCHITSKIY, B. A., STAROSTINA, A. K., SHVETS, V. I., and YEVSTIGNEYEVA, R. P., Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov

"Study of the Synthetic Routes of Polyphosphoinositide"

Moscow, Doklady Akademii Nauk SSSR, Vol 195, No 4, Dec 70, pp 848-850

Abstract: Synthesis of polyphosphoinositides -- the most important representatives of inosite phosphatides -- is tied closely to the resolution of optically active di-O-cyclohexylidenemyoinosites into optical antipodes. One such possibility is described for the case of 1,2:5,6-di-O-cyclohexylidenemyoinosite which yielded optically active antipodes through diastereomeric orthoacetates of D-mannose: 1,2:5,6-di-O-cyclohexylidene-sn-myoinosite, $[\alpha]_D^{20} -7.4^{\circ}$ and its enantiomer 2,3:4,5-di-O-cyclohexylidene-en-myoinosite, $[\alpha]_D^{20} +7.5^{\circ}$, both melting at 130-140°C.

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USSR

UDC: 548.5:535.37

KUZ'MINA, I. P., LOBACHEV, A. N., PREDTECHENSKIY, B. S., STAROSTINA, L. S.,
STOPACHINSKIY, V. B., KHAYDUKOV, N. M., Institute of Crystallography,
Academy of Sciences of the USSR

"Luminescent Crystals of Cuprous Oxide"

Moscow, Kristallografiya, Vol 18, No 3, May/Jun 73, pp 635-637

Abstract: The paper describes a method of growing large perfect crystals of Cu_2O to study bright narrow luminescence lines of recombination of free excitons. A polycrystal like specimen of Cu_2O is treated by zone melting with an electron beam. The resultant specimen usually consists of 2-3 crystals. A single crystal is grown, using one of these crystals as a seed. The result is a transparent cylindrical rod up to 10 mm in diameter and 100 mm long. These large crystals can be used to study many new properties of excitons -- interaction between excitons and the feasibility of making lasers based on cuprous oxide crystals.

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1/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--GAS CHROMATOGRAPHIC DETERMINATION OF HEATS OF ADSORPTION -U-
AUTHOR--(05)-BEREZKIN, V.G., NIKITINA, N.S., FATEYEVA, V.M., STAROSTINA,
N.G. STAROBINETS, L.L. /
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (1), 19-21 S
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--GAS CHROMATOGRAPHY, ALKANE, UNSATURATED HYDROCARBON,
ADSORPTION, HEAT OF SOLUTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1997/0642 STEP NO--UR/0062/70/000/001/0019/0021
CIRC ACCESSION NO--AP0119554
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--23OCT70

2/2 017

CIRC ACCESSION NO--AP0119554

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

ABSTRACT. THE DIRECT GAS LIQ. CHROMATOGRAPHIC METHOD MAY BE USED TO DET. THE HEAT OF ADSORPTION FROM AN IMMOBILE LIQ. PHASE TO A SOLID CARRIER SURFACE. THE HEAT OF SOLN. AND ADSORPTION OF ALKANES AND ALKYNES ON APEIZON K SUPPORTED BY THE CARRIER INZ-600 WAS DETD. ALKYNES GAVE HEATS OF ADSORPTION THAT ARE 5-8 KCAL-MOLE GREATER THAN THOSE FOR ALKANES, EXPLAINED BY SPECIFIC INTERACTION OF THE TRIPLE BOND WITH THE SUPPORT SURFACE. THE RESULTS FOR HEXANE, 1,HEXYNE, HEPTANE, AND 2,HEPTYNE ARE TABULATED. THE METHOD IS BASED ON THE DETN. OF THE RETENTION VOL. RELATIVE TO THE AMT. OF DEPOSITED LIQ. PHASE, FROM WHICH THE DISTRIBUTION COEFF. AT VARIOUS TEMPS. MAY BE CALCD.; THE CONTRIBUTION OF ADSORPTION TO THE RETENTION VOL. IS THEN ESTD.

FACILITY: INST. NEFTEKHIM. SIN. IM.

TOPCHIEVA, MOSCOW, USSR.

UNCLASSIFIED

Acc. Nr.

AP0053762

Abstracting Service:
CHEMICAL ABST.

5/50

Ref. Code

UR0366

110967g Peracylalkyl(aryl) carbonates. VIII. Reactions of
 some aryloxy radicals with carbon tetrachloride. Razuvaev, G.
 A.; Starostina, L. I.; Dodonov, V. A. (Gor'k. Gos. Univ. im.
 Lobachevskogo, Gorki, USSR). *Zh. Org. Khim.* 1970, 6(2),
 237-40 (Russ). The thermal decompn. of $BzOOCO_2R$ or $AcO-$
 OCO_2R (R is iso-Pr, Me, or cyclohexyl) at 60° in CCl_4 gives
 $RO_2CO\cdot$, $BzO\cdot$ and $AcO\cdot$ which lose CO_2 to give $RO\cdot$, $Ph\cdot$, or
 $Me\cdot$. $RO\cdot$ react with CCl_4 to give HCl, acetone (HCHO or
 cyclohexanone) and $Cl_2C\cdot$. $Cl_2C\cdot$ reacts further with HCHO to
 give $HCCL_3$, CO, and HCl.

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REEL/FRAME
19830825

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Acc. Nr:

A70048316

Abstracting Service:
CHEMICAL ABST. 5/70

Ref. Code:

2180020

104446c Isotopic exchange of oxygen on films of silver and gold alloys. Starostina, T. S.; Khasin, A. V.; Borekov, G. K.; Plyasova, L. M. (Inst. Katal., Novosibirsk, USSR). *Dokl. Akad. Nauk SSSR* 1970, 190(2), 394-7 [Phys Chem] (Russ). In their relation to O, Ag and Au differ greatly. Whereas O is readily adsorbed on Ag at room temp. and at 200° there is perceptible reaction of homomolecular isotopic O exchange between the adsorbed and gaseous O, O is not adsorbed on Au at room temp. and no perceptible isotopic exchange occurs at 400°. Adsorption of O was studied on a series of Ag-Au alloys. On a Ag alloy with up to 50-60% Au, the rate of isotopic O exchange increases. Beyond this Au content, the rate starts to drop. The max. rate of exchange on the alloys is 5-8 times greater than on Ag alone. Inclusion of up to 60% Au in the alloy does not materially affect the activation energy of homomolecular O exchange and it remains the same as on pure Ag, 28-33 kcal/mole. In alloys with 60-80% Au, the activation drops to 16-17 kcal/mole. The quantity of O on alloys decreases with a decrease of Ag content. For pure Ag it is ~2.7 monolayers, whereas for alloys with 33, 63, and 89% Au, it is 1.9, 1.1, and 0.4 monolayers, resp. M. Hosh

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1/2 022 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PENICILLIN SENSITIVITY OF GONOCOCCI AND ITS ROLE IN CLINICS AND
THERAPY OF WOMAN GONORRHEA -U-
AUTHOR-(03)-CHASTIKOVA, A.V., STAROSTINA, Z.D., KUNTSEVICH, L.D.
COUNTRY OF INFO--USSR
SOURCE--ANTIBIOTIKI, 1970, VOL 15, NR 6, PP 561-564
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--VENEREAL DISEASE, GYNECOLOGY, PENICILLIN, DRUG SENSITIVITY,
ANTIBIOTIC, DRUG RESISTANCE, STREPTOMYCIN, TETRACYCLINE, LEVOMYCETIN
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0999 STEP NO--UR/0297/70/015/006/0561/0564
CIRC ACCESSION NO--APO126641
UNCLASSIFIED

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PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0126641

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SENSITIVITY OF GONOCOCCI TO PENICILLIN WAS STUDIED ON 252 FEMALE CASES WITH VARIOUS FORMS OF GONORRHEA. GONOCOCCAL SUSCEPTIBILITY TO PENICILLIN WAS ESTIMATED WITH THE METHOD OF SERIAL DILUTIONS AND THAT TO PENICILLIN, LEVOMYCETIN, STREPTOMYCIN, CHLORTETRACYCLINE AND OXYTETRACYCLINE BY THE METHOD OF PAPER DISCS. IN 1966 TO 1969 STRAINS WITH DECREASED SENSITIVITY TO PENICILLIN (AT LEAST 0.1 UNITS) WERE ISOLATED FROM 14.7 PERCENT OF FEMALE CASES SUFFERING FROM GONORRHEA. NO CORRELATION BETWEEN THE SENSITIVITY LEVELS OF GONOCOCCI TO PENICILLIN, THE STAGE OF THE DISEASE AND ITS PROGRESSION WAS FOUND, HOWEVER, STRAINS WITH DECREASED SENSITIVITY WERE ISOLATED FROM CASES WITH ASCENDING PROCESSES TWICE AS FREQUENTER, THAN FROM CASES WITH GONORRHEA OF THE LOWER PART OF THE UROGENITAL ORGANS. IT WAS SHOWN THAT DEVELOPMENT OF RESISTANCE TO PENICILLIN IN GONOCOCCI WAS LARGELY DUE TO PREVIOUS TREATMENT OF THE DISEASE WITH INSUFFICIENT DOSES OF THE DRUG. THE RESULTS OF THE TREATMENT DEPENDED ON THE HOST REACTIVITY AND THE SENSITIVITY LEVELS OF GONOCOCCI TO THE ANTIBIOTICS. COMPARISON OF THE DATA OF THE GONOCOCCAL SENSITIVITY TO PENICILLIN OBTAINED WITH THE TWO METHODS, THAT IS SERIAL DILUTIONS AND PAPER DISCS SHOWED FREQUENT DEVIATIONS. THE METHOD OF SERIAL DILUTIONS IS SUPPOSED TO BE MOST EXPEDIENT FOR DETERMINATION OF GONOCOCCAL SENSITIVITY TO PENICILLIN. FACILITY: GORKY INSTITUTE FOR SKIN AND VENERIAL INFECTIONS, MZ RSFSR.

UNCLASSIFIED

USSR

UDC 615.31:547.751].012.1

PREOBRAZHENSAYA, M. N., ORLOVA, Z. G., STAROSTINA, Z. G., LIBERMAN, S. S., SUKHININA, G. P., and SUVOROV, N. N., All Union Scientific Research Institute of Pharmaceutical Chemistry imeni S. Ordzhonikidze, Moscow

"Synthesis and Investigation of the Pharmacological Activity of 1-(Indolyl-3')-2-alkylaminoethanols"

Moscow, Khimiko-farmatsevticheskiy zhurnal, Vol 4, No 10, Oct 70, pp 5-9

Abstract: 1-(Indolyl-3')-2-alkylaminoethanols were synthesized by hydrogenating the corresponding N- substituted 3-aminoacetylindoles, using Raney nickel as a catalyst. The resultant amino alcohols were converted to salts (chlorohydrates or adipinates) which were pharmacologically studied. The initial 3-alkylaminoacetylindoles were produced by interacting 3-chloroacetylindole or 3-bromoacetylindole with primary or secondary amines. The physicochemical properties of the 3-alkylaminoacetylindoles and 1-(indolyl-3')-2-alkylaminoethanols are tabulated. It was found that all amino alcohols containing the secondary amino group have sympathomimetic properties: they increase arterial blood pressure in rats and cats under anesthesia, cause contraction of the nictitating membrane, and constrict the peripheral vessels. This effect is 1/2

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PREOBRAZHENSAYA, M. N., et al., *Khimiko-farmatsevticheskiy zhurnal*, Vol 4, No 10, Oct 70, pp 5-9

attributed to excitation of the α -adrenoreactive systems. The most active of all compounds studied was 1-(indolyl-3')-2-methylaminoethanol. This alcohol has only 1/10-1/20 the activity of adrenalin, but its effect is longer-acting. Amino alcohols containing the tertiary amino group did not cause contraction of the nictitating membrane, they reduced blood pressure and relaxed the peripheral vessels.

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- 71 -

USSR

Powder Metallurgy

UDC: 669.245'26:621.762

BELOV, A. F., FATKULLIN, O. Kh., POPOV, D. S., STAROSVETSKIY, D. I., Moscow

"Degassing of Nickel-Chromium-Based Alloys Made by Powder Metallurgy Methods"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 6, 1973, pp 101-105.

Abstract: This work studies one problem in the area of improvement of processes of powder metallurgy of nickel-chromium-based alloys -- the gas content of the materials produced from various types of charge (alloyed powders and mixtures of powders of the individual alloy components), and the influence of certain technological parameters on the final gas content in the powders. The temperature dependences were produced for the liberation of gasses in a vacuum from powder materials composed of individual components and produced by atomizing, used as the charge for nickel-based alloys. The gas content of various fractions of powders produced by atomizing of a melt into water has an extreme. The extremal nature of the gas content of various powder fractions is explained by the influence of changes in the total surface of the powders and the number of pores in the particles.

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Acc. Nr: AP0049022

Ref. Code: UR0607

PRIMARY SOURCE: Vestnik Otorinolaringologii, 1970, Nr 1
PP 45-48

THE SURGICAL TREATMENT OF CHRONIC HIGHMORITIS IN PATIENTS WITH
DIABETES MELLITUS

Professor Ye. N. Manuylov, Candidate of Medical Sciences V. A. Starosvetkiy (Moscow)

Summary

During the examination of 1600 patients suffering from diabetes mellitus chronic highmoritis was revealed in 38 (2.4%) cases. It was established that exacerbations of chronic highmoritis aggravate the course of diabetes mellitus. A radical operation was performed in 21 diabetic patients with chronic highmoritis. Out of the latter 19 patients had a productive form and 2 — an exudative-suppurative form. In the preoperative period all the patients were subjected to insulin therapy (crystalline insulin and protamine zinc-insulin) for the compensation of metabolic processes. The operation was carried out without the use of adrenaline. On the day of the operation and in the postoperative period

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the patients received an antidiabetic diet and individually selected dose of insulin. The dosage of insulin was altered correspondingly with the daily indications of laboratory investigations for the sugar content of the blood and urine. The operation and postoperative period ran a quite satisfactory course. Decompensation of diabetes mellitus did not occur in a single case. After the operation in 14 patients the indices of metabolic processes improved, this being manifested by reduction of hyperglycemia or decreased requirement of exogenic insulin. Follow-up studies (up to three years) revealed no relapses of higo-

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UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--REASONS FOR DEFECTIVE PRODUCTS AND AN IMPROVEMENT IN QUALITY
CONTROL FOR DIELECTRIC RUBBER FOOTWEAR --U-

AUTHOR--(03)--BERLIZEV, D.K., PAVLOV, A.A., STAROV, I.M.

COUNTRY OF INFO--USSR

SOURCE--KAUCH. REZINA 1970, 29(3), 42-3

S

DATE PUBLISHED--70

SUBJECT AREAS--MATERIALS, MILITARY SCIENCES

TOPIC TAGS--FOOTGEAR, ELASTOMER, DIELECTRIC PROPERTY, ELECTRIC STRENGTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0835

STEP NO--UR/0138/TQ/029/003/0042/0043

CIRC ACCESSION NO--AP0124502

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124502

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CAUSES FOR DEFECTS IN RUBBER FOOTWEAR WERE TRACED TO IMPROPER PREPN. OF RUBBER BLENDS AND FORMATION OF AIR GAPS IN THE BONDED SEAM. ELASTOMER SHEETS USED FOR THE MANUF. OF DIELEC. FOOTWEAR HAD ADEQUATE ELEC. STRENGTH. A METHOD WAS DEVELOPED FOR TESTING THE BREAKDOWN VOLTAGE OF RUBBER FOOTWEAR. FACILITY: MOSK. INST. KHIM. MASHINOSTR., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.382.3

XIR'YANOVA, V.M., MAKOVIIY, A.N., PRAVDINA, T.V., STAROV, V.G., FURSOV, V.V.,
SHCHEVELEV, M.I.

"To The Problem Of The Physical Interconnection Of The Drift Of Certain Parameters
Of Silicon Drift Transistors"

Sb.Tr. po poluprovodnikovym materialam, priboram i kh primeneniyu (Collection Of
Works On Semiconductor Materials, Devices, And Their Application), Voronezh, 1971,
pp 75-80 (from RZh:Elektronika i yeye primeneniye, No 11, Nov 1972, Abstract No
118255)

Translation: Using two types of silicon drift transistors as an example, the
dependence is studied of the electrical parameters on the dislocation density,
the content of C₂ and the resistivity of the initial Si, and the correlation be-
tween the values of the parameters and their changes in the process of current
aging. 1 tab. 2 ref. V.B.

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1/3 015
UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--RELATIONSHIP BETWEEN MAGNETIC FIELD AND SPORADIC E LAYER -U-
AUTHOR--(03)-KOLESNIKDYA, T.V., STAROVATOV, A.A., FILONOVA, L.D.
COUNTRY OF INFO--USSR
SOURCE--MOSCOW, GEOMAGNETIZM I AERONOMIYA, VOL X, NO 2, 1970, PP 358-359
DATE PUBLISHED--70
SUBJECT AREAS--ATMOSPHERIC SCIENCES, EARTH SCIENCES AND OCEANOGRAPHY
TOPIC TAGS--E LAYER, GEOMAGNETIC FIELD, CORRELATION ANALYSIS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1990/0018
CIRC ACCESSION NO--AP0108408
STEP NO--UR/0203/70/D10/002/0358/0359
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0108408

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MANY STUDIES HAVE BEEN MADE OF THE RELATIONSHIP BETWEEN THE EARTH'S MAGNETIC FIELD AND THE SPORADIC E LAYER. HOWEVER, THE RESULTS HAVE BEEN AMBIGUOUS. THIS STUDY WAS MADE ON THE BASIS OF DATA FOR 1964, 1965, AND 1966 FOR ALMA-ATA STATION. IT WAS POSSIBLE TO DETERMINE THE DEVIATIONS OF THE MEAN HOURLY F SUBO E SUBS VALUES FROM THE MEAN MONTHLY VALUE AND THE DELTA F SUBO E SUBS VARIATIONS WERE AVERAGED BY SEASONS. THE DELTA H (GAMMA) VALUES WERE ALSO DETERMINED FOR THE H-COMPONENT OF THE EARTH'S MAGNETIC FIELD. THE DIURNAL VARIATIONS DELTA H AND DELTA F SUBO E SUBS WERE DETERMINED. IN SUMMER AND AT THE EQUINOX THE CHANGES OF THESE PARAMETERS ARE IN ANTIPHASE; IN WINTER THE CORRELATION IS POSITIVE. IN SUMMER AND AT THE EQUINOX, WHEN E SUBS OF TYPES C AND H IS MOST COMMONLY OBSERVED, THE CORRELATION BETWEEN F SUBO E SUBS AND H IS NEGATIVE, BUT IN WINTER, WHEN TYPES L AND F PREVAIL, THE CORRELATION IS POSITIVE. SOMETIMES THE E SUBS SCREENING FREQUENCIES EXPERIENCE BRIEF BUT SIGNIFICANT CHANGES DURING THE DAY. DURING 1966 THERE WERE ABOUT 220 F SUBB E SUBS BURSTS. DURING SUMMER THESE BURSTS ARE USUALLY OBSERVED DURING THE DAYTIME AND FOR THE MOST PART BELONG TO E SUBS TYPE C. THEIR DURATION DOES NOT EXCEED AN HOUR. VALUES OF THE H-, Z- AND D- COMPONENTS WERE DETERMINED FROM THE MAGNETOGRAMS AT TIMES OF F SUBB E SUBS BURSTS AND DURING ADJACENT TIME PERIODS. IT WAS FOUND THAT F SUBB E SUBS BURSTS ARE USUALLY ACCOMPANIED BY MARKED H-, Z- AND D-COMPONENT CHANGES. AN INCREASE IN F SUBB E SUBS WAS ACCOMPANIED WITH EQUAL PROBABILITY BY AN INCREASE OR DECREASE IN THE H- COMPONENT.

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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0103408

ABSTRACT/EXTRACT--IN ONLY 39PERCENT OF THE CONSIDERED CASES DID MAGNETIC FIELD CHANGES TRANSPIRE SYNCHRONOUSLY WITH F SUBB E SUBS FOR THE H-COMPONENT, IN 43PERCENT OF THE CASES FOR THE Z-COMPONENT AND IN 27PERCENT OF THE CASES FOR THE D-COMPONENT. CHANGES IN ELEMENTS OF THE EARTH'S MAGNETIC FIELD EITHER LAG SOMEWHAT OR SOMEWHAT OUTSTRIP THE F SUBB E SUBS CHANGES, THE TIME DIFFERENCE BEING ABOUT 15 MINUTES. THE E SUBS LAYER TYPE C CAN BE ACCOMPANIED BY THE APPEARANCE OF A LOCAL CURRENT SYSTEM WHOSE MAGNETIC FIELD IS EITHER COMBINED WITH THE CURRENT SYSTEM IN THE NORMAL E REGION OR IS SUBTRACTED FROM IT. ACCORDINGLY, THERE CAN BE AN INCREASE OR DECREASE IN THE H- AND Z-COMPONENTS. VARIATIONS OF THE D-VECTOR BECOME UNDERSTANDABLE IF IT IS POSTULATED WITH THE MAGNETIC FIELD OF THE REGIONAL CURRENT SYSTEM MAY NOT COINCIDE WITH THE DIRECTION OF THE MAGNETIC FIELD VECTOR OF CURRENTS FLOWING IN THE E REGION.

UNCLASSIFIED

USSR

UDC 541.183

KIROVSKAYA, I. A., LOBANOVA, G. L., STAROVOYTENKO, L. M., Tomsk State University imeni V. V. Kuybyshev

"Adsorption of Water Vapor on Gallium Arsenide"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 45, No 9, 1971, p 2374

Abstract: Adsorption of water vapor on finely ground powder of n- and p-gallium arsenide single crystals was determined in a static vacuum apparatus at 0-200°C, and $2.25-4 \cdot 10^{-3}$ mm Hg pressure. The amount of adsorption on both n- and p-type samples was of the same order of magnitude (10^{-5} a mmol/sq.m.) and adsorption isobars indicated reversibility of the process. Heats of adsorption, calculated for the cited ranges of temperature and pressure, were in the 0.31-6.4 kcal/mol range and approximately equal for n- and p-type samples. The concave adsorption isotherms at a small coverage are described by the Langmuir equation with adsorption constants in the 60-150°C range equal to $(1.6-7.2) \cdot 10^{-4}$ and $(2-40) \cdot 10^{-4}$ for n- and p-gallium arsenide, respectively. The experimental data indicate a preferential adsorption of water
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- 24 -

-USSR

KIROVSKAYA, I. A., et al, Zhurnal Fizicheskoy Khimii, Vol 45,
No 9, 1971. p 2374

molecules by Ga atoms with formation of H_2O^+ and Ga^- , hence a reversible chemisorption. Also a better interpretation of the adsorption mechanism of hydrogen-oxygen mixture by gallium arsenide is made possible.

2/2

USSR

KIROVSKAYA, I. A., LOBANOVA, G. L., STAROVYOTENKO, L. M.

"Adsorption of Water Vapors on Gallium Arsenide"

Adsorbtsiya Parov Vody na Arsenide Galliya [English Version Above], Moscow, 1971, 8 pages (Translated from Referativnyy Zhurnal, Khimiya, No 3, 1972, Abstract No 3 B1488 Dep. by the author's).

Translation: A volumetric-gravimetric method is used to study the adsorption of water vapor on electron and hole specimens of GaAs in the 0-200° temperature interval and $2.25-4.1 \cdot 10^{-3}$ mm pressure interval. The adsorption isobars are descending curves, indicating the reversible nature of the process. With slight fillings, the adsorption isotherms follow the Langmuir equation and indicate that with increasing filling, tangential interactions occur in the adsorbed layer. The Clapeyron-Clausius and Bering-Serpinskiy equations are used to calculate the heats of adsorption, 0.3-6 kcal/mol in the temperature interval studied. A mechanism of adsorption of H₂O vapors is suggested, which agrees with statements made earlier on the nature of adsorption of mixtures of H₂ and O₂ on gallium arsenide.

1/1

USSR

UDC 536.24

STAROVOYTENKO, YE. I., and MINAYEV, B.N.

"Experimental Investigation of the Effect of Eccentricity on the Resistance and the Heat Exchange in an Annular Channel at Laminar Motion Conditions of the Medium"

V Sb. "Teplo i Massopereenos". [In the Collection "Heat and Mass Transfer"], Technical Information Minsk, 1972, pp 245-249 (from Referativnyy Zhurnal, No 6, Jun 72. 34. Aviation and Rocket Engines. Abstract No 6.34.17)

Translation: Experimental data were obtained for the hydraulic resistance at laminar motion condition of water in an annular channel ($2000 \gg Re \gg 500$) in the region of stabilized flow and the initial hydrodynamic section. In this case, the geometric parameters varied within the limits $0.882 \leq \gamma \leq 0.67$; $1 \leq \epsilon \leq 0$; $d_2 = 50.25$ mm, where $\gamma = d_1/d_2$ is the relation of the diameters of tubes forming the channel, and ϵ = eccentricity. The pressure drops over the length of the investigated section were measured by help of a micro-manometer. Three illustr., three biblio. refs.

1/1

Acc. Nr:

AP0048297

Abstracting Service:

CHEMICAL ABST.

5770
S

Ref. Code:

4R0181

94652a Magnetic properties of gadolinium, neodymium, and praseodymium aluminates with perovskite structure. Starovoytov, A. T.; Ozhozin, V. I.; Bokov, V. A.; Zonn, Z. N.; Libackinoy, G. M. (Inst. Poluprov., Leningrad, USSR). *Fiz. Tverd. Tela* 1970, 12(1), 301-3 (Russ). Results are given of the measurements of the temp. dependences of inverse susceptibility in static fields and the magnetization curves in pulsed fields of ≤ 230 kOe at 4.2 and 1.7°K of single-crystal aluminates of Gd, Nd, and Pr. GdAlO₃ is an antiferromagnet with Neel temp.

$T_N = 3.87^\circ\text{K}$ and the axis of antiferromagnetism directed along the orthorhombic axis [010]. Satn. of the magnetization curve of GdAlO₃ in a field of 42 kOe at 1.7°K corresponds to disruption of antiferromagnetic ordering. The ferromagnetic moment of Gd³⁺ is 6.57 μB . The magnetic susceptibility of NdAlO₃ at 80-300°K follows the Curie-Weiss law and antiferromagnetic ordering is present. For PrAlO₃, the susceptibility depends on temp. in a complex manner.

A. Libackij

13

REEL/FRAME
19792019

18

USSR

UDC: 519.2:54

BUYANOVSKIY, L. A., L'VOV, S. V., STAROVOYTOV, G. P., SHEVTSOV, A. S.

"Optimization of Processes Represented by Polynomial Models"

Tr. Spets. konstrukt. byuro po avtomatike v neftepererabotke i nefte-
khimii (Works of the Special Design Office on Automation in Petroleum
Refining and Petrochemistry), 1971, vyp. 3, pp 160-169 (from RZh-Kiber-
netika, No 9, Sep 71, Abstract No 9V270)

Translation: Some models of search for the extremum points of techno-
logical processes are considered. The iteration step method of search
for the optimum is as follows. The first step is a total or fractional
factor experiment. From the resultant data (linear regression) the
gradient of the response function is determined, a shift is made in the
estimated direction, a model of linear regression is again constructed
in the neighborhood of the new point and so on. Motion continues until
the localized behavior of the response function can be adequately repre-
sented by means of linear regression. An extremum point is found in
the region where linear regression is inadequate. A polynomial regres-

1/2

USSR

BUYANOVSKIY, L. A. et al., Tr. Spets. konstrukt. byuro po avtomatike v neftepererabotke i neftekhimii, 1971, vyp. 3, pp 160-169

sion is constructed with a predetermined order to refine the response function in this region. The classical method of search for the extremum consists in varying only one parameter at each step while the others are held constant. The random search method involves conducting successive experiments at points lying in a direction from the given point which is chosen at random. The shift is made toward the new point or in the opposite direction depending on the estimates of the response function at the new and given points. A detailed comparison is made of these three methods of search for the extremum. A number of advantages of the step method are set forth. Consideration is given to the problem of selecting the number of observations which minimizes the error in determination of the gradient. A study is also made of the mathematical expectation per observation for the increment in the response. A. Zaslavskiy.

2/2

- 3 -

USSR

UDC: 519.2:54

BUYANOVSKIY, L. A., L'VOV, S. V., STAROVOYTOV, G. P., SHEVTSOV, A. S.

"On the Problem of Constructing Nonlinear Regression Models"

Tr. Spets. konstrukt byuro po avtomatike v neftepererabctke i nefte-
khimii (Works of the Special Design Office on Automation in Petroleum
Refining and Petrochemistry), 1971, vyp. 3, pp 150-180 (from RZh-Kiber-
netika, No 9, Sep 71, Abstract No 9V269)

Translation: In constructing statistical models of processes in chemi-
cal technology, it quite frequently turns out that a linear regression
model is inadequate. In this case, a polynomial regression model is
used. It is convenient for polynomial regression to use rotatable plans
for which the variance of the estimate for the response function depends
only on the distance of a point of the phase space from the coordinate
origin. The plan matrix $X=(x_{ij})$ is the set of coordinates of the points
of the factor space (columns of the matrix) at which observations should
be made. The necessary and sufficient conditions for the matrix X under
which a plan is rotatable are discussed in detail. The following defi-
nitions of vector power and matrix power are used. The p -th power $x^{(p)}$

1/2

USSR

BUYANOVSKIY, L. A. et al., Tr. Spets. konstrukt. byuro po avtomatike v neftepererabotke i neftekhimii, 1971, vyp. 3, pp 150-180

of the vector $x=(x_1, x_2, \dots, x_k)$ is defined as the vector which contains C_{k+p-1}^p components equal to all possible monomials in degree p of the variables x_1, x_2, \dots, x_k with coefficients chosen in a special way. The coefficients are chosen in such a way that the scalar product $x^{(p)}x^{(p)}$ coincides with the p -th power of the scalar product $x'x$. The vector $x^{(p)}$ is uniquely defined with respect to the vector x accurate to the order of magnitude of the components. Let H be a matrix which transforms vector x to the vector $z = Hx$. The p -th power $H^{(p)}$ of matrix H is defined as the matrix which transforms the vector $x^{(p)}$ to the vector $z^{(p)}$. Examples are given and some properties of the operators introduced are analyzed. It is known that the plan given by matrix X is rotatable of order d if the equality $X'X = R^{(d)}X'XR^{(d)}$ holds for any orthogonal matrix R . Formulas are presented for sample moments in rotatable planning of an experiment. Some properties of spherical distributions are discussed as well as the properties of their corresponding eigenfunctions and the generating function of the moments in rotatable planning. A. Zaslavskiy.

2/2

USSR

BABKO, L. D., STAROVOYTOV, I. N.

UDC 51.801

"An Algorithm for Syntactic Monitoring of the Responses of Trainees"

V sb. Mat. i inform. probl. prognozir. i upr. naukoy (Mathematical and Information Problems of Forecasting and Control of Science -- collection of works), Kiev, 1971, pp 173-183 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V702)

Translation: In this paper an algorithm is proposed for monitoring whether α belongs to a language generated by G by the given pair (α, G) where α is a sentence (the monitored response) and G is a grammar. The region of application of the algorithm includes the set of all context-free languages of practical importance.

The version of the algorithm executed on the BESM-6 computer permits a set of pairs (α_i, G_i) with a total sentence length of 3,000 to 5,000 symbols to be monitored in one second.

Power, Engine, Turbine, Pump

USSR

UDC 697.644.1:621.577.001.4(47+57)

STAROVOYTOV, N. G.

"Certain Results of an Experimental Study of the Operation of a Heat Pump With F-142 Agent"

Nauch. tr. Dal'nevost. politekhn. in-t (Scientific Works of Far Eastern Polytechnical Institute), 1971, Vol. 75, pp 40-46 (from RZh-Teploenergetika, No 7, Jul 72, Abstract No 7S169)

Translation: Studies of the operation of compression heat pumps based on the 4FU-60/30 refrigerator using F-12 and F-142 freon are described. The low potential heat source was water from the Amur Gulf with a temperature from 0 to 20°C. The relationships were obtained at a condensation temperature of 55°C. The energy characteristics of the F-12 freon heat pump were better. The conversion coefficient of the F-12 heat pump was: ~3.0 at a water temperature of 8°C, ~3.4 at 12°C, ~3.8 at 16°C, ~4.3 at 20°C. It was concluded that the F-12 heat pump can be applied in radiant panel heating systems. The F-12 heat pump can be feasibly used with a refrigerator based on ammonia. 5 ill., 3 ref. T. A. Avramenko.

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UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--EFFECT OF THE TECHNOLOGY OF MANUFACTURING ,ALLOY, STEELS ON THE LC;
CYCLE FATIGUE IN VARIOUS MEDIA -U-
AUTHOR--(05)-KUSLITSKY, A.B., KRIPYAKEVICH, R.I., TKACHEV, V.I., KOKOTAYLO,
I.V., STARODYIGY, YU.A.
COUNTRY OF INFO--USSR

S

SOURCE--FIZ. KHIM. MEKHAN. MAT., 1970, 6, (2), 96-97
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

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

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1829

STEP NO--UR/0369/70/006/002/0096/0097

ARC ACCESSION NO--AP0129197

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--04DEC70

Z/2 025

IRC ACCESSION NO--AP0129197

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

UNCLASSIFIED

UDC: 8.74

USSR

BELIKOVA, M. A., LYAPUNOV, A. A., ~~STAROVOYTOVA, E. P.~~

"Systems Approach to Mathematical Modeling of the Endocrine System and the Circulatory System"

V sb. Probl. kibernetiki (Problems of Cybernetics—collection of works), vyp. 25, Moscow, "Nauka", 1972, pp 205-215 (from RZh-Kibernetika, No 6, Jun 72, Abstract No 6V589)

Translation: The paper presents a certain summing up of factual material and outlines mathematical models of the pyroidal and insular subsystems of the endocrine system. An approach to distribution of the blood in the organism and transformation of the blood composition in various organs is described. It is characteristic of these processes that they evolve on two levels. The upper level is the distribution of blood among the various organs, and the lower level is transformation of the blood composition in these organs.

1/1

- 67 -

UDC 911.3.613.11 (98)

USSR

STAROVOYTOVA, M. I.

Comparative Characteristics of the Functional Condition of the Nervous System During the Acclimatization Process in Eastern and Western Sections of European Arctic"

V sb. Akklimatiz. i krayev. patol. cheloveka na Severe (Acclimatization and Regional Pathology of Man in the Far North--collection of works). Arkhangel'sk, 1970, pp 176-178 (from RZh-36. Meditsinskaya Geografiya, No 1, Jan 71, Abstract No 1. 36. 46 by T. Koretskaya)

Translation: Research was conducted at two polar points--Murmansk and the small settlement of Amerma, which are very far from large population centers, have a small population of their own, and share a very severe climate. The subjects were from 19-20 years of age; had the same living and nutritional conditions; and had all come from the central zone of the USSR. During the habituation period, some of the healthy subjects developed unpleasant subjective symptoms (headaches, cardialgia, dizziness, etc); work capacity decreased; sleep habits altered (daytime sleepiness or a combination of daytime sleepiness and night insomnia); and irritability, or depressive low spirits occurred, which the subjects had not previously experienced. The frequency and degree of these symptoms was greater for the subjects in Amerma than for those living in Murmansk.

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USSR

UDC 621.375.4

SAKHAROV, Yu. S., STAROVOYTOVA, Ye. M.

"Characteristic Features of Planning Extremal Experiments when Investigating Transistor Devices"

Metody razrab. radioelektron. apparatury. No 1 (Methods of Developing Radio-electronic Equipment. No 1), Moscow, 1970, pp 154-157 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8D52)

Translation: It is demonstrated that optimization of the functional assembly made of transistors cannot be achieved by selection of the transistor itself since in practice it is impossible to select the optimal type of transistor for the given assembly by the assigned technical specifications; therefore, optimization is carried out with respect to the parameters of the passive elements and the electrical conditions of the transistor. Methods of representation of the transistor are compared when searching for optimal solutions by an active experiment. The advantages of the generalized parameter method are presented.

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- 260

USSR

UDC 669.295.41

SEREBRYAKOVA, A. V., LEBEDEV, G. N., STARSHENKO, V. I., BAKHIREVA, L. D.

"Studies on Obtaining Titanium Tetrachloride Purified from Vanadium"

Tr. In-ta metallurgii. Ural'sk. fil. AN SSR (Works of the Institute of Metallurgy. Urals Branch of the USSR Academy of Sciences), 1970, vyp. 22, pp 23-27 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G231)

Translation: Purification of $TiCl_4$ with respect to V is possible in a condensation system by introducing H_2 , S or H_2 and S simultaneously. Purification is most complete with a S to H_2 ratio close to stoichiometric for H_2S . At a temperature of 200° , the interaction of $VOCl_3$ takes place with the formation of $VOCl_2$, and at 500° , with the formation of $VOCl$. The article contains 1 illustration, 4 tables, and an 8-entry bibliography.

- END -

5915

CSO: 1842-W

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- 89 -

USSR

UDC 669.295.046.43

"APPROVED FOR RELEASE: 09/01/2001

CIA-RDP86-00513R002203130005-5"

STARSHENKO, V. I., VOLYNSKAYA, M. P., and LEBEDEV, G. N.

"Status of Analytic Testing of Purification of Titanium Tetrachloride"

Sb. tr. Vses. n.-i. i proyekt. in-t titana, [Collected works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, 54-61, (Translated from Referativnyy Zhurnal-Metallurgiya, No: 1, 1971, Abstract No.1 G180 by the authors).

Translation: Methods of analysis of $TiCl_4$ are systematized. The influence of impurities in $TiCl_4$ on the increasing hardness of Ti sponge is estimated on the basis of the limits of sensitivity for determination of the impurities. The analytic uncertainty factor in the composition of purified $TiCl_4$ exceeds the depth of purification. The impurities tested in purified $TiCl_4$ do not characterize the quality of purification, and the sensitivity of determination of the total content of O, N, C, S, and H does not correspond to the requirements for depth of purification of $TiCl_4$.

The required depth of purification and limit of sensitivity of the determination of impurities is $1 \cdot 10^{-4}\%$ (by mass). 3 tables; 13 biblio. refs.

1/1

- 76 -

Titanium

UDC 669.295.05

USSR

STARSHENKO, V. I., VOLYNSKAYA, M. P., and LEBEDEV, G. N.

"The State of Analytic Control in Cleaning Titanium Tetrachloride"

Moscow, Metallurgiya i Khimiya Titana (Institut Titana), Metallurgiya Publishing House, Vol 6, 1970, pp 54-60

Translation: Methods of analyzing titanium tetrachloride are systematized. The limits of sensitivity in determining impurities in titanium tetrachloride are used to evaluate their effect on increasing the hardness of titanium sponge. It is shown that the coefficient of analytical indeterminacy as to the composition of cleaned titanium tetrachloride increases the depth of its cleaning. The controlled impurities in the cleaned titanium tetrachloride do not characterize the qualities of cleaning, while the sensitivity in determining the total content of oxygen, nitrogen, carbon, sulphur, and hydrogen does not meet requirements for depth of cleaning titanium tetrachloride. The necessary depth of cleaning and limit to sensitivity in defining impurities is $1 \cdot 10^{-4}$ percent (by mass). Three tables and 13 bibliographical entries.

1/1

1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70
 TITLE--CHANGE IN THE KINETIC ENERGY OF THE BLAST AND ADJUSTMENT OF THE
 TUYÈRE DIAMETER WHEN USING NATURAL GAS -U-
 AUTHOR--(02)-SENKO, G.YE., STARSHINOV, B.N.
 COUNTRY OF INFO--USSR
 SOURCE--STAL' 1970, 30(2), 107-10
 DATE PUBLISHED-----70



SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR
 TOPIC TAGS--COKE, NATURAL GAS, BLAST FURNACE, KINETIC ENERGY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--1994/1949

STEP NO--UR/0133/70/030/002/0107/0110

CIRC ACCESSION NO--AP0115757

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0115757

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CALCNS. PERFORMED AND RESULTS OBTAINED ON BLAST FURNACES OPERATING WITH OR WITHOUT O ENRICHMENT OF THE BLAST AND USING NATURAL GAS ADDNS. TO THE BLAST SHOWED THAT BURNING OF THE LATTER IN THE TUYERES INCREASES KINETIC ENERGY OF THE GAS BLAST MIXT. AND ACTIVATES THE CENTER OF THE FURNACE WHILE REDUCING THE PERIPHERAL EFFECT. THE ORIGINAL LEVEL OF THE KINETIC ENERGY CAN BE RETAINED BY CORRESPONDINGLY INCREASING THE TUYERE DIAM. AN INCREASE FROM 180 TO 190 MM WITH A SIMULTANEOUS INCREASE OF BLAST VOL. FROM 3506 TO 3690 M PRIME2-MIN LED TO IMPROVED OPERATING CONDITIONS, AN 8.5PERCENT PRODUCTION INCREASE, AND A 20 KG-TON LOWERING OF THE COKE RATE, WHILE INCREASING TUYERE LIFE TO 30-5 DAYS. FACILITY: UKR. NAUCH. ISSLED. INST. METAL., KHARKOV, USSR.

UNCLASSIFIED

USSR

UDC: 621.311.21.004(282.251.2)

BOCHKIN, A. E., LISKUN, E. E., EPIFANOV, A. P., KOKOT,
D. M., STARSHINOV, S. N., Engineers

"On Condition of Krasnoyarskaya GES Dam during First Years
of Operation"

Moscow, GidrotekhnicheskoyeStroitel'stvo, No. 4, April,
1971, pp 12-19

Abstract: The subject dam is 124 meters high. It has a
triangular cross-section. The upstream face is vertical.
It rests on granite rock.

Measures were taken to prevent crack formation by
controlling the temperature regime. 1,269 cracks were
detected on the piers during the period from 1961 to 1968,
which is one-third the number of cracks on Bratskaya GES.

Joints between blocks were periodically inspected
ultrasonically for three years after being cemented. Most
of them showed increased strength, 20% indicated a slight
opening of the joint near the edge.

1/2

USSR

BOCHKIN, A.E., et al, Gidrotekhnicheskoye Stroitel'stvo, No 4, April 1971,
pp 12-19

The filling of the reservoir started in 1967 and was completed in 1969. Temperature of water at various depths was monitored.

Seeping of water was observed because it is an indication of tension stresses on the upstream face. The seeping decreased from 1967 to 1969.

Vertical and horizontal displacements of various points of the dam were determined optically. Measurements indicated the settling of the foundation on the upstream face of the dam, probably due to the weight of water. Horizontal displacements reached 15 mm.

2/2

UDC 911.3:616.34(575.1)

USSR

SHATROV, I. I., POKROVSKAYA, M. P., KRASKINA, N. A., BRAYNINA, R. A.,
ELKIN, I. I., SKVORTSOV, V. V., KILESSO, V. A., BUNIN, K. V., NIKIFOROV,
V. N., POKROVSKIY, V. I., and STARSHINOVA, V. S.

"Current Status of Typhoid"

V sb. Materialy XV Vses. syezda epidemiologiv, mikrobiologov i infektsion-
istov, Tezisy Dokl. Ch. 1 (Proceedings of the 15th All Union Conference
of Epidemiologists, Microbiologists, and Infectious Disease Specialists,
Theses Reports, Part 1 -- collection of works), Moscow, 1970, pp 262-269
(from RZh-Meditsinskaya Geografiya, No 3, Mar 71, Abstract No 3.36.258)

Translation: During the last seven years, the incidence of typhoid has
decreased each year by 6-7% on the average in this country. Maximum drops
were observed in the Belorussian SSR, Kazakh SSR, Lithuanian SSR, Latvian
SSR, Armenian SSR, and Estonian SSR; minimum drops were found in the Uzbek
SSR and Kirghiz SSR. During the last two years, the incidence of typhoid
was 10% higher among rural residents than among urban residents. In com-
parison with 1964, a drop in incidence of approximately 40% was observed;
in rural locations, the drop was 23%. The leading significance of the
water factor in transfer and distribution of the agent of typhoid is

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- 34 -

USSR

SHATROV, I. I., et al., Materialy XV Vses. syezda epidemiologiv, mikro-biologov i infeksionistov, Tezisy Dokl. Ch. 1 (Proceedings of the 15th All Union Conference of Epidemiologists, Microbiologists, and Infectious Disease Specialists, Theses Reports, Part 1 --- collection of works), Moscow, 1970, pp 262-269 (from RZh-Meditsinskaya Geografiya, No 3, Mar 71, Abstract No 3.36.258)

confirmed. Of decisive importance, particularly in recent years, is the nutritional (milk) factor of typhoid transfer and distribution.

2/2

USSR

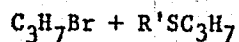
UDC 547.241

KRASIL'NIKOVA, Ye. A., ZYKOVA, T. V., RAZUMOV, A. M., STARSHOV, I. M.,
ORLOVA, G. V., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological
Institute Imeni S. M. Kirov

"Investigation of the Series of Phosphinic and Phosphinous Acid Derivatives.
XC. Effect of the Structure of Alkyl Halide on the Reaction With Esters of
Ethyl(Phenyl)dithiophosphonous Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 8, Aug 73, pp 1701-1705

Abstract: The study included reactions of normal and branched alkyl halides
with dipropyl esters of ethyl- and phenyldithiophosphonous acids. The normal
alkyl halides react much faster in this reaction than the branched alkyl
reagents. The reaction can be described by the equation $RP(SC_3H_7)_2 +$
 $R'Br + RR'P(S)(SC_3H_7) + RR_2'P(S) + RP(S)(SC_3H_7)_2 +$



as supported by NMR ^{31}P data. It was shown that changing from normal alkyl
halides to the branched isomers increases the tendency of this reaction to
occur via the sulfur atom rather than through the phosphorus atom.

1/1

USSR

UDC: 543.812.2:547.312.2/.3

STARSHOV, I. M., IVANOVA, G. Ya.

"Determination of Small Quantities of Moisture (5-30 ppm) in Ethylene and Propylene"

Tr. Metrol. In-tov SSSR [Works of Metrological Institutes, USSR], 1972, No 136(196), pp 50-54 (Translated from Referativnyy Zhurnal Metrologiya i Izmeritel'naya Tekhnika, No 12, 1972, Abstract No 12.32.1160).

Translation: Comparative data are presented on the results of measurement of the moisture content of ethylene by the method of Fischer and the method of reaction gas chromatography. The mechanism of the interaction of calcium carbide with water is studied and it is established that with moisture contents of up to $25 \cdot 10^{-6}$, the reaction of water with calcium carbide results in the formation of CaO, while with moisture contents of over $25 \cdot 10^{-6}$, Ca(OH)_2 is formed. The optimal mode of operation of a carbide reactor is experimentally determined: length 200 mm, diameter 15 mm, flow rate of ethylene through reactor 60 ml/min. The content of moisture in the ethylene was determined from the quantity of acetylene liberated. It is indicated that, on the basis of the studies performed, the method of reaction gas chromatography can be used for analysis of the moisture content of ethylene with moisture contents of $5 \cdot 10^{-6}$ and higher. 4 figures, 2 tables, 6 biblio. refs.

1/1

UDC 575.24

USSR

USMANOV, P. D., STARTSEV, G. A., SPABALOV, V. V., and NASYROV, Yu. S., Institute of the Physiology and Biophysics of Plants, Academy of Science Tadzhik SSR, Dushanbe

"Mutagenic Effects of Laser Irradiation of Seeds of *Arabidopsis thaliana* (L.) Heynh"

Moscow, Doklady Akademii Nauk SSSR, Vol 193, No 2, 1978, pp 455-457

Abstract: Since absorption of laser rays produces a release of heat and a high-intensity electrical field it was decided to investigate the possible mutations that may develop in plants after such irradiation. Air-dried seeds of *Arabidopsis thaliana* (L.) Heynh (Enkheim strain) were irradiated with modulated ($t = 6 \times 10^{-9}$ sec) and freely generated ($t = 5 \times 10^{-7}$ sec) ruby laser rays and planted in appropriate media. Both the percentage of germinating seeds and the size and viability of the sprouts were reduced. As a result of mutations in pigmentation, the plants acquired a pale green, yellow, or whitish color. Evidence suggests that these mutations were caused not only by the heat released, but also (and primarily) by nonlinear optical processes. Since 180 of the 750 irradiated plant families developed viable mutants, laser rays may be regarded as a new physical agent that can be used to produce mutations in *Arabidopsis thaliana*.

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Acc. Nr. **AP0050453** - Abstracting Service:
CHEMICAL ABST. 5/70

Ref. Code
4R 0051

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105523n Absorption spectrum of strontium vapors in the vacuum ultraviolet. Kozlov, M. G.; Startsev, G. P. (USSR). *Opt. Spektrosk.* 1970, 28(1), 14-17 (Russ). Oscillator strengths of spectral lines in the range 1645-2177.1 Å arising out of the autoionization of Sr (4 *dnp*) and converging to the limit Sr II $^2D_{3/2, 5/2}$ have been measured by the method of complete absorption by using a 3-m grating spectrograph. The dependence of photoionization cross section on wavelength has been studied. Lifetimes of energy states corresponding to simultaneous excitation of 2 electrons have been measured. Ved Prakash Gupta

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REEL/FRAME
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UDC: 621.741.4:66.046.51:669.741

SIDOROV, Yu. I., BAKSULEVICH, V. B., STARTSEV, V. A., MALYSIN, Yu. N.,
KAZAKOVA, I. I., ZONOV, V. Ye., and UMIRKIN, P. V., Ural Polytechnic
Institute

"Surface Alloying of Steel Castings With Boron"

Moscow, Investiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 8, 1970,
pp 132-134

Abstract: A method of surface alloying of steel castings with boron regenerated from dehydrated borax ($\text{Na}_2\text{B}_4\text{O}_7$) in the process of filling the mold is discussed. The reducing agents are aluminum, calcium, and silicon. The mechanism of boron reduction from borax comprises two stages: a) decomposition of borax into Na_2O and B_2O_3 ; b) reduction of boron from its oxides. Data are given on changes in the free energy of boron reduction from borax. The results of a thermodynamics analysis and the study of kinetics regularities indicate silicon, calcium and aluminum to be the most efficient reducing agents. The method of surface alloying with boron has been tested on experimental batches of low-carbon steel and has demonstrated its applicability under industrial conditions. The boron content on the surface of the casting was 0.5 to 0.7% and at a depth of 15 mm about 0.008 to 0.009%. The wear resistance of surface-alloyed parts was found to be two to three times that of ordinary parts.

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UDC: 621.741.3

USSR

SIDOROV, YU. I., UMRIKHIN, P. V., STARTSEV, V. A., and KAZAKOVA, I. I.

"Specifics of Physical-Chemical Processes During Surface Alloying of Steel Castings with Vanadium"

Izv. VUZ, Chernaya Metallurgiya, No 6, 1970, pp 125-127

Abstract: The physical and chemical processes occurring during surface alloying of steel castings with vanadium, reduced from vanadium-containing converter slag by silicon, calcium, and aluminum, were investigated. The slag was included as part of a paint applied to the surface of the casting mold. Production tests showed that the vanadium can penetrate 40 mm into the casting and can increase wear resistance by 1.5 times. One illustration; two tables; three biblio. refs.

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- 94 -

UDC 620.172.251.1:669.14.018.8

USSR

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

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

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

Abstract: A study was made of the mechanical properties of VNS-17 martensitic aging steel in the delivered state (hot rolled products) and its welded joints at temperatures to -269° C. In the hot-rolled state VNS-17 steel has sufficient plasticity and is insensitive to acute notching at test temperatures from room temperature to -253° C. In structural elements welded without filler metal or with basic composition wire, VNS-17 steel can be used to -196° C. In the presence of an acute notch, the strength of the welded joints at -253° C and -269° C is greater than the strength of the steel at room temperature. The chemical composition of the investigated steel was 0.014% C, 0.08% Mn, 0.17% Si, 10.28% Cr, 9.58% Ni, 0.66% Ti, 0.07% Al, 2.1% Mo, 0.01% Zr, 10.28% Cr, 9.58% Ni, 0.66% Ti, 0.07% Al, 2.1% Mo, 0.01% Zr.

USSR

UDC 621.785.78.9:539.376:669.14.018.8

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

"Creep of Kh18N10T Steel at Low Temperatures"

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

Abstract: The study on low-temperature creep involved Kh18N10T steel (0.1% C; 1.39% Mn; 0.67% Si; 18.79% Cr; 9.6% Ni; 0.7% Ti) at 77.2 and 4.2°K and various initial stresses. The creep curves at the above temperatures and stresses show three distinctive sections: initial deformation, non-steady state (transitory) deformation, and steady state of creep which proceeds at a fixed rate and is observed within 4.2 to 77°K as a function of stress and temperature. The study included creep under stepped loading conditions at 20 and 4.2°K. The stress increment was 6.8 kg/mm² and the hold time -- 1.5 hr. (3 illustrations, 1 bibliographic reference).

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- 11 -

USSR

UDC 539.4

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

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

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

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

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

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

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- 67 -

UDC 548.4

USSR

NOVIKOVA, I. G., LUBENETS, S. V., and STARTSEV, V. I., Physico Technical Institute of Low Temperatures, Academy of Sciences UkrSSR

"Study of the Microstructure of KCl Alkali-Halide Single Crystals by Lang's Method"

Kiev, Metallofizika, No 31, 1970, pp 132-139

Translation: It is shown that x-ray diffraction topography as applied to KCl alkali-halide single crystals without impurity and alloyed barium and lead cations can give important information on the dislocation structure in the volume of a specimen. The boundaries of low-angle blocks oriented toward the observation surface in various ways and dislocation networks embedded in the volume of and within the blocks were detected by the Lang method. Individual cases of a good contrast on individual dislocations, the effect of the thickness of a crystal on the image contrast of the imperfections during a change of $\lambda \sin \theta$ in the interval 0.35-2.7, and a change in contrast in the points of intersection of orthogonal slip lines were revealed. The characteristics of the microstructure disclosed by x-ray diffraction topography were compared with the data obtained by means of etching, by the polarization optical method, and during observation in an ultramicroscope. Bibliography: 14 entries, 5 illustrations. 1/1

USSR

UDC 620.172.251.1:669.14.018.8

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

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

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

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

Mechanical Properties

UDC 539.4.015

USSR

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

"Low-Temperature Properties of Austenitic Steels"

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

Abstract: A study was made of the mechanical properties of some steels of industrial melts destined for use at temperatures down to -269°C . A low carbon content was characteristic for the investigated steels, and some were also alloyed with nitrogen. The 21-16-9-N type stable-austenitic steel had the best strength properties and smallest reduction in plasticity and toughness at reduced temperatures.

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1/2 047 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PLASTIC DEFORMATION OF LEAD IN THE NORMAL AND SUPERCONDUCTING
STATES -U-
AUTHOR--(03)-PUSTOVALOV, V.V., STARTSEV, V.I., FOMENKO, V.S.
COUNTRY OF INFO--USSR
SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 37, NR 1, PP 413-423
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, MATERIALS
TOPIC TAGS--LEAD, PLASTIC DEFORMATION, SUPERCONDUCTIVITY, CRYSTAL
DISLOCATION, CONDUCTION ELECTRON, STRESS ANALYSIS, DUCTILITY, SINGLE
CRYSTAL PROPERTY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/1077 STEP NO--GE/0030/T0/037/001/0413/0423
CIRC ACCESSION NO--AP0107586

UNCLASSIFIED

2/2 047

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0107586

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS ARE GIVEN OF A SYSTEMATIC INVESTIGATION OF THE DIFFERENCES BETWEEN THE MACROSCOPIC CHARACTERISTICS OF PLASTICITY OF LEAD SINGLE AND POLYCRYSTALS OF 99.9992 AND 99.9995 PERCENT PURITY IN THE SUPERCONDUCTING STATE AND IN THE NORMAL STATE AT THE SAME TEMPERATURE. IN THE SUPERCONDUCTING STATE THE CRITICAL RESOLVED SHEAR STRESS OF SINGLE CRYSTALS, THE YIELD POINT OF POLYCRYSTALS, AND THE FLOW STRESS FOR DIFFERENT STAGES OF DEFORMATION ARE LOWER THAN IN THE NORMAL STATE. NEAR THE FRACTURE AND AT THE TENSILE STRENGTH NO DIFFERENCE BETWEEN THE FLOW STRESS IN THE NORMAL AND SUPERCONDUCTING STATE WAS OBSERVED. A TEMPERATURE DEPENDENCE OF MACROSCOPIC PROPERTY CHANGES WAS NOT FOUND IN THE TEMPERATURE RANGE OF 1.8 TO 4.2 DEGREE SK. THE RESULTS OBTAINED REVEAL AN ESSENTIAL CONTRIBUTION FROM THE DRAG DUE TO CONDUCTION ELECTRONS TO THE RESISTANCE TO DISLOCATION MOTION. THE ESSENTIAL INTERACTION WITH CONDUCTION ELECTRONS IMPLIES THAT IN PURE METALS THE DISLOCATIONS MOVE WITH RATHER LARGE VELOCITIES (10^2 TO 10^5 CM-S) AT LOW TEMPERATURES.

FACILITY: PHYSICO-TECHNICAL INSTITUTE OF LOW TEMPERATURES.

FACILITY: ACADEMY OF SCIENCES OF THE UKRAINIAN SSR, KHARKOV.

NOT RECORDED

1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--EXPERIMENTAL INVESTIGATION OF THE EFFECT OF IMPURITY ATOMS AND
DISLOCATIONS OF X RAY DIFFUSE SCATTERING INTENSITY -U-
AUTHOR-(02)-BRAUDE, I.S., STARTSEV, V.I.
COUNTRY OF INFO--USSR S
SOURCE--UKR. FIZ, ZH. (RUSS, ED.) 1970, 15(2), 224-7
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--ANGULAR DISTRIBUTION, SINGLE CRYSTAL, X RAY SCATTERING,
CRYSTAL DISLOCATION PHENOMENON
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/0550 STEP NO--UR/0185/70/015/002/0224/0227
CIRC ACCESSION NO--AP0121222
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0121222

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

ABSTRACT. THE ANGULAR DISTRIBUTION OF THE INTENSITY OF X RAY DIFFUSE SCATTERING BY SINGLE CRYSTALS OF NAI AND TL AND "PURE" NONANNEALED AND ANNEALED CRYSTALS, WAS MEASURED. THREE TYPES OF CHARACTERISTIC DEPENDENCES OF THE INTENSITY OF THE NAI SMAPLE WITH VARYING STRUCTURE WERE OBSD. AN INCREASE IN THE DISLOCATION D. TO THE ORDER OF 1.5 CAUSES AN INCREASE IN THE INTENSITY BY A FACTOR OF 1.5. THE INTRODUCTION OF IMPURITIES (EVEN UP TO 0.1 WT. PERCENT TL) CAUSES AN INCREASE IN THE INTENSITY BY A FACTOR COMPARABLE TO THAT OF THE "PURE" SAMPLES.

FACILITY: FIZ.-TEKN. INST., KHARKOV, USSR.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--EFFECT OF THE SUPERCONDUCTING TRANSITION ON THE CREEP IN LEAD -U-

AUTHOR--(03)-SOLDATOV, V.P., STARTSEV, V.I., VAINBLAT, T.I.

COUNTRY OF INFO--USSR

SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 37, NR 1, PP 47-51

DATE PUBLISHED-----70

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

TOPIC TAGS--LEAD, METAL CREEP, CREEP MECHANISM, SUPER CONDUCTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0634

STEP NO--GE/0030/70/037/001/0047/0051

CIRC ACCESSION NO--A0107231

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0107231

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF THE SUPERCONDUCTING TRANSITION ON THE VELOCITY OF CREEP IN LEAD HAS BEEN INVESTIGATED AND FOUND TO INCREASE SHARPLY AT THE TRANSITION TO THE SUPERCONDUCTING STATE. THE VALUE OF THE JUMP OF CREEP VELOCITY DEPENDS ON THE SAMPLE PURITY. THE MAGNETIC FIELD DOES NOT EFFECT THE CREEP VELOCITY. THE POSSIBLE CAUSES (CHANGE OF INTERACTION BETWEEN ELECTRONS AND DISLOCATIONS, CHANGE OF BARRIERS DETERMINING THE MOBILITY OF DISLOCATIONS AT THE SUPERCONDUCTING TRANSITION) OF THE EFFECT OBSERVED ARE DISCUSSED.

UNCLASSIFIED

1/2 007 UNCLASSIFIED PROCESSING DATE--11SEP70
 TITLE--MOBILITY OF TWINNING DISLOCATIONS IN CALCITE -U-
 AUTHOR--SOLDATOV, V.P., STARTSEV, V.I., CHAYKOVSKAYA, N.M., DANILEVICH,
 T.O.
 COUNTRY OF INFO--USSR
 SOURCE--FIZ. TVERD. TELA 1970, 12(1) 79-82
 DATE PUBLISHED-----70
 SUBJECT AREAS--PHYSICS
 TOPIC TAGS--CRYSTAL DISLOCATION, CALCITE
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--1988/0638
 CIRC ACCESSION NO--AP0105617
 STEP NO--UR/0181/70/012/001/0079/0082
 UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0105617

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE METHODS OF SELECTIVE ETCHING AND IMPULSE LOAD OF THE CRYSTALS WERE USED TO INVESTIGATE THE MOBILITY OF TWINNING DISLOCATIONS IN CALCITE. THE VELOCITIES OF THE TANGENTIAL MOVEMENTS OF TWINNING DISLOCATIONS ALONG THE TWINNING BOUNDARY WERE MEASURED IN THE REGION OF SHEAR STRESS τ 30-35 G-MM PRIME². IN THE ABOVE INTERVAL OF STRESSES, THE TWINNING DISLOCATION VELOCITY v CHANGES FROM 2 TIMES 10 PRIME NEGATIVE⁴ TO 6.9 CM-SEC. THE MOBILITY CURVE FOR THE TWINNING DISLOCATIONS IN CALCITE IN THE COORDINATES LOG v VS τ HAS LINEAR (THERMALLY ACTIVATED BRANCH OF THE MOBILITY CURVE) AND NONLINEAR (ATHERMAL BRANCH) SECTIONS, WITH THE INFLECTION POINT IN THE STRESS REGION OF 45 G-MM PRIME². THE ACTIVATION VOL. (γ) FOR THE LINEAR SECTION OF THE v - γ CURVE IS 2.8 TIMES 10 PRIME NEGATIVE¹⁹ CM PRIME², AND THE SENSITIVITY (m) OF v TO THE STRESS IS 15.

IMPACTED

USSR

UDC 539.389.1

PODKUYKO, V. P., PUSTOVALOV, V. V., ROYTMAN, L. U., STARISEY, V. I., (Khar'kov)

"Temperature Dependence of Critical Shear Stress of Al-Mg Single Crystals of Various Concentrations at Temperatures Between 1.6 and 300°K"

Kiev, Problemy Prochnosti, No 8, 1972, pp 61-65.

Abstract: This work studies the influence of various concentrations of magnesium on the critical shear stress (CSS) and temperature dependence of CSS over a broad range of low temperatures. Magnesium concentration was varied between 0 and 5.52 at.%. The temperature dependence of CSS was found to have three sectors: 1) between 300 and 120-130°K, the CSS is independent of temperature; 2) between 120 and 4.2°K, the CSS increases with decreasing temperature; 3) below 4.2°K the CSS decreases with decreasing temperature. The value of CSS is proportional to \sqrt{c} in the temperature intervals studied and is satisfactorily described by the concepts of Fleischer concerning the interaction of edge dislocations with maximum elastic stress fields and local changes in the shear modulus with concentration. The absolute value of the drop of CSS at temperatures below 4.2°K increases in proportion to the value of \sqrt{c} , while the relative values are independent of Mg concentration in the alloy.

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Extraction and Refining

USSR

UDC 669.243

STARTSEV, V. N., BAKARDZHIYEVA, T. P., STEPANOVA, L. N.

"Ion-exchange Technology for Extraction of Nickel from Cadmium Production Solutions"

Moscow, Tsvetnye Metally, No 11, Nov 72, pp 14-16.

Abstract: This work presents the results of development of an ion-exchange technology for extraction of nickel from the cadmium electrolyte using new ion exchange materials -- ANKB-1 and ANKB-7 ampholytes. ANKB-1 is based on AN-31 anionite; ANKB-7 is based on AV-16 anionite. The technology is based on the significant difference in the affinity for ampholytes of nickel on the one hand and cadmium and zinc on the other. The technology assumes elution of the nickel with a sulfuric acid solution, followed by removal of the H_2SO_4 to correct the pH of the solution. Laboratory-scale tests of the new technology indicated that either of the two ampholytes yields practically identical results.

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USSR

UDC: 546.261:538.632:537.5

BORUKHOVICH, A. S., GEL'D, P. V., and STARTSEV, V. Ye.

"Galvanomagnetic Characteristics of Monocarbides of the IVa-Va Subgroup Transition Metals"

Tomsk, Izvestiya VUZ--Fizika, No 5, 1973, pp 142-145

Abstract: This brief communication discusses the results of measurement of the galvanomagnetic characteristics of monocarbides, which by composition are closely related to equiatomic varieties. It is noted that such an investigation, even in weak magnetic fields in which the ratio of the mean free path to the radius of the cyclotron orbit is less than unity, is important to establish a connection between these characteristics and those of the electronic structure computed for TiC, ZrC, and NbC. This, in turn, opens the possibility of qualitative interpretation of such kinetic behavior in monocarbides as the Hall effect and reluctance. The experimental data used by the authors for their analysis was obtained in research of the Hall effect and transverse reluctance in TiC_{0.99}, ZrC_{0.98}, NbC_{1.0}, and TaC_{0.98} specimens at 300 and 20.4° K temperatures and magnetic fields up to 22 koeersteds. An explanation is found for the difference in Hall coefficients and reluctance values for these various specimens.

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1/2 032 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--ON THE FERMI SURFACE IN IRIIDIUM -U-
AUTHOR--(03)-VOLKENSHTEYN, N.V., NOVOSYLOV, V.A., STARTSEV, V.YE.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 5, PP 1609-1611
DATE PUBLISHED--70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--MAGNETORESISTANCE, ANISOTROPY, HALL EFFECT, SINGLE CRYSTAL,
IRIDIUM, FERMI SURFACE, ELECTRON
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/0001 STEP NO--UR/C056/70/05E/005/1609/1611
CIRC ACCESSION NO--AP0127651
UNCLASSIFIED