USSR

LEBEDEV, A. A., Meditsinskiy Zhurnal Uzbekistana, No 6, 1971, pp 70-72

absenteeism decreased to approximately the same degree during the next two months. The differences observed between test groups and the control groups were statistically significant. Lemon seed and dibazol extracts are recommended as a fairly effective, completely harmless, and quite inexpensive means of nonspecific prevention of acute respiratory diseases.

2/2

USSR

GUTKIN, A. A., KAGAN, M. B., LEBEDEV, A. A., KHOLEV, B. A., SHAPOSHNIKOVA, T. A.

"Nonadditive Photoeffect During Combined Excitation in GaAs p-i-n-Structures"

Abstract: Results are presented from studying the photoeffect during combined excitation in p-i-n-structures of GaAs alloyed with Cr. Light from the admixture and the characteristic absorption bands was used at room temperature. The study revealed mutual signal amplification. With constant illumination, the relative increase in the photocurrent $I_k/I_{ad} + I_{char}$ reaches 10, and with modulation of one of the light fluxes, the variable signal component can increase by 100 times and more. The effect is observed for $\hbar\omega \gtrsim 0.7$ electron volts. In the admixture region the photocurrent depends linearly on the illumination, and in the characteristic region it depends superlinearly. During combined excitation, the lux-ampere characteristic is sublinear. A qualitative model was investigated which explains the observed amplification of the photoresponse by an increase in the effective lifetime in the quasineutral region with illumination of the diode by admixture light. The experimental results agree well with the proposed model. The amplification of the photoresponse is not specific to the given diodes, but it is possible if the width of the
1/2

USSR

GUTKIN, A. A., Fizika i Tekhnika Poluprovodnikov, Vol 6, No 2, 1972, pp 237-241

quasineutral regions between the illuminated surface and the volumetric charge surface is greater than l_D (the length of the diffusion shift of the minority current carriers).

2/2

USSR

UDC: 621.382.2

LEBEDEV, A. A., MAMADALIMOV, A. T., and SULTANOV, N. A.

"Investigating Diodes with S-Shaped Negative Resistance, Based on Silicon Alloyed with Sulfur"

Leningrad, Fizika i tekhnika poluprovodnikov, Vol 5, No 1, 1971, pp 22-30

Abstract: This article discusses the preparation of an investigation into light-sensitive n-silicon semiconductor diodes, dopes with sulfur, which are important in the field of optical electronics. The sulfur forms two donor levels in the upper half of the forbidden zone with activation energies of 0.18 and 0.37 ev. It also has the advantage of high diffusion factor in silicon, 10^{-8} cm^2/s at 1100° C, and can therefore be easily alloyed by the diffusion method. Experiments for the measurement of the Hall effect, the volt-ampere characteristics, and the spectral dependence of the photoelectric voltage on the photon energy of incident light are described, and the transient characteristics and oscillations of the diode are measured. The results of these experimental measurements are given in curve form.

1/1

Semiconductors and Transistors

USSR

UDC 621.382.3

LEBEDEV, A.A., MAMADALIMOV, A.T., SULTANOV, N.A.

"General Parameters Of Silicon Diodes With Ni As Impurity"

Abstract: Silicon diodes compensated with nickel, with a section of negative differential resistance (NDR) of S-shape in the direct branch of the voltage-current characteristic are prepared and investigated. The diodes were created by fusing of aluminum and the alloy Au + 0.1 percent Sb at 700^0 C for one minute. The area of the contacts was on the order of 0.2 mm^2. Part of the specimens were produced by ordinary technology --- the contacts are located on opposite sides of the Si wafer. The thickness of the base in such diodes $W \approx$ 0.15--0.25 mm. The other specimens were produced by planar technology --- all the contacts are located on one side of the wafer. In these specimens the distance between the contacts (i.e., the thickness of the base) was different --- from 0.1 to 1.5 mm. The thickness of the Si wafer was on the order of 0.4 mm. Such a location of the contacts made it possible to study the distribution of the potential along the base of the diode and the dependence of the "separation" [sryv] voltage V_s on W. The section of the NDR was observed at 77--350° K. The "separation" voltage
1/2

USSR

V_s is proportional to the square of the base line. The turn-on time of the diodes
is $\lesssim$ 1 microsec, the turn-off time is ~ 1--10 microsecond and weakly depends
on the temperature. The voltage-current characteristic of the diodes depends on
the illumination. V_s is reduced by 50 percent with illumination of ~ 400 lux.
Extrinsic photoconductivity with $h\nu > 0.4$ ev, infrared quenching and negative
photoconductivity in specimens with injection at 0.7 $\lesssim h\nu \lesssim$ 1.1 ev are observ-
ed in silicon with nickel at 77° K. In the fundamental absorption region the
photoconductivity sublinearly depends on the intensity of the light.
Physicotechnical Institute imeni A.F. Ioffe, AS, USSR, Leningrad. Received by
editors 9 March 1971. 8 fig. 7 ref.

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- 63 -

USSR

GUTKIN, A. A., LEBEDEV, A. A., TALALAKIN, G. N., and SHAPOSHNIKOVA, T. A.,
Physicotechnical Institute imeni Ioffe, Acad. Sci. USSR, Leningrad

"Photoconductivity of Semi-Insulator GaAs Doped With Cr in Strong
Electric Fields"

Abstract: This paper discusses the N-shaped volt-ampere character-
istics of high-resistance GaAs alloyed with chromium and their ac-
companying spontaneous low-frequency current oscillations. The ex-
periments of this research involved the measurement of photoconduc-
tivity with the Q-1 monochromator using an SiO_2 prism with unmodu-
lated illumination from the KIM12-100 incandescent lamp. The GaAs
specimens were prepared by the Chokhral'skiy method, with a re-
sistivity of 10^6-10^8 ohm·cm at room temperature; their contacts were
obtained by melting an In-Au alloy at 400° C. The photoconducti-
vity spectral distribution obtained for various electric field in-
tensities is plotted. The authors express gratitude to D. N. Nasledov
and N. M. Kolchanov for their useful comments.

1/1

USSR

GREKHOV, I. V., KOSSHINA, L. S., LEBEDEV, A. A.

"Cutout Process of a PNPN Structure at High Levels of Injection in the Base Layers"

Abstract: The paper deals with the process of cutout of a PNPN structure under the effect of inverse anode voltage when the injection level is high in both bases. The shape of the current and the voltage across the PNPN structure is analyzed for the case where the space charge region during cutout is initially formed near the high-voltage emitter junction. The time for recovery of the blocking capacity of the low-voltage emitter junction is calculated as well as the cutout time constant when the position of the boundary of the space charge region of the P-emitter is fixed. The authors thank A. I. Uvarov for discussion and remarks.

1/1

1/2   019   UNCLASSIFIED   PROCESSING DATE--16OCT70
TITLE--DIODES WITH S SHAPED VOLT AMPERE (V A) CHARACTERISTICS PREPARED
 FROM COPPER COMPENSATED SILICON -U-
AUTHOR-(02)-LEBEDEV, A.A., SULTANOV, N.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK UZB. SSR. SER. FIZ.-MAT. NAUK 1970, 14(1), 65-8

DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--SILICON DIODE, COPPER COMPOUND, VOLT AMPERE CHARACTERISTIC

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/0952   STEP NO--UR/0166/70/014/001/0065/0068

CIRC ACCESSION NO--AP0121554
                         UNCLASSIFIED

UNCLASSIFIED

CIRC ACCESSION NO--AP0121554   PROCESSING DATE--16OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LONG DIODES WERE MADE, AND CU
DIFFUSION WAS CARRIED OUT AT 1150DEGREESC. RESISTIVITIES OF 10
PRIME4-10 PRIME5 OHM-CM FOR N-SI AND (3-5) TIMES 10 PRIME4 OHM-CM FOR
RHO-SI WERE OBTAINED. V-A CHARACTERISTICS WERE TAKEN AT 300 AND
77DEGREESK. ONLY SIMILAR TO 30PERCENT OF THE DIODES EXHIBITED NEG.
DIFFERENTIAL RESISTANCE. THE VALUE OF V SUBMAX WAS PLOTTED VS. TEMP.
SWITCHING TIME CONSTS. WERE DETD. FROM MEASUREMENTS WITH DELAYED
RECTANGULAR PULSES. RECOVERY TIMES WERE 10 NEGATIVE PRIME6-10 NEGATIVE
PRIME7 SEC.

UNCLASSIFIED

USSR

UDC 539.4

PISARENKO, G. S., LEBEDEV, A. A., KOVAL'CHUK, B. I., and LAMASHEVSKIY, V. P.

"Anistropy of the Mechanical Properties of Metal at Low Temperatures"

Khar'kov, Fiz. Mekhanizmy Plastich. Deform. pri Nizkikh Temperaturakh --
Sbornik (Physical Mechanisms of Plastic Deformation at Low Temperatures --
Collection of Works), 1971, p 55 (from Referativnyy Zhurnal, Mekhanika, No 2,
Feb 72, Abstract No 2V1252, Summary)

Translation: The article presents a discussion of the results of an experimental
investigation of the influence of low temperatures upon the anisotropy of the
mechanical properties of alloys AL19, D16T, and carbon steel type 45. On the
basis of microstructural analysis data, the anisotropy of the aluminum alloys
has both a homogeneous and an inhomogeneous nature. The anistropy of carbon
steel (of the heterogeneous type) was attained by plastic deformation by means
of elongation at normal temperature to $\varepsilon_{res} = 2\%$. The characteristics of
the mechanical properties in the direction of the main axes of anisotropy were
obtained at normal temperature and at temperatures of -100 and $-180°$. It is
shown that as the temperature decreases, change of the elastic, strength, and
deformation properties in the direction under consideration takes place unequally,
1/2

USSR

UDC 669.018.2:669-974

PISARENKO, G. S., LEBEDEV, A. A., KOVAL'CHUK, B. I., and LAMASHEVSKIY, V. P.

"Anisotropy of Mechanical Properties of Metals at Low Temperatures"

V sb. Fiz. mekhanizmy plastich. deform. pri nizk. temperaturakh (Physical Mechanisms of Plastic Deformation at Low Temperatures -- Collection of Works), Khar'kov, 1971, p 55 (from RZh-Metallurgiya, No 1, Jan 72, Abstract No 1I725 by I. Yeroshenkova)

Translation of Abstract: The authors investigated the effect of low temperatures (-100 and -180°) on the anisotropy of mechanical properties of AL19 and D16T Al alloys and carbon steel 45. Variations in elastic, strength, and deformation properties occur nonuniformly in different directions with a decline in temperature. More intense growth occurs in the direction which at normal temperature is characterized by fewer high parameters. Anisotropy of the metals declines on cooling, which is characteristic of a large group of metals.

1/1

USSR

UDC 620.172.251.12

PISARENKO, G. S., KOVAL'CHUK, B. I., LEBEDEV, A. A., (Kiev)

"Plasticity of D16T Aluminum Alloy During Double Extension Under Low Temperature Conditions"

Abstract: Results are presented from an experimental study of the influence of low temperatures on the deformation properties of D16T aluminum alloy in the planar stressed state. The tests were performed at + 20, - 100 and - 180°C by loading thin-walled tubular specimens with both axial tension and internal pressure. It was determined that the alloy has anisotropic elastic and plastic properties in the annealed state. The plasticity of the alloy is 45% higher, the Young modulus 9.5% lower in the direction of rolling than in the perpendicular direction. As the temperature drops, the anisotropy of both elastic and plastic properties decreases. The deformation ability of the alloy depends on the stressed state and temperature. As the temperature drops, plasticity increases. At normal and low temperatures, the minimum plasticity is observed when the ratio between primary stresses $\sigma_z/\sigma_\theta = 0.5$. The deformation curves

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USSR

UDC 620.172.251.12

PISARENKO, G. S., KOVAL'CHUK, B. I., LEBEDEV, A. A., (Kiev), Kiev, Probleny prochnosti, No. 1, 1971, pp 45-59

$\sigma_i = \phi \; (\varepsilon_i)$, $\tau_{max} = f \; (\gamma_{max})$ are not invariant to the form of the stressed state. Decreasing the test temperature to - 180°C has no significant influence on the divergence of the curves.

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USSR

UDC 539.4

SENIN, A. M., LAMASHEVSKIY, V. P., SIDOROV, N. G., KOPYLOV, A. K., NOVIKOV, N. V., and LEBEDEV, A. A., Kiev, Institute for Problems of Strength, Academy of Sciences-UkrSSR

"Strength of Welded Pipe Joints from Heterogeneous Metals at Room and Low Temperatures"

Abstract: The results are presented of an investigation of the strength of welded pipe joints made from heterogeneous metals, such as KhL8N10T steel and AMG-6 alloy, using friction welding and a soft ADl aluminum interlayer. Tests were conducted under various loading conditions at room (20°C) and low temperatures (-180°C). The effect of the scale factor on strength was investigated by varying the pipe diameter, the width of the interlayer, and the shape of the joints. The results show that the width of the soft interlayer in a square butt joint substantially affects the strength of the joint, and that qualitatively different effects are obtained at different temperatures. At room temperature the strength of the joint decreases with interlayer width, while at -196°C the strength increases.
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USSR

SENIN, A. M., et al, Problemy Prochnosti, No 8, Aug 70, pp 64-69

In order to determine the magnitude of thermal stress, an investigation was made of the stress level in the soft interlayer and in joined items during cooling. The measurement of thermal deformations of welded joint elements was conducted tensometrically. The investigation of the effect of loading conditions on strength characteristics was conducted on a test bench designed for combined loading of pipe samples by axial force and internal pressure under conditions of room and low temperatures. The axial and tangential stresses were computed by Lamé formulas for a thick wall cylinder under internal pressure. The fracture stress levels, during application of axial force, internal pressure, and combined proportional loading by axial force and internal pressure at 20° and -180°C are presented in graphs and tables.

USSR

UDC 539.4.011

PRISARENKO, G. S., LEBEDEV, A. A., LAMASHEVSKIY, V. P., Institute of Reliability Problems of the Academy of Sciences, UkrSSR

"Criteria of Plasticity and Breaking Point Strength for Carbon Steel under Low Temperature Conditions"

Kiev, Problemy Prochnosti, No. 1, 1970, pp. 3-7

Abstract: The authors tested thin walled tubes of medium carbon steel (C = = 0.37%) under plane stress along one axis and two axes, at temperature from +20 to -180°C. They determined an arbitrary yield point, taken as 0.2% deformation in the direction of most intensive deformation, and a destructive tension, considered as the ultimate loads in the area of two-axis elongation. The samples developed instability when plastic deformations appeared under pure shear and single-axis compression, making it impossible to determine shear or compression strength for the material. The results of these tests are shown in a figure where the experimental yield points are shown by open circles and the corresponding breakdown points by dark circles. Also shown in these diagrams are the Mieses and Coulomb-More curves for the arbitrary yield point and the ultimate strength under single-axis tension.

1/1

Acc. Nr: Abstracting Service: Ref. Code:
AP0046650   INTERNAT. AEROSPACE ABST-5-70 UR 3663

A70-25292 #   Geometrical treatment of a generalized
strength criterion (Geometricheskaie traktovka obobshchennogo
kriteriia prochnosti), A. A. Lebedev. (Akademiia Nauk Ukrainskoi
SSR, Institut Problem Prochnosti, Kiev, Ukrainian SSR). *Problemy
Prochnosti*, vol. 2, Feb. 1970, p. 21-23. 8 refs. In Russian.

Consideration of the general properties of limit surfaces of
quasi-brittle materials. It is shown that the approximation of a limit
curve in a deviator plane by second-order curves leads to strength
criteria obtained previously by combining the conditions of plasticity
and brittle failure.   A.B.K.

REEL/FRAME
19781963

1/2   025   UNCLASSIFIED   PROCESSING DATE--11SEP70
TITLE--CRITERIA OF PLASTICITY AND BREAKING POINT STRENGTH FOR CARBON STEEL
  UNDER LOW TEMPERATURE CONDITIONS -U-
AUTHOR--PRISARENKO, G.S., LEBEDEV, A.A., LAMASHEVSKIY, V.P.

COUNTRY OF INFO--USSR

SOURCE--KIEV, PROBLEMY PROCHNOSTI, NO. 1, 1970, PP 3-7

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--LOW TEMPERATURE PROPERTY, CARBON STEEL, THIN WALL TUBE, YIELD
  STRESS, COMPRESSIVE STRESS, SHEAR STRESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0638   STEP NO--UR/3663/70/000/001/0003/0007

CIRC ACCESSION NO--AT0104170
                     UNCLASSIFIED

CIRC ACCESSION NO--AT0104170

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS TESTED THIN WALLED
TUBES OF MEDIUM CARBON STEEL (C EQUALS 0.37PERCENT) UNDER PLANE STRESS
ALONG ONE AXIS AND TWO AXES, AT TEMPERATURE FROM PLUS 20 TO MINUS
180DEGREESC. THEY DETERMINED AN ARBITRARY YIELD POINT, TAKEN AS
0.2PERCENT DEFORMATION IN THE DIRECTION OF MOST INTENSIVE DEFORMATION,
AND A DESTRUCTIVE TENSION, CONSIDERED AS THE ULTIMATE LOADS IN THE AREA
OF TWO AXIS ELONGATION. THE SAMPLES DEVELOPED INSTABILITY WHEN PLASTIC
DEFORMATIONS APPEARED UNDER PURE SHEAR AND SINGLE AXIS COMPRESSION,
MAKING IT IMPOSSIBLE TO DETERMINE SHEAR OR COMPRESSION STRENGTH FOR THE
MATERIAL. THE RESULTS OF THESE TESTS ARE SHOWN IN A FIGURE WHERE THE
EXPERIMENTAL YIELD POINTS ARE SHOWN BY OPEN CIRCLES AND THE
CORRESPONDING BREAKDOWN POINTS BY DARK CIRCLES. ALSO SHOWN IN THESE
DIAGRAMS ARE THE MIESES AND COULOMB MORE CURVES FOR THE ARBITRARY YIELD
POINT AND THE ULTIMATE STRENGTH UNDER SINGLE AXIS TENSION.

1/2   024   UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--EQUIVALENCE CRITERIA UNDER CREEP CONDITIONS AT A COMPLEX STRESS
  STATE -U-
AUTHOR--LEBEDEV, A.A.

COUNTRY OF INFO--USSR

SOURCE--PROBLEMY PROCHNOSTI, VOL. 2, APR. 1970, P. 45-48. 10 REFS

DATE PUBLISHED----APR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--STEEL, CREEP MECHANISM, STRESS ANALYSIS/(U)1KH18N9T STEEL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0113   STEP NO--UR/3663/70/002/003/0045/0048

CIRC ACCESSION NO--AP0123885
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0123885
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   DISCUSSION OF THEORETICAL AND
EXPERIMENTAL FUNDAMENTALS FOR DETERMINING THE EQUIVALENT STRESSES UNDER
CREEP CONDITIONS.   SPECIAL ATTENTION IS GIVEN TO AN APPROXIMATE SOLUTION
FOR THE INTENSITY OF CREEP RATE WHICH IS ASSUMED AS AN INVARIANT
FUNCTION OF STRESS INTENSITY.   THIS METHOD IS ILLUSTRATED BY RESULTS
OBTAINED FOR THE IKH18N9T STEEL.   FACILITY: AKADEMIIA NAUK
UKRAINSKOI SSR, INSTITUT PROBLEM PRECHNOSTI, KIEV, UKRAINIAN SSR.

UNCLASSIFIED

USSR UDC 620.172

KOVAL'CHUK, B. I., LEBEDEV, A. A., Institute of Problems of Strength,
Academy of Sciences UkrSSR, Kiev

"Fluidity and Breakdown of the D16T Alloy at Low Temperatures Under a
Complex Stress State"

Abstract: The purpose of this research was to study the effect of low
temperatures on the fluidity and breakdown of the D16T aluminum alloy under
a plane stress state. This alloy is widely used in instrument building,
the aircraft industry, and in cryogenic technology. Previous studies
showed that the alloy has considerable anisotropy in mechanical properties
as furnished by the supplier. The strength of the alloy can be increased
by appropriate heat treatment, such as by tempering with subsequent
natural aging. Large residual stresses then arise in the metal which can
have a considerable effect on the anisotropy of the alloy and also on its
deformation and breakdown characteristics when subject to a complex stress
state. The strength properties of the D16T alloy has been insufficiently
studied despite the wide application of the alloy in the fabrication of
machine parts that operate under a complex stress state at low tempera-
tures. Tests were made on thin-walled tubes of samples (S/D = 1/27)

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USSR

KOVAL'CHUK, B. I., LEBEDEV, A. A., Problemy prochnosti, No. 5, May 72, pp 36-39

made from a rod of diameter 45 mm. The blanks were subjected to annealing at a temperature of 350°C. The samples were aged naturally for 6 months after fabrication of the sample. The chemical composition of the metal in percent is as follows: Cu -- 3.62, Mg -- 1.74, Mn -- 0.72, Al -- 93.74. The tests measured the longitudinal and transverse deformation of the sample using a special tensometer. The radial deformation was found by assuming an elastic change in the volume. The anisotropy of the strength properties of the alloy in the annealed state and the effect of low temperatures on it were determined by tests for pure stress in the axial and tangential directions at three temperature levels: +20, -100, and -180°C. Tests conducted at normal temperature show that the alloy in the annealed state is isotropic. The breaking point in the axial direction was 37% higher than in the tangential direction. A drop in temperature leads to an increase in the breaking point in both the axial and tangential directions. There is an intense rise in strength in the tangential direction characterized by lower strength characteristics than at normal temperature. In the case of a temperature drop to -180°C from normal, the breaking point in the axial direction increased by 21% and by 36.4% in the tangential direction. The yield point increased by 47 and 50.5%,

USSR

KOVAL'CHUK, B. I., LEBEDEV, A. A., Problemy prochnosti, No. 5, May 72, pp 36-39

respectively. It follows from the data that the initial anisotropy of the strength properties of the alloy decreases with a drop in temperature. Destruction tests of samples showed that breakdown in all cases occurred along the planes of action of maximum tangential stresses.

USSR

UDC 539.4

LEBEDEV, A. A., SHKANOV, I. N., KOZHEVNIKOV, Yu. L., Kazan'

"Criteria for Endurance of Steels Under Variable Loads Under Conditions of Monaxial and Biaxial Static Extension"

Kiev, Problemy Prochnosti, No 12, Dec 1972, pp 15-19.

Abstract: A comparative analysis is presented of the existing criteria for fatigue strength under the combined influence of static and variable stresses and the criterion suggested for the case when the static stresses are a result of biaxial extension. The analysis is well argued with new, as well as known, experimental data and references to the literature.

1/1

1/2   030   UNCLASSIFIED   PROCESSING DATE---16OCT70
TITLE--THE STATE OF WATER SALT METABOLISM IN PATIENTS WITH EOSINOPHIL
  ADENOMA OF THE HYPOPHYSIS -U-
AUTHOR--LEBEDEV, A.A.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL NEVROPATOLOGII I PSIKHIATRII IMENI S. S. KORSAKOVA, 1970,
  VOL 70, NR 5, PP 689-693
DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PITUITARY GLAND, ENDOCRINE SYSTEM DISEASE, ACROMEGALY, WATER
  METABOLISM, X RAY RADIATION BIOLOGIC EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/0236   STEP NO--UR/0246/70/070/005/0689/0693

CIRC ACCESSION NO--AP0117488
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0117488

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHOR STUDIED THE ANTIPYRINE
  SPACE, THE HYPOSULPHITE SECTOR, THE CONTENT OF NA AND K IN THE PLASMA
  AND ERYTHROCYTES, THE DIURNAL EXCRETION OF THESE ELECTROLYTES WITH THE
  URINE IN 18 PATIENTS WITH AN EOSINOPHIL ADENOMA OF THE HYPOPHYSIS WITH
  THE SYNDROME OF ACROMEGALIA AND IN 20 NORMALS. THE GENERAL WATER
  (ANTIPYRINE SPACE) AND EXTRACELLULAR WATER (THE SECTOR OF HYPOSULPHITE
  DISTRIBUTION) IN ALL PATIENTS WERE SIGNIFICANTLY HIGHER IN COMPARISON
  WITH THE CONTROL GROUP. THE SIGNIFICANT INCREASE WAS MAINLY OF THE
  EXTRACELLULAR WATER. THESE DATA SPEAK IN FAVOR OF THE FACT THAT IN
  PATIENTS WITH ACROMEGALIA THERE IS A GENERAL HYPERHYDRATATION
  PREVALENTLY WITH AN INTRACELLULAR OEDEMA. THE GENERAL HYPERHYDRATATION
  AND THE RETENTION OF NA IN EOSINOPHIL ADENOMAS APPEARS BEFORE THE
  AFFECTION OF THE CENTERS IN THE HYPOTHALAMIC AREA BECAUSE NOT IN ANY
  CASE WERE THERE SYMPTOMS OF SUPRASELLAR TUMOR GROWTH. THE MAIN REASON
  PROBABLY IS THE HYPERSECRETION OF HORMONES OF THE ANTERIOR LOBE OF THE
  HYPOPHYSIS BRINGING ON A DISTURBANCE OF THE WATER SALT METABOLISM.
  AFTER A COURSE OF X RAY THERAPY THE WATER SALT METABOLISM ACHIEVED A
  NORMAL LEVEL.   FACILITY: KAFEDRA NERVNYKH BOLEZNEY IVANOVSKOGO
  MEDITSINSKOGO INST.

USSR

MELIYEV, A., LEBEDEV, A. D., AVAKYAN, A. A., and MAKSIMOV, S. S., Uzbek Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, Academy of Medical Sciences USSR; and Institute of Scientific Information, Academy of Sciences USSR

"Carriers of Hemorrhagic Fever in the Uzbek SSR"

Abstract: Twenty-six species of Ixodid ticks were discovered in regions of Uzbekistan where hemorrhagic fever had been recorded. They belonged to the genuses Hyaloma, Dermacentor, Rhipicephalus, Haemaphysalis, Ixodes, Boophilus, and the Argasidae family. The seasonal fluctuation in incidence of hemorrhagic fever corresponds to the curve of seasonal population density of Hyaloma anatolicum, which predominates in most regions of the republic in foci of the disease and is, according to most investigators, the principal carrier and vector of the virus. Other widespread species include H. detritum, H. plumbeum, H. asiaticum, and D. daghestanicus. The ticks develop mainly in cowsheds and other shelters for farm animals, from which they invade human dwellings. The virus most probably exists in the system of H. plumbeum turanicum, which,

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USSR

MELIYEV, A., et al, Meditsinskiy Zhurnal Uzbekistana, No 4, 1971, pp 15-13

living on livestock together with H. anatolicum and H. detritum, passes the
virus on to them. Final solution of the question of vectors and reservoirs of
the virus, and measures for fighting the infection require virological studies
of the fauna of various localities by entomologists and epidemiologists.

1/2   025   UNCLASSIFIED   PROCESSING DATE--30OCT70
TITLE--ON EVOLUTION OF ARBOVIRUSES -U-

AUTHOR-(02)-LVOV, D.K., LEBEDEV, A.D.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 3, PP 372-376

DATE PUBLISHED------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ARBOVIRUS, EVOLUTION, ECOLOGY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1611   STEP NO--UR/0402/70/000/003/0372/0376

CIRC ACCESSION NO--AP0125233
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0125233

ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT. A HYPOTHESIS OF EVOLUTION OF
  ARBOVIRUSES IS SUGGESTED ON THE BASIS OF THE ANALYSIS OF ECOLOGICAL
  CHARACTERISTICS OF ARBOVIRUSES, DATA OF THEIR CURRENT GEOGRAPHICAL
  DISTRIBUTION AND CONSIDERATIONS OF GENERAL BIOLOGICAL REGULARITIES OF
  PARASITISM DEVELOPMENT. PRIMARILY THEY ORIGINATED IN AN EQUATORIAL
  SUBEQUATORIAL CLIMATIC ZONE AND SUBSEQUENTLY ADAPTED TO CONDITIONS OF
  TROPICS, SUBTROPICS AND A TEMPERATE ZONE. THE MAJORITY OF ARBOVIRUSES
  DERIVE FROM VIRUSES SYMBIONTS OF MOSQUITO INTESTINAL TRACT. THE MAIN
  SCHEMES OF CIRCULATION OF ARBOVIRUSES IN DIFFERENT CLIMATIC ZONES ARE
  ANALYSED. AS WELL AS SOME GENETIC MARKERS OF ARBOVIRUSES APPEARING IN
  THE PROCESS OF EVOLUTION. SOME MODES PRACTICAL APPLICATION OF THE
  SUGGESTED HYPOTHESIS ARE OUTLINED.   FACILITY: INSTITUT
VIRUSOLOGII IMENI D. I. IVANOVSKOGO AHN SSSR, VSESOYUZNYY INSTITUT
NAUCHNOY I TEKHNICHESKOY INFORMATSII AN SSSR, MOSKVA.

VIKHAREV, A. F., YEGOROV, A. P., ZHUKOV, V. P., CHUKAL'SKIY, YE. N., and
LEBEDEV, A. I.

"Mastering the Continuous Refining of Magnesium in a Mixer for the Titanium
Industry"

Abstract: The mixer is divided into two sections and filled with electrolyte
(chloride salts). The magnesium is purified by passing it through a layer
of electrolyte under the vertical divider from one section to the other. The
sludge is collected at the bottom of the mixer, which is inclined at 45° in
each section. A special automatic grab bucket facilitates sludge removal.
The mixer is lined with graphite and magnesite in order to withstand high
temperatures. Pipe heaters containing molten salts (K, Na, Mg, Ca chlorides)
are used to heat the mixer. The magnesium is transported to and from the
mixer by a vacuum ladle equipped with one or two tap holes. The magnesium
is protected from oxidation by a flux mixture sprayed into the mixer by
compressed argon for 5-10 seconds after each teeming and evacuation of the
magnesium. Analysis of the mixer sludge showed that magnesium losses amounted
to only 0.22% in 1970; it varied from 0.1 to 0.3%, depending on the frequency
1/2

USSR

VIKHAREV, A. F., et al., Tsvetnyye Metally, No 6, 1972, pp 44-46

of sludge removal. In 1970, average consumption of argon was 0.4 m^3/ton Mg; average consumption of flux was 0.3 kg/ton Mg. The authors recommend much wider use of such mixers in the titanium industry.

Veterinary Medicine

USSR   UDC 619:576.858.41578.083

LEBEDEV, A. I., GOGOLEV, M. M., MUTUZKIN, L. I., and MUTUZKINA, Z. P., All-
Union Institute of Experimental Veterinary Medicine

"Specific Resistance of Cells Induced by Foot-and-Mouth Disease Virus"

Moscow, Veterinariya, No 1, 1972, pp 31-33

Abstract: Guinea pig kidney cells obtained from animals that recovered from
foot-and-mouth disease and transplanted cells (sheep kidney fetal pig kidney,
hamster kidney) that survived infection with different foot-and-mouth disease
virus strains yielded subcultures which after 11 passages remained completely
resistant to the homologous A_{22} virus. Bioassays on laboratory animals and
in tissue culture failed to reveal the presence of virus in the cells, i.e.,
the acquired resistance was not accompanied by the virus carrier state.
The cells' resistance proved to be specific. It was manifested only to the
homologous A_{22} varient, whereas another variant of the virus, A_5, and type C,
reproduced actively; the titer did not differ from that of virus grown in the
control culture. However, the cells remained sensitive to heterologous types
and variants of the virus.

1/1

UDC: 621.397.61

USSR

LEBEDEV-KARMANOV, A. I., STEPANOV, N. V., FAYNSHTEYN, A. L.

"New High-Power Band III Transmitters at the Soviet-Wide Radio and Television Transmitting Station"

V sb. Televizion. tekhnika (Television Technology--collection of works), Moscow, "Svyaz", 1971, pp 266-302 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6G172)

Translation: The authors review the development of television transmitters in the Soviet Union from the thirties to the fifties. The peculiarities of construction of modern TV stations for the meter wave band are considered. The general characteristics of radio and television transmission equipment at the Ostankino telecenter are given. TV stations for band III with a power of 80/15 kW are described. Circuits of individual modules are presented, and the monitoring system and arrangement of the equipment at the center are described. Twenty-nine illustrations, bibliography of eight titles. N. S.

1/1

USSR

UDC 619:576.858.4:576.809.33

LEBEDEV, A. I., Scientific Candidate of Veterinary Sciences, and GOGOLEV, M. M., Associate, All Union Institute of Experimental Veterinary Medicine

"The Interaction of Food-and-Mouth-Disease Virus With Cells"

Moscow, Veterinariya, No 5, May 71, pp 38-40

Abstract: The initial stages of virus interaction with sensitive and resistant cellular systems, the character of virus adsorption by the cell and virus penetration into the cell were studied, as well as several aspects of the mechanism by which nonsensitive cells resist the virus. Foot-and-mouth disease virus A (variant A22, clone 432/6) was used. Virus-sensitive cells such as fetal pig kidney cells, hamster, calf and kitten cells and subcultures of calf cells were tested. As insensitive cells, the following were used: trypsin-treated chick kidney cells, chick embryo fibroplasts, and ram and guinea pig erythrocytes. The virus was irreversibly adsorbed on sensitive cells, whereas it could be desorbed from insensitive cells. It was established that the sensitivity of cells to the virus was caused by the presence of "receptor" structures on their surface. The virus receptor cells of fetal pig kidney cells have a lipoprotein structure and are bonded to the cell surface. Insensitive cells did not have specific virus receptors.

1/1

Veterinary Medicine

USSR

UDC 636.2:618.983.4

LEBEDEV, A. I., AVILOV, V. S., KOVALEV, L. V., and RIVENKOV, A. G., Candidates of Veterinary Science All Union Institute of Experimental Veterinary Medicine

"Virus-Neutralizing Activity of Extracts of Tongue Epithelial Tissue and Serum From Animals Recovered From Foot-and-Mouth Disease"

Moscow, Doklady Vsesoyuznoy Ordena Lenina Akademii Sel'skokhozyaystvennykh Nauk imeni V. I. Lenin, No 1, 1971, pp 39-40

Abstract: A definite relationship was observed between the results of the virus-neutralization reaction with tongue epithelial tissue extracts and serum obtained from animals 4 months after recovering from foot-and-mouth disease caused by the type A_{22} strain 20/432 virus. The index of neutralization was comparatively high in both cases - 2.5 to 4.5 lg ID_{50}. On the other hand, no such relationship was found 9 to 12 months after the animals recovered. A high level of virus-neutralizing antibodies was found in the serum at this time, but the tissue extracts had virtually no virus-neutralizing capacity. Titration of the type A_{22} virus grown in a culture of cattle tongue epithelium revealed that the accumulation of virus in epithelium obtained 9 to 12 months after the disease was on the average 2 logarithmic units higher than in epithelium obtained after 4 months.

1/2

USSR

LEBEDEV, A. I., et al, Doklady Vsesoyuznoy Ordena Lenina Akademii Sel'skokhozyay-
stvennykh Nauk imeni V. I. Lenin, No 1, 1971, pp 39-40

Based on the results of their experiments and on the literature data, the
authors concluded that the type-specific immunity of epithelial tissue from
animals recovering from foot-and-mouth disease is largely attributable to
specific cellular (tissue) factors.

2/2

LEBEDEV, A I.

UNCLASSIFIED

UNCLASSIFIED

11

Photosynthesis

Name: Institute of Photosynthesis, Pushchino

SECTION V   So: Scientific Research Activities

Peg-69
June 71

Description:

(U) During this quarterly reporting period, one new article was located from the Institute of Photosynthesis in Pushchino. On the basis of this 1970 article on plant growth, it was possible to associate three new persons with the Institute: S. G. Akvulova, V. L. Stanley, and Ye. F. Yegorova (?). At the present time, however, it has not been possible to identify very many persons with the Institute; the complete listing of staff members identified to date is given below:

Directors of Photosynthesis

Akulova, Ye. A.
Gavrilova, V. A.
Khrushcheva, S. G.
Lebedev, A. I.
Nikarov, A. D.
Mal'yan, A. N.
Abkhin, Ye. N.
Olovyanishnikova, G. D.
Popova, M. B.

Prokhorova, I. I.
Sadovnikova, N. D.
Shmeleva, V. L.
Sidorov, A. N.
Stashov, L. F.
Stolovitskiy, Yu. M.
Surovtsev, V. L.
Yegorova, Ye. F.
Yestigneyev, V. B.

USSR

LEBEDEV, A. N., and LUTSKIY, V. A.

"Polyphase Nature of Evoked Potential Is a Result of the Reactive Consolidation
of Background Oscillations"

Moscow, Biofizika, Vol 18, Vyp 2, Mar/Apr 73, pp 397-399

Abstract: Using the equation derived in earlier works, theoretical and experi-
mental results are compared. Statistical analysis of more than 100 background
pulse sequences obtained from the rabbit brain cortex showed that most of them
were within 20-60 msec. intervals. The time interval between the primary and
secondary positive variations evoked by visual, sonic, and electric (skin)
stimulations was never below the calculated interval (20-40 msec.). The lowest
interval amounts to 10-15 msec. according to theory. The post stimulation
histogram of the pulsed discharges of neurons also corresponded well to the
theoretical. The characteristic configuration features of the evoked potentials
in the cerebral cortex of rabbits are attributed to frequency range of individual
central neurons. The shape of the evoked potentials (plotted in 2 figures) was
the result of changes in the membrane potentials of single neurons.

1/1

UDC: 621.384.6.01

USSR

KISLETSOV, A. V. and LEBEDEV, A. N.

"Electron Beam Autophasing in Delay Systems"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 4, 1972, pp 699-704

Abstract: The question of particle autophasing is an important
one in the modern technique of using a heavy flow of relativistic
electron beams in accelerators. This article demonstrates the
possibility of obtaining stable electron pulses which are auto-
phased under the action of characteristic fields alone. It also
explains the fundamental characteristics of these pulses by con-
sidering the often used model of real systems in the form of a
smoothly cylindrical waveguide filled with a dielectric without
dispersion. To avoid complicating the problem, transverse motion
is ignored by considering that the beam is acting under a strict-
ly longitudinal magnetic field. Curves are plotted for the ini-
tial beam energy as a function of the beam current. The authors
express their gratitude to A. A. Kolomenskiy for his interest in
the work, and to V. S. Voronin for his comments; A. V. Agafonov
is also mentioned for participating in the research. They are
... with the P. N. Lebedev Physics Institute in Moscow.

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UNCLASSIFIED   PROCESSING DATE--23OCT70

1/2   009

TITLE--COLLECTIVE EFFECTS IN CIRCULAR ACCELERATORS -U-

AUTHOR-(02)-KOLOMENSKIY, A.A., LEBEDEV, A.N.

COUNTRY OF INFO--USSR

SOURCE--(KFK-TR-302), PREPRINT NO. 176, 28P. (CONF-681029-2). DEP. CFSTI
    FROM NATIONAL PARTICLE ACCELERATOR CONFERENCE, MOSCOW, USSR

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, BEHAVIORAL AND SOCIAL SCIENCES

TOPIC TAGS--CIRCULAR ACCELERATOR, BIBLIOGRAPHY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1990/0199   STEP NO--UR/0000/70/000/000/0001/0028

CIRC ACCESSION NO--AT0108523
                    UNCLASSIFIED

2/2   008
CIRC ACCESSION NO--AT0108523
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A BIBLIOGRAPHIC REVIEW IS
PRESENTED ON THE EXPERIMENTAL STUDIES ON COLLECTIVE EFFECTS IN CIRCULAR
ACCELERATORS.   FACILITY: AKADEMIYA NAUK SSSR, MOSCOW. INSTITUT
FIZIKI.

UNCLASSIFIED   PROCESSING DATE--04DEC70

1/2   020

TITLE--PASSIVATION AND DEPASSIVATION OF GOLD IN CYANIDE SOLUTIONS -U-

AUTHOR-(02)-KAKOVSKIY, I.A., LEBEDEV, A.N.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., TSVET. MET. 1970, 13(1), 56-9

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--METAL PASSIVATION, GOLD, CYANIDE, SOLUTION CONCENTRATION,
  OXYGEN, SURFACE ACTIVE AGENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/0840   STEP NO--UR/0149/70/013/001/0056/0059

CIRC ACCESSION NO--AT0132930
                    UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--04DEC70

2/2   020
CIRC ACCESSION NO--AT0132930
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AU PASSIVATION AND DEPASSIVATION
  DURING DISSOLN. IN CYANIDE SOLNS. ARE DEFINED BY THE CONCN. OF O IN
  SOLN. AND BY SURFACE ACTIVE REAGENTS.   FACILITY: URAL. POLITEKH.
  INST., SVERDLOVSK, USSR.

UNCLASSIFIED

UDC 610.193.41 : 669.24

USSR .

MATUSEVICH, V. S., LEBEDEV, A. M., FOKIN, M. N., and KONSTANTINOVA, YE. V.

"Study of Corrosion of Nickel-Molybdenum Alloy EP-496 in Hydrochloric Acid Solutions Containing a Fluorine Ion"

Moscow, Zashchita Metallov, Vol 8, No 3, May-Jun 72, pp 317-320

Abstract: For purposes of selecting a corrosion-resistant material for highly corrosive media of the system $HCl+HF+H_2O$, the authors tested nickel-molybdenum alloy EP-496 (C < 0.05, Si < 0.5, Mn < 0.5, V 1.4-1.7, Fe < 4.0, Mo 25-29 percent, the rest Ni), developed by the Central Scientific Research Institute of Ferrous Metallurgy. The tests were conducted in a 10 M HCl solution with additions of 0.2-1.0 M F^- at the boiling point (104°). Alloy EP-496 possesses satisfactory corrosion resistance in a hydrochloric acid solution with fluoride additions. The corrosion rate and potential change slightly with the introduction of up to 1.0 M fluorine ion into the solution. The alloy corrodes at an increased rate if there are oxidizing agents in the solution. The corrosion potential of EP-496 in a 10 M $HCl+0.2$ M F^- solution shifts towards

1/3

USSR

MATUSEVICH, V. S., et al., Zashchita Metallov, Vol 8, No 3, May-Jun 72, pp 317-320

positive values and the average corrosion rate rises sharply with an increase in the Fe^{3+} concentration. For purposes of corrosion protection, the authors tried a method of Fe^{3+} reduction in solution and selected the most effective reducing agents. This treatment was found to be more effective with a homogeneous oxidation mechanism than with heterogeneous oxidation. The problem was to select a reagent which permits sufficiently rapid and complete reduction of Fe^{3+} with minimum consumption of the introduced reducing agent.

Sodium hyposulfite and hypophosphite proved ineffective. The introduction of tin dichloride provides effective protection, reducing the corrosion rate to that in a solution free of an oxidizing agent. In experiments with metallic reducing agents, their protector effect on the alloy was eliminated (the experiments being staged in the absence of direct contact between specimen and the chip of the introduced metal). There was an increase in the

2/3

- 15 -

USSR .

MATUSEVICH, V. S., et al., Zashchita Metallov, Vol 8, No 3, May-Jun 72, pp 317-320

corrosion rate of the alloy with the introduction of a metal chip (steel St. 3) into the solution. The transition of metallic iron to the ionic state was accompanied by intensive hydrogen evolution. Metallic aluminum cuts in half the corrosion rate of the alloy. Metallic titanium was found to be an exceptionally effective corrosion inhibitor for alloy EP-496 in a hydrochloric acid-fluoride medium both in the presence and in the absence of trivalent iron ions in the solution. The optimum addition of metallic titanium for protection at certain oxidizing agent concentrations is chosen empirically.

3/3

Biophysics

USSR

UDC 577.37

LEBEDEV, A. V. and BOGUSLAVSKIY, L. I., Institute of Electrochemistry, Academy of Sciences USSR

"Experimental Study of the Mechanism of Conductivity of Artificial Phospholipid Membranes by Measuring Impedance"

Moscow, Biofizika, No 1, 1971, pp 221-229

Abstract: The capacitance and conductivity of artificial phospholipid membranes in the presence of uncouplers of oxidative phosphorylation (2,4-dinitrophenol, pentachlorophenol, and tetrachlorotrifluoromethylbenzimidazole [TFB]) and the antibiotic valinomycin were dependent on the concentration of the penetrating ion (proton for the uncouplers and potassium for the antibiotic). The frequencies were measured in the range of 10^{-3} hz and 30 khz. It appears that impedance of the ion takes place in the membrane rather than during the migration of the ion from the electrolyte to the membrane. The resistance of the volume of the membrane can be compared to that of the border only in the presence of TFB, the most effective additive. A bell-shaped dependence of conductance on alternating current is maintained at high frequencies when capacitance is determined by its geometric value. At a low frequency, capacitance either has a peak (in the case of TFB) or it is independent
1/2

USSR

LEBEDEV, A. V. and BOGUSLAVSKIY, L. I., Biofizika, No 1, 1971, pp 221-229

of the concentration of the transferred ion up to 10^{-3} hz (in the case of the other compounds). The results are consistent with relay-race theory.

2/2

- 5 -

PROCESSING DATE--09OCT70

1/2   020
TITLE--LATEX FOR FINISHING LEATHER -U-

AUTHOR-(04)-LARKINA, T.A., ZURABYAN, K.M., RAKHLIN, P.I., LEBEDEV, A.V.

COUNTRY OF INFO--USSR

SOURCE--KOZH. OBUV. PROM. 1970, 12(2) 17-21

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--LATEX, SPECIALIZED COATING, BUTADIENE, ACRYLATE, COPOLYMER, ACRYLAMIDE, LEATHER, THERMAL STABILITY/(U)DMMA65 IGP LATEX

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0264   STEP NO--BU/003C/70/012/002/0017/0021

CIRC ACCESSION NO--AP0106920

2/2   020
CIRC ACCESSION NO--AP0106920
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   A BUTADIENE ME METHACRYLATE
COPOLYMER CONTG. O.75PERCENT METHACRYLAMIDE WAS DEVELOPED FOR FINISHING
LEATHER.   THE LATEX FILMS HAD HIGH THERMAL STABILITY AND LOW SWELLING H
IN SUB2 O, WHICH MADE THEM EXCELLENT SUBSTITUTES FOR DMMA-65-1-GP LATEX
(PRESENTLY USED FOR FINISHING LEATHER).

USSR   UDC: 621.385.632

DANOVICH, I. A., KASATKIN, L. V., LEBEDEV, A. V., PETHANGOVSKIY, A. N.

"A Type O Traveling Wave Tube With Reversible Shielded Magnetic Focusing
System"

USSR Author's Certificate No 256882, filed 23 Nov 67, published 1 Sep 70
(from RZh-Elektronika i yeye Primeneniye, No 6, Jun 71, Abstract No 5A176P)

Translation: A type O traveling wave tube is proposed with reversible
shielded magnetic focusing system. The focusing system has flat pole pieces
made of a magnetically soft material located at points of reverses in the
magnetic focusing field. As a distinguishing feature of the patent, the
magnetic field levels and high azimuthal homogeneity of the focusing field
which are required for shaping the electron beam are assured by varying the
pitch of the reversible magnetic focusing system, decreasing the distance
between adjacent pole pieces and the axial dimensions of the corresponding
magnets in the end regions of the system and at points where energy is
coupled out.

1/1

UDC 621.762.002.5(088.8)

USSR.

DOROFEYEV, YU. G., LEBEDEV, B. A., ZHERDITSKIY, N. T., and KOLESNIKOV,
V. A., Novocherkassk Polytechnic Institute

"Die for Making P/M Bushings"

USSR Authors' Certificate No 264136, Cl. 49 h, 11; 49 i, 16, (B 21 j B 21 k),
filed 19 Jun 68, published 24 Jun 70 (from RZh-Metallurgiya, No 3, Mar 71,
Abstract No 3G477P)

Translation: The die consists of a frame, an upper punch suspended from the
top of the die frame on a spring, a bottom punch which is the pusher, and a
needle passing through the upper punch. In order to make possible the
extraction of the needle from a pressed bushing without breaking it, the die
is equipped with a double upper-punch lock, which is tripped by guide
blocks fastened to the top of the die frame. Four illustrations.

1/1

LEBEDEV, B. D., SAVITSKIY, V. Ye., TROITSKAYA, N. A.

"Integer Model of a Freight Transfer Problem"

Translation: In a number of sectors of the national economy
the necessity arises of transferring freight from certain
production points to predetermined points of consumption.
Most problems of this type are formulated as a transport
model. Rather frequently in practice a modification of the
ordinary transport problem is encountered where the delivery
of freight to each consumption point must be carried out at
a strictly defined time, i. e. the freight transfer problem
according to a time schedule. An approximate method of di-
rectional sorting has been proposed for solving an analogous
problem. This article gives its main attention to distin-

1/2

USSR

LEBEDEV, B. D. et al., Mat. metody resheniya ekon. zadach,
No 3, "Nauka", 1972, pp 201-208

guishing a number of classes of models for which the problem
of freight transfer according to a time schedule reduces to
a transport problem of linear programming. Also given are
some models which are not reducible to a transport model.
A numerical example is considered.

2/2

UDC: 8.74

USSR

KUZ'MIN, V. I., LEBEDEV, B. D., CHUYEV, Yu. V.

"Ways to Improve Analytical Models of Development"

V sb. Probl. kibernetiki (Problems of Cybernetics--collection of works),
vyp. 24, Moscow, "Nauka", 1971, pp 5-14 (from RZh-Kibernetika, No 4,
Apr 72, Abstract No 4V602)

Translation: The paper investigates ways to improve models of develop-
ment based on analysis of existing models of specific processes. Bibli-
ography of 28 titles. Authors' abstract.

1/1

KUBRIN, E. Ye., LEBEDEV, B. D., SAVITSKIY, V. Ye., TROITSKAYA, K. A.

"Integer Model of Problem of Transfer of Cargos Using Hourly Schedules"

Translation: Points of consumption ($s = 1, 2, \ldots, S$) are fixed, each of which must be supplied at fixed moments in time $\tau_1^{(s)}, \ldots, \tau_{k_s}^{(s)}$ with cargos of predetermined types and quantities. Also fixed are m points of production, each moment $\tau_p^{(s)}$ corresponding to a subset $I_p^{(s)} \subset I = (1, \ldots, n)$ points of production, the specialization of which allows the sth point of consumption to be supplied at the fixed moment in time. The problem is to determine a plan of cargo transfer optimizing a certain criterion of effectiveness. The following model of integer linear

programming is produced. Find the number θ_{fij} minimizing $\sum_{j=1}^{m} \sum_{i=1}^{n} \theta_{ij}$ under

the conditions

$$\sum_{f=0}^{j-1} \sum_{i \in I_j} \theta_{ij} = 1, \quad j = 1, 2, \ldots, n,$$

$$\sum_{j=0}^{j-1} \sum_{i \in I_j} (T_j + t_{jij}) \theta_{jij} \leqslant T_j, \quad j = 1, 2, \ldots, n,$$

$$\sum_{i=1}^{m} \sum_{j=i+1}^{n} \theta_{jij} \leqslant 1, \quad j = 0, 1, \ldots, n, \quad \theta_{jij} \in \{0, 1\}.$$

An investigation of the model is performed. Important particular cases are indicated, when it is reduced to the transport problem.

USSR

AVRAMENKO, V. I., Engineer, LEBEDEV, B. F., Doctor of Technical Sciences, and
BOZHKO, V. I., Engineer, Institute of Electric Welding imeni Ye. O. Paton;
and RUBANOVICH, B. B., Engineer, Stal'konstruktsiya Trust

"Some Means of Increasing Electroslag Welding Productivity"

Abstract: Reducing the gap in a butt joint while simultaneously increasing
the feed rate of electrode wire is the most advantageous and simple method of
increasing electroslag welding productivity, and work has been done in this area
at the Institute of Electric Welding imeni Ye. O. Paton, where samples of low-
alloy steels 09G2S and 10G2S were welded using wire Sv-10G2 and AN-48 flux. An
empirical formula was established making it possible to determine the critical
rate of electrode wire feed during electroslag welding which is based on the
cross sectional area of the gap and electrode wire diameter. Gaps of 16, 18,
20, 20, 20, and 20 mm were determined for steel thicknesses of 20, 24, 30, 36,
40, and 50 mm. Experiments showed that gaps 20±2 mm were optimum for steel
thicknesses of 30-50 mm. The optimum electrode diameter was 2-3 mm and optimum
welding wire feed rate—40-50 m/hr. 1 figure, 2 bibliographic references.

1/1

2.

USSR   UDC 621.791.79.046.003.13

IVOCHKIN, I. I., ALEKSEYEV, A. I. (Candidates of Techn. Sciences),
SOSEDOV, A. F. (Engineer), /VNIImontazhspetsstroy/, LEBEDEV, B. E.
(Doctor of Techn. Sciences), AVRAMENKO, V. I. (Engineer) /Electric
Welding Institute imeni Ye. O. Paton/, and IVOCHKIN, I. M.,
/Sokolovskiy Plant of Metal Structures/

"Electroslag Welding With the Use of Powdered Filler Metal"

Abstract: The article describes an electroslag process involving the
feed of powdered filler metal (PFM) to the slag bath. The use of PFM
enables more effective utilization of the welding heat, doubles the
welding efficiency, and yields a weld with better properties. In
addition, the article discusses equipment designed for electroslag
welding of low-carbon and low-alloy steels, 25-60 mm thick, with PFM
and a consumable electrode of continuous cross sections. A block
diagram of a unit for proportioning and feeding PFM to the slag bath
is shown. Various PFM compositions for low-carbon and low-alloy steels
are cited and test data on the strength properties of the welds are
given. (2 illustrations, 4 tables, 4 bibliographic references)

1/1

Welding

USSR   UDC 621.791.75.045-52+621.791.046

IVOCHKIN, I.I., ALEKSEYEV, A.I. (Candidates of Techn. Sciences)
/ VNIImontazhspetsstroy /, LEBEDEV, B.E. (Doctor of Techn. Sci-
ences) / Institute of Electric Welding imeni Ye.O. Paton /,
STEKLOV, O.I. (Cand. of Techn. Sciences) / Moscow Higher Techni-
cal School imeni N.E. Bauman /, IVOCHKIN, I.M. (Engineer)
/ Sokolovskiy Plant of Erecting Cranes / and MOTSOKHIN, S.B.(En-
gineer) / Trust No 7 /

"Automatic Submerged Arc Welding Using Powder Filler Metal"

Abstract: The use of powder filler metal in submerged arc welding
permits joining plate structures up to 50 mm thick without bevel-
ling in two passes at a lower per-unit consumption of heat energy.
Described here is a new analytical technique for determining the

1/2

USSR

IVOCHKIN,I.I.,et al, Svarochnoye proizvodstvo, No 2,Feb 72,pp 15-17

optimal technological parameters of welding with the use of powder
filler metal including the root gap, welding rate, electrode wire
feed, granulation,and the amount of powder filler metal. The weld
quality is rated on the basis of fusion depth, shape factor, weld
continuity,and the heat efficiency of the welding. Proposed is a
new automatic direct submerged (two-sided) welding technology with
metal powder as the filler metal for low carbon and low-alloy
steels up to 50 mm thick without bevelling. The new process is said
to increase the welding efficiency two to three fold (as compared
to conventional welding),decrease the cost per meter of weld by
about 80%,and produce an economic effect within the 10-50 mm thick-
ness range averaging at 330 rubles per ton. (3 illust., 3 tables,
4 biblio. ref.)

2/2

USSR   UDC 616.34-001-29.092.9-091

SHIKHODYROV, V. V., and LEBEDEV, B. I.

"Pathological Anatomy of the Enteric Form of Acute Radiation Sickness in Dogs"

Moscow, Arkhiv Patologii, Vol 33, No 11, 1971, pp 18-22

Abstract: A study was made to define the effects of acute enteric radiation
sickness on systems other than the intestine, and to determine the role of
such changes in the outcome of the disease. Experiments were conducted on 40
dogs, irradiated with gammaneutrons in doses from 1,000 to 5,000 REM. [Ro-
entgen equivalent man]; death occurred within 7-9 days. The pathological
and anatomical nature of the disease was destruction of hemodynamics,
dystrophy, and tissue destruction; the critical organ was the small intestine.
Necrotic changes were pronounced in other internal organs; cell destruction
was observed in hemopoietic organs. Morphological changes in the internal
organs (spleen, liver, kidneys, lungs) in the lymph, thyroid, pituitary, and
adrenal glands, in bone marrow; and in the circulatory, nervous, and gastro-
intestinal systems are described. Changes in the hemopoietic organs and
testicles are direct consequences of radiation; in others, cell destruction
is possibly the result of acute impairment of blood supply. However, the
conclusion is that, with the exception of the small intestine, such changes
1/2

USSR

were not severe enough to cause death. In cases of early death (2-3 days following irradiation), when the mucosa had not yet been destroyed, but a circulatory impairment was present, there was indication of a neuroreflex mechanism: traumatic shock. This consisted of general impairment of capillary and venous circulation in organs with development of stasis and edema, impaired hemodynamics in the lungs and liver, and changes in the anterior lobe of the pituitary gland with degranulation and decrease in basophilic cells. Secondary shock is known to be related to intoxication of the nervous system, possibly, in this case, by histamine and histamine-like substances. The results may be peculiar to dogs, as they are especially sensitive to these agents and have more of them in their gastric and intestinal mucosa than other experimental animals.

2/2

UDC 8.74

USSR

LEBEDEV, B. L., PLOTNIKOV, V. N.

"Some Statistical Aspects of Pattern Recognition"

V sb. Avtomat. upr. i vychisl. tekhn. (Automatic Control and Computer Engineer-
ing -- collection of works), Vyp. 10, Moscow, Mashinostroyeniye Press, 1972, pp
6-40 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V660)

Translation: A study was made of the general statement and mathematical model
of the pattern recognition problem as a problem in extremlitization of a func-
tional of the quality of the recognition automaton. The search for the family
of extremals and the sorting among them are carried out in the training process
of the automaton by variation of some of its parameters.
    Finding the recognition scheme offers the possibility of constructing
the sequence of the solution of the standard recognition problem.
    Determination of the schematic and the sequence of solving pattern recog-
nition problems permits us to proceed to the investigation of the basic methods
of solving the problem. Such methods are classified in this paper by the simi-
larity measures used and by the procedures for determining the statistical de-
scriptions of the separate classes of patterns. From this point of view of the
procedure used for constructing the statistical descriptions of the separate
classes a study was made of algorithms with rigid logic and adaptive algorithms.
    In this paper attention has also been given to the problems of selecting

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USSR

LEBEDEV, B. I., et al., Avtomat. upr. i vychisl. tekhn., Vyp. 10, Moscow, Mashinostroyeniye Press, 1972, pp 6-40

informative attributes. The necessity for determining the strict physical and mathematical informativeness criteria in the recognition problem is noted.

The concluding part of the paper is devoted to adaptive recognition automata of the perceptron type. The physical model of the mechanism of operation of the perceptron and its analogy to the classical recognition theory are discussed. The bibliography has 28 entries.

USSR   UDC 8.74

LEBEDEV, B. I., and PLOTNIKOV, V. N.

"Certain Statistical Aspects of Pattern Recognition"

Translation: A general formulation and mathematical model of the problem of pattern recognition as a problem in minimizing or maximizing of a certain functional of the quality of the recognizing automaton is considered, in which the search for a family of extremals and the selection among them is carried out during the learning process of the automaton by means of a change in certain of its parameters. Finding the recognition circuit makes it possible to construct the sequence of the solution of a typical recognition problem. Determining the circuit and the sequences of the solution of the pattern recognition problem makes it possible to turn to a consideration of the basic method of solving the problem. These methods are classified in the paper on the basis of the coincidence measures used and the methods for determining statistical descriptions of separate classes of patterns. Algorithms with a rigid logic and adaptive algorithms are
1/2

USSR

LEBEDEV, B. I., and PLOTNIKOV, V. N., Avtomat. upr. i vychisl. tekh., No 10,
Moscow, "Mashinostroyeniye," 1972, pp 6-40

considered from the aspect of the method used for constructing statistical
descriptions of the separate classes. Attention is also given in the paper
to problems of selecting informative indicators. The necessity of determin-
ing strict physical and mathematical criteria of informability in the
recognition problem is noted. The concluding section of the paper concerns
adaptive recognizing automata of the perceptron type. A physical model of
the operating mechanism of a perceptron and its analogy with the classical
theory of recognition are discussed. 28 ref. Authors abstract.

2/2

3

USSR   UDC: 621.317.3(088.8)

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

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

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

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

1/1

USSR

UDC: $629.7.036.3:536.46$

LEBEDEV, B. P. and DOKTOR, I. YU.

"Stabilization of the Flame of Inhomogeneous Mixtures"

Moscow, Goreniye i Vzryv--Sbornik (Combustion and Explosion--Collection of Works), Nauka, 1972, pp 361-364 (from Referativnyy Zhurnal--Aviatsionnyye i Raketnyye Dvigateli, No 2, 1973, Abstract No 2.34.29. Resume)

Translation: An experimental investigation is conducted of the process of stabilization of the flame of an inhomogeneous kerosene-air mixture (in the vapor phase, speed $W=100-180$ m/sec, pressure $p_0 = 0.2-0.6$ absolute atmosphere, gas temperature $650°C$). It is established that the flame-stabilization mechanism of an inhomogeneous mixture behind a poorly streamlined body does not differ in principle from the flame-stabilization mechanism of a homogeneous mixture. The value which determines the boundaries of the stable-combustion region of an inhomogeneous mixture is the air-excess coefficient in the circulation zone behind the stabilizer α_{st}. The boundary characteristics of the stable-combustion region are generalized by the relationship $\frac{W}{dp_0} = f(\alpha_{st})$

(d is the characteristic dimension of the stabilizer). 2 figures.
2 references.
1/1

USSR

LEBEDEV, D. P., CHUNCHENPAK, I. M.

"Optimization of Water Distribution in Irrigation System by Network Flow Method"

Tr. In-ta Elektron. Upravl. Mashin [Works of the Institute of Electronic Control Machines], 1972, No 17, pp 4-12 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V609, by Ye. Gahovich).

Translation: The problem of minimization of the loss resulting from flow shortage is studied for a network, the lines of which are irrigation canal . It is stated that with the hypothesis of linearity of the loss functions, this problem is a specific problem on the flow of minimum cost in the network. For more complex loss functions, it is suggested that they be replaced with piecewise-linear approximations and that the problem of minimization of the loss from water shortage be solved by using the Ford-Fulkerson algorithm suggested in (RZhMat, 1966, 4V367K). Going beyond simple reference to this monograph, the authors, in order to explain the essence of their suggested complication of the Ford-Fulkerson algorithm, dedicate a large portion of

1/2   24

- USSR

Lebedev, D. P., Chunchenpak, I. M., Tr. In-ta Elektron. Uprayl. Mashin.,
1972, No 17, pp 4-12.

their article to a detailed description of the Ford-Fulkerson algorithm itself,
borrowed from a monograph by the authors of the algorithm (RfhMat, 1966,
4V367K). The operation of these two algorithms is illustrated by calculations
using a simplified irrigation network from the Zeravshan River valley for the
case of a linear model and a model with two-stage piecewise-linear approxima-
tion of the loss function. The discretion interval used in the problem is
the decade. The calculations were performed for two or three decades. The
network had not over 26 lines. For the actual irrigation network and a time
section of 20 decades, the number of lines is estimated at 700-1000. It is
concluded that the Ford-Fulkerson algorithm and its modification as required
for consideration of the specific features of the problem can be effectively
used to solve the problem of water distribution in a large irrigation network.

2/2

Abstract: The noise dealt with in this article originates either
in industrial appliances or in the receiver itself, and is mani-
fested as chaotic pulses of random amplitude and of the duration
of one scanning element. The authors obtain an algorithm for the
filtration of the noise on the basis of the radical difference be-
tween the nature of the pulse noise and of the image signal. This
algorithm is found by using the theory of statistical solutions if
the a posteriori distribution of the transmitted image and the
form of the function for the losses connected with the difference
between the transmitted and reproduced images are known. The dis-
tribution of the difference between the video signal for a given
element of the image and its value predicted for the surrounding
elements is taken as the a posteriori distribution value. On the
basis of the obtained algorithm, a filtration system is worked out
and its block diagram given. It was developed in transistorized
form, in 20 stages, and tested; the results of the test are shown
in the form of contrasted photographs of television images with
and without the filter.

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USSR

UDC 529.4

LEBEDEV, D. V., GADZHIBALAYEV, G. A., Moscow

"Estimate of Impact Toughness of Steels at Cryogenic Temperatures"

Abstract: Data are presented characterizing the work of rupture and its components -- the work of formation and work of propagation of cracks -- in chrome-nickel and chrome-manganese steels in the temperature interval from 20 to -253° C. Results of determination of the work of crack propagation by the methods of Drozdovskiy and of Gulyayev are compared.

1/1

USSR   UDC 539.4
- SOROKINA, N. A., LEBEDEV, D. V., UL'YANIN, Ye. A., ANTROPOV, N. P., (Moscow)

"Strength and Ductility of Chrome-Nickel-Manganese Steel as Functions of
Carbon and Nitrogen Content in the 20-253°C Temperature Interval"

Abstract: The influence of carbon and nitrogen on the strength and ductility
of chrome-nickel-manganese steel at low temperatures is studied considering
stress concentrations. An increase in the content of carbon from 0.008 to
0.1% in the steel studied (hardened state) has little influence on strength
and ductility determined on smoothed specimens and specimens with circular
notches in the temperature interval studied. Test data from tensile testing
of specimens with cracks at -253°C indicate a tendency of the steel studied
toward increased strength with increasing carbon content from 0.008 to 0.03%.
Increasing the nitrogen content in the hardened steel from 0.043 to 0.285%
increases the strength significantly (by about 50%) in the 20-253°C interval,
as determined on smoothed specimens, specimens with circular notches and
cracks; ductility decreases, but even with 0.285% nitrogen, ductility is
rather high. The sensitivity of the steel to stress concentration in the
temperature interval studied at K_t = 3.03 is practically independent of carbon

content between 0.008 and 0.1% and nitrogen content between 0.043 and 0.285%.
1/2

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UDC 539.4

SOROKINA, N. A., LEBEDEV, D. V., UL'YANIN, Ye. A., ANTROPOV, N. P., Kiev,
Problemy Prochnosti, No 8, 1972, pp 89-93.

The impact toughness of the steel studied following tempering at 600-900°C
is determined by the content of carbon and nitrogen and is significantly
dependent on test temperature. In the hardened state, the toughness is
high and little dependence on carbon and nitrogen content.

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- 17 -

USSR

GROBOV, V. A., LEBEDEV, D. V., Kiev

"On the Effect of Asymmetry of Masses on the Dynamics of the Motion of a Solid in the Process of Orientation"

Abstract: Asymptotic methods of nonlinear mechanics are used to study the effect of inertial crossed bonds caused by centrifugal moments of inertia on the dynamics of the process of orientation of a solid. Two rectangular coordinate systems $OXYZ$ and $Oxyz$ with common origin O at the center of mass of the body are introduced. The axis of the first system is directed parallel to the axis of the coordinate system relative to which the orientation of the body is determined and the axis of the second is rigidly fastened to the solid body. The axes of the $Oxyz$ coordinate system are generally not the major axes of inertia but make small angles with them. The motion of the solid around the center of mass is investigated under the following assumptions: (1) the body rotates with constant angular velocity $\omega_y = \Omega$ relative to the Oy axis;

(2) $J_y = J_z \gg J_x$, $J_y > J_z$; (3) the motion of the solid is under the

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USSR

GROBOV, V. A., LEBEDEV, D. V., Mekhanika tverdogo tela, No. 2,
Mar/Apr 72, pp 34-39

action of a controlling moment M_3 acting relative to the Cz axis;
(4) the angle between the OY and Oy axes determined from the condition
$\cos \delta = \cos \alpha \cos \beta$ is small, where α, β and γ are the Krylov angles
determined by the mutual position of the two coordinate systems. It
is shown that the presence of centrifugal moments of inertia leads to
displacement of the equilibrium position relative to the coordinate
origin by certain angles, analytical expressions for which are given.

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USSR

UDC 539.43

LEBEDEV, D. V., OVSYANNIKOV, B. M., Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"The Effect of Stress Concentration Upon the Properties of Steel for Cryogenic Engineering"

Abstract: An investigation is made of the stress concentration created by circular grooves with various geometric parameters on cylindrical specimens, by cracks on flat specimens in the case of static stretching, and by one-sided grooves and cracks on prismatic specimens in the case of dynamic flexure, upon the mechanical properties of steel in the temperature range from 20 to -253° C. An analysis of the indicative value of static and dynamic test methods under conditions of the action of stress concentration was conducted. For evaluation of the deformation property of cryogenic steel within the indicated temperature interval, three coefficients were proposed, which take inot account the action of stress concentrators when the deformation temperature changes. Six figures, 15 references.

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USSR

UDC 621.787:621.785.02:620.17

LEBEDEV, D. V. and OBSYANNIKOV, B. M., Central Scientific Research Institute of Ferrous Metallurgy imeni I. P. Bardin

"Crack Development in Prismatic Samples Notched On One Side Under Fatigue Load"

L'vov, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 7, No 6, Nov-Dec 71, pp 27-30

Abstract: Purpose of this work was to study the stress state and morphology of crack development under fatigue load in the elastic region of strain. Prismatic samples were made from steel Kh21N5AG7 (EP-22?) having the following chemical composition: (in %) 0.1 C, 21.3 Cr, 5.4 Ni, 7.7 Mn, 0.03 Si, 0.4? N2, 0.02 S (max) and 0.02 P(max). Using optical polarization data the authors conducted an analysis of the stress state of notched samples under fatigue load from which they ascertained that the absolute value of stress in the notch apex was maximum and 3.3 times greater than the nominal stress (1.77 kg/cm^2). The authors also discuss the morphology of crack development and the relationship of stress state and crack development. 5 figures, 2 bibliographical references.

1/1

USSR

UDC 620.17:669-155.3:621.785.78.9

LEBEDEV, D. V., OVSYANNIKOV, B. M. and ANTROPOV, N. P., Central Scientific
Research Institute of Ferrous Metallurgy imeni I. P. Bardin (TsNIICHERMET)

"Mechanical Properties of Nitrided Austenitic Steels at Low Temperatures"

Abstract: A study has been made of the effect of surface nitriding of
specimens of Kh18N10T and Kh21N5AG7 (EP222) steels on their mechanical
properties at +20, -196, and -253°C. The nitrided layer was 0.18-02 mm
thick. It is shown that the supporting power of surface-nitrided
K18N10T steel versus ordinary steel under linear state of stress is 20%
higher within +20 to -253°C under static load conditions. Nitrided
Kh18N10T steel is insensitive to stress concentration under three-
dimensional state of stress and linear static loads at below-zero tempera-
tures (as low as -253°C). Under dynamic bending, surface nitrided Kh18N10T
steel exhibits high formability under three-dimensional state of stress
in the deformation zone and is suited for use at below-zero temperatures (as
low as -253°C). Surface nitrided Kh21N5AG7 steel has low formability under
both static loads and dynamic bending within +20 to -253°C, is sensitive to

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USSR

LEBEDEV, D. V., et al, Metallovedeniye i termicheskaya obrabotka metallov,
No 2, 1972, pp 10-15

stress concentration and is unsuited for service under either linear or
volumetric state of stress and under above types of loads even at +20°C.
(4 illustrations, 1 table, 3 bibliographic references).

2/2

USSR   UDC: 621.787:621.785.02:620.17

LEBEDEV, D. V., and OVSYANNIKOV, B. M., TsNIICHERMET (Central Scientific
Research Institute of Ferrous Metallurgy imeni I. P. Bardin)

"Effect of Work Hardening of Specimens on Mechanical Properties at Low
Temperatures"

Abstract: Machining of specimens for mechanical tests hardens the surface
layer and produces residual stresses. When cooled to sub-zero temperatures
and subsequently formed, such specimens from austenitic metastable steels
develop in the work-hardened zone a higher martensite content which adversely
affects the plastic properties of these specimens. The drop in plasticity
depends on the tool's cutting depth during its last pass and also on the
testing temperatures; it was found to occur at cutting depths of 0.3 mm and
higher and only when the tests were conducted in liquid hydrogen. The
problem may be alleviated by either machining the specimens at depths lower
than 0.3 mm (at the last pass of the tool) or by tempering (for cases
involving deeper cutting). This study was conducted on Kh18N10T,

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USSR

LEBEDEV, D. V., et al, Metallovedeniye i termicheskaya obrabokka metallov, Sept 71, no 9, pp 24-28

Kh21N5AG7 (EP222), and Kh25N18 steel grades most widely used in cryogenic technology. The tests were conducted at temperatures from 20 to -253°C. The mechanical properties of the above grades (in low-temperature forming) on untempered specimens and specimens tempered at 450°C for 3 hrs were almost identical for cases involving cutting depths of 0.1 mm (at the last pass of the cutting tool).

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UDC 620.17:669.073

USSR

LEBEDEV, D. V., Central Scientific Research Institute of Ferrous Metallurgy

"Strength Reduction at Cryogenic Temperatures"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 3, 1971, pp 12-14

Abstract: The results of investigating silicon steel with a body-centered cubic lattice having a definite plasticity reserve at temperatures close to cryogenic and the ultimate strength of which is reached for small degrees of deformation (3-4%) are presented as a means of discovering the mechanism of deformation of polycrystalline metals with face-centered cubic lattices and high degrees of deformation. From the analysis it was determined that the reduction in ultimate strength as a function of the temperature drop in materials with face-centered cubic lattice indicates embrittlement of the material. The decrease in strength with reduction in temperature arises from a decrease in the effective surface energy, i.e., an increase in resistance to plastic flow on occurrence of cracks under stresses close to the
1/2

USSR

LEBEDEV, D. V., Metallovedeniye i Termicheskaya Obrabotka
Metallov, No 3, 1971, pp 12-14

yield point. The effect of stress concentration on the mechanical
properties is the decisive factor in estimating the operating
qualities of the material. Realization of the mechanism of
microplastic flow by twinning in an elastic region leading to
the formation of stress concentration centers at cryogenic
temperatures does not lower the yield point but only predeter-
mines a possible reduction of ultimate strength.

2/2

USSR   UDC 620.17:669.973

LEBEDEV, D. V., Central Scientific Research Institute of Ferrous
Metallurgy

"Strength Reduction at Cryogenic Temperatures"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 3,
1971, pp 12-14

Abstract: The results of investigating silicon steel with a body-
centered cubic lattice having a definite plasticity reserve at
temperatures close to cryogenic and the ultimate strength of
which is reached for small degrees of deformation (3-4%) are
presented as a means of discovering the mechanism of deformation
of polycrystalline metals with face-centered cubic lattices and
high degrees of deformation. From the analysis it was determined
that the reduction in ultimate strength as a function of the
temperature drop in materials with face-centered cubic lattice
indicates embrittlement of the material. The decrease in strength
with reduction in temperature arises from a decrease in the
effective surface energy, i.e., an increase in resistance to
plastic flow on occurrence of cracks under stresses close to the

1/2

USSR

LEBEDEV, D. V., Metallovedeniye i Termicheskaya Obrabotka
Metallov, No 3, 1971, pp 12-14

yield point. The effect of stress concentration on the mechanical
properties is the decisive factor in estimating the operating
qualities of the material. Realization of the mechanism of
microplastic flow by twinning in an elastic region leading to
the formation of stress concentration centers at cryogenic
temperatures does not lower the yield point but only predeter-
mines a possible reduction of ultimate strength.

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USSR   UDC 669.14:620.172.2

GULYAYEV, A. P., LEBEDEV, D. V., OVSYANNIKOV, B. M., TIMOSHUK, L. T.

"Determination of Mechanical Characteristics of High Strength Steels in Extension"

Moscow, Zavodskaya Laboratoriya, Vol 37, No. 8, 1971, p 967-970.

Abstract: Problems are studied related to the necessity of supplementing existing All-Union State Standard GOST 1497-61 for estimation of the mechanical properties of high strength, low ductility steels ($\sigma_B > 200$ kg/mm^2). These additions concern both the norms for the technology of preparation of specimens, their surface condition, shape and size, as well as the techniques of preparation of machines for testing. The existing standard should be used for tensile testing of materials with strengths of less than 200 kg/mm^2 and relative reduction in area greater than 15%. For high strength, low ductility materials, the characteristics produced by the standard method may be unreliable.

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Conferences

USSR

LEBEDEV   D. V.

"All-Union Seminar 'Progressive Methods of Metal and Alloy
Thermal Processing'"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 5,
1970, pp 77-79

Abstract: The All-Union Seminar "Progressive Methods of Metal
and Alloy Thermal Processing" was held in Voronezh from 19-21 May
1970. It was organized by the Central and Voronezh Oblast Direct-
orates of the Scientific and Technical Society of the Machinery
Industry, the Voronezh Polytechnical Institute, and the Central
Black-Earth Scientific-Technical Information Center. More than
300 delegates from 117 research institutes, higher educational
institutions, and industrial enterprises, from 55 cities of the
Soviet Union, participated. At the plenary sessions and section
 meetings on structural materials, instrument steels, thermal pro-
cessing with minimum deformation, and stabilization of detail di-
mensions, 52 reports were read and discussed. They dealt with
the theory and practice of metallurgy, thermal processing of
steels, the development and application of new structural and in-
1/2

USSR

LEBEDEV, D. V., Metallovedeniye i Termicheskaya Obrabotka Metallov,
No 8, 1970, pp 77-79

strumental steels, improvements in thermal and chemicothermal pro-
cesses, and enlarging the dimension stability, reliability, and
durability of machine and structural parts. The seminar was
opened by Professor Yu. M. Lakhtin, chairman of the organizing
committee of the seminar and Chairman of the Metallurgy and Ther-
mal Processing Section of the Central Board of Directors. NTO
MASHPROM, who defined the problems to be covered by the seminar
and informed the delegates of the resolutions approved by the
preceding seminar, held in Minsk in 1969. The papers heard by
the delegates are summarized and the names of their authors given.
At the end of the seminar, the chairmen of the Metallurgy and
Thermal Processing Sections of the Kharkov and Voronezh Oblasts
of the NTO MASHPROM Board of Directors, L. S. Polanov and I. Ye.
Galinkin, respectively, communicated the results achieved by the
Sections of Socialist Duty for the 100th Anniversary of Lenin's
birth to the delegates.

2/2

UDC 620.171.32:669.295

USSR

GUDKOV, S. I., LEBEDEV, D. V., and REZNICHENKO, V. V., Central Scientific Research Institute of Ferrous Metallurgy

"Mechanical Properties of Oxidized Titanium Alloys at Low Temperatures"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 6, 1970, pp 23-26.

Abstract: An investigation was made to determine the effect of the oxidized layer on the mechanical properties of titanium alloys in the presence of stress concentration at -253 to 20°C. The chemical compositions of VT1-1, AT2, VT3-1, and VT 5-1 titanium alloys are shown in a table. The preparation of samples and the test procedure are described. The sensitivity of alloys to stress concentration was evaluated by the strength of cut samples, and by the sensitivity to cuts. The expediency of surface strengthening of samples with strength concentrators, for the purpose of improving their properties at cryogenic temperatures, is demonstrated for the VT1-1 and AT2 alloys. Surface strengthening is not valid for alloys whose plasticity decreases with temperature. 1 figure, 3 tables, 10 references.

1/1

1/2   039   UNCLASSIFIED   PROCESSING DATE--11SEP70
TITLE--EFFECT OF FIRST AND SECOND ORDER STRESSING ON THE MECHANICAL
   PROPERTIES OF STAINLESS STEEL OKH20N4AG10 (NN3) AT LOW TEMPERATURES -U-

AUTHOR--TALOV, N.P., LEBEDEV, D.V., FATKINA, A.M.

COUNTRY OF INFO--USSR

SOURCE--METALLOVED. TERM. OBRAB. METAL. 1970, (2), 62-3

DATE PUBLISHED-------70

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

TOPIC TAGS--STAINLESS STEEL, MECHANICAL PROPERTY, ALLOY DESIGNATION,
   CHROMIUM STEEL, LOW TEMPERATURE ALLOY, PLASTICITY, HEAT RESISTANT STEEL,
   COLD WORKING, AUSTENITICS STEEL/(U)AP319 HEAT RESISTANT STEEL, (U)NN3
   HEAT RESISTANT STEEL, (U)OKH20N4AG10 CHROMIUM STEEL

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CIRC ACCESSION NO--AP0106075
                            UNCLASSIFIED

CIRC ACCESSION NO--AP0106075
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ECONOMICALLY ALLOYED STAINLESS
  AUSTENITE STEEL OKH20N4AG10 (NN3, AP319) HAS HIGH MECH. PROPERTIES AT
  LIQ.H TEMPS.   STRESSES OF THE 1ST AND 2ND ORDER, ARISING AS A RESULTS OF
  THERMAL AND MECH. TREATMENTS (COLD WORK), SUBSTANTIALLY AFFECTS THE
  PLASTICITY OF STEEL BY LOWERING IT, PARTICULARLY THOSE STRESSES CAUSED
  BY MECH. TREATMENT.   IN ORDER TO REMOVE THESE STRESSES FROM ARTICLES
  PREPD. FROM THIS STEEL, ANNEALING AT 440-60DEGREES FOR 3 HR AND FURNACE
  OR AIR COOLING FOLLOWING MECH. TREATMENT IS RECOMMENDED. THE
  POSSIBILITY OF THE EFFECT OF STRESSES OF THE 1ST AND 2ND ORDER, ARISING
  DURING HEAT AND MECH. TREATMENT OF THE SPECIMENS MUST BE TAKEN INTO
  ACCOUNT WHEN ESTG. THE MECH. PROPERTIES OF AUSTENITE STEELS AT LOW
  TEMPS.   THE POSSIBILITY OF THE EFFECT OF THE POSSIBLE FORMATION OF
  MARTENSITE AND THE PRESENCE OF STRESSES MUST BE CONSIDERED WHEN ESTG.
  THE MECH. PROPERTIES AT MINUS 253DEGREESC.

UNCLASSIFIED

Conferences

USSR

LEBEDEV, D. V.

"All-Union Scientific and Technical Conference on Structural Strength at Low Temperatures"

Moscow, Metallovedeniye, No 5, May 70, pp 77-79

Abstract: The All-Union Scientific and Technical Conference on Structural Strength at Low Temperatures was held in Kiev on 24-26 February 1970. The conference was sponsored by the Scientific Council on the problem "Scientific Fundamentals of Strength and Ductility" of the Academy of Sciences Ukrainian SSR, the Union Interdepartmental Council for Cryogenic Engineering, and the Institute of Strength Problems, Academy of Sciences Ukrainian SSR.
     G. S. PISARENKO, Academician and Director of the Institute of Strength Problems, keynoted the conference with an analysis of applied problems of structural strength at low temperatures.
     G. S. PISARENKO, N. V. NOVIKOV, A. M. LYUL'KA, M. A. KUZ'MIN, A. K. POTEMKINA, V. I. ZASTAVSKIY, V. N. YEGOROV, and others delivered papers dealing with problems of operational reliability mechanisms and structures used in conditions of low climatic temperatures such as Siberia and the far north.
     N. A. DROZDOV, B. A., BAYKOV, V. P. TIBANOV, A. I. KHOROSH, I. R. KRYANIN,

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V. P. RABINOVICH, ZH. V. BASHKATOVA, A. SH. SHNEYDERMAN, YA. M. GUSAK, O. N. CHEBOTAREV, T. I. USTINOV, and G. I. ZUYEV gave reports on the analysis of low-temperature reliability of parts, machine assemblies, etc., where it was shown that the change in the nature of failure of parts in relation to the temperature of operation, technological and metallurgical factors, and conditions of stress and strain can be used in finding a solution to low-temperature problem. O. S. SUVOROVA and V. A. FREYTAG presented a design for assemblies and elements of vessels taking into account the stresses formed in couplings and cast heat exchangers. G. I. FEDENKO presented a design for reinforcing elements in the openings of vessels and other apparatuses performing under internal pressure.

V. G. DAN'KO, V. S. KIL'DISHEVA, V. L. KONOVALOVA, and L. YA. STANISLAVSKOGO presented an interesting report on the use of superconducting materials for turbogenerator windings cooled to 5-6°K.

B. I. VERKIN, V. YA. IL'ICHEV, V. I. STARTSEV, I. K. USPENSKAYA, O. F. POPOV, E. D. RAYMOND, V. S. RASTORGUYEVA, K. S. GORDEYEVA, L. I. PETROVA, V. S. SOKOLOV, B. V. KUBORSKIY, T. A. VLASOVA, T. S. MIKHEYEV, P. F. KOSHELEV, P. N. NIKITIN, O. N. ROMANIV, M. A. KUTSIN, YU. V. ZIMA, N. I. KAKHOVSKIY, K. A. YUSHCHENKO, G. G. MAN'KO, A. M. SOLOKHA, L. A. LIVSHITS, O. A. STEPANOV, and A. F. VOYTENKO reported

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on the mechanical properties of a large group of cryogenic steels and alloys for use under static and dynamic loads. A. G. VOYNITSKIY and N. V. NOVIKOV discussed the effect of deformation temperature on the strength of composite materials.
A. I. KLIMICHEV, YE. A. GUSEVA, M. A. KOMAROV, A. M. SMITH, V. P. LAPASHETSKIY, P. G. SIDOROV, A. K. KOPYLOV, N. V. NOVIKOV, A. A. LEBEDEV, YE. I. TAVER, and others investigated the mechanical properties of welds in steels and alloys at low-temperature deformation. YU. I. KORUNOV and N. A. BARESKOV reported on the mechanical properties, down to 20°K, of brazed joints in KhlBN10T and EP... steels using silver, copper, and Mn-Ni base brazes.
A. A. KRITSUKA, V. V. RYBAKOVA, A. YA. STOCHENKO, D. K. ..., and B. A. TEPLITSKOGO evaluated the effect of temperature on the elastic and strength properties of fiberglasses.
Wide discussion was engendered by reports on the effect of stress concentrations (B. F. BELYAYEV, N. A. MAKHUTOV, O. N. VINKLER, R. I. IL'INA, I. G. SIDOROV, B. F. MOROZOV, M. F. NIKITINA, P. F. KOSHELEV, N. M. MULIN, V. Z. MESHKOV, Z. G. DUTSYAK, Z. K. ..., S. YA. YAREMA, YU. I. BAREY), the type of stress state (A. A. LEBEDEV and V. I. KOVAL'CHUK), and the cold-brittleness of steels and alloys and resistance of steel to crack propagation (A. P. GULYAYEV, A. K. ..., V. G. MINDLIN, A. B. KAPLAN, YU. I. PASHKOV, I. I. SERGEYEV, YU. A. BONDAREV, O. N. VINKLER, V. V. LARIONOV, N. A. MAKHUTOV, S. YA. YAREMA, YE. L. ...,
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A. A. CHIZHIK, YU. A. SHUL'TE, V. V. LUNEV, YE. I. PINCHUK, A. V. TSAREV, I. P. VOLCHOK, and A. A. SHALOMEYEV).

YA. S. PODSTRIGACH And P. R. SHEVCHUK examined the effect of temperature changes on the stress-strain state of solid bodies with foreign inclusions or thin coatings.

A. YA. KRASOVSKIY reported on the basic principles of the effect of strain rate and low temperatures on the transition of materials into a brittle state.

Treatment of criteria on ductile fracture and methods of evaluating it for various cases of stressing were considered in a report by B. B. KASATKINA and A. F. TERESHCHENKO.

V. D. ZELENOVOY gave a paper on the influence of a hardened surface of an impact specimen (nitrided, carburized) on the nature of fracture.

A. N. OVCHINNIKOV, N. D. TYUTEVA, S. L. VOYTSELENOK, A. V. LYSYAK, N. I. KAKHOVSKIY, K. A. YUSHCHENKO, G. G. MAN'KO, A. M. SOLOKHA, and O. G. KVASNEVSKIY studied the structural changes of steels at low-temperature strain and the effect of alloying on structural changes.

Many reports were given on questions of the methodology of materials testing and testing equipment (M. M. ALEKSYUK, S. I. LIKHATSKIY, L. P. ANDREYEV, N. V. NOVIKOV, R. S. FAZLIAKHMETOV, and M. A. KIRSONOVA). The necessity of standardizing

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