USSR

BASOV, N.G., et al, Kvantovaya elektronika, Moscow, No 6(12), pp 50-55

inclined Fabry-Perot interferometers were used for narrowing of the generation spectrum. With the aid of these interferometers the generation spectrum was narrowed to ∼0.05 Å and in so doing the pulses emitted by the oscillator were expanded to 1 nanosec. In the KDP crystal the radiation at the output is converted into a second harmonic with an efficiency greater than 50 percent. The radiation energy at a 0.53 micron wavelength amounts to 10 joule. The authors thank M.F. Stel'makh , I.S. Rez , A.I.Kovrigin , and V.P.Polov for assistance in conducting experiments with KDP crystals. 5 ill. 16 ref. Received by editors, 25 Oct 1971.

2/2

USSR   UDC: 533.9...16

BASOV, N. G., ZARITSKIY, A. R., ZAKHAROV, S. D., KRYUKOV, P. G., MAT-
VEYETS, Yu. A., SENATSKIY, Yu. V., FEDOSIMOV, A. I., CHEKALIN, S. V.

"Producing High-Power Light Pulses on Wavelengths of 1.06 and 0.53 μm
and Using Them to Heat a Plasma. II. A Neodymium Glass Laser With Con-
version of Emission to the Second Harmonic"

Moscow, Kvant. elektronika--sbornik (Quantum Electronics--collection of
works), "Sov. radio", 1972, pp 50-55 (from RZh-Fizika, No 6, Jun 73,
abstract No 6G375)

Translation: Investigations of processes of heating by means of laser
sources with different wavelengths are of considerable importance for
explaining mechanisms of energy transfer in laser heating of a plasma.
This paper tells of the development of a high-power light source for
heating experiments with emission on two wavelengths: the wavelength of
a neodymium laser (1.06 μm) and its second harmonic (0.53 μm). An ef-
ficiency of greater than 50% in converting 1.06-μm emission to the second
harmonic is achieved in a KDP crystal. The emission energy on the 0.53-μm
wavelength is 10 j with a pulse duration of 1.0 ns. Part I, see RZhFiz,
1973, 5G239.
1/1

USSR   UDC: 621.378.9:533.9.02

ZARITSKIY, A. R., ZAKHAROV, S. D., KRYUKOV, P. G., FEDOSIMOV,
A. I.

"Measuring the Polarization of Back-Scattered Radiation Accom-
panying Laser Heating of a Plasma"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972,
pp 89-90

Abstract: When a plasma is heated by powerful laser emission
with the use of solid targets, the laser light is strongly
back-scattered. Polarization measurements are made on a wave-
length of 530 nm using polaroid films; the degree of polariza-
tion of the reflected emission comes to 90-95%. Bibliography
of three titles.

1/1

USSR

ZARITSKIY, A. R., ZAKHAROV, S. D., KRYUKOV, P. G., MATVEYETS, YU. A., and
~~FEDOSOV, A. I.~~, Physics Institute imeni P. N. Lebedev, Academy of Sciences
USSR

"Variations in Back-Scattered Radiation Spectrum During Laser Heating of
Plasma"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15,
No 4, 20 Feb 72, pp 184-186

Abstract: It is known that strong back-scattering of laser light occurs
during the high-power laser radiation heating of a plasma with the use of
solid targets. The authors measured the spectrum of the laser light reflected
by the plasma. The targets used were LiD, $(CO_2)_n$, heavy ice, Al. The radia-
tion source was a self-mode-locking Nd laser consisting of a master oscillator
and a six-stage amplifier. The plasma heating and spectral measurements were
carried out on the fundamental frequency ($\lambda = 1.06$ microns), as well as on
the second harmonic frequency ($\lambda = 0.53$ micron). The measurements were

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USSR

ZARITSKIY, A. R., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy
Fiziki, Vol 15, No 4, 20 Feb 72, pp 184-186

made on a grating spectrograph with $f = 130$ cm. The back-scattered radiation
spectrum was found to have a large number of equidistant lines, situated gen-
erally both in the Stokes and the anti-Stokes part of the spectrum. This is
due to the presence at the line of incident radiation from weak satellites,
the distance between which equals the interval between the lines of reflected
light. The observed process is of a stimulated character. Its explanation
may be related to the phase modulation of high-power light pulses in the plas-
ma layer.

2/2

USSR   UDC 621.375.82

KRYUKOV, P. G., MATVEYETS, YU. A., SENATSKIY, YU. V., FEDOSIMOV, A. I.,
CHEKALIN, S. V., and SHATBERASHVILI, O. B.

"On Mechanisms for Radiation Energy and Power Limitation During the Amplifica-
tion of Ultrashort Pulses in Neodymium Glass Lasers"

Translation: It is shown that a limitation of the energy and power of ultra-
short pulses during amplification in Nd glass lasers sets in as a result of
the nonlinear interaction of the laser radiation with the optical medium of
the laser itself. Emerging as limitation mechanisms here are breakdowns due
to self-focusing in the case of the propagation of light beams close to
parallel through the amplifier, and spectrum broadening and radiation scatter-
ing in the case of divergent beams.

1/1

Magnetohydrodynamics

UDC 621.378.9:533.9.02

USSR

BASOV, N. G., ZAKHAROV, S. D., KROKHIN, O. N., KRYUKOV, P. G., SENATSKIY, Yu. V.,
TYURIN, Ye. L., FEDOSIMOV, A. I., CHEKALIN, S. V., SHCHELEV, M. Ya.

"Studies of a Plasma Formed by Ultrashort Laser Pulses"

Abstract: Experimental studies of processes occurring in the high-temperature
heating of a plasma by focusing ultrashort laser radiation on the surface of
lithium deuteride are described. Studies of plasma heating with laser radiation
of duration 10^{-11}-10^{-12} sec were begun in 1968 at the Laboratory of Quantum Radio-
physics of the Physics Institute imeni P. N. Lebedev. Fast neutrons were recorded
upon focusing these pulses on the surface of a lithium deuteride target, indicat-
ing the rise of conditions for a thermonuclear db-reaction and for obtaining a
plasma of high temperature and density. Subsequent research raised the following
questions: how does absorption of energy by a solid occur if the laser radiation
is concentrated in a pulse with a duration of several picoseconds? How is the
strong reflection of laser radiation from the target explained? What are the
possibilities of raising ion temperature, and consequently neutron yield, in

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USSR

heating a plasma with ultrashort pulses? Shadow photographs of the plasma with illumination by ultrashort pulses and the recording of plasma dispersion with the aid of an electron-optical converter are described. The same electron-optical converter was used to study the change in the reflection of laser pulses with time, and x-ray measurements were made of the electron temperature of the plasma. A review of the basic experimental data indicates that the results are from laser pulses consisting not of one, but of several subpulses. Experiments show that the interaction of each subpulse with the target is not the same but a function of the previous history and repetition time of the subpulse relative to the beginning of the process. Heating of the plasma occurs as follows: one of the first subpulses incident on the target ionizes it to a depth approximately equal to the wavelength of the laser radiation. When the value of n_e becomes comparable to the value of n_{cr}, the remaining part of the subpulse is reflected. Heating of the plasma to a temperature of several electron-volts occurs simultaneously with ionization. As a result, the plasma formed is slowly dispersed. All subpulses incident on the target at this stage will be reflected until the particle density drops, as a result of dispersion, to a value corresponding to n_{cr}. At this time high-temperature heating of the plasma is possible. It is thus established that reflection of ultrasonic pulses arises in plasma regions where the electron density is close to critical. Other subjects discussed in the article include plasma radiation and heat conductivity, the effect of laser radiation pressure, and electron-ion relaxation in a plasma formed by a powerful ultrashort laser pulse.

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USSR   UDC: 621.385:530.145-6;53

BASOV, N. G., ZAKHAROV, S. D., KROKHIN, O. N., KRYUKOV, P. G., SENATSKIY,
Yu. V., CHEKALIN, S. V., FEDOSIMOV, A. I., SHCHELEV, M. Ya.

"Investigation of Heating of a Plasma Formed by Ultrashort Laser Pulses"

Translation: In order to form a plasma, ultrashort pulses of emission from
a neodymium glass laser operating under conditions of self-synchronization
of modes on a wavelength of 1.06 µ were focused on a target of LiD in a
vacuum. The period between pulses was 15 nsec. The individual laser pulse
is not simple, but rather consists of a series of peaks, the interval
between them and the number of peaks varying from flash to flash. The
overall pulse duration reaches 10 nsec, the duration of an individual peak
being in the range of $10^{-11}-10^{-12}$ s. The output energy is ~0.1 J. The
diameter of the focal spot on the target is $2 \cdot 10^{-2}$ cm. Heating of the
plasma was studied by the methods of shadow photography and schlieren
photography. A. K.

1/1

1/2   024   UNCLASSIFIED   PROCESSING DATE--04DEC70
TITLE--MELTING OF ARGON AT HIGH TEMPERATURES -U-

AUTHOR-(04)-STISHOV, S.M., MAKARENKO, I.N., IVANOV, V.A., FEDOSIMOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--JETP LETTERS (USA), VOL. 11, NO. 1, P. 22-5, JAN. 1970

DATE PUBLISHED-----JAN70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--MELTING POINT, ARGON, HIGH TEMPERATURE EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1768   STEP NO--US/0000/70/011/001/0022/0025

CIRC ACCESSION NO--AP0133673
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0133673
ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. PRESENTS THE RESULTS OF
MEASUREMENTS OF THE VOLUME OF ARGON IN THE MELTING REGION AT 291.6,
294.2, AND 322DEGREESK. IT IS FOUND THAT DELTA V SUBM -V SUBS, WHERE
DELTA V SUBM IS THE CHANGE IN VOLUME OF MELTING AND V SUBS IS THE VOLUME
OF SOLID ARGON AT THE MELTING POINT, TENDS TO ZERO WHEN THE MELTING
TEMPERATURE INCREASES.   FACILITY: USSR ACAD. SCI.

UNCLASSIFIED

Acc. Nr. *AP0053898* Abstracting Service: 6-70 Ref. Code
                      CHEMICAL ABST.   UR0386

115059e High-temperature melting of argon. Stishov, S.
M.; Makarenko, I. N.; Ivanov, V. A.; Fedosimov, V. I.
(Inst. Kristallogr., Moscow, USSR). Pis'ma Zh. Eksp. Teor.
Fiz. 1970, 11(1), 22-5 (Russ). Pressure-vol. (V) isotherms of
Ar were exptl. detd. in a piezometer filled at 2000 atm at 291.6,
294.2, and 322°K. Changes in V (ΔV) and entropy (ΔS) on
melting decrease with increase in the m.p. (T_m); ΔS approaches
a const. value of ~2.13 cal/degree mole and ΔV follows the law
$\Delta V = \gamma(T_m - T_0)^{-1/2}$ (γ and T_0 are consts.).
                                                Karel A. Hlavaty

C. K.

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REEL/FRAME
. 19830975

18

Pesticides

USSR

UDC 632.952

ORYNBAYEV, S. O., and FEDOSIMOVA, O. S., Kazakh Scientific Research Institute of Plant Protection

"Effect of Fungicides on the Stimulators of Black Wheat Germ"

Moscow, Khimiya v Sel'skom Khozyaistve, No 4, 1973, pp 41-42

Abstract: A study was carried out on the effect of mercury organic (mercuron, mercurhexane, granozan), sulfur (TMTD), and chlorine (GKhB) fungicides on pure cultures of fungi -- stimulators of black wheat germ and on the suppression of the seed infection with symptoms of this disease, as well as on the sprouting energy and laboratory germination of the seeds. When used at low concentrations, the fungicides increased the growth and development of black wheat germ stimulators. Increasing the concentration to 0.05% stopped the growth of the fungi completely. Among the black wheat germ stimulators the most sensitive one towards the fungicides was Helminthosporium sativum P. K. et B fungus. Granosan, TMTD and GKhB increaded the sprouting energy and germination of the infected seeds and lowered root rot infection of wheat plants under field conditions.

1/1

USSR

UDC 621.771.01

VYDRIN, V. N., FEDOSIYENKO, A. S., and KRAYNOV, V. I.

"Protsess nepreryvnoy prokatiki" (Continuous Rolling Process), Moscow,
Izd-vo "Metallurgiya," 1970, 456 pp

Abstract: Regularities of continuous rolling on a smooth barrel and in roll
passes under conditions of cold and hot deformation are discussed on the
basis of a unique methodology. Special features of the operation of contin-
uous mills are considered and algorithms describing the process of continuous
rolling on equipment of various types are presented. Technological founda-
tions for the automation of continuous mills are established. Particular
attention is given to processes taking place in the deformation source which
determine the operating conditions of continuous mills.

The book is intended for engineers involved with the technology, equipment,
and automation of rolling mills and also for scientific personnel and stu-
dents at higher educational institutions. 130 figures, 31 tables, 146
references.

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USSR

VYDRIN, V. N., et al., "Protsess nepreryvnoy prokatiki" (Continuous Rolling
Process), Moscow, Izd-vo "Metallurgiya," 1970, 456 pp

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VYDRIN, V. N., et al., "Protsess nepreryvnoy prokatiki" (Continuous Rolling
Process), Moscow, Izd-vo "Metallurgiya," 1970, 456 pp

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USSR

VYDRIN, V. N., et al., "Protsess nepreryvnoy prokatiki" (Continuous Rolling
Process), Moscow, Izd-vo "Metallurgiya," 1970, 456 pp

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USSR

VYDRIN, V. N., et al., "Protsess nepreryvnoy prokatiki" (Continuous Rolling Process), Moscow, Izd-vo "Metallurgiya," 1970, 456 pp

Inorganic Compounds

SMIRNOVA, O. M. and FEDOSOV, A. YE.

"Production of Calcium Sulfide for Luminescent Compositions"

Translation: An arrangement is described for obtaining calcium sulfide by the reduction of $CaSO_4$ with hydrogen. The firing ampoule in which the reduction occurs, rotates, the $CaSO_4$ powder is stirred, and as a result of this there is an increase in the contact surface of the gas phase of the powder. The resultant calcium sulfide contains 97-99 percent of the principal substance and is suitable for the preparation of luminescent compositions.

1/1

USSR

POLUKHIN, P. I., ZHADAN, V. T., BERKOVSKIY, V. S., FEDOSOV, B. M., and
BRYUKHOV, B. N.

UDC 621.771.8

"An Investigation of Forming in Flange Passes during Rolling of Stainless
Steel"

Translation: The results of an experimental study of the forming process
during the rolling of square billets of Khl8N10T steel in open-flange passes
are considered. Selection of the geometric parameters of the pass and billet
is substantiated. Results are presented of an analysis of forming parameters
as a function of the dimensions of the peak and the amount of roughing.
Eight illustrations, one table, and five bibliographic entires.

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USSR   UDC 621.771.8

POLYKHIN, P. I., BERKOVSKIY, V. S., ZHADAN, V. T., FEDOSOV, B. M., STETSENKO,
N. V., OSADCHIY, N. A., AVRUNIN, P. M., and KOVTANYUK, Yu. P.

"Developing New Technology for Rolling the PSh-20 Section from Kh18N10T Steel
on the 550 Mill"

Translation: A brief description is given of the technology for rolling the
shaped sections being studied. An analysis is made of the existing rolled
pass design and deformation parameters by templets, and data are given from
an investigation of the power parameters of rolling. On the basis of an
analysis of the data received and the technical-economic indicators, a new
technology for the process of rolling the sections under study is developed.
Eleven illustrations and one table.

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USSR   UDC 621.771.23.001.5

KARPOV, M. I., PAPCHENKO, V. I., and FEDOSOV, N. M., Moscow Institute of Steel
and Alloys

"Textures of Rolled Body-Centered-Cubic Metals"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Chernaya Metallurgiya, No 9,
1970, pp 90-94

Abstract: A theoretical analysis was made of the occurence and development of
texture in the cold rolling of body-centered cubic metal sheets. Theoretical
texture pole figures were constructed for single crystals and polycrystal foils
for various rolling conditions. The obtained pole figure for a single crystal
agrees well with previous experimental data, although it contradicts the au-
thors' conclusion regarding the stability of orientation. This orientation
does not appear stable, and its variation with an increase in reduction is very
small.

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1/2   025   UNCLASSIFIED   PROCESSING DATE--09OCT70
TITLE--EFFECT OF SOME PARAMETERS OF COLD ROLLING ON THE TEXTURE AND
   PROPERTIES OF TRANSFORMER STEEL -U-
AUTHOR-(04)-BRINZA, V.N., BARANTSOV, V.YA., PAVLOV, I.M., FEDOSOV, N.M.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(2), 292-6

DATE PUBLISHED--------70

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

TOPIC TAGS--TRANSFORMER STEEL, COLD ROLLING, HOT ROLLING, MAGNETIC
   PROPERTY, CRYSTALLIZATION, PLASTIC DEFORMATION, STEEL SHEET

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1994/1934   STEP NO--UR/0048/70/034/002/0292/0296

CIRC ACCESSION NO--AP0115744
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0115744

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF THE THICKNESS OF
  HOT ROLLED SHEET AND THE DEFORMATION RATIOS APPLIED IN SUBSEQUENT COLD
  ROLLING OPERATIONS ON THE DEGREE OF PERFECTION OF THE SECONDARY
  RECRYSTN. TEXTURE AND THE MAGNETIC PROPERTIES OF FINISHED TRANSFORMER
  STEEL SHEET (CONTG. 3.18PERCENT SI) WERE STUDIED ON SPECIMENS 50 TIMES
  500 MM, COLD ROLLED IN SEQUENTIAL OPERATIONS ON A LAB. ROLLING STAND
  (ROLLING SPEED 0.1M-SEC) FROM INITIAL THICKNESSES OF 2.2, 2.5, AND 3.0
  MM TO A FINAL THICKNESS OF 0.33 MM.   STD. ANNEALING PROCEDURES WERE
  USED. THE DISTRIBUTION OF TEXTURE DEVIATIONS, THE SP. CORE LOSSES, AND
  THE MAGNETIC INDUCTION WERE DETD. AND RELATED TO THE DISLOCATION
  STRUCTURE IN THE DEFORMED METAL. WHEN THE THICKNESS OF THE INTERMEDIATE
  SHEET (BEFORE THE 2ND COLD ROLLING) WAS 0.85 OR 1.0 MM, THE TEXTURE
  DEVELOPED BY SECONDARY RECRYSTN. WAS INDEPENDENT OF THE THICKNESS OF THE
  HOT ROLLED SHEET. WHEN THE INTERMEDIATE SHEET THICKNESS WAS 0.7 MM THE
  EFFECT OF THE THICKNESS OF THE HOT ROLLED SHEET WAS SUBSTANTIAL; LESS
  PERFECT TEXTURES WERE OBTAINED FROM SHEET 2.2 AND 3.0 MM THICK. THE
  SECONDARY RECRYSTN. TEXTURE WAS IMPAIRED AND THE SP. CORE LOSSES WERE
  INCREASED WHEN THE HIGHEST DEFORMATION WAS APPLIED IN INTERMEDIATE
  ROLLING. MORE PERFECT TEXTURES WERE ATTAINED WHEN THE DEFORMATION WAS
  GRADUALLY DECREASED OR WAS UNIFORM PER PASS, OR WHEN THE MIN.
  DEFORMATION WAS APPLIED IN THE INTERMEDIATE ROLLING.   FACILITY:
  MUSK. INST. STALI SPLAVOV, MOSCOW, USSR.

Acc. Nr. AP0047675   Abstracting Service: 4-70   Ref. Code
CHEMICAL ABST: UR 0365

81953z Corrosion protection of steel in a 3% sodium chloride solution by vacuum titanium coatings. Roikh, I. L.; Fedosov, S. N.; Koltunova, L. N. (Odess. Tekhnol. Inst., Odessa, USSR). Zashch. Metal. 1970, 6(1), 52-4 (Russ). Low-C cold-rolled steel strips were vacuum coated with Ti by its evapn. at an initial pressure 0.015-0.045 N/m^2 and 1800-900°. The condensation temp. was changed between 100 and 1250° by passing direct current through the strips. All coatings which were put on condensation temps. at >500° showed good adherence to steel, but the best protective properties were given by those put on at 450-850 and 1050-1190°. The former range yields a poreless structure and properties similar to solid β-Ti. The structure in the later range consists of a Fe-Ti alloy, mainly the intermetallic FeTi compd. The stable potential of strips covered at 1050-1190° was +0.45 V. These specimens did not show corrosion defects during 1.5 yr in a 3% NaCl soln. The thickness of Ti coatings should be ≥20 μ.   J. Pietkiewicz

EP

REEL/FRAME
19791251

18

· USSR

VOROB'YEV, N. F., FEDOSOV, V. P.

"Supersonic Flow around Intersecting Wings"

Translation: Supersonic flow is calculated within the framework of linear
theory for an arbitrary dihedral angle $0 \le \gamma \le 2\pi$, formed by slightly bent
intersecting surfaces. The problem is solved using the Walter method of
solution of a wave equation. For the case of angle $\gamma = \pi/n$ $(n = 1, 2, 3, \ldots)$,
the solution is given in quadratures. The solution of the problem in the
general case $0 \le \gamma \le 2\pi$ is reduced to the solution of integral or integral-
differential Walter-type equations, solved by the method of successive approx-
imations. For arbitrary $\pi \le \gamma \le 2\pi$, when diffraction phenomena occur, an
approximate solution is found in quadratures, which corresponds to the pre-
cise solution on the characteristic lines of the area of interaction (boundary
of area of interaction, rib of dihedral angle) and differs little from the

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USSR

VOROB'YEV, N. F., FEDOSOV, V. P., Aerofiz. Issledovaniya, Novosibirsk, 1972,
p 93.

precise solution in the other parts of the area of interaction. This approxi-
mate solution is used to construct the precise solution by the method of
successive approximations. If the end effect of the wing has an influence on
the zone of interaction of nonflat wings, the solution of the problem is re-
duced to solution of a system of generalized Abelian equations. In the case
of conical flow, when the intersecting wings are flat, the problem is reduced
to the Hilbert problem for a half plane. For arbitrary angle $0 \le \gamma \le 2\pi$, the
solution is produced in elementary functions. In the diffraction case
$\pi \le \gamma \le 2\pi$, the influence of nonlinearity of boundary conditions on the solu-
tion in the area of the rib of the dihedral angle is demonstrated.

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USSR   UDC 533.06.011

VOROB'YEV, N. F., FEDOSOV, V. P., Novosibirsk

"Supersonic Flow Over a Two-Sided Angle (Conical Case)"

Moscow, Mekhanika zhidkosti i gaza, No. 5, Sep/Oct 72, pp 170-175

Abstract: Supersonic flow over intersecting plane wings forming a two-sided angle $\pi \leq \gamma \leq 2\pi$ is considered within the framework of linear theory. Formulas are obtained for pressure in the interaction zone. The effect of non-linearity of the boundary conditions in the diffraction section of the bow characteristic surface on the flow parameters in the neighborhood of a rib of the two-sided angle is considered. It is shown that the order of singularity of transverse velocity components as determined by the law given by the change in pressure in the diffraction segment of the bow wave is independent of the size of the two-sided angle. This singularity in order of magnitude corresponds to a velocity singularity induced by a vortex coinciding with the rib of the two-sided angle. The intensity of the vortex arising at the rib of the angle is dependent on the magnitude of the two-sided angle. For example,

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- USSR

VOROB'YEV, N. F., FEDOSOV, V. P., Mekhanika zhidkosti i gaza, No. 5, Sep/Oct 72, pp 170-175

In the case of a triangular plate ($\gamma = \pi$) at the vertex, there is a drop in the vortex even at small angles of attack. A singularity of the vortex type is present in the numerical solution and its intensity is determined in the process of solving the problem.

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Acc. Nr.: __AR 0046831__   Ref. Code: __UR0000__

USSR   UDC 669.27/.28.046.43

FEDOSOV, V. N., and NADOL'SKIY, A. P.

"Aspects of the Mechanism of Calcium Molybdate and Tungstate Chlorination in an Ethyleneglycol Medium"

Tr. Irkutskogo Politekhn. In-ta (Works of the Irkutsk Polytechnical Institute),
No 47, 1969, pp 43-45 (from Moscow, Referativnyy Zhurnal -- Metallurgiya, No 1,
1970, Abstract No 1G176 by A. Tseydler)

Translation: A study was made of the bubbling of elementary Cl_2 through a pulp composed of ethyleneglycol and $CaWO_4$ or $CaMoO_4$. Ethyleneglycol reacted with Cl_2 and an HCl sample yielding WO_2Cl_2 or MoO_2Cl_2 which formed soluble complexes with ethyleneglycol. According to thermodynamic calculations, it was established that the most likely course of chlorination reaction was via HCl. Experiments confirmed the derivation of solutions of $CaCl_2$, WO_2Cl_2 and MoO_2Cl_2 in ethyleneglycol. Solubility in ethyleneglycol at $20°$ was established: $CaCl_2$ 27.5%, WO_2Cl_2 and MoO_2Cl_2 at 200-240 gram/liter each. Similar results were obtained upon chlorination of $CaWO_4$ and $CaMoO_4$ weighed samples in a CCl_4 medium by passage of Cl_2 at the rate of 2.24 g/min for one hour at 20-50°. (8 biblio. ref.)

Reel/Frame
19730140

Acc. Nr.: __AR0046832__

USSR

Ref. Code: __LLR0000__

UDC 669.27/.28.046.43

NADOL'SKIY, A. P., and FEDOSOV, V. N,

"Thermodynamic Analysis of the Processes of Calcium Tungstate and Molybdate Chlorination With Gaseous Chlorine and Hydrogen Chloride"

Tr. Irkutskogo Politekhn. In-ta (Works of the Irkutsk Polytechnical Institute), No 47, 1969, pp 46-48 (from Moscow, Referativnyy Zhurnal -- Metallurgiya, No 1, 1970, Abstract No 1G175 by A. Tseydler)

Translation: Calculations were made of the enthalpy, free energy, and logarithms of equilibrium constants of reactions for possible schemes of $CaWO_4$ and $CaMoO_4$ chlorination with gaseous Cl_2 and HCl in order to determine the thermodynamic characteristics for finding the most likely chlorination schemes. All the calculations related to a temperature of $25°C$ $(298°K)$. Energy-wise, the most efficient reaction was the chlorination which proceeded with the formation of WO_2Cl_2 or MoO_2Cl_2. This is in accord with data from literature on the subject. The data obtained confirm the fact that, in the treatment of $CaWO_4$ or $CaMoO_4$ pulp in ethyleneglycol or in a medium of primary alcohols with gaseous Cl_2, HCl is the chlorinating agent. (1 table, 11 biblio. ref.)

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REEL/FRAME

19790141

18

FEDOSOV, Ye. A.

Space-Craft
System

METHOD OF ANALYZING RANDOM PARAMETRIC EFFECTS IN SPACECRAFT

[Article by Ye. A. Fedosov... L. Petrovskiy...
Apparatani i Korablyami, Russian, 1971, pp ...]

Random parametric effects have long attracted researchers to the design of control systems and general mechanics. On the one hand, the complexity of control systems with respect to these effects, and on the complexity of the analytical tools that consider random parametric perturbations on the other, have prevented the development of an suitable mathematical engineering tool.

The development of space systems brought to light the phenomena of consideration of random parametric effects, particularly in the design of precision stabilization and guidance systems for spacecraft.

Random parametric perturbations are manifested in the form of random scattering of the parameters of motion of spacecraft in the presence of randomly distributed masses in its orbit, in the form of random scattering of stabilization and guidance parameters in the presence of a pilot in the control system, etc.

A diagram of spacecraft in the presence of mobile masses is illustrated in Figure 1. They may be the sensors, system of the guidance system and scientific equipment, recording instruments, crew of the spacecraft, gimbal chambers of the motors, etc.

In this case a reactive moment develops in the spacecraft, due to moving masses, leading ultimately to a random component of the instantaneous moment of inertia of the spacecraft, appearance of the damping effect of the moment of Coriolis forces and perturbation effect of the moment of forces of relative motion.

The general vector notation of the equations of motion in this case is [3]:

$$ I\frac{d\omega}{dt} + \vec{\omega} \times I\vec{\omega} = \vec{M} - \vec{M}_r $$

- 2 -

Acc. Nr:
AP0036824

Ref. Code: UR 0016

AUTOINFECTION IN HOMOLOGOUS DISEASE IN HYBRID MICE

Shevelev, A. S.; Fedosov, Ye. A.; Kirvel', M. M.

A regular autoinfection caused by bacteria of the normal intestinal microflora was seen at the late stages of homologous disease developing as a result of reaction of the transplant against the host in hybrid mice. Homologous disease was induced by intravenous injection to nonirradiated hybrids (CBA×C57BL/6/F₁), weighing 15 to 18 g, of live parent cells of the spleen obtained from mice C57BL/6. The dose was 110—120 million cells. The animals were sacrificed at various periods after the injection of parent cells; blood, mesenteric lymph nodes, liver and spleen samples were planted on culture media. Bacterial cultures from the organs and blood proved to be positive only in 6% of control intact hybrids. In experimental hybrids killed 5, 10, 15, 25 and 30 days after the transplantation the percentage of positive cultures constituted correspondingly 8, 12, 56, 60 and 72. Of the cultures isolated 87.7% were E. coli, 11.5% — E. paracoli, and 1.8% — were various species of Proteus.

D.n.

REEL/FRAME
19721741

USSR   UDC 539.3

FEDOSOV, YU. A.

"On Stability of Toroidal Shells"

Moscow, Prochnost' i Ustoychivost' Tonkostennykh Aviatsionnykh
Konstruktsiy, 1971, pp 283-289

Abstract: The stability of toroidal shells, assuming that buckling
is not axisymmetrical, is investigated.
      The conditions of stability are expressed by the differential
equations (1), (2) and (3).
      The numerical solutions obtained by means of computers are
presented on fig. 1, which shows the critical pressure versus the
ratio of the meridional section radius to the distance of the center
of this section from the axis of the torus.   The ratio of the wall
thickness to the meridional section radius and the number of nodes
are taken as parameters.

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USSR

FEDOSOV, YU. A., Prochnost' i Ustoychivost' Tonkostennykh Aviatsionnykh Konstruktsiy, 1971, pp 283-289

An experimental investigation was also conducted. The models were placed inside a hydrostatic pressure tank. The critical pressures obtained from the experiments were 6-7 times lower than the theoretical values.

2/2

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1/2   024   UNCLASSIFIED   PROCESSING DATE--20NOV70
TITLE--CRYSTALLIZATION OF R SILLENITES UNDER HYDROTHERMAL CONDITIONS -U-

AUTHOR-(02)-SURNINA, V.S., FELOSOVA, S.P.

CCUNTRY OF INFC--USSR

SCURCE--KRISTALLOGRAFIYA 1970, 15(2), 395-6

DATE PUBLISHED------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--CRYSTALLIZATION, BISMUTH, SINGLE CRYSTAL, WATER, THERMAL
    EFFECT, METAL OXIDE

CCNTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/0901   STEP NO--UR/0070/70/015/002/0395/0396

CIRC ACCESSICN NO--AP0116411
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0116411
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE REACTION WAS STUDIED OF BI
SUB2 O SUB3 WITH VARIOUS OXIDES (R) IN AQ. SOLNS. OF NAOH TO OBTAIN THE
CORRESPONDING SINGLE CRYSTAL SILLENITES. THE EXPTS. WERE MADE IN ALK.
AND ACID (HNO SUB3) SOLNS. AT 300-500DEGREES USING A METHOD AND APP.
DESCRIBED EARLIER (B. LITVIN AND TULES, 1968). EXPTL. DATA ARE
TABULATED FOR R EQUALS ZNO, COO, HGO, BEO, NA SUB2 B SUB4 O SUB7, AL
SUB2 O SUB3, GA SUB2 O SUB3, NA SUB2 CO SUB3, SIO SUB2, GEO SUB2, H SUB2
TIO SUB3, ZRO SUB2, FE SUB2 O SUB3, CO SUB2 O SUB3, CR(OH) SUB3, NB SUB2
O SUB5, V SUB2 O SUB5, NA SUB2 MOO SUB4, AND NA SUB2 WO SUB4.
FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

USSR   UDC 615.361.419.014.413

FEDOTENKOV, A. G., DANILOVA, L. A., and ALEKSEYEVA, L. P., Laboratory of
Bone Marrow Conservation and Culture of the Central Institute of Hematology
and Blood Transfusion, Ministry of Health USSR, Moscow

"The Effect of Various Freezing Regimes on the Proliferating Activity and
Differentiation of Bone Marrow Stem Cells"

Abstract: A study was carried out of the effect of freezing and thawing on
the preservation of stem cells, with quantitative determinations of such cells
made by the method of cloning the hematopoietic tissue. The bone marrow of
mice was prepared in TsOLIPK (Tsentral'nyy Ordena Lenina Nauchino-issledovatel'-
skiy Institut Gematologii i Perelivaniya Krovi; Central "Order of Lenin"
Scientific Research Institute of Hematology and Blood Transfusion) No 3
solution and frozen with 15% glycerine solution and 10% serum solution. Four
regimes were studied with different freezing times. The bone marrow was
thawed out in a water bath with different thawing times, and transplanted into
the spleen of lethally irradiated mice. On the 9th transplant day the mice
were sacrificed and the stem cells studied in the excised spleens. The greatest
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USSR

number of stem cells were preserved with rapid thawing. A parallel study of cell colony structures revealed that after the transplant of fresh bone marrow the predominant type was erythroblastic, and with frozen bone marrow -- undifferentiated. The largest number of stem cells were retained with freezing 1 degree per minute to -13°, then 10 degrees per minute to -196°, and with quick thawing in a water bath at 39°C for 1 minute. Stem cells subjected to extremely low temperature reveal a proliferating   capacity in the body of an irradiated recipient later than the stem cells of fresh bone marrow, which explains the slower restoration of peripheral blood indexes in patients treated with frozen bone marrow.

2/2

USSR   UDC 615.849.19.015.4:612.35

OGNEV, B. V., VISHNEVSKIY, A. A., TROITSKIY, R. A., KOCUM, E. Z., RAZGULIN,
B. A., and FEDOTKIN, G. F., Institute of Surgery imeni A. V. Vishnevskiy,
Academy of Medical Sciences, Chair of Operative Surgery and Topographical
Anatomy, USSR, and Central Institute of Advanced Training of Physicians,
Ministry of Health USSR, Moscow

"Effect of Laser Radiation on Rabbit Liver"

Abstract: Following laparotomy, the right lobes of the livers of rabbits were
exposed to either pulsed or continuous laser waves. The pulsed waves produced
a local burn and coagulation necrosis of the tissue together with hemorrhages
and thrombosis of the blood vessels. Continuous laser irradiation resulted in
bloodless incision of liver parenchyma and formation of a scar at the site of
entry 5 days later. Vascularization was restored within 15 to 30 days with
the formation of blood vessels possessing an atypical structure (narrowed,
enlarged, amputated, bent, etc.).

1/1

USSR

FEDOTKIN, M. A., KNYAZHITSKIY, B. Ya.

"Study and Optimization of Traffic Flow at Intersections Using a Special Physical Model"

Izv. Vyssh. Ucheb. Zavedeniy. Radiofizika [News of Higher Educational Institutions. Radio Physics], 1972, Vol 15, No 7, pp 1085-1095 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V657, by the authors).

Translation: The method of statistical testing on a specialized physical model is used to study the operation of an automaton with fixed switching rhythm, regulating Poisson streams, with continuous flow of vehicles through an intersection with constant saturation flow intensity. The statistical characteristics of the stable mode are determined. The automaton solves the problem of construction of an optimal switching automaton, using the condition of minimum mean time spent in crossing the intersection by an arbitrary flow or the condition of minimum mean number of stops and starts of all vehicles over a certain period of time.

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USSR

UDC 546.3-19:537

SIROTA, N. N., Academician of the BSSR Academy of Sciences, FEDOTOV, A. K., Institute of Solid-State and Semiconductor Physics, BSSR Academy of Sciences

"Electrical Conductivity and Superconductivity of Solid Solutions of Vanadium, Niobium, and Chromium"

Abstract: An investigation is made of the variation, with temperature, of resistivity $\rho(T)$ of solid solutions in the vanadium-niobium-chromium ternary system at temperatures from 2 to 350°K. It is shown that at temperatures below 50°K the function $\rho(T)$ is proportional to the square of the temperatures, while it is linear above 250°K. A correlation is found between the superconductive parameters of dilute alloys of V-Cr and Nb-Cr and their resistivity above the Debye temperature.

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1/2   014   UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--COMBINED ACTION OF ADDITIVES VNIINP 360, ALL UNION SCIENTIFIC
  RESEARCH INSTITUTE FOR PROCESSING OF PETROLEUM AND GAS AND FOR THE
AUTHOR--FEDOTOV, A.S.

F

COUNTRY OF INFO--USSR

SOURCE--NEFTEPERERAB. NEFTEKHIM. (MOSCOW) 1970, (4), 30-2

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--DETERGENT ADDITIVE, CHEMICAL STABILITY, AROMATIC CARBOXYLIC
  ACID, PETROLEUM PRODUCT, FURAN, BENZENE DERIVATIVE/(U)VNIINP360
  ADDITIVE, (U)MIZV OIL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1937   STEP NO--UR/0318/70/000/004/0030/0032

CIRC ACCESSION NO--AP0133781
                      UNCLASSIFIED

CIRC ACCESSION NO--AP0133781
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE ADDITIVE REDUCED OIL
  CONSUMPTION 25-30PERCENT FROM THAT THE DETERGENT ADDITIVE VNIINP 360
  ALONE. THE COMPN. DECREASED SCALE AND LACQUER FORMATION ON THE PISTONS
  AND PISTON SKIRTS AND HAD A HIGH EFFICIENCY AND STABILITY.

UNCLASSIFIED

1/2   015   UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--SYNTHESIS OF A LOW ASH SULFONATE ADDITIVE BASED ON EXTRACTS FROM
   THE PHENOLIC REFINING OF OILS, AND ITS PERFERMANCE PROPERTIES -U-
AUTHOR-(03)-BUGAYCHUK, A.M., DZHASHITOV, E.A., FEDOTOV, A.S.

COUNTRY OF INFO--USSR

SOURCE--NEFTEPERERAB. NEFTEKHIM. (MOSCOW) 1970, (5), 26-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--CHEMICAL SYNTHESIS, PETROLEUM PRODUCT, ANTIWEAR ADDITIVE,
   DETERGENT ADDITIVE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1946   STEP NO--UR/0318/70/000/005/0026/0027

CIRC ACCESSION NO--AP0133790
                    UNCLASSIFIED

CIRC ACCESSION NO--AP0133790
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EXTS. WERE SULFONATED AT
40-50DEGREES WITH 20-5PERCENT OLEUM (18-20PERCENT SO SUB3). THE UPPER
LAYER, CONTG. A MONOSULFO ACID CONC., WAS NEUTRALIZED WITH BA(OH) SUB2
AT30-40DEGREES TO YIELD 45-50 WT. PERCENT (BASED ON THE EXT.) BA SALTS
OF SULFO ACIDS. THE ADDITIVE HAD DETERGENT AND ANTIWEAR PROPERTIES.
   FACILITY: PERM. POLITEKH. INST., PERM, USSR.

UNCLASSIFIED

FEDOTOV, B. N.

Fedotov, B. N. and G. G. Skiba. Nonstationary
three-dimensional motion of bodies of revolution
in an ideal gas. IN: Trudy II Respublikanskoy
konferentsii po aerogidromekhanike, teploobmenu
i massoobmenu. Sektsiya "Aerodinamika bol'shikh
skorostey". Kiyev. Kiyevskiy universitet, 1971,
44-49. (RZhMekh, 5/72, no. 5B326)

A boundary-value problem is considered for equations of
three-dimensional nonsteady motion with boundary conditions on
shock wave and body surfaces. In the selected system of coordinates,
the functions characterizing the nonsteady motion of the body are the
angle of precession, the angle of nutation, two components of the vector
of angular velocity, and the velocity of the origin of coordinates. A
sinusoidal relationship of the perturbation functions to time is postulated.
The expressions of the fundamental functions are substituted into the
initial equations. Linearization led to the reduction of the problem to the
solution of a nonlinear system and a series of linear systems with
coefficients dependent on the solution to the nonlinear system. A brief
description is given of th. procedure for solving the three-dimensional
boundary-value problem with application to smooth bodies of revolution
with spherical bluntness, with oscillations centered in the center of
sphere. The scheme of G. F. Telenin, et al. is applied in the region
adjoining a sphere. (Gilinskiy, Telenin, and Tinyakov, IAN SSSR.
Mekhanika i mashinostroyeniye, no. 4, 1964, 9-28. RZhMekh, 1965,
5B263), while in the region between the shock wave and a conic surface
the difference method of Babenko, et al is applied. (Babenko, Voskresenskiy,
Lyubimov, and Rusanov. Prostranstvennoye obtekaniye gladkikh tel ideal'nym
gazom. Three-dimensional ideal gas flow around smooth bodies by an ideal
gas. Moskva, Nauka, 1964, RZhMekh, 1965, 4B207K).

USSR

FEDOTOV, D., Professor

"Psychological Factor in Internal Diseases"

Moscow, Meditsinskaya Gazeta, 2 Aug 72, p 3

Abstract: Psychological disorders occur in   the development of any disease.
In some somatic diseases they play the leading etiopathogenetic role, and in
others, not being an etiologic factor, they prepare the way for the develop-
ment of somatic pathology. They can also occur as a result of a somatic
disease. Different trends in the psychosomatic area are noted. In the
American psychosomatic school this area is based on psychoanalysis and suffers
from all the procedural and conceptual errors characteristic of freudism.
The German school is similar to the Soviet school based on creative use of
the concepts of nervism.
        The most important pathogenetic link in visceral disorders is the
change in the functional state of the diencephalon which regulates the neuro-
humoral processes in the organism controlling the vegetative, hormonal and
visceral functions and is closely connected both with the neocortex and with
the reticulolimbic structure, the hypophysical region and other endocrine
glands. The fact that the reticulo-hypothalamic formations participate in
the integrated response reactions of the organism to various "stresses,"

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USSR

FEDOTOV, D., Professor, Meditsinskaya Gazeta, 2 Aug 72, p 3

both emotional and somatic, is explained by the frequently existing similarity between the somatogenic and psychogenic disorders. Difficulties in diagnosis and prognosis of diseases arise from the interlinking of the somatic and psychological states. Further studies of the development of somatic diseases having direct relation to psychological disturbances, especially on the level of functional disorders, is urged.

2/2

AAC044756   UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

243735 HIGH-POWER EXPLOSIONPROOF LIGHT SOURCE employing an incandescent-filament lamp in an explosion-

proof envelope in two parts, the intervening space being fitted with a translucent liquid. To enable a source up to 1 KW in power to be used in explosive surroundings of all categories up to 4D, the liquid-filled space forms part of a closed circulation system, working in conjunction with the light reflector which serves as a radiator.

28.3.67 as 1144261/24-7. G.A. FEDOTOV. THE P.N.YABLOCHKCV "ELEKTROSVYET" WORKS (3.10.69.)-Bul-17/14.5.69. Class 21f. Int.Cl. H 01k.
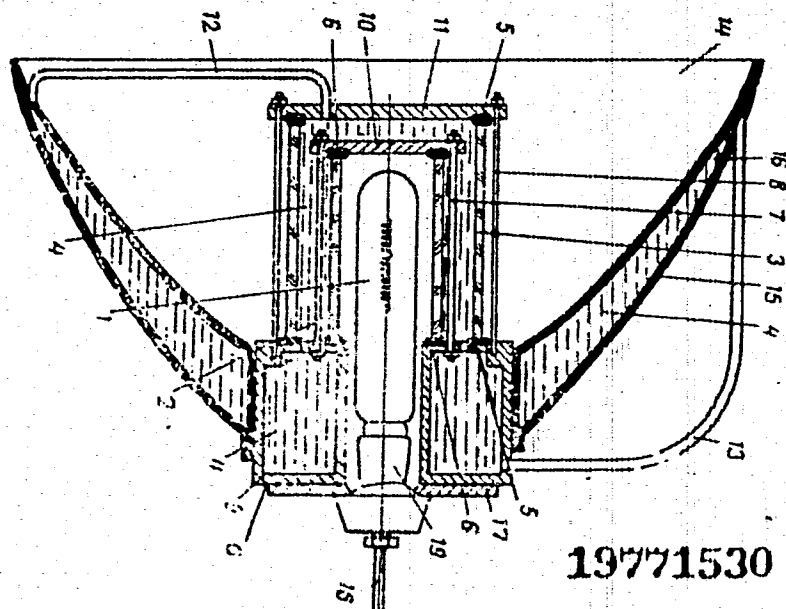
Zavod "Elektrosvet" im. P. N. Yablochkova

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19771529

AA0044756

19771530

UDC: 537.312.62

USSR

KADYKOVA, G. N., MOLOTILOV, B. V., PROKOSHIN, A. F., SERGEYEV, I. P., FEDOTOV, L. N.

"Properties of 35BT Superconductive Alloy"

Moscow, Sverkhprovodyashchiye aplavy i soyedin.--sbornik (Superconductive Alloys and Compounds--collection of works), "Nauka", 1972, pp 160-166 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D558 [résumé])

Translation: The structure, electrical resistance and thermal expansion of 35BT superconductive alloy containing titanium and small additives of zirconium in addition to 35% niobium were studied in the state after cold deformation, annealing, and also during heating. A maximum current density $I_K = 1 \cdot 10^5$ A/cm^2 in a transverse magnetic field of 30,000 Bi/cm was reached after cold deformation and annealing at 450°C for 4 hours. Segregations of α-phase with transverse dimensions of about 300 Å are observed in the structure of the alloy in this state. On the $I_K(H)$ curve of the specimens in the state after cold deformation and after annealing at 200-300°C, a peak is observed due to the presence of ω-phase in the alloy structure. Four illustrations, bibliography of 14 titles.

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- 145 -

UDC: 537.312.62

USSR

KIRSHENINA, I. I., FEDOTOV, L. N.

"Temperature Dependence of Electrical Resistance of Ti-Nb and Ti-Nb-Zr Super-conducting Alloys Treated by Hydrostatic Pressure"

Moscow, Sverkhprovodyashchiye splavy i soyedin.--sbornik (Superconducting Alloys and Compounds--collection of works), "Nauka", 1972, pp 115-121 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D562 [résumé])

Translation: Treatment with hydrostatic pressure up to 15 kbar raises the superconductive transition point in certain alloys of titanium with niobium by 1-1.3 K (10-15%). Adding 0.4% Fe to a type 35BT Ti-Nb-Zr alloy increases the T_c by 1.4-1.6 K. The investigated alloys showed a zero or negative coefficient of resistance at temperatures above the T_c, indicating a semiconductor type of conduction. Two illustrations, two tables, bibliography of six titles.

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UDC 537.312.62

USSR

IL'ICHEV, A. I., MOLOTILOV, B. V., SUVOROV, V. A., FEDOTOV, L. N., SHIRYAYEV, YU. P.

"Properties of Superconducting Materials"

Sb. tr. TsNII chern. metallurgii (Collected Works of the Central Scientific Research Institute of Ferrous Metallurgy), 1971, vyp. 78, pp 108-110 (from RZh-Radiotekhnika, No 6, Jun 72, Abstract No 6D450)

Translation: In recent years the Central Scientific Research Institute of Ferrous Metallurgy has developed and mastered the production of the following superconducting materials: 65BT, wire (ChMTU 1-29-66); 50BT, wire (ChMTU//TsNIIChM 1458-67); 35BT, wire (ChMTU/TsNIIChM 1489-69); 70B, tape (ChMTU//TsNIIChM 1491-69); SKM, compositional material (ChMTU/TsNIIChM 1487-69). In this survey a study is made of the technological and the physical-mechanical properties of the indicated materials, and recommendations are made with respect to their application.

1/1

USSR

FEDOTOV, L. N., KIRSHENINA, I. I., ZARUBINA, O. A.

"Electric Resistance of Zirconium-Tantalum Alloys Under Hydrostatic Pressure"

Translation: The electric resistance is studied as a function of hydrostatic pressure of up to 15 kbar for alloys of Zr with 1.84 and 2.7 at.% Ta, near the $\alpha \to \beta$ conversion boundary. In annealed specimens, a change was observed in the slope of the $R(P)$ curves in the 4-6 kbar area for the alloy Zr-2.7 at.% T a and in the 8-10 kbar area for the alloy Zr-1.84 at.% T a. A decrease was noted in the resistance after removal of the pressure in comparison with its initial value both in hardened and in annealed specimens of Zr-Ta alloys, which is related to the formation of the ω phase. The results produced are compared with the results of measurement of $R(P)$ for Ti-Nb alloys. 7 figs; 1 table; 4 biblio refs.

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USSR   UDC 532.111:537.311.31:669.296'.294

FEDOTOV, L. N., KIRSHENINA, I. I., and ZARUBINA, O. A.

"Resistivity of Zirconium-Tantalum Alloys Under Hydrostatic Pressure"

Problemy Sverkhprovodyashchikh Materialov [Problems of Superconducting
Materials -- Collection of Works], Moscow, Nauka Press, 1970, pp 156-160

Translation: The dependence of resistivity on hydrostatic pressure up to
15 kbar is studied for alloys of Zr with 1.84 and 2.7 at.% Ta, near the
$\alpha \rightarrow \beta$ transition boundary. In annealed specimens of the alloys, a change in
the slope of the R(P) curves was observed in the 4-6 kbar area for the alloy
ZR - 2.7 at.% Ta and at 8-10 kbar for the alloy Zr - 1.84 at.% Ta. A decrease
in resistance after removal of pressure in comparison with the initial value
was noted both for hardened and for annealed specimens of Zr-Ta alloys, which
is related to the formation of the ω phase. The results produced are compared
with the results of measurement of R(P) for Ti-Nb alloys.
    7 figures; 1 table; 4 biblio. refs.

1/1

USSR

FEDOTOV, L. N., and KALININ, G. N., Central Scientific-Research Institute of
Ferrous Metallurgy imeni I. P. Bardin

"Phase Conversions in Superconducting 35BT Alloy"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 35, No 1, 1973, pp 056-312

Abstract: The changes in the structure and superconducting properties occurring
in cold-deformed specimens of 35BT alloy after heating and annealing are studied.
The alloy contains approximately 30 wt. % niobium, titanium, and small quantities
of zirconium. When cold-deformed specimens of the alloy are annealed at below
350° C, the metastable β-solid solution decomposes with formation of an α-phase.
After cold deformation and annealing at 450° for 4 hr, banded superstructure of an
α-phase of about 300 A is noted. This state corresponds to a critical current
j_c of about 10^5 a/cm². The α→β conversion occurs in this alloy at 450-650°.

1/1

Burn Studies

USSR

F

FEDOTOV, N., Col Med Serv

"Burns, Frostbite, and Freezing"

Moscow, Starshina Serzhant, No 1, Jan 70, p 33

Abstract: The four degrees of burns are described and some first aid measures outlined. 1) If the victim's clothes are burning or smoldering, throw water on him or wrap him in a blanket (but do not spray him with a fire extinguisher, as this will cause chemical burns). 2) Take the appropriate measures if the burned areas are chemically or radioactively contaminated. 3) Apply astringent substances to the affected areas (or substitutes, such as strong tea). 4) Cover the affected areas with a sterile dressing. Cold and impairment of blood circulation are the chief causes of frostbite, which is also characterized by four degrees of severity. First aid consists of gradual warming of the frostbitten areas and of the entire organism. Rubbing with snow is not recommended. Freezing may be caused or aggravated by sickness or poor clothing. Victims of freezing should be brought into a warm room, sponged with diluted alcohol, massaged with a soft, dry cloth, and immersed in a warm bath. Artificial respiration may be necessary as soon as the skin begins to turn red.

1/1

Ion Exchange

USSR

UDC 533.66.063

FEDOTOV, N. A., URUSOV, K. KH., and SKURATNIK, YA. B., Scientific Physical-Chemical Research Institute Imeni L. YA. Karpov, Moscow

"Determination of the Selfdiffusion Coefficient of Water in Ion Exchange Membrane Electrolytes"

Abstract: The study was aimed at obtaining data on the "mobility" of water in a membrane electrolyte under conditions excluding its direct transfer together with ions under the influence of the electric field. The methodology was developed for the determination of the selfdiffusion coefficient of water in membrane electrolytes using triturated water, these data being reported for a series of heterogeneous membranes with varying content of the cation exchange resin KU-2-8 and fluoroplastics 42-L, as well as for a homogeneous membrane. It has been noted that the coefficient of selfdiffusion increases rapidly with an increased content of the cation exchange resin in the membranes, eventually approaching the value characteristic of the homogeneous membranes.

1/1

FEDOTOV, N. G.

29 Oct 71

101

87. USSR

MAKVETSOV, Ye. N. and FEDOTOV, N. G. (Penza)

"Method for Preprocessing Symbols in Reading Automata"

Moscow, Avtomatika i Telemekhanika, No 3, 1971, pp 159-161

Abstract: The authors propose a method for reducing redundancy in reading circuits by preprocessing the symbol so that its lines uniformly cover one cell width of the input matrix of the copy instead of carying in thickness. Connectivity of the image is also reestablished. The method is based on some properties of point sets.

1/1

USSR   UDC: 51:155.001.57:681.3.06

SADYKOV, S. S., FEDOTOV, N. G., MAKVETSOV, Ye. N.

"A Universal Algorithm for Recognizing Handwritten and Printed Symbols"

V sb. Vopr. kibernet. i vychisl. matem. (Problems of Cybernetics and Com-
puter Mathematics--collection of works), Vyp. 36, Tashkent, 1970, pp 35-43
(from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V654)

Translation: An algorithm is proposed for operation of a reading machine
which, in the authors' opinion, permits perception of information on a
symbol regardless of the specific characteristics of its graphic represen-
tation. An alphabet of 33 letters and 10 digits is examined. The directions
of the outline of the symbol were taken as the characteristics for recog-
nition. It is proposed that ruled blanks be used for writing the symbols.
This standardizes writing of the symbols to some extent, and what is impor-
tant, ensures separate writing of letters. The algorithm provides for
transferring an image of the symbol to an operational memory, the symbol
being recorded on a ferrite matrix analogously to its recording on paper.
Redundant information is then eliminated during the operation of refinement
of the symbol. After refinement of the outline is completed, the operation
of "reading" of the symbol begins, i. e. the image of the symbol is replaced
by an enumeration of the directions of its outline. The recognition process

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SADYKOV, S. S. et al., Vopr. kibernet. i vychisl. matem., Vyp. 36, Tashkent, 1970, pp 35-43

is completed by comparing the resultant sequence of directions with reference sequences. M. Chelyshev.

2/2

Water Treatment

MASHOVETS, V. P., PUSHKOV, L. V., SMAYEV, V. N., FEDOROV, M. K., and FEDOTOV, N. V.

"Density, Viscosity and Electroconductivity of Sea Water at Temperatures Up to 300-350°"

Abstract: Investigation of density, viscosity and electroconductivity of sea water at various temperatures $d = d_0 + 0.0105\ c^{1/2}$, where d_0 = density of pure water at a given temperature and c = salinity of sea water (weight-%). The logarithm of the viscosity of sea water ($\lg n_{sw}$) is related to the logarithm of the viscosity of pure water ($\lg n_{H2O}$) by $\lg n_{sw} = 0.913$ $\lg n_{H2O} - 0.00597$. The electronegativity increases with temperature reaching a maximum at 250°. The curve in the temperature range 10-160° can be described by the equation $x = 0.027 + 10^{-3}\ t$, where x = conductivity, t = temperature.

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USSR   UDC 669.205'28':621.78

FEDOTOV, S. G.; KONSTANTINOV, K. M., SINODOVA, Ye. P., and
KVASOVA, N. F., Moscow

"Decomposition of Molybdenum-Titanate Martensite"

Moscow, Izvestiya Akademii Nauk SSSR, No 5, 1973,
pp 225-230

Abstract: A study made of the decomposition processes of super-
saturated α'-solid solutions of the Ti-Mo system in the whole
range of their development is based on different methods of
physico-chemical analysis supplemented by structural investiga-
tions. The effect of martensite decomposition processes on the
mechanical properties was investigated on alloys
with 8.0 and 8.6 wt% Mo; their change in Young's modulus and in
mechanical properties after heating to different temperatures
is shown. The decomposition of supersaturated α'-solid solutions

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- USSR

FEDOTOV, S. G., et al., Izvestiya Akademii Nauk SSSR, No 5, 1973, pp 225-230

.of Ti-Mo martensite (up to 6 wt% Mo) takes place in the temperature interval at continuous decrease of the temperatures of beginning and ending decomposition with increasing Mo-content. In higher alloyed alloys (6-11 wt% Mo)possessing $(\alpha'+\beta+\omega)$-phases , the temperature of beginning decomposition of the α'-component does not decrease   with changing composition of the alloy; it remains on the temperature level of the decomposition of the supersaturated martensite with 6 wt% Mo. The possibility of a controllable change of the mechanical properties of the alloys in a wide range at decomposition of the martensitic structure is indicated. Five figures, 14 bibliographic references.

2/2

Titanium

USSR

UDC: 536.425

FEDOTOV, S. G., KONSTANTINOV, K. M., SINODOVA, Ye. P., Institute of Metal-
lurgy imeni A. A. Baykov, Academy of Sciences of the USSR, Moscow

"Concerning Suppression of the ω-Phase When Tempering Titanium Alloys in
the Presence of Aluminum and Tin"

Abstract: Present concepts of $\beta \rightarrow \omega$ transformations in titanium alloys sug-
gest that the part played by aluminum in suppressing formation of an ω-phase
during tempering consists in the retardation of processes of redistribution
of the elements in the initial β-solid solution which terminate in the for-
mation of titanium-rich regions. The authors attempt to verify this hy-
pothesis by diffusion experiments in the titanium-vanadium system with
aluminum and tin dopants (and also molybdenum, as a control). The study
specimens were titanium-base and vanadium-base alloys doped with 1, 2 and 3
wt.% aluminum, with 2 wt.% tin, and with 2 wt.% molybdenum. The specimens
were diffusion-annealed in titanium-vanadium pairs in the β-region at 950,
1000, 1050, 1100 and 1200°C for 600, 402, 165, 72 and 23 hours respectively.
When the annealing time had elapsed, the specimens were water-quenched. The

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USSR

distribution of elements in diffusion layers was studied by x-ray spectral analysis. The results showed a sharp reduction in the concentration of aluminum and tin in the zone of the steepest gradient of vanadium and titanium concentration. This abrupt drop was observed regardless of dopant concentration or annealing temperature, and coincided with the time displacement of the diffusion front. No singularities were observed in the distribution of molybdenum in the diffusion layer. It is concluded that α-stabilizing elements do not have time to migrate from the points of direct redistribution of titanium atoms and the β-stabilizing atoms during annealing of alloys in the critical region. This is what delays the process leading to formation of titanium-rich regions where $\beta \rightarrow \omega$ transformation then takes place because of the loss of elastic stability. For this reason, the temperature of martensite transformation is reduced and the metastable β-solid solution is supercooled in the presence of aluminum and tin with a lower concentration of β-stabilizing elements.

2/2

Titanium

KONSTANTINOV, K. M., FEDOTOV, S. G., and SHNYREV, G. D., Moscow

"Phase Conversions Upon Rapid Heating of Titanium-Vanadium Martensite"

Abstract: Continuous heating of titanium-vanadium α' martensite at 3 deg/min and isothermal holding cause its decomposition, forming an ($\alpha + \beta$) structure, characteristic for alloys in the equilibrium state. Increasing the heating rate to 80-100 deg/sec does not prevent decomposition of the supersaturated vanadium solid solution based on α Ti. This work studies the question as to whether similar decomposition occurs at higher heating rates such as 1,000 deg/sec or whether the reverse martensitic ($\alpha' \to \beta$) conversion occurs, as is usually thought. The experimental results indicate that heating at 1,000 deg/sec does not prevent decomposition of the martensitic structure produced in an alloy of titanium with 10% V by quenching from the β-phase area. The concentration and structural changes occurring at high heating rates during the process of decomposition of the supersaturated α solid solution do not differ significantly from those occurring during heating at relatively low rates, when the phase structure of the alloy is practically characterized by the equilibrium diagram.

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Titanium

USSR   UDC 669.295.ɔ'292

KONSTANTINOV, K. M., FEDOTOV, S. G., and SHNYREV, G. D., Moscow

"Phase Conversions Upon Rapid Heating of Titanium-Vanadium Martensite"

Moscow, IAN SSSR, Metally, No 2, Mar-Apr 71, pp 172-175

Abstract: Continuous heating of titanium-vanadium α' martensite at 3 deg/min and isothermal holding cause its decomposition, forming an (α + β) structure, characteristic for alloys in the equilibrium state. Increasing the heating rate to 80-100 deg/sec does not prevent decomposition of the supersaturated vanadium solid solution based on α Ti. This work studies the question as to whether similar decomposition occurs at higher heating rates such as 1,000 deg/sec or whether the reverse martensitic (α' → β) conversion occurs, as is usually thought. The experimental results indicate that heating at 1,000 deg/sec does not prevent decomposition of the martensitic structure produced in an alloy of titanium with 10% V by quenching from the β-phase area. The concentration and structural changes occurring at high heating rates during the process of decomposition of the supersaturated α solid solution do not differ significantly from those occurring during heating at relatively low rates, when the phase structure of the alloy is practically characterized by the equilibrium diagram.

1/1

1/2   028   UNCLASSIFIED   PROCESSING DATE--04DEC70
TITLE--DECOMPOSITION OF AN UNSTABLE BETA SOLID SOLUTION OF TITANIUM WITH
  18 WEIGHT PER CENT VANADIUM -U-

AUTHOR-(02)-FEDOTOV, S.G., KONSTANTINOV, K.M.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 192(3), 555-8

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--SOLID SOLUTION, TITANIUM ALLOY, VANADIUM CONTAINING ALLOY,
  BETA PHASE, ELASTICITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/1257   STEP NO--UR/0020/70/192/003/0555/0558

CIRC ACCESSION NO--AT0138268
                      UNCLASSIFIED

CIRC ACCESSION NO--AT0138268
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ELASTIC PROPERTIES OF THE TI 82
PLUS V 18 WT. PERCENT ALLOY WERE STUDIED EXPTL. AT ROOM TEMP. THEY
CHANGE SUBSTANTIALLY WITH TIME 0-10,000 HR FOR SAMPLES QUENCHED FROM
1000DEGREES. THE CHANGES MAY BE ACCELERATED BY HEATING AT GREATER THAN
280DEGREES. THE UNSTABLE BETA SOLID SOLN. DECAYS DURING PROLONGED
HEATING AT LESS THAN 280DEGREES INTO 2 SOLNS.; THE STRUCTURE OF 1 OF
THEM IS NEAR TO THAT OF BETA TI.   FACILITY: INST. MET. IM.
BAIKOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2   043   UNCLASSIFIED   PROCESSING DATE--20NOV70
TITLE--EFFECT OF THE HEATING RATE ON THE PROCESSES OF TITANIUM VANADIUM
   MARTENSITE DECOMPOSITION -U-
AUTHOR-(02)-FEDOTOV, S.G., KONSTANTINOV, K.M.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIIA NAUK SSSR, DOKLADY, VOL. 191, APR. 21, 1970, P.
   127-1273. 13 REFS.
DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--TITANIUM ALLOY, BIBLIOGRAPHY, VANADIUM CONTAINING ALLOY,
   ELASTIC MODULUS, METAL HEATING, MARTENSITE, HEAT TRANSFER RATE,
   METALLURGIC RESEARCH FACILITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3001/0562   STEP NO--UR/0020/70/191/000/1270/1273

CIRC ACCESSION NO--AT0126309
                            UNCLASSIFIED

CIRC ACCESSION NO--AT0126309

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION OF THE DECOMPOSITION
OF MARTENSITE TITANIUM ALLOYS WITH 10 WT PERCENT V AFTER PARTIAL
TEMPERING AT 350, 450, 550, 600 AND 750 DEG C. CHANGES IN THE ELASTIC
PROPERTIES OF THESE ALLOYS OCCURRING AFTER BRIEF TEMPERING AT THESE
TEMPERATURES ARE DISCUSSED AND ARE SHOWN IN DIAGRAM FORM. SUBSTANTIAL
INCREASES IN THE ELASTIC MODULUS AFTER 2 AND 6 SEC EXPOSURES TO 750 DEG
C ARE NOTED.   FACILITY: AKADEMIIA NAUK SSSR, INSTITUT
METALLURGII, MOSCOW, USSR.

UNCLASSIFIED

USSR   UDC: None

BASOV, N. G., BOYKO, V. A., ZAKHAROV, S. M., KROKHIN, O. N.,
MIKHAYLOV, Yu. A., SKLIZKOV, G. V., and FEDOTOV, S. I.

"Mechanisms of Neutron Generation in a Laser Plasma"

Moscow, Pis'ma v ZhETF, vol 18, No 5, 5 September 1973, pp 314-317

Abstract: This letter gives the results of experiments performed to
investigate the mechanisms which give rise to neutrons in laser
plasmas. The experiments here described proved that, depending on
the experimental conditions, both hot and cold neutrons are pro-
duced. The measurements involved were conducted in a variant of
the sharp focusing of a single-channel laser on a massive CD_2 tar-
get, as well as in spherically symmetrical irradiation of CD_2
particles measuring about 100 μ in diameter by the output of a
multichannel laser. Both methods were discussed in earlier papers
by the first-named author above, et al (Pis'ma v ZhETF, 13, 1971,
p 691; 15, 1972, p 589; ZhETF, 62, 1972, p 203). Results of both
types of measurement are separately examined. Some of these cast
doubt on the assertion of previous researchers that the appearance
of fast ions is connected with acceleration in the critical den-
sity region.
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USSR

BASOV, N. G., IVANOV, YU. S., KROKHIN, O. N., MIKHAYLOV, YU. A., SKLIZKOV,
G. V., and FEDOTOV, S. I., Physics Institute imeni P. N. Lebedev, Academy
of Sciences USSR

"Neutron Production in Spherical, High-Power Laser Irradiation of a Target"

Abstract: The authors recorded the neutron yield during the heating of a
solid, deuterated polyethylene target subjected to spherical irradiation by
a multibeam laser. It was found that the results significantly exceed those
obtained during strong focusing. The size of the heated target was approxi-
mately equal to the focal spot diameter, and the heated mass was determined
by the particle mass. The scheme for focusing nine laser beams on the tar-
get was similar to one previously described by the authors. The neutrons
were recorded by three scintillation detectors placed at various distances
from the target. Recoil-proton nuclear photoemulsions were used for the
quantitative measurements. Assuming isotropism of the neutron escape from
the plasma, the number of neutrons per burst was found to be equal to $3 \cdot 10^6$.

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USSR

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1/2   041   UNCLASSIFIED   PROCESSING DATE--30OCT70
TITLE--LATTICE DEFECTS IN GALLIUM ARSENIDE -U-

AUTHOR-(04)-BAZHENOV, V.K., BAZHENOVA, G.N., PRESNOV, V.A., FEDOTOV, S.P.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA TVERDOGO TELA, VOL. 12, MAR. 1970, P. 909-910

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--IRON, METAL COATING, GALLIUM ARSENIDE, CRYSTAL LATTICE
   STRUCTURE, ELECTRON PARAMAGNETIC RESONANCE, SPECTROSCOPIC ANALYSIS,
   LUMINISCENCE, CRYSTAL LATTICE DEFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/1283   STEP NO--UR/0181/70/012/000/0908/0910

CIRC ACCESSION NO--AP0107759
                         UNCLASSIFIED

CIRC ACCESSION NO--AP0107759
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION OF THE MECHANISMS OF
  THE INFLUENCE OF LATTICE DEFECTS ON THE ELECTRIC AND LUMINISCENT
  CHARACTERISTICS OF IRON DOPED GALLIUM ARSENIDE CRYSTALS (3,500,000 OHM
  CM) ANNEALED FOR 12 HR AT 700 TO 1200 C. THE TYPE OF LATTICE DEFECTS
  RESPONSIBLE FOR THE EPR SPECTRA IN HEAT TREATED CRYSTALS IS STUDIED, AND
  THE INTENSITY OF THE EPR SPECTRUM OF TRIVALENT IRON IONS IN GALLIUM
  ARSENIDE IS PLOTTED VS THE ANNEALING TEMPERATURE IN A VACUUM.
  FACILITY: ODESSKII GOSUDARSTVENNYI UNIVERSITET, ODESSA, UKRAINIAN SSR.

UNCLASSIFIED

1/2   010   UNCLASSIFIED   PROCESSING DATE--30OCT7

TITLE--EARTHQUAKE IN KIRGIZIYA -U-

AUTHOR--FEDOTV, V.

CCUNTRY OF INFO--USSR

SCURCE--MOSCOW, PRAVDA, 9 JUNE 1970, P 6

DATE PUBLISHED--09JUN70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TCPIC TAGS--EARTHQUAKE, SEISMOLOGIC STATION, EPICENTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/0815   STEP NO--UR/9012/70/000/000/0006/0006

CIRC ACCESSICN NO--AN0129904
                              UNCLASSIFIED

CIRC ACCESSION NO--AN0129904
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FRUNZE. 8 JUNE. AN EARTHQUAKE
  OCCURRED IN TYUPSKIY RAYON IN KIRGIZIYA ON 5 JUNE AT 0752 HOURS.
  ACCORDING TO DATA FROM THE "FRUNZE" SEISMIC STATION, ITS INTENSITY AT
  THE EPICENTER ATTAINED 8 ON THE SCALE.   STRONG UNDERGROUND TREMORS
  CONTINUED ON 8 JUNE. A NUMBER OF POPULATED PLACES SUFFERED. ABOUT
  5,000 HOMES WERE DESTROYED. MORE THAN 20,000 PERSONS HAVE BEEN LEFT
  WITHOUT SHELTER.   THE EARTHQUAKE EPICENTER WAS SITUATED 22 KM FROM
  PRZHEVAL'SK, AT SARY-KAMYSH VILLAGE. IN PRZHEVAL'SK THE SOIL
  OSCILLATIONS ATTAINED 5-6 ON THE SCALE, AT FRUNZE, 3.   COMMUNISTS AND
  YOUNG COMMUNISTS ACTED SELF SACRIFICINGLY UNDER THE DIFFICULT
  CONDITIONS. BORDER GUARD RENDERED MUCH ASSISTANCE TO THE RAYON
  POPULATION.   MEDICAL WORKERS HAVE NOW BEEN SENT TO THE AFFLICTED
  POPULATED PLACES: TENTS HAVE BEEN SENT FROM MOSCOW, ALMA-ATA, AND
  SURROUNDING RAYONS. TRANSPORT OF SUPPLIES HAS BEEN ARRANGED.   FIELD
  WORK HAS RESUMED ON ALL FARMS.

UNCLASSIFIED

USSR   F   UDC 621.3.049.75

KOPYLOV, S. G., KAZAKOV, S. N., YEGUNOV, A. V., KUZ'MICHEV, V. S., MELIK-
OGANDZHANYAN, P. B., IGNATOV, B. M., FEDOTOV, V. A., YAKOVLEV, YE. G.

" Multilayer Printed Board"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsv, Tovarnyye Znaki, No 16,
8 May 70, p 43, Patent No 270029, Filed 4 Mar 68

Translation: This Author's Certificate introduces a multilayer printed board
containing alternating layers of dielectric and electrically conducting material
designed for mounting integral circuits with flat leads in which grooves are
cut out on both sides of the integral circuit. The interlayer connections are
made in these grooves. They are executed by welding or soldering. The board
is distinguished by the fact that in order to insure high density of arrange-
ment of highly reliable interlayer connections with a minimum number of them
and also to lower the labor involved in manufacturing the boards, the interlayer
connections are executed in the form of bunches of printed conductors made
during the process of pressing the multilayer printed board, and the number of
bunches leading into the groove is determined by the number of leads of the
integral circuits mounted on the board.

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KOPYLOV, S. G., et al., Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy,
Tovarnyye Znaki, No 16, 8 May 70, p 43, Patent No 270029, Filed 4 Mar 68

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USSR   •   UDC 541.125

FEDOTOV, V. G., CHAYKIN, A. M., Institute of Chemical Physics of the USSR
Academy of Sciences, Moscow

"Study of the 'Cold' Flame of the Fluorine Reaction with Hydrogen in a Flow"

Abstract: The first and second limits of self-ignition in the fluorine reaction
with hydrogen were discovered previously and proofs were obtained for the branch-
chain mechanism of this reaction. Branching of the chains is realized in the
reaction $H_2^* + F_2 \rightarrow H + HF + F$ where H_2^* is the hydrogen molecule excited vibra-
tionally during almost resonance energy exchange in the process $HF^* + H_2 \rightarrow HF +$
$+ H_2^*$. When studying the self-ignition limits of fluorine mixtures with deu-
terium, it was concluded [V. I. Vedeneyev, et al., Kinetika i kataliz, No 11,
36, 1970] that in the branching reaction $D_2^* + F_2 \rightarrow D + DF + F$, the D_2^* molecule
must be excited to the vibrational level v > 2. A study has now been made to
determine what vibrational level of the hydrogen molecule (first or higher) is
responsible for branching of the chains, that is, to answer the question of
linearity of the branching. The conditions of obtaining the cold flame of a
mixture of fluorine with hydrogen were found, and the kinetic characteristics
1/2

USSR

FEDOTOV, V. G., et al., Doklady Akademii Nauk SSSR, Vol 203, No 2, 1972, pp 406-408

of development of the flame were obtained. A study was also made of the flame by the method of optical spectroscopy and electron paramagnetic resonance.
     A study of the dependence of the induction period on the initial condition for the reaction of fluorine with deuterium indicated the significant role of quadratic branching in this reaction.

2/2

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USSR   UDC: 621.762.8(088.8)

PROSKURYAKOV, Yu. G., SAYKO, I. B., FEDOTOV, V. I.

"Method of Saturation of Metal Ceramic Products"

USSR Author's Certificate Number 358088, Filed 19/10/70, Published 26/12/72
(Translated from Referativnyy Zhurnal Metallurgiya, No 8, 1973, Abstract No
8G407P).

Translation: A method is suggested for saturation of metal ceramic products
with liquid, differing in that in order to increase the degree of saturation,
the products are saturated during the process of standardization.

1/1

Biochemistry

SHVACHKIN, YU. P., VDOVINA, R. G., POZNYAK, M. G., VOLUYSKAYA, YE. N.,
RYABTSEV, M. N., KRIVTSOV, V. F., GRACHEVA, A. K., KRASNOSHCHEKOV, S. P.,
NOVOSELOV, V. A., GRUZDEV, V. S., OLEYNIK, A. M., KALINKINA, Z. B., FEDOTOV,
V. P., IVANOV, A. I., YUDAYEV, N. A.

"New Synthesis of Human Insulin"

Abstract: Human insulin was synthesized on the basis of obtaining A and B
chains by the solid phase method / R. B. Merrifield, J. An. Chen. Soc., No
85, 2149, 1963; J. Stuart, et al., Tverdofazny sintez peptidov, Moscow, Mir,
1971/ and subsequently combining the synthetic chains into the complete mole-
cule of the biologically active hormone. Here, a new version of the synthesis
is realized which permits exclusion of treatment of the chains with sodium
in liquid ammonia which eliminates the danger of undesirable side reactions
caused by this reagent / A. Marglin, et al., J. Am. Chem. Soc., No 88, 5051,
1966/. The A and B chains of human insulin were synthesized on an automated
device using a spherical chloromethylated copolymer of styrene with 1% divinyl
benzene as the insoluble carrier. All operations were performed in a nitrogen
atmosphere. The derivatives of the L-amino acids used in the synthesis of
the A and B chains are listed. The fluorohydrates of the chains were con-
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USSR

SHVACHKIN, YU. P., et al., Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp 216-217

verted into S-sulfonates which exhibited no differences from the S-sulfonates of the corresponding natural chains of bull insulin. The synthetic A and B chains were recombined both with the corresponding natural chains and among each other. The resultant compounds had specific insulin activity of comparable magnitude to the previously synthesized insulin compounds [K. Lubke, et al., Adv. Enzymol., No 33, 445, 1970].

2/2

FEDOTOV, V. P.

Ser: JPRS 51314

6 June 1973

INTERACTIONS OF GASES AND LIQUID METALS

(Symposium in Moscow)

[Article by Candidate of Technical Sciences V. P. Fedotov, Moscow, Vestnik Akademii Nauk SSSR, Russian, No 4, April 1973, pp 92-95]

A symposium devoted to the kinetics and thermodynamics of the interaction of gases with liquid metals, held in Moscow on 17-19 October 1972, was organized by the Scientific Council for the Physicochemical Principles of Metallurgical Processes of the AS USSR. Participating in the work of the symposium were 175 specialists from 23 cities of the Soviet Union, and also scientists from Australia, Bulgaria, East Germany, and West Germany. In his address of greeting the chairman of the Scientific Council, N. V. Ageyev, noted that the problem of the interaction of gases and metals in the production of metals, alloys, and also in the manufacture of metallic articles, is one of the most urgent in qualitative metallurgy, and the experimental study of the thermodynamics, in particular the mechanism and kinetics, of the interaction of gases with liquid and solid metals is one of the complex problems in the theory of metallurgical processes. N. V. Ageyev noted that the progress of technology and improvement of methods of producing and finishing metals are not only not lessening the acuteness of the problem but, on the contrary, are accompanied by the emergence of new aspects of the problem.

In a number of reports presented at the symposium there were discussions of questions of mass transfer and the interaction of hydrogen with metals (iron, cobalt, nickel, copper, aluminum and some alloys based on them) in the liquid state, in the process of cooling, and in crystallization. It has been established that of great practical importance is not only the value of the solubility of hydrogen in the molten metal but also the

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Acc. Nr.: AP0029814

Ref. Code: UR 0475

PRIMARY SOURCE: Vrachebnoye Delo, 1970, Nr 1, pp 67-69

IMMUNOLOGIC REACTIONS IN PATIENTS WITH ALLERGIC NODULAR VASCULITIS OF THE SKIN

V. P. Fedotov and A. P. Bazyka (Zaporozhye)

70 patients with nodular vasculitis of the skin showed either foci of chronic infection, mainly staphylococcal or pyococcal diseases in the anamnesis. The majority of patients showed positive cutaneous-allergic reactions, complement fixation reactions, agglutination and passive hemagglutination with pyococcal vaccines, these being most marked in case of staphylococcus.

Data received suggest certain immunological changes in respect to pyococci and in particular staphylococci and their role in the pathogenesis of allergic nodular skin vasculitis.

mK

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REEL/FRAME

19681500

USSR

DODONOV, A. G. and FEDOTOV, V. V.

"The Problem of the Maximum Dynamic Flow in a Network"

Gibrid. Vychisl. Tekhn. i Elektronika [Hybrid Computer Equipment and Elec-
tronics -- Collection of Works], Kiev, Nauk. Dumka Press, 1972, pp 384-390
(Translated from Referativnyy Zhurnal Kibernetika, No 9, 1973, Abstract
No 9V521).

Translation: Oriented network G is studied with source H and sink K, in which
each arc (i, j) has not only throughput capacity $c(i, j)$, but time of passage
$t(i, j)$. The problem is to find the flow of the maximum quantity of product
from the source to the sink over a given number of time periods τ (this flow
is called the maximum dynamic flow from H to K in τ periods). This problem is
solved in a book of L. R. Ford and D. R. Fulkerson (RZhMat, 1966, 11V249K).
     This article is dedicated to discussion of one theorem of Ford and Fulker-
son, according to which the maximum dynamic flow from H to K in τ periods can
always be generated by stable flow $x_{\tau+1}(i, j)$ from H to K in the initial network,
maximized by the linear function

$$(\tau+1)v - \sum_{(i,j)} t(i, j) \cdot x(i, j).$$

$$(1)$$

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USSR

Dodonov, A. G. and Fedotov, V. V., Gibrid. Vychisl. Tekhn. i Elektronika, Kiev, Nauk. Dumka Press, 1972, pp 384-390.

where $x(i, j)$ is the stable flow from H to K in network G, y is the value of this flow $x(i, j)$ (here flor $x(i, j)$, naturally, should not disrupt the condition of throughput capacity $c(i, j)$ of network G).

In the first portion of this article it is affirmed that this theorem "does not indicate what stable flow $x(i, j)$ should be," and a "contradictory example" is constructed, i.e., a network in which stable flow $x(i, j)$ does not generate the maximum dynamic flow. Actually, the authors of the article are confused, since their example involved the maximum stable flow in network G, not flow $x_{\tau+1}(i, j)$, maximizing function (1). As concerns flow $x_{\tau+1}(i, j)$ the statement of the theorem of Ford and Fulkerson is always fulfilled in any network for it.

The second portion of the article actually repeats the method of Ford and Fulkerson for production of the maximum dynamic flow by means of a chain expansion of stable flow $x_{\tau+1}(i, j)$.

Ye. Levner

2/2

USSR

ANTSUT, V. A., DODONOV, A. G. and FEDOTOV, V. V.

"One Method of Solution of the Problem of the Minimum Flow"

Gibrid. Vychisl. Tekhn. i Elektronika [Hybrid Computer Equipment and Electron-
ics -- Collection of Works], Kiev, Nauk. Dumka Press, 1972, pp 445-455
(Translated from Referativnyy Zhurnal Kibernetika, No 2, 1973, Abstract No
9V520).

Translation: The flow of the minimum quantity satisfying the conditions
$z(i, j) \geq r(i, j)$ is sought in a fixed oriented network, where $r(i, j)$ repre-
sent the fixed throughput capacities of the arc. The method of reduction of
this problem to the problem of maximum flow is described in detail. The
search for the minimum flow consists of the following three stages: 1. A
certain permissible flow is sought, such that $x(i, j) \geq r(i, j)$ in all arcs
(i, j). 2. The residual throughput capacities $\Delta s(i, j) = x(i, j) - r(i, j)$
are calculated and the maximum flow $\bar{x}(i, j)$ is constructed (for example with
a Ford-Fulkerson algorithm) such that $x(i, j) \leq \Delta x(i, j)$ on all arcs (i, j).
3. The desired minimum flow is found as follows $x_{min}(i, j) = x(i, j) - \bar{x}(i, j)$.
    This method agrees with a method presented (in shorter form) in a book of
K. Berzha (RZhMat, 1963, 7A314K, pp 88-89).

<div style="text-align: right">Ye. Levner</div>

1/1

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USSR

UDC 512.25/.26+519.3:330.115

FEDOTOV, V. V.

"One Method of Solution of the Problem of Synthesis of a Network with Minimal Throughput Capacity"

Kibernet. Tekhnika. vyp. 8 [Cybernetic Equipment, No 8 -- Collection of Works], Kiev, 1970, pp 57-64, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V510).

Translation: Application of the known method of Ford and Fulkerson.

USSR

FEDOTOV, YA.A., MADOYAN, S.G., AVETISYAN, G.KH., MANAGAROV, V.D., REBNIKOV, G.I.

"Properties Of $^+$Ge-nGaAs Structure Prepared By The Liquid Epitaxy Method"

Translation: The optimum conditions were determined for the growth of high-quality layers of Ge on GaAs by the liquid epitaxy method (from a solution in Ge). The optimum supercooling of the solution for preparing ideal layers was calculated. (It was found to be $\sim 15°$ C.) The calculation was confirmed by experiment. With supercoolings above $50°$ C the perfection of the layers sharply deteriorated. Heterojunctions of p$^+$Ge--nGaAs were prepared without intermediate layers of the solid solution Ge + GaAs and without a "false" junction at the interface resulting from diffusion of arsenic in the Ge. 9 ref. Ye.G.

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UNCLASSIFIED

TITLE--PHOTOSENSITIVITY AND ELECTROLUMINESCENCE SPECTRA OF GAAS-IN,SUB X,GA,SUB 1-X,AS P-N HETEROJUNCTIONS -U-

PROCESSING DATE--27NOV70

AUTHOR-(03)-FEDOTOV, YA.A., GRATSERSHTEYN, A.I., ZIMOGOROVA, N.S.

COUNTRY OF INFO--USSR

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SUBJECT AREAS--PHYSICS

TOPIC TAGS--PHOTOELECTROMOTIVE FORCE, PHOTOSENSITIVITY, GALLIUM ARSENIDE PN JUNCTION, LUMINESCENCE SPECTRUM

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CIRC ACCESSION NO--AP0136331

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CIRC ACCESSION NO--AP0136331
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT. DETERMINATION OF THE SPECTRAL
  DISTRIBUTION OF THE PHOTO EMF OF GAAS-IN(SUB X)GA(SUB 1-X)AS P-N
  HETEROJUNCTIONS AT ROOM TEMPERATURE.   IT IS SHOWN THAT A REGULAR CHANGE
  IN THE PHOTOSENSITIVITY CHARACTERISTICS OCCURS WITH A CHANGE IN THE
  COMPOSITION OF THE JUNCTIONS.   IN ADDITION TO THE MAIN MAXIMUM AT 1.42
  EV, DUE TO INTRINSIC ABSORPTION IN GALLIUM ARSENIDE, A SECOND
  PHOTOSENSITIVITY MAXIMUM OCCURS IN THE VICINITY OF 1.32 EV.   WITH AN
  INCREASE IN THE INDIUM CONTENT IN THE SOLID SOLUTION LAYER THE INTENSITY
  OF THIS PEAK INCREASES AND THE INTENSITY OF THE PEAK ASSOCIATED WITH THE
  INTRINSIC ABSORPTION DECREASES.   FACILITY: MOSKOVSKII INSTITUT
  STALI I SPLAVOV, MOSCOW, USSR.

UNCLASSIFIED

TITLE--ISOTYPIC N,GERMANIUM,N,SILICON HETEROJUNCTIONS -U-

AUTHOR-(04)-FEDOTOV, YA.A., GRUZDEVA, G.A., KOVALEV, A.N., SUPALOV, V.A.

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TOPIC TAGS--SILICON SINGLE CRYSTAL, GERMANIUM SINGLE CRYSTAL, EPITAXIAL
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DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/0894   STEP NO--UR/0449/70/004/005/0825/0829
CIRC ACCESSION NO--AP0136328
                              UNCLASSIFIED

CIRC ACCESSION NO--AP0136328
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF THE
TECHNOLOGY OF THE PREPN. OF ISOTYPIC HETEROJUNCTIONS N,GE,N,SI ON THEIR
ELEC. AND PHOTOELEC. CHARACTERISTICS. THE ISOTYPIC HETEROJUNCTIONS WERE
PREPD. BY THE IODIDE TRANSPORT METHOD, WITH H AS THE CARRIER GAS. GE
EPITAXIAL LAYERS WERE GROWN ON FREE SI SURFACES OR IN THE OPENINGS IN A
SI OXIDE LAYER, WHICH WERE OBTAINED BY THE PHOTOLITHOGRAPHIC METHOD.
THE ADDNL. INTRODUCTION OF LINEAR DEFECTS DURING THE GROWTH OF GE IN THE
OPENING OF OXIDE LAYER SUBSTANTIALLY CHANGES THE D. OF STATES ON THE
GE-SI INTERFACE.   FACILITY: MOSK. INST. STALI SPLAVOV, MOSCOW,
USSR.

UNCLASSIFIED

Photoelectric Effect

USSR

UDC   621.383.52.029.6

GEORGIYEVSKAYA, Ye. A., ISTOMIN, A. N., KAMENSKIY, N. N., PRICHKO, Yu. V.,
FEDOTOV, Ye. A.

"High-Frequency Silicon Photodiodes With PIN-Junction Structure"

Moscow, Radiotekhnika i Elektronika, vol 16, No 11, Nov 71, pp 2232-2234

Abstract: Silicon photodiodes are described in which speed is increased
at high inverse bias voltages by eliminating the diffusion time and re-
ducing RC parameters. The diodes are made from high-resistance P-silicon
(resistivity of 1000-2000 0·cm). Curves are given for the frequency re-
sponse of the diodes for incident radiation on wavelengths of 0.63 and
0.91 μ at various supply voltages from 0 to 100 V. The spectral charac-
teristics of the photodiode are given as well as a structural schematic.
The proposed photodiodes can be used in high-quality optico-electronic
equipment in combination with various radiation sources. Particularly
promising is the use of these diodes in semiconductor devices in con-
junction with gallium arsenide emitters. The authors thank N. Zh. Kol-
lender for her assistance with preparation of the diodes. Two figures,
bibliography of two titles.
1/1

USSR

UDC 621.382.3

FEDOTOV, Ya. A., MARTIROSOV, I. M., DATIYEV, K. M., and KUZNETSOV, Yu. A.

"Avalanche-Drift Diode With a Heterojunction"

Abstract: In the course of work on avalanche-drift diodes with heterojunctions of Ge-GaAs, specimens were obtained in which the generation of UHF oscillations was observed. Heterojunctions with a p-n-n$^+$ structure were obtained by growing layers of p-type germanium alloyed with gallium, the layer thickness being 7 microns, with an acceptor impurity of about $1 \cdot 10^{16}/cm^3$, on n-type GaAs epitaxial film, 6 microns thick with a donor impurity concentration of about $6 \cdot 10^{15}/cm^3$, grown on an n substrate with a resistivity of 0.001 ohm cm. The power supplied to the load in the oscillations amounted to 40-120 mw per pulse at a frequency of 11 GHz. The volt-ampere characteristic of an AV-15 diode, belonging to this class of device, is given. The authors are associated with the Moscow Steel and Alloy Institute.

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