TITLE--SOME PROBLEMS OF PATHOGENESIS OF JUVENILE CHLOROSIS -U-

AUTHOR-(02)-IDELSCN, L.I., KARDASH, B.YE.

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 6, PP 22-29

DATE PUBLISHED------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--IRON, DIETARY MINERAL DEFICIENCY, ANEMIA, PEDIATRICS,
HEMOGLOBIN, BLOOD SERUM

CENTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1916   STEP NO--UR/0504/70/042/006/0022/0029

CIRC ACCESSION NO--AP0129265
                           UNCLASSIFIED

CIRC ACCESSION NO—AP0129265

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TO FIND OUT THE ROLE OF CONGENITAL
IRON DEFICIENCY IN THE DEVELOPMENT OF JUVENILE CHLOROSIN THE AUTHORS
EXAMINED 40 MOTHERS WHO HAD HYPOFERROUS ANEMIA AND THEIR HEALTHY
CHILDREN (54 PERSONS), AS WELL AS 47 CHILDREN WITH HYPOFERROUS ANEMIA
AND THEIR HEALTHY MOTHERS (36 PERSONS). IT WAS ESTABLISHED THAT IN ONE
FOURTH OF HEALTHY PERSONS THE HOMOGLOBIN CONTENT WAS DECREASED. IN ONE
THIRD HEALTHY CHILDREN OF ANEMIC MOTHERS AND ONE FIFTH HEALTHY MOTHERS
OF ANEMIC CHILDREN THE IRON CONTENT IN THE BLOOD SERUM APPEARED TO BE
DECREASED. THE DIFFERENCE IN THE MEAN IRON CONTENT IN THE HEALTHY
GROUPS WAS THE SAME OR SIGNIFICANTLY LOWER. IN NORMAL HEMOGLOBIN
CONTENT AND THE IRON LEVEL IN THE SERUM A DROP IN IRON RESERVES WAS
REVEALED IN SOME HEALTHY INDIVIDUALS BY MEANS OF A DESFERAL TEST.
POSSIBILITIES OF DEVELOPMENT OF HYPOFERROUS ANEMIA AT THE AGE OF 13-15
YEARS IN GIRLS BORN WITH IRON DEFICIENCY ARE DISCUSSED.   FACILITY:
GRUPPA AKAD. AMN SSSR I. A. KASSIRSKOGO, MOSKVA.

UNCLASSIFIED

1/2   023   UNCLASSIFIED   PROCESSING DATE--02OCT70
TITLE--CONGENITAL HYPOFERRIC ANEMIA AMENABLE TO VITAMIN B SUB6 TREATMENT
-U-

AUTHOR-(04)-IDELSON, L.I., RADZIVILOVSKAYA, E.G., LEVINA, D.A.,
APOLLONOVA, L.A.

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 3, PP 103-106

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ANEMIA, VITAMINE B6, THERAPEUTICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1986/0831   STEP NO--UR/0504/70/042/003/0103/0106

CIRC ACCESSION NO--AP0102793
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0102793
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A PATIENT WITH A SHARPLY MARKED
  HYPOCHROMIC ANEMIA WITH A HIGH IRON CONTENT IN THE BLOOD SERUM AND IN
  THE TISSUES OF THE ORGANISM IS DESCRIBED. A DISORDER OF PROTOPORPHYRIN
  BIOSYNTHESIS FROM COPROPORPHYRINOGEN WAS REVEALED IN THIS PATIENT.
  PRESCRIPTION OF VITAMIN B SUB6 AND THEN PYRIDOXALPHOSPHATE PRODUCED A
  GOOD THERAPEUTIC EFFECT.

UNCLASSIFIED

USSR   UDC 536.24

SHCHUKIN, V. K., IDIATULLIN, N. S., GOLDOBEYEV, V. I. and KIRSANOV, YU. A.

"Investigation of Heat Transfer With Flow Through Wire-Mesh"

Kazan', Tr. Kazan. Aviats. In-ta (Works of Kazan' Aviation
Institute), No 133, 1971, pp 62-71 (from Referativnyy Zhurnal-
Aviatsionnyye i Raketnyye Dvigateli, No 2, Feb 72, Abstract
No 2.34.116)

Translation: The results of the practical application of the gradient
method to the investigation of heat transfer near a porous wall are
presented. Direct measurements of the temperature distribution
through the thickness of the wall made out of wire mesh serve as
a basis for determining the heat flux to the surface of the wall and
the heat transfer coefficient with the flow of gas through the wall.
The wire mesh package and the test setup are described. The results
of tests for flow without vortex agree with known data. Some new
experimental data on heat transfer with vortex gas flow have been
obtained. 6 illustrations. 12 references.

1/1

Heat, Combustion, Detonation

USSR   UDC   536.24

SHCHUKIN, V. K., IDIATULLIN, N. S.

"Gradient Method of Studying Heat Exchange Near a Permeable Surface With Two-Dimensional Temperature Distribution"

Tr. Kazan' aviats. in-ta (Works of the Kazan' Aviation Institute), 1971, vyp. 128, pp 79-88 (from RZh-Mekhanika, No 10, Oct 71, Abstract No 10B647)

Translation: The authors consider the theoretical principles of experimental determination of the local coefficient of heat transfer near a permeable wall from the temperature gradient on the heat-exchange surface. It is assumed that the temperature field of the porous wall varies both transversely and longitudinally. The numerical solution of the equation of heat conduction in the wall is used for determining the temperature gradient on the surface in the flow. A difference scheme is given as well as expressions which approximate the boundary conditions. Simplifying assumptions are presented which reduce the problem to the one-dimensional case. Expressions are given for evaluating the grid spacing for a solution of the required accuracy. V. D. Vilenskiy.

1/1

1/2   043   UNCLASSIFIED   PROCESSING DATE--13NOV70
TITLE--THE ASTROPHYSICAL RANGE IS GREAT -U-

AUTHOR--IDLIS, G.

COUNTRY OF INFO--USSR

SOURCE--PRAVDA, JUNE 1970, P 2, COLS 1-5

DATE PUBLISHED--20JUN70

SUBJECT AREAS--SPACE TECHNOLOGY, ASTRONOMY,ASTROPHYSICS

TOPIC TAGS--MANNED ORBITAL LABORATORY, MANNED SPACECRAFT, ASTRONOMIC
  OBSERVATORY/(U)SOYUZ 9 MANNED SPACECRAFT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0984   STEP NO--UR/9012/70/000/000/0002/0002

CIRC ACCESSION NO--AN0107505
                          UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AN0107505
ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. THE AUTHOR OF THE ARTICLE COMMENTS
  ON THE POTENTIAL OF ORBITAL ASTRONOMICAL OBSERVATORIES PRESAGED BY THE
  FLIGHT OF THE "SOYUZ-9". HE ALSO CLAIMS THAT THE ASTROPHYSICAL
  INSTITUTE ACTIVELY PARTICIPATES IN THE GENERAL PROGRAM OF SPACE
  RESEARCH.

UNCLASSIFIED

USSR

MALEVICH, T. L. and IDRISOVA, S.

"Simultaneous Intersection of Fixed Levels by Two Gaussian Fields"

Izv. AN UzSSR. Ser. Fiz.-Mat. N.   [News of Academy of Sciences, UzSSR, Physics-Mathematical Sciences Series], 1973, No 2, pp 17-20 (Translated from Referativnyy Zhurnal Kibernetika, Abstract No 9V47)

Translation: Let $x_1(s, t)$ and $x_2(s, t)$ be homogeneous Gaussian fields with spectral functions $F_1(\lambda, \mu)$, $F_2(\lambda, \mu)$ respectively. Suppose further that G is an area limited by a piecewise-smooth curve, $N_{x,y}^{(u_1,u_2)}(G)$ is the number of internal points in the area for which $x_i(s, t) = u_i$, $i = \overline{1, 2}$. A formula is produced for $MN_{x,y}^{(u_1,u_2)}(G)$ on the assumption that

$$\int_{-\pi}^{\pi} \int_{-\pi}^{\pi} \lambda_i^2 \, [\ln(1 + |\lambda_i|)]^{1+\delta_j} \, dF_j(\lambda_1, \lambda_2) < \infty \, , \, i, j = \overline{1,2}.$$

Author's view

1/1

- 11 -

USSR

IDRISOVA, S., MALEVICH, T. L.

"Some Properties of Random Fields"

Translation: The authors consider m-dimensional fields $x_j(\bar{t}_m) = x_j(t_1, \ldots, t_m)$, $j = \overline{1, m}$ and show that if these fields $x_j(t_m^-)$ have continuous partial derivatives $\frac{\partial x_j}{\partial t_k}$, $j, k = \overline{1, m}$, and at the same time the joint distributions of quantities $x_1(\bar{t}_m), \ldots, x_m(\bar{t}_m)$ at any $\bar{t}_m$ are degenerate, absolutely continuous, and their densities are bounded uniformly with respect to $\bar{t}_m$, then

a) for the number N of points $\bar{t}_m$ of the m-dimensional cube $0 \leqslant t_j \leqslant 1$, $j = \overline{1, m}$, at which the condition

$$x_j(\bar{t}_m) = u_j, \ u_j = \text{const}, \ j = \overline{1, m} \qquad (1)$$

is satisfied, the equality $P(N < \infty) = 1$ holds.

b) for the number $\tilde{N}$ of points $\bar{t}_m$ of the cube $0 \leqslant t_j \leqslant 1$,

1/2

- 10 -

· USSR

IDRISOVA, S., MALEVICH, T. L., Nauch. tr. Tashkent. un-t, 1972, vyp. 402, pp 45-57

$j = \overline{1,m}$, at which the condition

$$\Delta(\bar{t}_m) = \det \left\| \frac{\partial x_j}{\partial t_k} \Big|_{t_m} \right\|_{j,\,k=\overline{1,m}} = 0$$

is satisfied in addition to condition (1), the equality holds. In addition to the formulated theorem, another theorem of the same type is also proved. O. Orekova.

2/2

USSR

LEONT'YEVA, N. A., FOMINA, A. N., IDRISOVA, Z. V., SHUBLADZE, A. K., and GALEGOV, G. A., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

"Combined Use of Interferon and Some Styrylquinolines in Cell Culture and in Experimental Arbovirus Infection"

Abstract: The synergistic prophylactic and therapeutic effects of interferon and styrylquinolines were studied in chick embryo fibroblast cultures and white mice infected with Venezuelan equine encephalomyelitis (VEE) and Western equine encephalomyelitis (WEE) viruses. The following compounds were employed: hydrate of 2-(4^1-bromostyryl)-4-(delta-diethylamino-alpha-methylbutylamino)-7-chloroquinoline triphosphate (R-29P), 2-(3^1-methoxy-4^1-hydroxystyryl)-4-(delta-diethylamino-alpha-methylbutylamino)-6-methoxyquinoline triphosphate (R-43P), and 2-(3^1-methoxy-4^1-hydroxystyryl)-4-(delta-ethylamino-alpha-methylbutylamino)-7-chloroquinoline triphosphate (R-42P). In cell culture these compounds reduced infectious titers of VEE and WEE virus by 2 and 2.6 lg respectively. When used in combination with interferon, these compounds reduced the titers by 6.6 and 7.5 lg respectively. R-42P was the most effective. When used on white mice 1/2

- 14 -

USSR

LEONT'YEVA, N. A., et al., Voprosy Virusologii, No 4, Jul/Aug 72, pp 482-485

infected with WEE virus, R-42P administered twice at 9 mg/ml to animals with 0.03 ml 10 LD_{50} (minimum dosage) resulted in the highest survival rate (35%). Combined 2-time administrations of interferon prior to WEE infection and R-42P after infection resulted in enhancement of the protective antiviral effect and prevented development of disease in 60-75% of the animals. Thus interferon and styrylquinolines act synergistically in response to arbovirus infection, indicating that their combined use may be effective in preventing and treating such infections.

USSR   UDC 621.039:536.24-97

IGAMBERDYYEV, A. T.

"On the Governing Liquid Temperature in the Nonuniform Heating of a Rec-
tangular Channel"

[Tr.] Tashkent. politekhn. in-ta ([Works of] Tashkent Polytechnical Institute),
1972, No. 87, pp 93-96 (from RZh-50. Yadernyye reaktory, No 11, Nov 72,
Abstract No 11.50.100)

Translation: The temperature field in a liquid flow is nonuniform over the
cross section in the nonuniform heating of a transverse cross section of a chan-
nel along   the perimeter, and the use of the average-mass temperature of
the liquid as a determinant is arbitrary. Experimental data on the local
heat transfer coefficient are presented which were obtained in the flow of
carbon dioxide at supercritical pressure in a single-wave, heated, copper rectangu-
lar channel. The experimental and calculated heat transfer coefficients are
related to the difference in the local wall temperature along the perimeter
and the mean-mass temperature of the liquid in a given transverse cross sec-
tion of the channel. 1 ill., 3 ref.

1/1

USSR   UDC 536.242:532.517.4.001.5

KRASNOSHCHEKOV, YE. A., PROTOPOPOV, V. S., IGAMBERDYYEV, A. T., GRIGOR'YEV, V. S.

"Experimental Study of Local Heat Transfer Coefficients in the Turbulent Flow
of Carbon Dioxide of Supercritical Parameters in a Rectangular Channel Heated
on One Side"

[Nauchn. tr.] Tashkent. politekhn. in-t ([Scientific Works of] Tashkent Poly-
technical Institute), 1970, No 65, pp 115-126 (from RZh-Teploenergetika,
No 12, Dec 70, Abstract No 12089)

Translation: An experimental section with a through cross section of 16 × 3.9 mm
and a heated length of 256 mm, and also a heated device in the form of a semi-
cylinder of diameter 120 and length 256 mm were made from a single copper block.
The thickness of the side walls was the same and equal to 1.9 mm and the thickness
of the roof of the channel was 4 mm. Before entering into the channel there was
an unheated segment for hydrodynamic stabilization. The section was connected
into a closed circulation circuit. The experimental results were compared with

1/2

USSR

KRASNOSHCHEKOV, YE. A., et al, [Nauchn. tr.] Tashkent. politekhn. in-t, 1970, No 65, pp 115-126

heat transfer coefficients calculated from a relationship that holds for turbulent flow of a fluid of supercritical parameters in a circular tube:

$$Nu_f = \frac{\xi/8\,Re_f\,Pr_f}{12.7\sqrt{\frac{\xi}{8}}\,(Pr_f^{2/3}-1)+1.07}\left(\frac{\bar{c}_p}{c_{p_f}}\right)^n\left(\frac{\rho_c}{\rho_f}\right)^{1.1};$$

$$\xi = (1.82\,\lg Re_f - 1.64)^{-2};$$

$$n = f(T_c/T_f,\ T_f/T_w).$$

Until the development of more exact methods of determining local heat transfer coefficients, it is recommended that they be calculated from the above formula with the introduction of the equivalent diameter of the channel as the characteristic dimension. 4 ill., 1 table, 6 references. Yu. D. Barulin.

2/2

- 21 -

UNCLASSIFIED
PROCESSING DATE--30OCT70
TITLE--NEUTRON DIFFRACTION IN LIQUID SODIUM IN THE TEMPERATURE RANGE FROM
THE MELTING POINT TO THE BOILING POINT -U-
AUTHOR-(03)-KRUSHCHEV, B.I., BOGOMOLOV, A.M., IGAMBERDIYEV, SH.KH.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK UZB. SSR. SER. FIZ. MAT. NAUK 1970, 14,1, 80-1

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--NEUTRON DIFFRACTION, LIQUID METAL, SODIUM ALLOY, BOILING
POINT, ALLOY MELTING POINT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/1347
STEP NO--UR/0166/70/014/001/0080/0081

CIRC ACCESSION NO--AP0121840
UNCLASSIFIED

CIRC ACCESSION NO--AP0121840
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FROM NEUTRON DIFFRACTION CURVES
  (WAVELENGTH OF NEUTRONS 1.09 ANGSTROM) AT 100, 300, 500, 700, AND
  883DEGREES THE STRUCTURE OF MOLTEN NA WAS INVESTIGATED. THE
  COORDINATION NO. OF NA AT 100-500DEGREES IS CONST. AT 8.8; THE RADIUS OF
  THE 1ST COORDINATION SPHERE DECREASES FROM 3.85 ANGSTROM AT 100DEGREES
  TO 3.65-3.70 ANGSTROM AT 500DEGREES.   FACILITY: INST. YAD. FIZ.,
  TASHKENT, USSR.

UNCLASSIFIED

USSR   UDC 51:621.391

IGEL'NIK, B. M.

"Relationships Among the Parameters of Channels Subject to the Bennett-Froelich Model or a Model with Error Stages, and Parameters of a Stationary, Symmetrical Binary Channel with Groups of Errors"

Moscow, v sb. Peredacha diskrotn. soobshch. po kanalam s gruppiruyushchimisya oshibkami (Discrete Information Transmission Along Channels with Grouped Errors -- collection of works), 1972, "Nauka," pp 77-81 (from RZh-Matematika, No 6, 1972, Abstract No 6V335)

Translation: The author investigates the connection between the parameters of a stationary, symmetrical binary channel with groups of errors specified either by the probability P_m that the distance between two successibe zero states is equal to m, or the generating function P_s of that probability, and the parameters of channels subject to the Bennett-Froelich model or a model with error stages. Author's abstract.

1/1

USSR   UDC: 51:621.391

IGEL'NIK, B. M.

"Relations Between the Parameters of Channels Conforming to a Bennet-Freu-
lich Model or to a Model With Chains of Errors, and the Parameters of a
Stationary Binary Symmetric Channel With Error Bursts"

V sb. Peredacha diskretn. soobshch. po kanalam s gruppiruyushchimisya oshib-
kami (Transmission of Discrete Messages Over Channels With Grouped Errors--
collection of works), Moscow, "Nauka", 1972, pp 77-81 (from RZh-Kibernetika,
No 6, Jun 72, Abstract No 6V335)

Translation: The paper investigates the relation between the parameters of
a stationary symmetric binary channel with error bursts which is given either
by the probabilities P_m that the spacing between two consecutive null states
is equal to m, or by the generating function p_s of these probabilities, and
the parameters of channels conforming to a Bennet-Freulich model or to a
model with chains of errors. Author's abstract.

1/1

USSR

IGEL'NITSKIY, V. S.

"Analysis of the Structure of an Oriented Graph"

Translation: An algorithm is proposed for the computer analysis of graphs with a large number of points and arcs for determining such characteristics of the graph as connectedness, the presence of cycles, and the establishment of a level (rank) of the points (i.e., that numbering of the points for which the initial point of each arc has a number less than—or greater than—the end point). V. Basenshpiler.

1/1

USSR

IGITKHANOV, YU. L., KADOMTSEV, B. B.

"Helicons of Finite Amplitude"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 58,
No 6, June 1970, pp 2147-2153

Abstract: The propagation of slow electromagnetic standing
periodic waves with helical symmetry in a magnetized plasma or
solid conductor in an external magnetic field is considered.
Waves of finite amplitude are considered because they are of
more practical interest. It is shown that the problem of find-
ing all possible waves of finite amplitude with helical symmetry
reduces to the solution of a single second-order, nonlinear
differential equation. This equation possesses a class of solu-
tions which are formally of the linear type. These solutions
have the feature that their frequency is independent of the
amplitude when the amplitude is finite. Ordinary helicons, in-
cluding those propagating at an angle to the magnetic field, be-
long to this class of solutions. In the homogeneous case helicons
exhibit considerable damping independent of the collision fre-
quency due to dissipation of the surface current. Under certain
1/2

- 95 -

8
7

USSR

IGITKHANOV, YU. L., et al, Zhurnal Eksperimental'noy i
Teoreticheskoy Fiziki, Vol 58, No 6, June 1970, pp 2147-2153

conditions densities can be achieved such that helicons of small
amplitude are localized as to radius and do not exhibit strong
damping due to surface currents; these solutions do not belong
to the class of waves with a frequency independent of the
amplitude.

2/2

USSR T UDC 533.952

IGITKHANOV, YU. L. (Corresponding Member of the Academy of
Sciences USSR), KADOMTSEV, B. B.

"Pinch-Effect Instability in Low-Density Plasma"

Moscow, Doklady Akademii Nauk SSSR (Proceedings of the Academy
of Sciences USSR), Vol 191, No 5, 1970, pp 1018-1021

Abstract: In a low-density plasma, the directional velocity
of the electrons approaches the speed of sound. If the linear
proton number (for a hydrogen discharge) becomes less than unity
(i.e., the number of particles per linear $cm < 10^{16}$), electron
velocity exceeds the speed of sound. Under these conditions
the normal hydrodynamic approximations fail: the entire physics
of instability changes.

The case is studied theoretically in which the proton number
is much less than unity (i.e., the electron velocity is much
greater than the speed of sound). The ions are not magnetized,
and their Larmor radii are greater than the radius of the plasma
column. There is an azimuthal magnetic field, but no longitu-
dinal field.
1/2

USSR

IGITKHANOV, YU. L., et al, Doklady Akademii Nauk SSSR, Vol 191, No 5, 1970, pp 1016-1021

The dynamics of the plasma are described by equations of ideal two-fluid magnetohydrodynamics. Small and shortwave oscillations of the column are studied. It is found that stability requires a sharp drop in density at the periphery of the column. Relatively strong instability can arise in low-density pinches from the resonance between helicons and Alfven waves. As in the case of ordinary diffusion pinch, kinks develop in the internal region and constrictions on the periphery.

The results can be extended qualitatively to cases of longitudinal magnetic fields. Low-density pinch instability can be demonstrated experimentally on an ordinary plasma column without a longitudinal field. As shown by experiments on the Zeta machine, the competing process of electron escape excites oscillations and interrupts the current. Orig. art. has 5 refs.

2/2

1/2   025   UNCLASSIFIED   PROCESSING DATE--20NOV70
TITLE--FINITE AMPLITUDE HELICONS -U-

AUTHOR-(02)-IGITKHANOV, YU.L., KADOMTSEV, B.B.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
   NR 6, PP 2147-2145
DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--OSCILLATION, ELECTRON SHELL STRUCTURE, ELECTRIC CONDUCTOR,
   MAGNETIC FIELD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1704   STEP NO--UR/0056/70/058/006/2147/2153

CIRC ACCESSION NO--AP0120416
                          UNCLASSIFIED

CIRC ACCESSION NO--AP0120416
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INERTIALESS SPIRAL SYMMETRY
  OSCILLATIONS OF THE ELECTRONS OF A CONDUCTOR OR PLASMA IN A MAGNETIC
  FIELD WITH AN ARBITRARY AMPLITUDE ARE CONSIDERED. IT IS SHOWN THAT
  ORDINARY HELICONS ARE A PARTICULAR CASE OF SOLUTIONS WITH A FREQUENCY
  WHICH IS INDEPENDENT OF THE AMPLITUDE.

UNCLASSIFIED

USSR

UDC 537.226+537:311:33]:[537+535]

IGLAMOVA, R. I., IZMAYLOV, S. V.

"Determining Special Features of Location of Energy Zones in a Semiconductor From Dependence of Photocurrent on the Spectrum"

XXIII Gertsenovsk. chteniya. Mezhvuz. konferentsiya. Teor. fiz. i astron. Kratk. soderzh. dokl., [23rd Hercene Readings. Inter-University Conference. Theory of Physics and Astronomy. Brief Contents of Reports -- Collection of Works], Leningrad, 1970, pp 10-13, (Translated from Referativnyy Zhurnal Fizika, No 10, 1970, Abstract No 10 Ye 1053 by E. Zak).

Translation: A simplified model of a semiconductor with several energy zones is studied (conductivity zone and two filled zones). Analysis is performed into the nature of the change in the variation of quantum yield of photocurrent J $(h\nu)$ with the spectrum, allowing information to be produced on the location of energy zones in the semiconductor. If the filled zones do not overlap, there should be a plateau on the curve of J $(h\nu)$; with overlap, the zones of the curve have a break point. The results of works studying photoemission are discussed on the basis of these considerations.

1/1

USSR   UDC 517.917

IGLIKOV, A.

"One Problem With a Free Boundary Considering Body Forces"

Alma-Ata, Izvestiya Akademii Nauk Kazakhskoy SSR, Seriya Fiziko-matematiches-
kaya, No. 5, Sep/Oct 71, pp 46-49

Abstract: A nonlinear problem in hydrodynamics is discussed that consists of
analysis of the axisymmetric flow of an ideal incompressible fluid with a free
boundary on which the velocity is not constant and the effect of external body
forces is taken into account. The problem is reduced by a transformation to
an auxiliary equivalent problem of the type with a directional derivative of
the nonlinear equation and this in turn is reduced to an equivalent nonlinear
singular integral equation using the Vekua method. This integral equation is
considered as an operator equation in Banach space and a theorem is proved
showing the existence of solutions for this equation. This existence theorem
is presented as proof of the existence of a solution of the hydrodynamics
problem. Particular hydrodynamic problems considered are when the flow occurs
in a gravitational force field or in the field of centrifugal forces.

1/1

USSR   UDC: 53.082

KUKUY, A. S., IGLITSYN, M. I.

"An Instrument for Measuring the Resistivity of Irregularly Shaped Single
Crystal Rods With Geometric Factors Taken Into Account Automatically"

Moscow, Izv. AN SSSR: Ser. Fizicheskaya, Vol 36, No 3, Mar 72, pp 599-600

Abstract: The paper describes an instrument for measuring resistivity of
single crystal rods in which the correction for the geometry of the speci-
men is automatically introduced by functional converters. A block dia-
gram of the device is given and its operation is explained. Measurements
of the resistivity of single crystals grown by the Stepanov method showed
an error of 5% with repeatability of about 0.6% as shown by the coefficient
of variation of repeated measurements.

1/1

YUROVA, YE. L., SOLOV'YEVA, YE. V., KISTOVA, YE. M., D'YAKONOV, L. I., IGLITSYN, M. I., PLYONOV, M. N.

"Autocompensation of Donors in Gallium Arsenide and the GaAs$_{1-x}$P$_x$ Solid Solution"

Abstract: A study was made of the autocompensation phenomenon (constancy of the degree of compensation in a broad alloying range) detected in films of GaAs$_{1-x}$P$_x$ alloyed with Te and Se and GaAs alloyed with Se. The dependence of the degree of compensation and the concentration of the compensating centers in the neutral state was obtained as a function of the composition of the solid solution. A deep level connected with compensating centers was detected, and the dependence of its activation energy on the composition of the solid solution was determined.

The study was made in the entire composition range of the solid solution and also in films of gallium arsenide alloyed with Se. The temperature range was extended to 450° K. The degree of compensation in the GaAs$_{1-x}$P$_x$ close with respect to composition to GaP was determined by the curve for the temperature dependence of the charge carrier concentration by the same procedure as used

1/3

USSR

Yli..., Yu. S., et al., *Fizika i Tekhnika Poluprovodnikov*, Vol 6, No 3, 1972, pp 49?-50?

earlier [.I. I. Iglitsyn, et al., JTP, No 4, 230, 1970]. Graphs are presented showing the degree of compensation and the concentration of the compensating defects in the neutral state as functions of the composition of $GaAs_{1-x}P_x$ crystals, the concentration of the ionized detectors as a function of the electron concentration in the films of GaAs alloyed with Se, the temperature dependence of the charge carrier concentration in the compensated samples of $GaAs_{1-x}P_x$, and the dependence of the approximate activation energy of the D' level on the composition of the $GaAs_{1-x}P_x$ crystals. The divergence between the degree of compensation observed in the GaAs crystals (K ≈ 0.5) and the value of K obtained by extrapolating the function K(x) for the solid solution to x = 0 is explained by the difference between the growth temperatures of these crystals ≈20°. The calculation of N_v^0 from the value of K in GaAs by the previously ob-

$$K = \frac{N_A}{N_D} + \frac{N_v^0}{N_c} e^{-E_a/kT},$$

- 143 -

USSR

UDC ..., ..., et al., _Fizika i Tekhnika Poluprovodnikov_, Vol 6, No 3, 1972, pp ...

... to ... ... the same order as the value of N_v^0 in $GaAs_{1-x}P_x$ determined ... ... crystals at a temperature close to the growth tempera-ture of ... ... (N_v^0 is the concentration of the compensating defects in the ... ... is the effective density of the states of the conduction band, and ... ... of the forbidden band).

USSR

UDC 537.311.3:546.26'28

BARINOV, YU.B., BULGAKOV, YU.V., DEM'YANCHIK, D.V., IGLITSYN, M.I., IL'IN, M.A., KASAGANOVA, M.G., PAVLOV, N.M., SOLOMATIN, V.N.

"Effect Of Irradiation On The Physical Properties Of Hexagonal Silicon Carbide"

V sb. Radiats. fiz. nemet. kristallov (Radiation Physics Of Nonmetallic Crystals-Collection Of Works), Vol. 3, Part 2, Kiev, "Nauk.dumka," 1971, pp 105-110 (from RZh--Elektronika i yeye primeneniya, No 10, October 1971, Abstract No 10336)

Translation: The effect was studied of irradiation by α particles and neutrons on the spectra of electronic paramagnetic resonance and the optical spectra of n-type α-SiC doped with nitrogen and p-type doped with boron. In the spectra of the electronic paramagnetic resonance of n-type specimens, the irradiation caused a decrease of the old and the appearance of a number of new lines. Irradiation of p-type crystals by α-particles lead to an increase of the optical absorption in the 2--25 micrometer region and irradiation by neutrons caused an increase of absorption at $\lambda < 0.55$ micrometer and a decrease of absorption in the $0.55 < \lambda < 6$ micrometer region. 3 ill. I.V.

1/1

USSR   UDC: 537.312.62

MATVEYEV, I. V., SHAPIRO, B. I., IGLITSYN, M. I., BASHKIROV, Yu. A.

"Investigation of Some Properties of the Mixed State of Superconducting
Niobium in Alternating Magnetic Fields"

Kratkiye soobshch. po fiz. (Brief Reports on Physics), 1971, No 2, pp 3-11
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D509)

Translation: The authors present the results of research on determining
the configuration of a magnetic field penetrating a superconducting cylinder.
The method is developed by Bean in application to determination of the
critical current density on the basis of Fourier analysis of the voltage
induced in a flip coil containing a specimen placed in a magnetic field.
According to this method, the odd harmonics of the induced voltage are
related to the critical current density of the specimen j_c. Temperatures
close to the critical temperature T_c are used. Curves of the magnetization
and induced voltage are plotted for four specimens of niobium single-
crystals grown by the method of zone refining. Identical values of j_c are
found for polished homogeneous specimens both from the magnetization curves

1/2

MATVEYEV, I. V. et. al., Kratkiye soobshch. po fiz., 1971, No 2, pp 3-11

and from Fourier analysis of the induced voltage curves. A difference of more than an order of magnitude between the j_c values obtained by these two methods for a specimen with a rough surface is attributed to the fact that a shallow-penetrating alternating field is sensitive only to the destroyed layer which gives the true localized critical current density. A. K.

- END -

1/1

CSO: 1860 -W

UDC: 621.315.59

' USSR

VORONKOV, V. V., VORONKOVA, G. I., and IGLITSYN, M. I.

"Effect of Second-Phase Inclusion on Conductivity and the Hall Effect"

Leningrad, Fizika i tekhnika poluprovodnikov, Vol. 4, No. 12, 1970, pp 2263-2266

Abstract: The included second phase is represented by the impurities that precipitate out of the semiconductor solid solution. Because of this inclusion, there is a deviation in the conductivity in the neighborhood of the inclusion from the volume value. If the inclusion is metallic, it acts as an emitter; if it is non-metallic, the distortion of the conductivity within the Debye screening distance is low. In addition to these phenomena, this article considers the case in which the radius of the nonuniformity in the semiconductor caused by the inclusion is small compared to the average distance between inclusions, and estimates the correction that must be given the measured value of the conductivity and the Hall effect coefficient. The authors also discuss their study of the form of Cu precipitation when introduced into Si for diffusion as well as for alloying.
1/1

1/2   028   UNCLASSIFIED   PROCESSING DATE--18SEP70
TITLE--COMPENSATION OF DONORS IN A GAAS SUBO TIMES2 P SUBO TIMES8 SOLID
   SOLUTION -U-

AUTHOR-(04)-IGLITSYN, M.I., KISTOVA, YE.M., RYTOVA, N.S., YUROVA, YE.S.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1) 230

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--SOLID SOLUTION, ACTIVATION ENERGY, CRYSTAL LATTICE VACANCY,
   ZINC, TELLURIUM, SELENIUM, PHOSPHORUS, GALLIUM ARSENIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1983/0579   STEP NO--UR/0449/70/004/001/0230/0230

CIRC ACCESSION NO--AP0105562
                        UNCLASSIFIED

CIRC ACCESSION NO--AP0105562

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEGREE OF COMPENSATION OF A
DONOR IMPURITY (K EQUALS N SUBA-N SUBD) IN N-TYPE GAAS SUB1 NEGATIVEX P
SUBX SOLID SOLNS. IS CONST. FOR X EQUALS 0.7-0.9 AND N SUBD EQUALS 10
PRIME17 MINUS 10 PRIME19-CM PRIME3 AND DOES NOT DEPEND ON POSSIBLE SMALL
SCALE DOPING BY TE, SE, (TE PLUS ZN), OR (SE PLUS ZN). THE COMPENSATING
CENTERS ARE SUPPOSED TO BE SINGLY CHARGED LATTICE DEFECTS. THE
ANNEALING OF BOTH N TYPE AND P TYPE SAMPLES AT VARIOUS TEMPS. AND AT
VARIOUS PARTIAL PRESSURES OF AS SHOWED THAT THE CONCN. OF THESE DEFECTS
DEPENDS EXPONENTIALLY ON TEMP. WITH AN ACTIVATION ENERGY OF 1.5 PLUS OR
MINUS 0.3 EV AND THAT IT DECREASES WITH INCREASING AS PARTIAL PRESSURE.
THE COMPENSATING CENTERS ARE PROBABLY ASSOCD. WITH AS VACANCIES.

UNCLASSIFIED

USSR   UDC 535.243.25:535.36

TOPORETS, A. S., MAZURENKO, M. M. and IGNAT'YEVA, M. G.

"A Goniospectrophotometer for Measuring the Spatial Indicatrix of Light Dispersion"

Leningrad, Optiko-Mekhanicheskaya Promyshlennost', No 2, Feb 73, pp 32-37

Abstract: A two-beam instrument for measuring the spatial indicatrix of light dispersion with one static detector is described. Illumination of the sample is possible at any angle from 0 to 85° from above and below, in the spectral region 0.4 to 0.8 micron. The indicatrix may be recorded from any point of the half-space either in a meridional or a parallel plane. The strength of the light scattered by the sample and also the coefficient of luminosity are registered. An expression for the ratio of the electrical signals in the measuring and reference channels is derived. The indicatrix of milky glass MS14 is presented as an example of machine function.

1/1

Conferences

USSR

IGLOVIKOV, V. G.

"All-Union Conference on the Use of Fertilizers in Hay Fields and Pastures"

Moscow, Agrokhimiya, Vol 6, 70, pp 155-157

Abstract: The Conference was held by the Central Board of Forage, Meadows, and Pastures of the Ministry of Agriculture and All-Union Institute of Forage on August 19 - 22, 1969. Presented were 47 reports on fertilization of pastures and meadows. V. G. IGLOVIKOV reported that in all types of fields in European USSR application of 30 - 60 kg/ha of N, P_2O_5, and K_2O increased the hay harvest respectively, and mixtures by 9,3, 5,0, and 7,3 ct/ha of phosphorus - potassium and nitrogen - phosphorus - potassium fertilizers increased the yield by 12 and 18.1 ct/ha, respectively. A high efficiency of nitrogen fertilizers in irrigated areas was reported by N. G. ANDREYEV. Liming of soil in Estonia increased the yield by 10-15% for several years. (R. I. TOOMRE). Nitrogen fertilizers increased the protein content in plants (Z. V. MOROZOVA and E. S. VOROB'YEV). A review of the problem of biological nitrogen in mixtures of leguminous plants and cereals was reported by A. A. KUTUZOVA. B. A. BINKUS reported on experiments with manure in Lithuania. The Conference approved in general terms the research program concerning development of fertilizer studies in different geographical zones.
1/1

Acoustical and Ultrasonic

KONOVALOV, YE. G., Academician of the Academy of Sciences Belorussian SSR,
and IGNASHEV, YE. P., Electronics Laboratory, Academy of Sciences Belorussian
SSR

"Flattening of Circular Wire Into Microtapes by Ultrasonic Vibration"

Abstract: The authors studied geometric parameters for the flattening of
narrow micron-section tapes obtained through ultrasonic vibrational energy.
The method consists in passing a wire between two threading dies, one of
which is attached to the base, the second directly to the face of the ultra-
sonic vibration concentrator. The experimental device consists of a magneto-
strictive transducer with an exponential half-wavelength concentrator, a
half-wave reflector to which one of the threading dies is attached, a winding-
unwinding mechanism. Vibration frequency: 22 kc. Wire made of various
metals and alloys, soft as well as difficult to deform, can be flattened into
narrow tapes by the ultrasonic vibration method without the use of a

USSR   UDC: 539.3

IGNASHOV, I. A.

"Determination of Stresses in a Circular Plate With Several Circular
Washers of Another Material Pressed Into it"

V sb. Uprugost' i neuprugost', vyp. 2 (Elasticity and Inelasticity--
collection of works, No 2), Moscow, Moscow University, 1971, pp 74-81
(from RZh-Mekhanika, No 7, Jul 72, Abstract No 7V64)

Translation: With the help of D. I. Sherman's method, the problem is
reduced to finding complex functions of stresses $\phi(z)$ and $\psi(z)$ which are
regular in the singly connected region S bounded by the contour L_0 of
the plate. The functions $\phi_0(z)$ and $\psi_0(z)$ which are regular in a multiply
connected plate, as well as the functions $\phi_n(z)$ and $\psi_n(z)$ $(n = 1, 2,\ldots, m$,
where m is the number of washers) are expressed in terms of $\phi(z)$ and $\psi(z)$
by means of a linear relation which contains an undetermined coefficient.
An example is given of determination of this coefficient for a plate into
which two circular washers of another material are pressed. Diagrams of
contact stresses are plotted, and an estimate is made of the accuracy of
the results. M. Z. Narodzetskiy.

1/1

USSR   UDC 621.372.823.09.001.24:621.371.372

BELOZEROV, YU.S., ILINICHEV, YU.A., SHORTOVSKIY, V.YA.

"On The Problem Of The Calculation Of The Critical Frequencies Of Higher-Type
Waves In A Hollow Elliptical Waveguide"

Abstract: The paper considers some distinctive features connected with deter-
mination of the critical frequencies of wave of high order and the change of
their mutual disposition at any eccentricity. A graph is shown of the depend-
ence of the critical wave numbers of an elliptical waveguide on the eccentricity.
1 fig. 8 ref. Received by editors, 14 April 1971.

1/1

Lasers & Masers

USSR   UDC 621.375.82

IGNATAVICHUS, M., KABELKA, V., PISKARSKAS, A., and YUOZAPAVICHUV, A.

"Use of Thin Phototropic Films for the Synchronization of a Neodymium Laser"

V sb. Nelinevn. protsessy v optike (Nonlinear Processes in Optics -- Collec-
tion of Works), No 2, Novosibirsk, 1972, pp 61-66 (from RZh-Fizika, No 11,
Nov 72, Abstract No 11D891)

Translation: The oscillation of a Nd glass laser with a synchronization of
modes produced by a thin phototropic film of polystyrene with polymethenyl
dye introduced into it was investigated. With an initial film transmission
of 60% the pulses generated with a total energy of $\sim$0.1 joule consisted of
12-15 subpulses, the duration of which as determined from two-photon lumines-
cence was $\sim$4 psec. Total radiation modulation was observed in 7-8 out of 10
oscillation pulses. The smoothness of the spectrum (the spectral width of the
radiation close to threshold was $\sim$6 Å), the stability of the average wave-
length of the radiation, and the ease of achieving oscillation in single-
mode operation were noted; this is explained by the high degree of homo-
geneity of the polystyrene films. 3 ref. S. F. Sharlay.

1/1

Electricity & Magnetism

.USSR

IGNATCHENKO, V. A.

"Fine Magnetic Films at High and Ultra-High Frequencies"

Moscow, Problemy Magnetizma, "Nauka," 1972, pp 96-117

Abstract: This paper is a review of the theoretical work done by
the Institute of Physics of the Sib· ian department of the USSR
Academy of Sciences, over a number of years, in the development
of the static and dynamic — linear and nonlinear — effects in
thin magnetic films. In addition to the published works discussed
here, some hitherto unpublished results are also given. The first
section of the article deals with boundary conditions of the equa-
tion of motion of magnetization derived by Landau and Lifshits in
vector form. The author then takes up a new spectroscopic method
for investigating magnetic reversal in fine magnetic films he de-
scribed in an earlier article (FMM, 14, 1962, p 125). Multi-
layered film systems are considered, and the theory of exchange
and magneto-elastic resonance is developed. A practical note is
injected with consideration of applications of high-frequency
magneto-elastic interaction and specifically the use of thin films
1/2

USSR

IGNATCHENKO, V. A., Problemv Magnetizma, "Nauka," 1972, pp 96-117

as magneto-elastic uhf converters. Next discussed are the basic
characteristics of nuclear magnetic resonance and pulsed magnetic
reversal in thin films and magnetic resonance frequencies in
thin films on an antiferromagnetic substrate. The final subject
discussed is the fine magnetic structure in the film -- i.e., the
smallness of the crystallite dimensions compared with the effect-
ive radius of exchange interaction -- and its relationship to
ferromagnetic resonance. A bibliography of 30 titles, primarily
Russian, is given.

2/2

USSR   UDC: 681.332.65

CHERNIKHOV, Yu. V., IGNATENKO, A. D., LIBERMAN, V. L., LOPACHEVSKIY, O. V.,
Scientific Research and Experimental Design Institute of Automation in Ferrous Metallurgy

"A Method of Shaping Multiphase Pulse Supply Voltage for Combination Logic
Circuits Based on Thyristors"

Translation: This Author's Certificate introduces a method of shaping a
multiphase pulse supply voltage for combination logic circuits based on
thyristors by isolating a unipolar half-wave of sinusoidal voltage, shifting
it in phase by 120 degrees, and adding the initial and shifted half-waves.
In order to improve the reliability and noise suppression of the combination
logic circuits, the aggregate pulse voltage of each phase is shifted by
120 degrees with respect to the same   voltage of the preceding phase.

1/1

USSR   UDC: 681.325.6

BLYUMIN, S. L., IGNATENKO, A. D., MASHLYKIN, V. G., and CHERNIKHOV,
Yu. V.

"Method of Analyzing a Typical Logic Element Using Thyristors"

Moscow, Avtomatika i telemekhanika, No 4, 1972, pp 162-167

Abstract: Although circuits consisting of thyristors for use in
logic systems can be investigated graphically, such an analysis
requires a good many diagrams. The authors of this article pro-
pose a method for analytically investigating stable modes of
operation of such thyristor circuits. Using the example of a
NOT circuit involving two thyristors, the authors show how the
method is used. The example of two NOT circuits connected in
series is also treated. This latter example is used to show how
the right moment for applying the control pulse as well as the
zone of insensitivity to noise can be determined. Thus, the
method explained in this article can be used to estimate the time
characteristics that must be taken into account for designing
stable circuitry.

1/1

TITLE--EFFECTIVENESS OF A THREE DIMENSIONAL MHD CHANNEL -U-

AUTHOR--IGNATENKO, M.M.

COUNTRY OF INFO--USSR

SOURCE--MAGNITNAIA GIDRODINAMIKA, VOL. 6, JAN.-MAR. 1970, P. 39-44

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--ELECTRIC FIELD, MHD, ELECTRODE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1848   STEP NO--UR/0382/70/006/000/0039/0044

CIRC ACCESSION NO--AP0118812
                         UNCLASSIFIED

2/2   026   UNCLASSIFIED   PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0118812
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT. DETERMINATION OF THE ELECTRIC
  FIELD IN AN MHD CHANNEL OF RECTANGULAR CROSS SECTION WITH IDEALLY
  CONDUCTING ELECTORDES, IN THE CASE WHERE A UNIFORM EXTERNAL MAGNETIC
  FIELD IS CONCENTRATED IN THE ELECTRODE REGION OR AT A CERTAIN DISTANCE
  BEHIND THE ELECTRODES. THE INFLUENCE OF THE NONUNIFORM VELOCITY ACROSS
  THE CHANNEL AND THE INFLUENCE OF THE SPACING BETWEEN THE FIELD AND THE
  ELECTRODES ON THE EFFECTIVENESS OF THE CHANNEL ARE EXAMINED. THE
  CONDITIONS UNDER WHICH THE CHANNEL EFFECTIVENESS IS MAXIMUM ARE
  DETERMINED.

                              UNCLASSIFIED

USSR   UDC: 51

OGANYAN, R. A., BONDER, O. V., IGNATENKO, N. V.

"Three Programs for Solving an Intersectoral Dynamic Model"

V sb. Algoritmy i programmy realizatsii narodnokhoz. modeley (Algorithms and
Programs for Realizing National Economic Models--collection of works), Novo-
sibirsk, 1971, pp 134-149 (from RZh-Kibernetika, No 6, Jun 72, Abstract No
6V447)

Translation: Description of three versions of a program for an 18-sector
model, flowcharts and texts of the programs in ALPHA language.

1/1   - 29 -

USSR

BERLOVICH, E. Ye., BLINNIKOV, Yu. S., VAYSHNIS, P. P., VITMAN, V. D., YELKIN,
Yu. V., IGNATENKO, Ye. I., PANTELEYEV, V. N., and TARASOV, V.K., B. P.
Konstantinov Nuclear Physics Institute

"Short-Lived Osmium Isotopes"

Abstract: The purpose of the experiments described in this paper is to
detect 175Os and to obtain information concerning gamma irradiation of
this and lighter osmium isotopes. The short-lived isotopes were obtained
in spallation reactions by irradiating mercury with 1-Gev protons in the synchro-
cyclotron of the*irradiation conditions vary, inasmuch as the proportion of the
different Os isotopes in the specimens depends on the mode of proton bombard-
ment. In the gamma irradiation, the gamma ray spectrum was measured by a Ge(Li)
detector, with a resolution of 3.5 kev for a line of 662 kev, and the spectra
were recorded by an electronic system including an AI-1024 analyzer, a control
block with timer, and the Minsk-22 computer to measure half-lives. Isotopes

1/2

USSR

BERLOVICH, E. Ye., <u>Izvestiya Akademii Nauk SSSR -- Seriya Fizicheskaya</u>, No 12, 1972, pp 2490-2498

with half-lives of more than 2.5 minutes and less than 2.0 minutes were investigated, and tables of their gamma-radiation spectra are given. Results of the present paper are compared with those of earlier papers. An attempt was also made to find a genetic connection between short-lived osmium and rhenium isotopes, and a table for the gamma irradiation of ^{174}Re is also given.

*   <u>Leningrad Institute of Nuclear Physics</u>;

2/2

- 55 -

USSR   UDC 51:155.001.57:518.9

IGNATENKO, Yu. G., LOVITSKIY, V. A.

"Modeling of the Process of Human Determination of the Value of Information"

Probl. Bioniki. Resp. Mezhved. Nauchno-tekhn. Sb. [Problems of Bionics, Republic Interdepartmental Scientific and Technical Collection], No 4, 1970, pp 60-70, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V658 by the authors).

Translation: Results are presented from experiments using determination of the value of information presented as a function of a number of factors. The data produced are compared with the results of human activity. The model was realized on a Ural-4 computer. 11 Biblio. Refs.

1/1

USSR   UDC 51:155.001.57:612.82

IGNATENKO, Yu. G., LOVITSKIY, V. A.

"Algorithm of Learning of Model of Certain Processes in Verbal Memory System. 2."

Translation: For Part 1, see Abstract 6 V670. A program realization of the algorithm for learning the model of verbal memory developed earlier by the authors is presented, written in an associative programming language. Realization of the algorithm formulates the first level of the model, a system which classifies words in natural language.

1/1

USSR

UDC 537.311.33

MIKOLAYCHUK, A. G., KOGUT, A. N., and IGNATIV, M. I., L'vov State University imeni Iv. Franko

"Electrical Properties of Germanium Telluride and Selenide Thin Films"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Fizika, No 7, 1970, pp 103-105

Abstract: The article describes results of the measurement of the electrical conductivity and forbidden-gap width of germanium telluride and selenide in thin films and discusses the dependence of these parameters on the structure. The results are qualitatively explained on the basis of A. I. Gubanov's theory of the electrical conductivity of amorphous semiconductors.

1/1

USSR

UDC: 620.179.16   1

NIKIFORENKO, Zh. G., SYSKOV, V. A., KREPS, N. S., IGNATINSKIY, I. L., VNIINK, Kishinev

"Ultrasonic Inspection of Bilayer Plates"

Abstract: In order to evaluate the possibility of inspecting bilayer plates by the ultrasonic reflected pulse resonance method (L. G. Merkulov, V. M. Verevkin, Defektoskopiya, 1965, No 5, p 13) when the contacting liquid can wet only one surface of the plate to feed ultrasonic oscillations into the material being inspected, the authors calculate the shape of a pulse reflected from a plate separating liquid from air, disregarding attenuation. A block diagram of the ultrasonic flaw detector is presented. The proposed device can be used to check for diffusion welds between the layers of double-layer plates. The results of experiments show that the Merkulov-Verevkon method is a sound basis for highly sensitive high-productivity flaw detection.

1/1

USSR   UDC 620.178.1:669.15

MAKSIMOVICH, G. G., NAGIRNYY, S. V., LYUTYY, YE. M., and IGNATIV, M. I.,
Institute of Physico Mechanics, Academy of Sciences Ukrainian SSR

"Change in the Fine Structure of 1Kh18N9T Steel After Extended Stressing in
Molten Lithium"

Abstract: A study was made of dislocation structural changes occurring in
1Kh18N9T steel when it is immersed in molten lithium under stress. Both the sur-
face (less than 50 microns) and center of the steel samples were studied after
holding the samples in lithium at temperatures of 500 and $650^\circ C$ under stress.
    A low dislocation density ($10^7/cm^2$) was noted in the initial samples, and the
dislocation distribution was not uniform. Small masses of dislocations were noted
near the grain boundaries and near the twin boundaries, as well as near a different
site of inclusions and stacking faults. A large portion of the sample cross sec-
tion was free of dislocations. After holding samples at $500^\circ C$ for 100 hours, dis-
location density was reduced further ($10^6/cm^2$), and was concentrated primarily be-
tween the carbides. Slip traces of dislocation groups and some growth of carbides
in the dislocations were detected. Holding samples in lithium for 100 hours at
$500^\circ C$ under a stress of 17 kg/mm^2 caused a significant increase in dislocation
1/3

USSR

MAKSIMOVICH, G. G., Fiziko-Khimicheskaya Mekhanika Materialov, No 3, May-June 70, pp 67-70

density. In the sample center, dislocation density was much higher than in the surface layer and they formed complex and tightly joined masses, especially around precipitated constituents. In the surface layer, dislocations were grouped around coarse carbides, where individual dislocation loops and lattices were observed close to large carbides and grain boundaries.

For samples held in lithium for 100 hours at 650°C under a load of 11.9 kg/mm^2 the fine structure was similar to that described above--as to dislocation distribution. In this case the dislocation density gradient in the surface layers and in the center of the samples was much larger than at 500°C. In the sample centers growth of both small and large carbide chains was noted while around the precipitated particles there was a dense, barely discernible dislocation lattice. In the surface layers there were fewer carbides, lower dislocation density, and a more uniformly distributed dislocation density. Individual dislocations interacted to form dislocation loops, and there were large areas free of dislocations. Near the grain boundaries a true dislocation lattice is formed. Moreover, twins were noted which in the center zone of the sample were surrounded by dense dislocation masses. Dislocations were absent in the surface layer.

2/3

USSR

MAKSIMOVICH, G. G., et al, Fiziko-Khimicheskaya Mekhanika Materialov, No 3, May-June 70, pp 67-70

From the above-described observations it was deduced that molten lithium dissolves the oxide film on the sample surface and dissolves impurities and inclusions in 1Kh18N9T steel as a result of which the number of barriers retarding dislocation movement to the surface is diminished.

3/3

1/2   042   UNCLASSIFIED   PROCESSING DATE--13NOV70

TITLE--CONDUCTIVITY ANOMALIES OF TUNNEL JUNCTIONS AL,AL SUB2 O SUB3,BI
  SUB1-X SB SUBX AT LOW BIAS -U-

AUTHOR-(02)-GALKIN, A.A., IGNATIYEV, O.M.

COUNTRY OF INFO--USSR

SOURCE--UKRAYIN. FIZ. ZH. (USSR), VOL. 15, NO. 5, P. 820-3 (MAY 1970)

DATE PUBLISHED----MAY70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--TUNNEL CURRENT, SEMICONDUCTOR JUNCTION, SEMICONDUCTOR
  CONDUCTIVITY, CRYOGENIC PROPERTY, HIGH PRESSURE EFFECT, STRONG MAGNETIC
  FIELD, ALUMINUM, ALUMINUM OXIDE, BISMUTH, ANTIMONY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1801   STEP NO--UR/0185/70/015/005/0820/0823

CIRC ACCESSION NO--AP0133706
                            UNCLASSIFIED

CIRC ACCESSION NO--AP0133706

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT.   A DESCRIPTION IS PRESENTED OF
  ANOMALOUS CONDUCTIVITY OF TUNNEL STRUCTURES AL,AL SUB2 O SUB3,BI SUB1-X
  SB SUBX AT ZERO BIAS.   CONDUCTIVITY WAS MEASURED AT PRESSURES UP TO 10
  KATM, TEMPERATURES 4.2-1.8DEGREESK IN MAGNETIC FIELDS UP TO 40 KOE.
  ANTIMONY CONCENTRATION X IN THE ALLOY OF THE UPPER ELECTRODE IS 10-67
  AT. PERCENT.   A POSSIBLE MECHANISM IS DISCUSSED OF ANOMALOUS TUNNEL
  CONDUCTIVITY ARISING AT SMALL BIAS.

UNCLASSIFIED

UDC 546.681'181.1:541.67

USSR

GLORIOZOVA, R. I., IGNATKIN, A. D., MARINA, L. I., and NASHEL'SKIY, A. YA., Giredmet, State Scientific Research and Planning Institute of Rare Metals

"Electrical Properties of GaP Single Crystals"

Moscow, Izvestiya Akademii Nauk SSSR -- Neorganicheskiye Materialy, Vol 6, No 10, Oct 70, pp 1768-1771

Abstract: The article describes results of a study of the electrical properties of GaP single crystals obtained by the floating zone method. Undoped, as well as tellurium- and zinc-doped single crystals were used. The Hall effect and conductance were measured at 77-400° K. Undoped crystals have n-type conductivity and a carrier concentration at room temperature of $10^{15}-10^7$ cm^{-3}. The activation energy of the residual uncontrolled centers for them is 0.24 and 0.7 ev. The carrier concentration of the doped crystals is $10^{17}-10^{18}$ cm^{-3}. The ionization energy of tellurium varies according to the Te concentration. The

1/2

USSR

GLORIOZOVA, R. I., et al., Izvestiya Akademii Nauk SSSR -- Neorgani-
cheskiye Materialy, Vol 6, No 10, Oct 70, pp 1768-1771

ionization energy of zinc is ~ 0.05 ev. The electron and hole mobil-
ity is ~80-150 sq cm/volt sec at room temperature, 250-550 sq cm/volt
sec at 100° K, and varies as $T^{-1.5}$ in the high temperature region.

2/2

USSR   UDC: 621.317.71:621.791.03

VINOGRADOV, G. V., IGNATKIN, Yu. N., and CHERNOV, V. D.

"Instrument for Measuring the Welding Current Amplitude in Low-Power Contact Machines"

Elektron. tekhnika. Nauch.-tekhn. sb. Tekhnol., organiz., proiz-vo i oborud. (Electronics Engineering; Scientific-Technical Collection; Technology, Organization of Production, and Equipment) No 3(51), 1972, pp 41-43 (from RZh--Avtomatika, telemekhanika i vychislitel'naya tekhnika, No 2, 1973, Abstract No 2A351)

Translation: A device is described for measuring pulse current amplitudes in welding small parts on a welding automaton of an automatic line for producing resistors of the VS type. Two illustrations, bibliography of one. Resume

1/1

USSR   UDC: 621.382.3

IGNAT'EVA, R. S., KUROLEVA, N. Ye., HELSHER, L. A., K?TED, ?. ?.,
NEDEL'SKIY, L. F., RAVICH, V. H., TOKARENKOV, B. V., Moscow Coordinating
Institute, Physicotechnical Institute imeni A. F. Ioffe, Academy of
Sciences of the USSR, Leningrad

"The Gallium Phosphide Electroluminescent Dynistor"

Abstract: This paper describes sources of red and green light with an
S-shaped current-voltage curve based on epitaxial gallium phosphide
PNPN structures -- electroluminescent dynistors. The electrical and
electroluminescent characteristics and parameters of these devices are
presented, and it is shown that the properties of electroluminescent
gallium phosphide dynistors are similar to those of dynistors based on
other materials.

1/1

USSR

UDC 621.382:621.383.8 (088.8)

YESHCHIK, K.K., IGNATKINA, R.S., MEDVEDEV, N.F., MESKIN, S.S., RAVICH, V.N.

"Optical Indicator"

Translation: A device is proposed for visual control of voltage. The device is a semiconductor optical indicator, one of the areas of which has at least two ohmic contacts and a fixed resistance per unit length along the p-n junction, and the second accomplished so that the resistance between its contacts and any point of the operating zone decreases, for example along a parabola. Because of this a reduction is achieved of the consumable power, as well as an increase of the degree of contrast of the boundary of the luminous area, which considerably expands the range of application of such devices. 2 ill. G.8h.

1/1

USSR

IGNATKINA, R. S., Et al., Fizika i Tekhnika Poluprovodnikov, Vol 5, No 4, April 1971, p 626-630

(293°K). A study of the relaxation of the green electroluminescence at room temperature demonstrated that after inclusion of a square direct current pulse the intensity of the green radiation builds up to a stationary value exponentially with a time constant of 200-300 nanoseconds, and after exclusion of the current pulse, the light intensity drops exponentially with the same time constant but a postinjection electromotive force appears on the diode. Thus it is concluded that the electroluminescence properties of the p-n structures with two epitaxial layers are determined only by the conditions of growth of these layers and the type of admixtures with which these layers are alloyed during the epitaxy process. It is most expedient for both green and red light sources to create completely epitaxial p-n structures and at the same time strongly reduce the dependence of the instrument parameters on the properties of the initial substrate, using a substrate of large area.

2/2

1/2   028   UNCLASSIFIED   PROCESSING DATE--23OCT70
TITLE--SURFACE ELECTRICAL CHARACTERISTICS OF SINGLE CRYSTAL SILICON FILMS
  ON SAPPHIRE -U-
AUTHOR-(04)-LISENKO, V.S., LITOVCHENKO, V.G., KOSENKO, V.YU., IGNATKOV,
  V.D.
COUNTRY OF INFO--USSR

SOURCE--UKRAINS'KII FIZICHNII ZHURNAL, VOL. 15, MAR. 1970, P. 409-414.

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, PHYSICS

TOPIC TAGS--SILICON SINGLE CRYSTAL, PHOTOCONDUCTIVITY, BIBLIOGRAPHY, METAL
  FILM, EPITAXIAL PN JUNCTION, EPITAXIAL GROWTH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1923   STEP NO--UR/0185/70/015/000/0409/0414

CIRC ACCESSION NO--AP0118885
                         UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0118885
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   APPLICATION OF FIELD EFFECT,
  CONTACT POTENTIAL DIFFERENCE, AND PHOTOCONDUCTIVITY MEASUREMENTS TO
  DETERMINE THE SURFACE ELECTRICAL CHARACTERISTICS OF P AND N TYPE
  HETEROEPITAXIAL SILICON FILMS ON SAPPHIRE.   A SIGNIFICANT NONUNIFORMITY
  OF THE FREE SURFACE POTENTIAL IS SHOWN TO BE CAUSED BOTH BY SURFACE
  BOUNDARIES IN MOSAIC TYPE FILMS AND BY HETEROGENEITY OF THE SURFACE.
  THE FREE SURFACE CONTAINS SIGNIFICANT CONCENTRATIONS OF BOTH ACCEPTOR
  AND DONOR CENTERS.   THE SURFACE ADJACENT TO THE SAPPHIRE SUBSTRATE
  EXHIBITS RELATIVELY HIGH FIELD EFFECT MOBILITY, WITH ACCEPTOR
  PREDOMINANCE IN BOTH N AND P TYPE FILMS.   THE PHOTOCONDUCTIVITY OF THE
  FILMS HAS A MAINLY UNIPOLAR NATURE.   FACILITY: AKADEMIIA NAUK
  UKRAINS'KOI RSR. INSTITUT NAPIVPROVIDNIKIV, KIEV, UKRAINIAN SSR.

UNCLASSIFIED

USSR

UDC 621.039.51.12

IGNATOV, A. A., SHIKHOV, S. B., SUVOROV, A. P.

"Semianalytical Method for Calculating the Neutron Field in a Straight One-Dimensional Shield"

V sb. Vopr. fiz. zashchity reaktorov (Problems in Reactor Safety Physics -- Collection of Works), No. 5, Moscow, Atomizdat, 1972, pp 57-63 (from RZh-50. Yadernyye reaktory, No 5, May 72, Abstract No 5.50.60)

Translation: The exact solution of neutron transport boundary value problems can be obtained on the basis of a complete system of elementary solutions of the kinetic equation (the Case method). The boundary value problem for a shielding layer irradiated by an external source is reduced to a system of linear algebraic equations on the basis of the representation of the continuous portion of the spectrum of the transport operator by discrete points. Calculations by the method of elementary solutions in one- and two-group consideration are compared with calculations by the method of discrete ordinates based on the ROZ program. 2 ill., 10 ref.

1/1

Ignatov, A. A.

JPRS 56,499
14 July 72

EXPERIENCE IN CONSTRUCTING A SYSTEM FOR THE AUTOMATIC PROCESSING OF PHYSIOLOGIC INFORMATION

Prolonged space flights, investigations of a scientific and training nature, and other types of studies under conditions when man is subjected to the influence of extremal factors, are impossible without a reliable system of medical monitoring having both operational characteristics and resolution in the elements of health and performance of crew members.

The development of such a system is inseparably related to the creation of a system for the automated processing of physiologic information (APPI). This report gives some results of the practical application of the basic principles in constructing an APPI system based on an M220-A electronic computer. In addition to this electronic computer, the APPI system includes a device for coupling the information sources to the computer at the input and for coupling the computer with the output devices for the printout and representation of the processed information, and also devices for the preliminary processing of physiologic signals (PPD) ensuring the compression of information prior to computer input or input into a magnetic recorder.

The sources of physiologic signals for the APPI system are a complex of sensors with amplifying apparatus and other devices constituting the system for the collection of medical information. Since all the physiologic signals are recorded parallel with the processed information on a magnetic recorder, the latter can serve as an auxiliary source of information during repeated analysis in the absence of the patient. In addition, some of the data is fed from the measuring instruments of the life support system. Using portable data readout

1

12

IGNATOV, A.A.

muscle physiology/electro-myography

METHOD FOR PROCESSING MUSCLE BIOPOTENTIALS FOR INPUT INTO AN ELECTRONIC COMPUTER

Electromyography is one of the principal methods making it possible to investigate the process of muscle contraction in the intact body. Electromyography plays an important role in clinical medicine and in study of motor acts and fatigue in the physiology of work and sports. Investigations of muscle biopotentials are of great interest for drawing conclusions concerning the mechanisms of coordination of movements, especially in the man-machine system.

Due to the complexity in analyzing electromyograms (EMG) many physicians and physiologists make extensive use of the illustrative-descriptive method. A distinguishing feature of this method is a verbal description of changes in the EMG without citing any quantitative (numerical data), usually with a demonstration of the corresponding oscillograms.

In addition to the illustrative-descriptive method, work has now been undertaken on a method for qualitative analysis of the EMG based on the assignment of the EMGs to a certain type on the basis of their external appearance (Yu. S. Yusevich, 1958, 1963). Qualitative analysis of the EMG is of considerable diagnostic importance in clinical practice. However, a study of the fine dynamics of change in muscle practice, however, a study of the fine dynamics of change in muscle biopotentials is possible only when using quantitative methods for their evaluation.

Methods for quantitative EMG analysis involve a mandatory conversion determination of one or more indices of the investigated process into digital form, that is, are now known for processing EMGs (N. G. Kreol; S. P. Gutman; F. B. Solodkov; Jacobson).

- 106 -

USSR

SHIKHOV, S. B., IGNATOV, A. A., and ODINTSOV, V. S.

"Solution of the Problem on Radiation Transfer With Representation of the Continuous Portion of the Spectrum of the Transfer Operator by Discrete Points"

Translation: Application of the Case method to transport problems is made difficult by the fact that to find the coefficient $A(\nu)$ in the integral term one must solve a singular integral equation. An approximation method is proposed for solving the singular integral equation based on representing the integral term in the interval $\nu \in \{-1, 1\}$ by a finite sum; the points of division of the interval ν_i, $i = 1-n$ are roots of the equation $h_N(\nu) = 0$, where $h_N'(\nu)$ is the N-th moment of the expansion of the elementary solution of $\Phi(\nu, \mu)$ in Legendre polynomials. N is greater than or equal to the order of anisotropy of the scattering nucleus. The problem of the passage of neutrons through a multilayered plate was solved by this method.
1/2

USSR

in the transport approximation. A Green's function was constructed for any layer, and the relationship was derived between the angular moments $\psi_k(\chi, u)$ for two different layers. The boundary conditions are achieved approximately by the Marshak method or for a number of discrete directions. A. G. Promokhov.

2/2

- 74 -

USSR

IGNATOV, A. B., KOMISSAROVA, I. I., OSTROVSKAYA, G. V., and
SHAPIRO, L. L.

"Double-Wavelength, Single-Exposure Holographic Plasma Inter-ferometry"

Abstract: This paper is connected with an article written by the
third-named of the authors above and published in the same journal
(vol. 40, No. 11, 1970). In this earlier article the author proposed
a method of double-wavelength,single-exposure holographic interfero-
metry in which the form and position of the interference bands are
determined only by the dispersion characteristics of the investi-
gated object. Essentially, this method involves two wavelengths,
one of which is half the other, radiated by a hologram of a phased
object on photomaterial with a light transmissivity which is a non-
linear function of the illumination on it. In the present paper,

1/2

USSR

IGNATOV, A. B., et al, Zhurnal Tekhnicheskoy Fiziki, Vol. 41, No. 2, 1971,
pp 417-423

a closer and more detailed look is taken at this method, and a de-
scription is given of the first attempt to use it for interferomet-
ric investigation of a plasma. The authors found that dispersion
interferometry gives results which are inferior to those of their
method. They are with the A. F. Ioffe Physico-Technical Institute
of Leningrad.

2/2

- 97 -

USSR

UDC 621.317.444

IGNATOV, A. I., UDALOV, V. F.

"An Automatic Magnetometer for Research on Films"

Abstract: A description is given of an automatic magnetometer for the
measurement, in the longitudinal field and in the transverse field, of the
magnetization curves, the hysteresis loop, the constant of plane and
perpendicular anisotropy, and other physical values of magnetic fields. An
analysis of various magnetometers is conducted, and the advantages of the
proposed instrument are noted.

Instruments developed in previously published works, both in the USSR and
abroad, do not permit automatic research on films within a wide range of
fields with sufficient reliability and accuracy. The magnetometer described
in the article is presented in Figure 1. This magnetometer makes it possible
to investigate automatically the various physical properties of thin films.
In distinction from the known automatic magnetometers, the proposed instru-
ment has a higher sensitivity, and can automatically measure with precision
and reliability the relationship $I_p(H)$ under quasi-static conditions. The

1/2

USSR

IGNATOV, A. I., UDALOV, V. F., Izmeritel'naya Tekhnika, No 7, 1971, pp 53-55

broad range of fields and moments of compensation of the instrument makes it possible to investigate all the characteristics of film that have to do either with emergence of the magnetization vector from the plane, or with rotation of the magnetization vector in the plane of the film. 5 figures, 27 bibliographic entries.

2/2

USSR

IVANOVA, K. N., PALETOV, A. M., SAVITSKIY, YE. M., and IGNATOV, D. V.

UDC 537.533.35

"Nature and Distribution Characteristics of Carbide Phases in Aged Niobium Alloys as Revealed by Electron Microscopy"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 1, Jan/Feb 73, pp 105-111

Abstract: Aging of RN-6S alloy (5% W, 5% Mo, 1% Zr, and 0.1% wt% C) at 1000°C for 5 hours produced mainly Nb_2C with an hexagonal crystal lattice and zirconium carbide which upon closer examination under the electron microscope appeared as $(Zr,Nb)C$ with a face-centered cubic lattice. When aging at 1000°C was increased to 25 hours, more $(Zr,Nb)C$ phase was formed as laminar inclusions with a well defined orientation in the matrix and to some extent along the grain boundaries. Aging at 1100°C for 25 hours produced more oriented inclusions of the $(Zr,Nb)C$ phase while the large particles of the Nb_2C phase remained along the grain boundaries. When aging at 1100°C was extended to 50 hours, Nb_2C inclusions disappeared almost completely from the grain boundaries while the $(Zr,Nb)C$ phase coagulated along the grain volume and its dispersed inclusions coagulated along the grain boundaries. A further coagulation of the $(Zr,Nb)C$ phase and its nonuniform distribution was observed in the same alloy aged at 1100°C for 100 hours. Only an insignificant amount of the Nb_2C

1/2

USSR

IVANOVA, K. N., et al, Moscow, Fizika i Khimiya Obrabotki Materialov, No 1,
Jan/Feb 73, pp 106-111

phase was left in this case. The observed structural changes in the RN-6S
alloy produced by aging resulted in changes of the mechanical properties at
room temperatures. The appearance of the $(Zr,Nb)C$ phase increased the alloy
strength and the yield point, while coagulation of this phase decreased these
properties. Formation of inclusions along grain boundaries free from carbides
after aging at $1100°C$ for 25 hours decreased somewhat the plasticity of the
alloy compared with the hardened state. Lead quenching of the RN-6S alloy from
$2000°C$ after 3 hour exposure at this temperature showed that the Nb_2C phase
is much more stable at $1700°C$, while the $(Zr,Nb)C$ phase is more stable at
$1000-1100°C$.

2/2

- 59 -

IGNATOV D. V.

UDC 669.018.45

STRUCTURAL-KINETIC STUDY OF THE OXIDIZABILITY OF NICKEL-CHROMIUM BASED ALLOYS

A structural and kinetic study was made of the oxidizability of Ni + 10% Cr and Ni + 10% Cr + 6% W alloys containing 0.2 percent Ce, La and Y each at 1000°C.

It was found that the introduction of additives of rare earth elements into the indicated alloys decreases their oxidation rate by 3-8 times; alloys containing yttrium have the greatest oxidation resistance.

Modern oxidation-resistant nickel-chromium based alloys are usually alloyed with such elements as tungsten, molybdenum and cobalt. While increasing the high-temperature strength of the alloy, these elements lower its oxidation resistance. Accordingly, we are faced with the problem of lowering the oxidation rate of such alloys. The published literature contains data on the effect of rare earth elements on the oxidizability of Kh20N80 alloys [1].

The purpose of the present paper is to study the effect of yttrium, lanthanum and cerium additives on the oxidation kinetics of Ni + 10% Cr and Ni + 10% Cr + 6% W alloys.

Experimental Section

The alloys were made in an arc furnace with permanent electrodes in a helium atmosphere. In order to achieve uniform distribution of the alloying additives in the ingots, fivefold remelting of them with subsequent homogenization annealing was performed. The rare earth elements were introduced calculating 0.2 percent of the charge mass. Their loss was 30-50 percent. The procedure for manufacturing samples for structural-kinetic studies of the oxidizability of the alloys is analogous to that described in reference [2]. The samples had the shape of cylinders 10 mm in diameter and 5 mm high.

- 1 -

[II - USSR - I]

Welding

USSR

UDC 621.791.011

KANTOR, M. M., CHERNYSHOVA, T. A., IGNATOV, D. V., and SHORSHOROV, M. KH., Moscow

"Electron Microscope Study of the Structure of Welded Joints of the Alloy TsM-2A"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71, pp 97-100

Abstract: Electronmicroscope studies were made of the structure of welded joints of TsM-2A alloy, made by cathode ray welding in various modes. It is demonstrated that processes of crystallization of the welding bath and decomposition of the solid solution in the cast zone of welded joints can be controlled by changing the thermal cycles of welding. Decomposition of the solid solution with separation of molybdenum carbide along the grain boundaries was found in the cast formation of the second phase depends on the thermal cycles of welding. Decreasing the chemical heterogeneity of the cast metal by welding in severe modes or by holding at temperatures above the phase separation point can be used to prevent formation of the second phase.
1/1

USSR

IGNATOV, D. V., KORNILOVA, Z. I., LAZAREV, E. M., and POPOVA, V. M.,

"Oxidizability of Ti-Al Alloys"

Abstract: Ti-Al alloys containing 6.8, 10, and 14% Al (by weight) were made in order to study the oxidation kinetics and determine phase composition of the scale formed. Oxidation kinetics was determined according to increase in sample mass after heating in air in muffle furnaces at 800 and 1000°C. Phase composition was determined by electronographic and x-ray methods. Distribution of titanium and aluminum in the scale and alloy was studied by x-ray spectral analysis.

The mechanism of the effect of aluminum on decreasing the oxidation rate of titanium at 800 and 1000°C (at 10-14% Al) resulted in the following: a) an increase in the forces of interatomic reaction (especially when the Ti_3Al phase is formed) significantly reduces the solubility of oxygen in the alloys; and b) the formation of an oxide (γ-Al_2O_3) in an intermediate layer through which the oxygen diffusion rate to the metal-scale interface is decreased.

The alloy containing 14% Al is oxidized approximately 10 times faster at 1000°C in comparison with the oxidation rate of nickel- and chromium-base

1/2

– 42 –

USSR

ICNATOV, D. V., et al., Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-
Apr 72, pp 204-209

alloys. This difference in oxidizability of the indicated alloys with
aluminum can be explained as follows: a) addition of 6-8% Al may not
suppress the allotropic transformation from alpha- to beta-titanium which
is the main cause of reduced heat resistance in alpha-titanium alloys; b)
for an aluminum content above 10% a multiphase scale is formed consisting
of titanium oxides (mainly TiO_2) and the aluminum oxide γ-Al_2O_3,
whereupon these oxides do not form a stable chemical compound between
themselves.

2/2

Welding

USSR   UDC 621.791.011

KANTOR, M. M., CHERNYSHOVA, T. A., IGNATOV, D. V., and
SHORSHOROV, M. KH., Moscow

"Electron Microscope Study of the Structure of Welded Joints
of the Alloy TsM-2A"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71,
pp 97-100

Abstract: Electronmicroscope studies were made of the structure
of welded joints of TsM-2A alloy, made by cathode ray welding in
various modes. It is demonstrated that processes of crystalliza-
tion of the welding bath and decomposition of the solid solution
in the cast zone of welded joints can be controlled by changing
the thermal cycles of welding. Decomposition of the solid
solution with separation of molybdenum carbide along the grain
boundaries was found in the cast formation of the second phase
depends on the thermal cycles of welding. Decreasing the chemi-
cal heterogeneity of the cast metal by welding in severe modes
or by holding at temperatures above the phase separation point
can be used to prevent formation of the second phase.
1/1

USSR

UDC 666.29

KORNILOVA, Z. I., and IGNATOV, D. V.

"Heat-Resistant Coatings on Titanium Alloy"

Moscow, Zashchita Metallov, Vol 6, No 6, Nov-Dec 70, pp 730-732

Abstract: It has been found that titanium alloys containing 9% Al and further alloyed with Zr, Sn, and Mo with a total content of them of 12% have high heat resistance (to 800-850°) with satisfactory plasticity. This article contains a study of oxidation of this alloy in air at 700-1,000° and the effectiveness of two heat-resistant coatings -- Si and Ni + Al. The scale and diffusion layers of the coatings were investigated by metallographic, electron diffraction, and radiographic methods. The heat resistance of titanium alloys can be increased while retaining high-temperature strength and plasticity by using coatings which form limited solid solutions with the alloys and are covered on the outer surface with oxide films preventing diffusion of oxygen through the coating. The coatings including the compounds with strong chemical binding must prevent diffusion of components to the gas phase. These requirements led to the selection of Si and Ni + Al coatings. The kinetic curves for oxidation of titanium alloy at 1,000° with the coatings and without them are presented.

1/2

- 7 -

USSR

KORNILOVA, Z. I., and IGNATOV, D. V., Zashchita Metallov, Vol 6, No 6, Nov-Dec
70, pp 730-732

It was found that the silicide coatings increase the heat resistance at
800° by 400 times and at $1,000^\circ$, by 50 times, and Ni + Al coatings by 25 times
at $1,000^\circ$. The high heat resistance of Ti_5Si_3 alloy with an unprotected film
of TiO_2 on the outer surface is explained by strong binding between Ti and Si
atoms in the Ti_5Si_3 lattice, which inhibits the transition of titanium ions to
the TiO_2 lattice. The primary formation of TiO_2 and not SiO_2 on the other sur-
face of the oxide is explained by the greater isobaric potential of formation
of TiO_2 -- 212.4 kcal/mole in comparison with 197.3 kcal/mole for SiO_2.
The oxidation rate of titanium alloy with a silicide coating at 800° is
70 times less than the alloy with 80% Ni + 20% Cr, and at $1,000^\circ$ the oxidation
rates of these materials are identical. It is thus concluded that by means of
such coatings it is possible to raise the strength of titanium alloys to the
level of nichrome alloys and almost completely eliminate the effect of oxygen
solubility and $\alpha \rightarrow \beta$-conversion on the oxidation rate.

2/2

U.C: 669.245

USSR

RYABTSEV, L. A., PRYAKHINA, L. I., and IGNATOV, D. V. , Moscow

"High-Temperature Oxidation Resistance of Nickel-Base Alloys"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, no 6, Nov-Dec 70, pp 190-191

Abstract: There is little if any information on the oxidation of multi-component nickel-base alloys with oxidizability as a function of alloying. The purpose of this study was to determine changes in the high-temperature oxidation of nickel-base alloys at 900° C as a function of open-air oxidation time and an increasing number of alloying elements. Three- Ni-Al alloys, with 3, 10, and 13.3 wt.% aluminum were selected for the study. It was found that the high-temperature oxidation resistance of the γ'-solid solution based on Ni_3Al (13.3% Al) in Ni-Al alloys is considerably higher than that of the γ-solid solution (3 wt.% Al) due to the formation of dense oxide films of spinel-type $\gamma-Al_2O_3$ and $NiAl_2O_4$. The presence of the γ'-phase in two-phase ($\gamma+\gamma'$) alloys causes higher oxidation resistance

1/2

USSR

RYABTSEV, L. A., et al, Izvestiya Akademii Nauk SSSR, Metally, no 6, Nov-Dec 70, pp 190-191

(at high temperatures). Subsequent addition of chromium (10 wt.%) and titanium (2 wt.%) results in a higher oxidation resistance of the nickel alloy with 6 wt.% Al. The further addition of alloying elements such as tungsten, molybdenum, and niobium has no appreciable effect on high-temperature oxidation resistance.

2/2

USSR

UDC 539.376:661.793

KORNILOVA, Z. I., IGNATOV, D. V., and LAZAREV, E. M., Moscow

"Investigation of the Heat-Resistance of the ST-4 Titanium Alloy and of Some Protecting Coatings On It"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 71, pp 113-115

Abstract: A kinetic and structural investigation was carried out of the oxidizability in the temperature interval of 700-1000°C of the ST-4 titanium alloy, unprotected and protected by coatings based on Si and Mo-Si. The Si coating consisted mainly of the compound Ti_5Si_3 and TiSi and $TiSi_2$ traces; the Mo-Si coating consisted mainly of $MoSi_2$ and of Mo_5Si_3. The Ti_5Si_3 coating showed the best protective properties against gaseous corrosion at 800-1000°C. The heat-resistance of the ST-4 alloy coated with Ti_5Si_3 at 800°C was 70 times greater than the heat-resistance of the 80%Ni + 20%Cr alloy. Protection of the ST-4 alloy by the investigated coatings makes it possible to eliminate the negative influence on the oxidation rate of titanium and its alloys of effects of the high solubility of oxygen (and nitrogen) in them and of the $\alpha \rightarrow \beta$ transformation. Two figures, one table, eleven bibliographic references.
1/1

1/2   030   UNCLASSIFIED   PROCESSING DATE--23OCT70
TITLE--ORIGIN OF CARBIDE INCLUSIONS IN MOLYBDENUM AND ITS ALLOY WITH
   CARBON -U-
AUTHOR-(04)-AGEYEV, N.V., IGNATOV, D.V., KANTOR, M.M., NALETOV, A.M.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(1), 89-91

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CARBIDE, MOLYBDENUM ALLOY, NONMETALLIC INCLUSION, ELECTRON
   MICROSCOPY, SOLID SOLUTION, EUTECTIC, METAL CRYSTALLIZATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1051   STEP NO--UR/0020/70/191/001/0089/0091

CIRC ACCESSION NO--AT0119918
                          UNCLASSIFIED

CIRC ACCESSION NO--AT0119918
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SHAPE AND DISTRIBUTION OF
  CARBIDE INCLUSIONS WAS STUDIED IN MO-C ALLOYS CONTG. 2 LEVELS OF C: (1)
  BELOW THE SATN. LIMIT IN MO AT THE EUTECTIC POINT (0.014-0.108 WT.
  PERCENT) AND (2) HIGHER THAN THE EUTECTIC CONCN. (0.05-0.07 WT.
  PERCENT). THESE ALLOYS WERE SOLIDFSOLIDIFIED ACCORDING TO 2 PROCEDURES
  AFTER MELTING: (A) WITH HIGH RATE OF CRYSTN., AND (B) AT A CONSIDERABLY
  , SLOWER CRYSTN. RATE; MELTING WAS DONE IN AN ELECTRON BEAM. THIN
  SPECIMENS WERE PREPC. AND STUDIED BY ELECTRON MICROSCOPY. THE MO-C
  0.05PERCENT ALLOY, WHEN CRYSTD. ACCORDING TO (A), SHOWED COLONIES OF
  DISTINCT EUTECTIC ORIGIN BETWEEN CRYSTALS OF SOLID SOLNS.; WHEN CRYSTD.
  ACCORDING TO (B) THE ALLOY SHOWED THE MO-C EUTECTIC WITH INCLUSIONS OF
  COARSE, IRREGULAR HEXAGONAL PRISMS OF MO_2C. THE ALLOY MO-C WITH C
  CONCN. (0.014-0.018 WT. PERCENT), CRYSTD. ACCORDING TO (ALPHA), HAD A
  SOLID SOLN. STRONGLY SUPERSATD. WITH C WITHOUT ANY EUTECTIC. THE SAME
  ALLOY CRYSTD. ACCORDING TO PROCEDURE (B) HAD SOME EUTECTIC. BY CHANGING
  THE CRYSTN. CONDITIONS IT IS POSSIBLE TO CHANGE THE CHARACTER OF SOLID
  SOLN. DECOMPN. DURING SOLIDIFICATION.   FACILITY: INST. MET. IM.
  BAIKOVA, MOSCOW, USSR.

UDC 669.295:620.193

USSR

FEDORCHUK, N. M., and IGNATOV, D. V., Moscow

"Oxidizability of Beta-Titanium Alloys and Their Protection From Gas Corrosion"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 6, Nov-Dec 72, pp 66-69

Abstract: A study was made of the oxidation kinetics of AN-5 titanium alloy (Ti-Nb-Mo-Cr, containing almost 52 wt% Ti) and IVT-1 titanium alloy (7% Mo+5.5% Cr+3% Fe+3% Al) with and without an aluminum coating under conditions of heating in air to 700-1200°C. It was established that there is intensive oxidation of the alloys at the phase transformation temperatures and that the average oxidation rate of samples coated with aluminum is significantly decreased where, for example, the oxidation rate of coated samples of AN-5 alloy is 14-20% less than that of nichrome in the 700-1000°C interval. The aluminum coating on AN-5 alloy completely eliminates the effect of the beta-solid solution decomposition on the oxidation rate of the sample in the 700-900°C interval. Graphic data show that both uncoated alloys begin oxidizing at a measureable rate at 700°C and then begin oxidizing at a rapid rate. AN-5 alloy reaches a peak oxidation rate (extrapolated) of slightly more than 3 mg/cm²/hr just about 900°C; then the rate falls sharply to 0.5 mg/cm²/hr

1/2

- 16 -

USSR

FEDORCHUK, N. M., and IGNATOV, D. V., Fizika i Khimiya Obrabotki Materialov, No 6, Nov-Dec 72, pp 66-69

at 1100°C where the oxidation starts to increase with increasing temperature. IVT-1 uncoated alloy reaches a maximum oxidation rate of 2.5 $mg/cm^2/hr$ at about 1025°C. The maximum oxidation rate of coated AN-5 was 0.1+$mg/cm^2/hr$ at 1200°C, and a measurable rate was not detected until 950°C, while the oxidation rate for coated IVT-1 was 0.2 $mg/cm^2/hr$ at 1000°C. Two figures, 6 bibliographic references.

2/2

USSR

UDC 669.295.5'28'26.018.8:669.234

TOMASHOV, N. D., IGNATOV, N. N., and CHERNOVA, G. P.

"Investigation of the Corrosion Resistance of Ti-Mo-Cr-Pd Alloys"

Translation: A study was made of the corrosion resistance of Ti-Mo-Cr alloys (5-30% Mo and 1-10% Cr) and certain ternary alloys supplementarily doped with 0.2 and 0.5% Pd in solutions of H_2SO_4 (5-40%) and HCl (5-25%) at 20, 60, and 100°. Supplementary doping of Ti-Mo alloys with chromium lessens the corrosion rate of the alloys in proportion to the increase of Cr concentration. The doping of Ti-Mo-Cr alloys with palladium raises their corrosion resistance 10-100 times. Two illustrations. Three tables. Bibliography of 11 titles.

1/1

1/2   028   UNCLASSIFIED   PROCESSING DATE--23OCT70
TITLE--PREPARATION OF THICK ANODE FILMS ON ALUMINUM ALLOYS IN A COMPOSITE
  ELECTROLYTE -U-
AUTHOR-(03)-IGNATOV, N.N., ZALIVALOV, F.P., TOMASHOV, N.D.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(3), 554-60

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--ALUMINUM ALLOY, ELECTROLYTE, ANODIZATION, MICROHARDNESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1948   STEP NO--UR/0080/70/043/003/0554/0560

CIRC ACCESSION NO--AP0118910
                            UNCLASSIFIED

2/2   028   UNCLASSIFIED   PROCESSING DATE---23OCT70
CIRC ACCESSION NO--AP0118910
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDIES WERE MADE OF THICK FILM
  ANODIZING OF INDUSTRIALLY IMPORTANT AL ALLOYS IN H SUB2 SO SUB4 20 PLUS
  H SUB2 C SUB2 O SUB4 15 G-1. AT 15-18DEGREES, 2.5 AND 5 A.-DM PRIME2
  C.D., AND FOR 0.5-3.5 HR. VOLTAGE VS. TIME CURVES ARE OBTAINED AND
  THEIR CHARACTERISTICS ARE EXPLAINED. THE RATIO ETA OF THE WT. OF ANHYD.
  AL SUB2 O SUB3 FORMED TO THE WT OF AL REACTED DECREASES WITH TIME FOR
  MOST CASES DUE TO DISSOLN. OF THE OXIDE FILM. THE QUALITY OF THE
  ANODIZED FILM DETERIORATES WITH LOWER ETA. THE THICKNESS INCREASES
  LINEARLY WITH TIME AT THE RATE 0.7-1 MU-MIN. FOR ALLOYS CONTG.
  NEGLIGIBLE CU, THE MICROHARDNESS IS 480-520 KG-MM PRIME2.   CU DECREASES
  THE MICROHARDNESS AND INCREASES THE POROSITY. AT THE HIGHER C.D. OF
  5A-DM PRIME2, THE FILM QUALITY IMPROVES. THE COMPOSITE ELECTROLYTE
  GIVES FILMS COMPARABLE TO THOSE OBTAINED IN COLD H SUB2 SO SUB4 AND CAN
  BE USED WIDELY IN PRACTICE.   FACILITY: INST. FIZ. KHIM.; MOSCOW,
  USSR.

UNCLASSIFIED

Information Theory & Pattern Recognition

IGNATOV, V. A., KONAREV, A. P., PETROPOL'SKIY, N. V., POLYAK, L. M.

"An Angle-to-Code Converter"

Translation: Converters for changing shaft position to code are known
which contain a phase shifter; a power supply; an amplifier; and a series
circuit comprised of a null detector, control module, square pulse gener-
ator, frequency dividers, flip-flops, coincidence gates, and a register.
The register input is connected to the output of the control module, and
the output is connected through a coincidence gate to the output of one
of the frequency dividers. A disadvantage of such converters is the
high error rate of conversion.
     To reduce conversion error, the proposed converter contains an ad-
ditional multiple-pole phase shifter and two parallel networks made up of
an amplifier, null detector, flip-flop, coincidence gate, OR gate, and pulse
counter connected in series. The inputs of these networks are connected

1/2