USSR

SOKOLOV, M. S., et al, Khimiya v Sel'skom Khozyaystve, no 11, Nov 70, pp 48-52

artificial sprinkling to imitate rain with an intensity of 0.83 mm/min at a precipitation norm of 10 mm. The herbicide absorption is arbitrarily characterized by its semilethal dose penetration time. The rate of penetration of aqueous solutions of herbicides in ready-to-use solutions is higher than that of their chemically pure form. The experimental data on the penetration rate and wash-off of 2,4-D sodium salt were confirmed by the microquantitative determination of the toxic agent absorbed by the plants. Tables in the original article cite data on absorption and retaining of the triethanolamine salt of 2,4-D with irrigation and those on the sodium salt of 2,4-D with irrigation and wash-off.

2/2

USSR

UDC 669-973:669.295'296

KOSHELEV, P. F., MIKHEYEV, V. S., NIKITIN, P. N., Institute of
the Machine Studies, Academy of Sciences USSR

"Strength and Plasticity at Low Temperatures of Titanium Alloys
With Zirconium"

Moscow, Metallovedeniye, No 10, 1971, pp 30-33

Abstract: The mechanical properties of titanium alloys with
zirconium (up to 30%) and their stress concentration sensitivities
at 20°C, -196°C, and -269°C were investigated. The principles
of the change of strength and plasticity, as a function of Zr-
content, were experimentally determined using iodide zirconium
and TG-110 titanium. The results are discussed by reference to
diagrams showing the mechanical properties of alloys of the
system Ti-Zr at 20°C, -196°C, and -269°C, stress-strain diagrams
of Ti-alloys with 5% Zr and 20% Zr, and their stress concentra-
tion sensitivities. The ultimate strength and yield point of
the investigated alloys increase smoothly with increasing Zr-
content. By alloying Ti with Zr, alloys of sufficient strength
and without significantly increased stress concentration sensi-
1/2

USSR

KOSHELEV, P. F., et al, Metallovedeniye, No 10, 1971, pp 30-33

tivity can be obtained. Titanium alloys with up to 15% Zr are
not susceptible to stress concentrations, possess satisfactory
plasticity, and can be recommended for use in cryogenic
technology. 3 illustrations, 4 bibliographic references

2/2

- 46 -

MIKHEYEV, V. S., NIKITIN, P. N., and KOSHELEV, P. F., Moscow

"The Mechanical Properties of Ti-Mo Alloys at Low Temperatures"

Abstract: The alloying of titanium with molybdenum in combination with zirconium in the α-solid solution range makes it possible to produce alloys with high mechanical properties at low temperatures. The rules of the variation of mechanical properties of Ti-Mo alloys and the effects of the structure and stress concentrations on these alloys were investigated at +20 and -269°C. The strength properties of the alloys increased with increasing Mo contents, but the plasticity decreased at both temperatures. Ti-Mo alloys with $\sim$4.0 wt%. Mo are of practical interest in cryogenic technology, because they are plastic at sufficiently high strength and have low susceptibility to stress concentration over a large low-temperature range. A significant heterogeniza-tion of the structure in alloys with Mo content $\geq$ 4.0-5.0 wt% results in decreased plasticity and increased susceptibility to stress concentrations. Three illustrations, four bibliographic references.

1/1

USSR   UDC 539.4

KOSHELEV, P. F., MIKHEYEV, V. S., NIKITIN, P. N., Institute of Machine Science

"The Influence of Tin Upon the Strength and Plasticity of Titanium at Low Temperatures"

Kiev, Problemy Prochnosti, No 2, Feb 72, pp 68-69

Abstract: A study is made of the mechanical properties, and the sensitivity to stress concentration, of alloys of titanium with tin corresponding to the structure of an alpha-solid solution, at temperatures from 20 to -253° C. Research was conducted on alloys containing 2.5, 5.0, 8.0, and 12.0% of tin by weight, with static stretching of smooth and incised cylindrical specimens. The alloys were melted in a vacuum-arc furnace with a nonconsumable tungsten electrode in a helium atmosphere. Titanium-base alloys, containing up to 5.0% of tin by weight, are plastic and possess low sensitivity to stress concentrations in a wide range of low temperatures. Increasing the tin content in the alloy above 5% by weight brings about an acute decrease of the plastic properties of the alloys and acutely decreases their deformability, particularly at low temperatures. Three figures, 2 references.

1/1

- 65 -

USSR   UDC 539.4

MIKHEYEV, V. S., KOSHELEV, P. F., NIKITIN, P. N., Institute of Metallurgy
imeni A. A. Baykov

"The Mechanical Properties of Alloys AT3 and AT6 at Low Temperatures"

Kiev, Problemy Prochnosti, No 1, Jan 72, pp 63-65

Abstract: The behavior of alloys AT3 and AT6 at temperatures from 20 to
-253°C was studied, and the following results were obtained: the standard
mechanical properties were determined; the sensitivity to stress concentrations
was studied; it was shown that the impact viscosity varied in relation to the
test temperature and the incision sharpness. The conclusion was drawn that
these alloys can be used in cryogenic-engineering structures operating at
temperatures to -196°C. In the entire temperature range under investigation,
alloy AT6 has definite advantages over alloy AT3; however, account must be
taken of the smaller amount of work required for crack spreading during the
destruction of this alloy. When these alloys are used at the temperature of
liquid hydrogen, calculations should be made for strength and the permissible
stresses should be specified, with account taken of a certain amount of
sensitivity of the alloys with respect to stress concentrations. One table,
three figures, three references.
1/1

- 64 -

KOSHELEV, P. F., MIKHEYEV, V. S., and NIKITIN, P. N., Institute of Metallurgy, Academy of Sciences USSR

"Mechanical Properties of Binary Titanium Alloys With Vanadium and Niobium at Low Temperatures"

Abstract: This study concerns the mechanical properties and stress concentration sensitivity of binary Ti alloys with various contents of V and Nb at temperatures from +20 to -269°C. Discussed are the principles governing the variation of properties and optimum alloying limits for Ti with V and Nb for producing stronger multicomponent alloys suited for use in the cryogenic technology. The strength of Ti alloys with up to 12% V increases 4.7 times at temperatures as low as -253°C; but the alloy becomes brittle. In Ti alloys with up to 11% Ni, the strength increases about 3.5 times and a certain amount of plasticity is retained. For service at temperatures as low as -269°C Ti alloys with up to 6-7% Nb are recommended; Ti alloys with up to 5-6% V may be used for service at temperatures as low as -253°C. (3 illustrations, 5 bibliographic references)

1/1

USSR

UDC 539.4.015

MIKHEYEV, V. S., KOSHELEV, P. F., NIKITIN, P. N., SHNYREV, G. D. (Moscow), Institute of Metallurgy imeni A. A. Baykov

"The Influence of Beta-Stabilizers on the Strength and Plasticity of Titanium at Low Temperatures"

Abstract: In the article is investigated the influence of beta-stabilizing metals (tantalum, vanadium, niobium) on the strength, plasticity, and sensitivity to stress concentration in titanium-based binary alloys corresponding to the structure of an alpha-solid solution, containing two atomic percent of the second component, at temperatures of 20 to $-253^\circ C$. Attention is paid to the rules governing the change of the mechanical properties of alloys in the multicomponent Ti-Ta-Cr; Ti-Ta-V-Mo systems at low temperatures. 2 figures, 1 table, 2 bibliographic entries.

1/1

N

USC 669.295.5'29+'292

USSR

MIKHEYEV, V. S., and NIKITIN, P. A., Moscow

"Investigation of a Section of the Structural Diagram of the Ti-Ta-V System"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan-Feb 1970, pp 139-192

Abstract: A   was made of the Ti-Ta-V system according to three radial
sections from the titanium angle to the side of Ta-V with a ratio Ta:V = 3:1,
1:1, and 1:3 up to 60 wt. % Σ Ta,V. Titanium iodide, tantalum (99.9% pure),
and electrolytic vanadium were used for preparing the alloys. Specimens weigh-
ing 30 g were smelted in a vacuum arc furnace in an argon atmosphere with 4-5
fold remelting. Tantalum was introduced into the alloy in the form of a Ti-Ta
master alloy at the ratio of 1:1. The alloys were homogenized at 1100° C for
75 hrs and forged at temperatures of 900-1000° C. The alloys, containing up to
16 wt. % of ΣTa, V, were formed in a cold state with a degree of 50% area re-
duction with subsequent heat treatment at corresponding temperatures. The
specimens were annealed at 800, 700, and 600° C for 150, 250, and 400 hrs,
respectively, with water quenching. A diagram of the composition of the system
Ti-Ta-V up to 60% ΣTa, V constructed according to data from microstructural
analysis, partial x-ray micrography, and measurements of electrical resistance

1/2

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MIKHEYEV, V. S., et al, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan-Feb 1970, pp 189-192

is presented. Tantalum and vanadium form continuous solid solutions with α-titanium and have a limited solubility with β-titanium. The solubility of Ta, V in α- and β-titanium at 600° C is in wt. T: α-Ti -- 6.4-6.8, 5.0-5.2, and 3.2-3.5; β-T -- 53-55, 42-40, and 25, respectively.

2/2

- 5 -

A70-25295 #   Study of the mechanical properties of new titanium alloys at low temperatures (Issledovanie mekhanicheskikh svoistv novykh titanovykh splavov pri nizkikh temperaturakh). P. F. Koshelev, V. S. Mikheev, and P. N. Nikitin (Gosudarstvennyi Nauchno-Issledovatel'skii Institut Mashinovedeniia, Moscow, USSR). *Problemy Prochnosti*, vol. 2, Feb. 1970, p. 40-45. In Russian.

Results of a study of the mechanical properties of a number of two-, three-, and higher-component titanium alloys. A promising trend in the manufacture of such alloys for use in cryogenic technology is indicated. The advantages of alloying titanium with tantalum are described. It is shown that an optimal complex of mechanical properties at temperatures down to -235 C is possessed by alloys with a Ta-V-Mo content ranging from 3.9 to 6.3%, an alpha solid solution structure, and traces of a dispersed beta phase. A.B.K.

A70-23788 #   Study of a part of the phase diagram of the
Ti-Ta-V system (Issledovanie chasti diagrammy sostoianiia sistemy
Ti-Ta-V). V. S. Mikheev and P. N. Nikitin, Akademiia Nauk SSSR,
Izvestiia, Metally, Jan.-Feb. 1970, p. 189-192. 8 refs. In Russian.

Study of the Ti-Ta-V system along three radial sections from the
titanium corner to the Ta-V side with Ta/V ratios of 3:1, 1:1, and
1:3 up to 60 wt % sigma Ta, V. It is found that tantalum and
vanadium form continuous solid solutions with beta titanium and
have limited solubility in alpha titanium. The solubility of sigma Ta,
V in alpha and beta titanium is determined along the investigated
sections.   A.B.K.

A.B.K.

A.S.

1/1

REEL/FRAME
19770144

/8

USSR   UDC   662.612.3

VOLCHKOV, E. P. and NIKITIN, P. V.

"Pitting of a Graphite Surface Under Blasting by an Inert Gas"

Novosibirsk, Fizika goreniya i vzryva, No 3, 1973, pp 369-375

Abstract: A method is proposed for computing the results of an
experimental investigation into the turbulent boundary layer on
the pitted and porous surface of graphite under a constant blast
of an inert gas. The purpose of such a blast is to protect the
surface against the action of chemically aggressive gases. Such
factors as the speed of surface destruction, the coefficients of
heat exchange and friction, and concentration of the components in
the gas mixture near the surface, all of practical importance in
such problems, are determined. The authors begin their analysis by
considering the turbulent boundary layer developed on the reacting
surface under blasting by the inert gas, using the integral rela-
tionship for diffusion of the i-th chemical element for the effect-
ive binary mixture. This equation is obtained from an earlier pa-
per (E. P. Volchkov, et al, TVT, 8, 1, 1970, p 116). Experiments
involving a graphite surface heated by induction are described and
their results discussed. It is found that the effectiveness of the
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USSR

VOLCHKOV, E. P., et al, Fizika goreniya i vzryva, No 3, 1973, pp 369-375

blast increases with decreasing molecular weight of the blasting gas and with increasing isothermic factor.

2/2

- 90 -

USSR

VASIL'KOVSKIY, V. A., KOVTUN, N. M., KUPROYANOV, A. K., NIKITIN, S. A., and OSTROVSKIY, V. F.

"Study of Nuclear Magnetic Resonance in $Gd_xY_{1-x}Fe_2$ Compounds"

Abstract : The nuclear magnetic resonance spectra were measured on gadolinium and yttrium nuclei in $Gd_xY_{1-x}Fe_2$ compounds at a temperature of $77°$ K. The contributions to the hyperfine fields in the gadolinium and yttrium nuclei on the part of the nearest neighbors of the gadolinium atom sublattice were evaluated. The primary contribution to the hyperfine fields in yttrium and gadolinium is made by the iron atom sublattice.

The variation of the position of the center of gravity of the nuclear magnetic resonance spectra of gadolinium and yttrium as a function of the atomic % concentration of gadolinium and the variation with temperature, of the nuclear magnetic resonance of Gd^{155} in $GdFe_2$ and Y^{89} in YFe_2 are plotted.

A table is presented for the probability of replacement of the neatest Gd atoms by a Y atom and the experimental procedure for obtaining and recording the
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nuclear resonance spectra is described in detail. The dependence on composi-
tion and temperature of the nuclear magnetic resonance of Gd^{155}, Gd^{157}, and
Y^{89} is determined both by the iron and gadolinium sublattices.

2/2

USSR

BELOV, K. P., NIKITIN, S. A., et al (Moscow State University, Baykov Metal-lurgical Institute of the USSR Academy of Sciences)

"Magnetic Properties of Rare Earth Metal and Iron Compounds of the RFe_3 Type"

Abstract: Magnetic studies of the compounds $DyFe_3$, YFe_3, $HoFe_3$, and $ErFe_3$ -- including measurements of the magnetization in fields up to 53 koersteds and of the variation, with temperature, of the coercive force -- are carried out. The magnetic moment per RFe_3 molecule and also the variation, with temperature, of spontaneous magnetization are determined. The Curie temperature is determined by a thermodynamic method. An anomaly of the coercive force near the magnetic compensation temperature is observed. The variation, with temperature, of the magnetic properties is due to the ferrimagnetic structure of the compounds which is characterized by an antiparallel orientation of the magnetic moments of the iron ion and rare earth ion sublattices. The Curie temperature of the RFe_3 compounds increases noticeably upon an increase of the rare earth ion spin, and this indicates that the contribution of exchange interaction between the rare earth ions and iron ions is considerable.
1/1

BELOV, K. P., YELYUTIN, O. P., KATAYEV, G. I., NIKITIN, S. A., PSHECHENKOVA,
G. V., TARATYNOV, V. P., and SHUL'TE, L. A., Moscow State University imeni
M. V. Lomonosov,   Central Scientific Research Institute of Fer-
rous Metallurgy imeni I. P. Bardin

"Study of Magnetic Properties of Rare-Earth Dysprosium-Holmium-Erbium Alloys
at a Temperature of 4.2° K"

Abstract: The absence of systematic research on saturation magnetization for
polycrystalline samples of rare-earth metals and their alloys makes it impos-
sible to establish whether, in practice, they can be used as high-induction ma-
terials in fields up to 50 kOe at low temperatures. The purpose of the pres-
ent article was to attempt to fill this gap. Pure rare-earth metals (ob-
tained from   the   State Scientific Research and Planning Institute of
the Rare Metals Industry) were studied, as well as dysprosium-holmium-erbium
system alloys. Their magnetization curves were measured in fields up to 50
kOe at 4.2° K, values for coercive force and remanence were determined, and
hysteresis loops were taken.
1/1

USSR

NIKITIN, S. A., Rostov State University

"On the Problem of the Isothermal Flow of a Viscous Gas in a
Circular Tube"

Abstract: The nonlinear problem of the isothermal flow of a
viscous gas in a circular tube of finite length is discussed.
The problem is solved on the basis of a system of nonlinear dif-
ferential equations of the boundary layer type. All quantities
characterizing the gas flow are expressed in the form of functions
of pressure, which in this formulation depends only on the longi-
tudinal coordinate. An ordinary second-order nonlinear differen-
tial equation is obtained which was integrated numerically on the
"Mir" computer by the Kutta-Merson method with automatic selection
of the integration interval; values are given for one set of ini-
tial parameters. The pressure distribution and velocity field
along the tube are compared with the solution of this problem in
the linear formulation that was given in a previous paper by the
author. Various cases of the velocity distribution in the initial
cross section of the tube are discussed.

1/1

USSR

BELOV, K. P., NIKITIN, S. A., TALALAYEVA, YE. V., CHERNIKOVA, L. A.,
KUDRYAVTSEVA, T. V., TIKHONOV, V. V., and IVANOVSKIY, V. I., Moscow State
University

"Determination of the Exchange Interaction of Ferrite-Gadolinium Garnet
Sublattices Based on the Magnetocaloric Effect"

Abstract: Ferrite-rare earth garnets $R_3Fe_5O_{12}$ have a trisublattice magnetic
structure. In the majority of cases within the framework of molecular
field theory it is possible to examine such ferrite-garnets as having a
bisublattice structure. In this case both a and d iron sublattices are
examined as a single Fe_{a-d}-sublattice, in the effective exchange field of
which are found rare earth ions. The author determined the effective
exchange field acting on the R^{3+} ions from the side of the Fe^{3+} ions.
Based on the measurement data of the magnetocaloric effect, the susceptibility
of the paraprocess, and the specific heat in the region of the temperature
of compensation, the authors determined the exchange field in the garnet
structure. The measurements showed that for the $Gd_3Fe_5O_{12}$ garnet the field

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USSR

BELOV, K. P., et al., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 61, No 3, Sep 71, pp 1101-1105

H_{2eff} = 258 kOe, and for $Gd_3Ga_{0.3}Fe_{4.7}O_{12}$ the field H_{2eff} = 232 kOe, which is 10% less than   for the gadolinium garnet. The article contains 3 illustration and 6 bibliographic entries.

2/2

- 103 -

USSR   UDC 538.116

NIKITIN, S. A., Chair of General Physics for Biologists

"Investigation of Intrinsic Magnetization of Ferromagnetics Close to the Curie
Point With the Aid of the Thermodynamic Theory of Phase Transitions of the Second
Kind"

Moscow, Vestnik Moskovskogo Universiteta, No. 6, Nov/Dec 70, pp 664-670

Abstract: It is shown that the cubic equation for magnetization at $H \neq 0$ obtained
by Landau for ferromagnetics close to the Curie point and following from the Landau
expansion is also applicable for ferrimagnetics, including ferrites. In the para-
magnetic region the susceptibility is shown to be subject to the Néel law and not
to the Curie-Weiss law, as in the case of ferromagnetics. The simplest type of
ferromagnetic crystal, which can be divided into two sublattices inserted into one
another, is considered.   The spins of the first sublattice are directed to the
right and the spins of the second are to the left, so that the spins of atoms of
the nearest neighbors are always antiparallel. It is shown that both below and
somewhat above the Curie temperature the process of intrinsic magnetization in the

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USSR

NIKITIN, S. A., Vestnik Moskovskogo universiteta, No. 6, Nov/Dec 70, pp 664-670

ferrimagnetic is characterized by the fact that with a change in the field I_1 and I_2 the magnetizations of the first and second sublattices, by remaining antiparallel, vary proportionally: $I_2 = -\xi I_1$, where $\xi > 0$ is a coefficient independent of the field. The ferrimagnetic state with the magnetization vectors of the sublattices oriented antiparallel is thus retained upon the application of a field close to the Curie point. The role of the magnetic field is only to induce considerably greater antiparallel molecular fields causing the ferrimagnetic state.

2/2

USSR   UDC 669.861.5,864.018.58(088.8)

NIKELOV, K. P., YELYUTIN, O. P., NIKITIN, S. A., PSHECHENKOVA, G. V., SOKOLOV,
V. I., TARTYNOV, V. P. [Central Scientific Research Institute for Ferrous
Metallurgy imeni Bardin, Moscow University]

"A Magnetic Alloy"

Translation: The alloy contains Er 40-80%, Dy 20-60% and differs from earlier
known alloys in its higher values of saturation magnetism (28,500-32,800 gauss)
at cryogenic temperatures.

1/1

USSR   UDC 669.865.866.018.58 (088.8)

NIKELOV, K. P., YELYUTIN, O. P., NIKITIN, S. A., PSHECHENKOVA, G. V., SOKOLOV,
V. I., TARTYNOV, V. P. [Central Scientific Research Institute for Ferrous
Metallurgy imeni Bardin, Moscow University]

"A Magnetic Alloy"

Translation: The alloy contains Er 20-80%, Ho 20-80%, and differs from the
earlier known Fe-Co alloy (24,600 gauss) in its higher values of saturation
magnetism (28,500 - 32,800 gauss) at cryogenic temperatures.

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1/2   029   UNCLASSIFIED   PROCESSING DATE--04DEC70
TITLE--EFFECTS OF THE PARAMAGNETIC PROCESS IN RARE EARTH FERRITE GARNETS
-U-
AUTHOR-(02)-BELOV, K.P., NIKITIN, S.A.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR: SERIYA FIZICHESKAYA; MAY,
1970; PP 957-64
DATE PUBLISHED----MAY70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY, PHYSICS

TOPIC TAGS--FERRITE, GARNET, RARE EARTH COMPOUND, BIBLIOGRAPHY,
THERMODYNAMICS, CRYSTAL LATTICE, CURIE POINT, PARAMAGNETIC MATERIAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/1889   STEP NO--UR/0048/70/000/000/0957/0964

CIRC ACCESSION NO--AP0137086
                              UNCLASSIFIED

CIRC ACCESSION NO--AP0137086
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL DATA ON THE
PARAMAGNETIC PROCESS IN RARE EARTH FERRITE GARNETS IN THE VICINITY OF
THE CURIE POINT, THE COMPENSATION POINT, AND IN THE REGION OF THE "LOW
TEMPERATURE" POINT ARE ANALYZED ON THE BASIS OF THE THEORY OF MOLECULAR
FIELDS AND THERMODYNAMIC RELATIONSHIPS. THE CONCLUSION IS DRAWN THAT
DUE TO THE PARAMAGNETIC PROCESS IN THE RARE EARTH SUBLATTICE THE
TRANSITION AT THE COMPENSATION POINT IN A MAGNETIC FIELD POSSESSES THE
PROPERTIES OF A PHASE TRANSITION OF THE FIRST KIND. THE CONSTANTS OF
THE PARAMAGNETIC PROCESS AT THE CURIE POINT, THE "LOW TEMPERATURE"
POINT, AND THE COMPENSATION POINT VARY UNIFORMLY DURING THE TRANSITION
FROM ONE RARE EARTH FERRITE GARNET TO ANOTHER, DEPENDING ON THE ATOMIC
CONSTANTS OF THE RARE EARTH IONS.   / FACILITY: PHYSICS DEPARTMENT,
MOSCOW STATE UNIVERSITY.

UNCLASSIFIED

USSR

N

NIKITIN, S. A., SOLNTSEVA, L. I. (Moscow State University)

"Effects of Pressure on the Galvanomagnetic Effect and the Critical Field in a Single Crystal of Dysprosium"

Abstract: The influence of pressure on the galvanomagnetic effect in dysprosium single crystals is measured at temperatures between 85 and 177°K. A strong dependence of the pressure-induced shift of the critical field on temperature is observed. A thermodynamic analysis of the experimental data for dysprosium shows that the increase of the critical field with pressure at 110-140°K can be explained by the growth of exchange interaction. The correlations between dH_c/d_p and dH_c/dT and also between the magnetostriction and dH_c/dT found in the present investigation indicate that the decrease of H_c due to cooling below 160°K, which results in a transition to the ferromagnetic state, occurs in dysprosium as a result of anomalous growth of the lattice constant c below the paramagnetism-helicoidal antiferromagnetism transition temperature.

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USSR

N

BELOV, K. P.; NIKITIN, S. A. (Physics Department, Moscow State University)

"Effects of the Paramagnetic Process in Rare-Earth Ferrite Garnets"

Moscow, Izvestiya Akademii Nauk SSSR: Seriya Fizicheskaya; May, 1970; pp 957-64

ABSTRACT: Experimental data on the paramagnetic process in rare-earth ferrite garnets in the vicinity of the Curie point, the compensation point, and in the region of the "low-temperature" point are analyzed on the basis of the theory of molecular fields and thermodynamic relationships. The conclusion is drawn that due to the paramagnetic process in the rare-earth sublattice the transition at the compensation point in a magnetic field possesses the properties of a phase transition of the first kind. The constants of the paramagnetic process at the Curie point, the "low-temperature" point, and the compensation point vary uniformly during the transition from one rare-earth ferrite garnet to another, depending on the atomic constants of the rare-earth ions.

The article includes 23 equations and 6 figures. There are 14 references.

1/1

Acc. Nr: AP0043698

Ref. Code: UR 0056

ON THE THEORY OF ANOMALIES OF PHYSICAL PROPERTIES OF FERROMAGNETIC SUBSTANCES IN THE VICINITY OF THE MAGNETIC COMPENSATION POINT

K. P. Belov, S. A. Nikitin

It is shown by employing the molecular field method that at the compensation point of rare earth ferrite-garnets there should arise anomalies in the magnetocalorimetric effect, magnetostriction coercive force and also in the entropy, specific heat and specific volume (in the presence of an external field). This conclusion is in agreement with the experimental data. It is suggested that the compensation point of ferrimagnetics in an external magnetic field is a phase transition of the first kind.

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REEL/FRAME
19770102

1/2   031   UNCLASSIFIED   PROCESSING DATE--23OCT70

TITLE--KA-26 IS IN THE SKY -U-

AUTHOR--NIKITIN, V.

COUNTRY OF INFO--USSR

SOURCE--KOMSOMOL, SKAYA PRACDA, JULY 15, 1970, P 2, COLS 4-6

DATE PUBLISHED--15JUL70

SUBJECT AREAS--AERONAUTICS

TOPIC TAGS--AIRCRAFT FLIGHT TEST, HELICOPTER PERFORMANCE, CIVIL AIR
    FLEET/(U)KA26 HELICOPTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1269   STEP NO--UR/9007/70/000/000/0002/0002

CIRC ACCESSION NO--AN0118318
                        UNCLASSIFIED

CIRC ACCESSION NO--AN0118318
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ACCORDING TO THE ARTICLE, THE
  HELICOPTER "KA 26" IS THE ONLY HELICOPTER IN THE SOVIET CIVIL AVIATION
  FLEET DESIGNED AS THE "FLYING CHASSIS". IN THE TESTS CONDUCTED THIS
  SPRING NEAR LABRADOR OFF A FISHING BASE VESSEL, THE "KA 26" WAS ABLE TO
  SCOUT THE AREA WITHIN THE 250 KM RADIUS AND REMAIN IN THE AIR FOR MORE
  THAN 4 HOURS. IT WAS FLOWN BY TEST PILOT GENADIY PROVALOV AND AVIATION
  TECHNICIANS VLADIMIR ZAKHARYEV AND ROBERT LAVRENT, YEV.   THE AUTHOR OF
  THE ARTICLE, V. NIKITIN, WAS THE "LEADING TEST ENGINEER".
  FACILITY: STATE SCIENTIFIC RESEARCH INSTITUTE OF CIVIL AVIATION.

UNCLASSIFIED

Graphite

USSR   UDC 546.882'26

GAL', V. V., and NIKITIN, V. A., Institute of High Temperatures
of the Academy of Sciences USSR

"Investigation of the Formation Process of Niobium Carbide by
Diffusion Metallization of Graphite in a Pseudo-Liquefied
Layer"

Abstract: The formation of niobium carbide by diffusion metal-
lization of graphite in a pseudo-liquefied layer was investiga-
ted by analyzing the kinetics of the carbide layer growth on
compact graphite particles in the temperature interval of 1500—
—3000 °C and the time range of 5 min — 3 hrs. The investigation
  results are discussed by reference to diagrams showing the
phase   distribution of C, the thickness of the NbC-layer depen-
ding on the settling time, the thickness of the carbide layer
in relation to the settling temperature of Nb during 1 hr, and
the settling rate of Nb depending on the temperature by forming

1/2

USSR

the layer in H and by decomposition of $NbCl_5$. The formation of
the NbC-layer by decomposition of $NbCl_5$ on graphite particles is
shown. The investigation demonstrates the possibility of niobium
carbide formation by diffusion metallization of graphite by de-
composition of $NbCl_5$ for the saturation temperature over 2400 °C.
Six illustr., two biblio. refs.

2/2

USSR

NIKITIN, V. A., et al.

"Problems of the Physics of Elementary Particles and the Atomic Nucleus" (book)

Moscow, Atomizdat; 1970, 295 pp

ABSTRACT: The book consists of a series of 7 articles: I. "Study of the Elastic Scattering of Protons by Nucleons in the 1-70-bev Energy Range", by V. A. Niki- tin (Joint Institute of Nuclear Research, Dubna); II. "Probability Description of Scattering at High Energies and the Smooth Quasi Potential", by A. A. Logunov and O. A. Khrustalev (High-Energy Physics Institute, Serpukhov); III. "Scattering of Hadrons at High Energies and the Quasi-potential Approach in Quantum Field Theory", by V. R. Garsevanishvili, V. A. Matveyev, and L. A. Slepchenko (Joint Institute of Nuclear Research, Dubna); IV. "Interaction of Photons with Matter", by Samuel C. C. Ting (Physics Department and Laboratory of Nuclear Studies, MIT, and Hamburg Electron Synchrotron [translated from English]); V. "Short-Wave Repulsion and Violation of Chiral Symmetry in Low-Energy Scattering", by V. V. Serebryakov and D. V. Shirkov (Mathematics Institute of Siberian Department of USSR Academy of Sciences, Novosibirsk); VI. "Violation of CP Invariance in the Decay of Neutral K-Mesons", by S. M. Bilen'kiy (Joint Institute of Nuclear Re- search, Dubna); VII. "Nonlocal Quantum Theory of a Scalar Field", by G. V. Yefi- mov (Joint Institute of Nuclear Research, Dubna).

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USSR

NIKITIN, V. A., Atomizdat; 1970, 295 pp

    I. A review of the experimental methods for the investigation of elastic scattering of protons by protons and nuclei at high energies is presented in this paper. The main results of the experiments on pp- and pd-scattering in the region of $E > 1$ bev are given. The problem concerning the verification of dispersion relations for pN-scattering is discussed. A review of the models of NN interactions at high energies is presented.

    II. The connection between the probability and quasi-potential descriptions of scattering at high energies is studied. It is shown that the probability description of scattering may be considered as some grounds for the necessary introduction of smooth quasi potentials to quantum field theory.

    III. A review of methods and some results of the quasi-potential approach to high-energy hadron collisions are presented.

    IV. The interaction of photons with matter is discussed. The review consists of three parts:

    (1) the validity of quantum electrodynamics at distances of 10^{-14}-10^{-15} cm (interaction of photons with electrons);

    (2) lepton decays of vector mesons (interaction of photons with photon-like particles);

USSR

NIKITIN, V. A., Atomizdat; 1970, 295 pp

(3) photoproduction of vector mesons (interaction of photons with nuclei).

The paper deals only with the most important and most recent experiments. The complete details of other related experiments are listed mostly in the Proceedings of the Vienna Conference.

V. The introduction of short-wave repulsion "potentials" into the low-energy equations for lower partial waves makes it possible to eliminate the basic requirements of the purely elastic low-energy approximation. There is then a possibility, in principle, of obtaining solutions with small s-wave scattering lengths and broad resonances.

The use of threshold conditions resulting from chiral symmetry allows one (under certain additional conditions) to express the main resonance scattering parameters in terms of the pion decay characteristics. Thus, using the broken chiral symmetry approximation and unitarity dispersion equations for low-energy ππ- and πN-scattering, one obtains masses, life-times, and coupling constants for p-wave resonances by specifying only the pion and nucleon masses, their life-times, and the Fermi coupling constant.

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USSR

NIKITIN, V. A., Atomizdat; 1970, 295 pp

VI. Problems of the violation of CP invariance in the decays of neutral K-mesons are reviewed. An effective equation for the system described by the superpositions of the K^0- and $\bar{K}^0$-states is discussed in detail. The $K_L \to 2\pi$ decays and the lepton decays of K_L-mesons are considered. The model of super-weak interaction is discussed.

VII. The nonlocal quantum field theory of a one-component scalar field is considered. Axioms of nonlocal quantum field theory are formulated. A class of relativistically invariant generalized functions which can play the role of form factors in the perturbation series of the S-matrix is introduced. It is shown that for the interaction Lagrangians of the type $L_T(x) = g\,\phi^n(x) \quad (n \geqslant 3)$ the perturbation series for the S-matrix is finite and satisfies the require-ments of unitarity and macrocausality in each order of perturbation theory.

1./4

UDC 621.319.4.002.5

USSR

PSHENICHNYY, I. S., NIKITIN, V. A., YAKUSHEV, S. G., BUDKIN, I. A.,
ALEKSEYEV, V. L., ARBUZOV, A. D.

"A Device for Applying Silver Paste to Ceramic Disc Capacitor Blanks"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki,
1970, No 33, Soviet Patent No 285112, class 21, filed 8 May 69, published
29 Oct 70, p 58

Translation: This Author's Certificate introduces a device for applying
silver paste to ceramic disc capacitor blanks. The unit contains a rotating
disc for transporting the blanks. Around the periphery of the disc are
multiple-place cartridges with pockets for the blanks. The device also
contains a mechanism for applying the paste to the blanks which is fitted
with punches. Also included in the device are a drying chamber and a
drive mechanism. As a distinguishing feature of the patent, the precision
and productivity of the device are improved by placing hollow split sleeves
with spring-loaded lugs in the cartridge pockets. Rods fit into these
hollow sleeves and open them, and the punches are located on both sides of
the cartridges.

1/1

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1/2   033   PROCESSING DATE--04DEC70
TITLE--INDUSTRIAL SPECTRAL INSTRUMENT MAKING IN THE USSR -U-

AUTHOR--NIKITIN, V.A.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. SPEKTROSK. 1970, 12(4), 583-95

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FLUORESCENCE, SPECTROPHOTOMETER, UV SPECTROPHOTOMETER, RAMAN
SPECTRUM, IR SPECTRUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/0472   STEP NO--UR/0368/70/012/004/0583/0595

CIRC ACCESSION NO--AP0137563

PROCESSING DATE--04DEC70

UNCLASSIFIED

2/2   033
CIRC ACCESSION NO--AP0137563
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   INDUSTRIAL UV, IR, FLUORESCENCE,
AND RAMAN SPECTROPHOTOMETERS AND ACCESSORIES MAKING IN THE USSR IS
REPORTED.   SOME CHARACTERISTICS OF THE EQUIPMENT MADE ARE GIVEN.

UNCLASSIF

UDC: 523.164

USSR

RAKHLIN, L. D., GRIGOR'YEV, M. I., ..., ..., V. ..., ..., P. D., KUZ'MIN,
A. D., MATVEYENKO, L. I., ..., G. ..., ..., ... B.: Institute of
SOLOMONOVICH, A. YE., SOROCHENKO, R. L., ... P. N. Lebedev
Physics of the Academy of Sciences ...

"Increasing the Effectiveness of the RT-22 on the 8-mm Wave Length"

Gor'kiy, Investiya Vysshikh Uchebnykh Zavedeniy, Radiofizika, No 8, 1969, pp
1115-1120

Abstract: The millimeter band of radio frequency waves is of significant in-
terest for investigations of celestial bodies of the solar system and for
solving a large number of problems in galactic and extra galactic astronomy.
The RT-22 radiotelescope, which was developed in 1959 at the P. N. Lebedev
Institute of Physics of the Academy of Sciences of the USSR, is capable of
operating in the 8-mm band, but its use on this band is significantly limited
due to insufficient sensitivity   in the millimeter range.
The program to increase the effectiveness of the radiotelescope included the
development of a highly-sensitive radiometer with a quantum paramagnetic
amplifier and the conversion of the RT-22 to a Cassegrain radiation system,
combining a low antenna noise temperature with the convenience of the use of the
quantum paramagnetic amplifier.

The configuration of the equipment used in accordance with this plan
is shown in a block diagram. The central radiating element is employed for
polarization measurements which demand maximum axial symmetry of the radiation
pattern. Depending on the nature of the investigation involved, the central
or the side radiating elements are connected to the radiometer. A table is
included to show the basic parameters of the radiotelescope on the 8 mm wave-
length after accomplishment of the program to improve the overall effective-
ness.

The effectiveness of the RT-22 on the 8 mm wave band was improved to
the extent that with an angular resolution of less than 2', the program of
radio astronomical investigations was significantly broadened and spectral
investigations of a large number of radio frequency sources were made possible.

ACC NR: AP8037265   SOURCE CODE: UR/0380/68/000/005/0106/0113

AUTHORS: Legkiy, I. N. (Leningrad); Mitskevich, A. I. (Leningrad); Nikitin, V. A.
(Leningrad)

ORG: none

TITLE: Radial seals with floating prestressed and unstressed graphite rings

SOURCE: Mashinovedeniye, no. 5, 1968, 106-113

TOPIC TAGS: hermetic seal, rotating seal, lubricant seal, sealing device, graphite,
steel, shaft, antifriction material

ABSTRACT: The characteristics of radial seals for high-speed shafts with free-
floating continuous graphite rings are studied theoretically and experimentally.
Formulas are given for the thermal energy liberated in the seal due to internal fric-
tion, the flow rates through the gap, the change in radial clearance due to tempera-
ture, the contact pressures, and the stresses in the graphite ring. Experiments were
performed to check the theoretical results and to obtain the leakage of working medium
through the seal as a function of the circular velocity, the pressure drop through one
ring, the temperature of the working medium, and the clearance. Tests with unstressed
rings, at circular velocities to 50 m/sec, pressure drops to 2 kg/cm², and gas temper-
atures to 400C, showed the existence of a working temperature limit (see Fig. 1),
after which jamming occurs. Tests with prestressed graphite rings showed that jamming

Card 1/2   UDC: 621.822.5

ACC NR: AP8037265

did not occur with an increase in temperature (see Fig. 2).
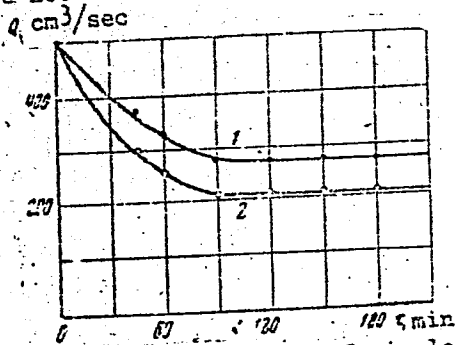
q cm^3/sec

Fig. 1. Time variation of air leakage through seal with floating unstressed graphite ring for clearance $h_y = 0.045$ mm and pressure drop $\Delta p = 0.5$ kg/cm^2 (AG-1500 graphite, shaft of 40Kh steel): 1 - $V_r = 14.7$ m/sec, steady-state temperature 40C; 2 - $V_r = 29.4$ m/sec, 50C
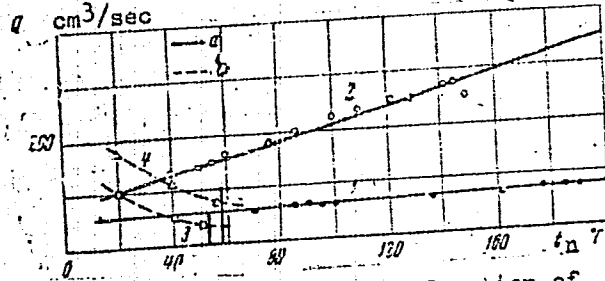
q cm^3/sec

Fig. 2. Air leakage as a function of node temperature t_n through seal with prestressed graphite ring (a) and with unstressed graphite ring (shaft of 40Kh steel) (b): 1 - $h_y = 0.035$ mm, shaft of EI-654 steel; 2 - $h_y = 0.045$ mm, shaft of 40Kh steel; 3 - $h_y = 0.045$ mm, $V_r = 29.4$ m/sec; 4 - $h_y = 0.055$ mm, $V_r = 36.7$ mm/sec

The prestressed rings are found to operate reliably over a wide range of velocity and temperature with small clearances and can be recommended for industrial use. Orig. art. has: 8 formulas and 4 figures.
Card 2/2   SUB CODE: 13, 11/ SUBM DATE: 19Jan68/ ORIG REF: 004

AP0001116   CHEMICAL ABST.

112328k Reaction of nitrosyl chloride with unsaturated compounds. XXVII. Reaction of nitric oxide with chloronitroso compounds. Ogloblin, K. A.; Nikitin, V. A.; Yufa, T. L.; Potekhin, A. A. (Leningrad. Gos. Univ., Leningrad, USSR). Zh. Org. Khim. 1969, 5(8), 1354-8 (Russ). During the nitrochlorination of olefins, chloronitro intermediates may be found, which subsequently react with NO (K. A. Ogloblin, 1964 and 1965). The intermediates are too unstable for isolation; therefore, the reactions of NO were studied with $Me_2CClC(NO)Me_2$ (I), $Me_2C(NO)Cl$ (II), and $EtC(NO)ClMe$ (III). The identification of the reaction products by gas chromatog. and ir spectroscopy permitted formulation of the following sequences: I + 2NO → $Me_2CClC(N_2ONO_2)Me_2$ → $Me_2CClC\cdot Me_2$ + N_2 + NO_2; $NO_2\cdot$ + NO → $2NO_2$; $Me_2CClC\cdot Me_2$ + NO_2 → $Me_2CClC(NO_2)Me_2$ (isolated). Similarly, II or III + 2NO → $RCH_2C(N_2ONO_2)ClMe$ (R = H or Me) (IV) → $RCH_2C\cdot ClMe$ → $RCH_2C(NO_2)ClMe$ + RCH_2CCl_2Me (both isolated); IV → $RCH_2C^+(NO_2^-)ClMe$ → $RCH:CClMe$ → $RCH(NO_2)CCl_2Me$ (isolated); IV → $RCH_2C(ONO_2)ClMe$ → RCH_2COMe (isolated).
CPJR

19501353

AT9044012

UR 0141

IMPROVEMENT OF THE OPERATION EFFICIENCY OF THE RADIOTELESCOPE RT-22 AT THE WAVELENGTH 8 mm

L. D. Bakhrakh, M. I. Grigor'eva, M. I. Zagatin, P. D. Kalachev, A. D. Kuz'min, L. I. Matveenko, G. S. Misezhnikov, V. A. Nikitin, V. A. Piranov, A. E. Salomonovich, R. L. Sorochenko, V. B. Shteinshleiger

The efficiency of FIAN 22 m radiotelescope RT-22 at the wavelength 8 mm is improved by the order using the quantum paramagnetic amplifier and Cassegrain antenna. Due to this it is possible to extend considerably the observational program at this wavelength and to carry out for the first time the observations of the galactic radio line in millimeter range.

1945   0426

UNCLASSIFIED   PROCESSING DATE--17JUL70

TITLE--HORIZONTAL VULCANISING PRESS -U-

AUTHOR--NIKITIN, V.A.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 240991
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI BUL
DATE PUBLISHED--22AUG69

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

TOPIC TAGS--PATENT, VULCANIZATION, PRESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1974/1954   STEP NO--UR/0482/69/000/000/0000/0000

CIRC ACCESSION NO--AA0040456
                          UNCLASSIFIED

AA0040456

UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, /-76

240991   HORIZONTAL VULCANISING PRESS, e.g. for
joining together the individual parts of
a rubber article, such as footwear (shoes),
consists of a plate (3) fixed between two rigid
supports (1 and 2); this plate carries one of the
half moulds (not shown in the diagram). There
are two guide bars (4 and 5) along which the cross-
piece (6) can move, with the other half-mould
(7) also mounted on a plate and provided with an
interchangeable rotatable mandrel for assembling

and joining the parts of the shoes. This mandrel
(12) projects upright from the small wheeled carrier
(11) which is rigidly connected to the slider bar
by means of the rod (9). The stop (10) restricts
the motion of the half-mould away from the mandrel
The finer details of the way inwhich the shoes are
assembled and vulcanised are also included.

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4/3

19741954

AA0040456
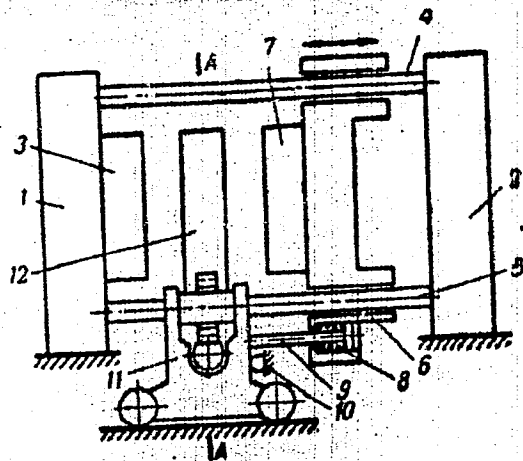
6.10.67. as 1188599/23-5, NIKITIN, V.A. Leningrad
Special Constructional Office for Polymer Machinery
Construction. (22.8.69) Bul. 13/1.4.69. Class
39a^6 Int. Cl. B 29h.

19741955

AA0040456

Leningradskoye Spetsial'noye Konstruktorskoye Byuro Polimernogo Mashinostroyeniya

19741956

2/

UNCLASSIFIED   PROCESSING DATE--30OCT70

1/2   019   TITLE--HYGIENIC EVALUATION OF CONDITIONS ATTENDING VISUAL WORK IN SORTING
OUT FINE GRADES OF INCANDESCENT LAMP COILS -U-
AUTHOR-(02)-BESSONOVA, A.N., NIKITIN, V.D.

COUNTRY OF INFO--USSR

SOURCE--GIGIYENA TRUDA I PROFESSIONAL'NYYE ZABOLEVANIYA, 1970, NR 6, PP
7-11
DATE PUBLISHED--------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES, BIOLOGICAL AND MEDICAL
SCIENCES
TOPIC TAGS--HUMAN FACTORS ENGINEERING, INDUSTRIAL HYGIENE, SANITARY
ENGINEERING, ELECTRIC LAMP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3003/0190   STEP NO--UR/0391/70/000/006/0007/0011

CIRC ACCESSION NO--AP0129446
UNCLASSIFIED

UNCLASSIFIED   PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129446
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LIGHTING CONDITIONS IN THE METAL
CUTTING AND PROCESSING DEPARTMENT OF AN ELECTRIC LAMP PLANT WERE STUDIED
AND AN OPHTHALMOLOGICAL EXAMINATION (INCLUDING VISUAL ACUITY,
REFRACTION, EYE FUNDUS, ADAPTATION, ACCOMODATION AND CONVERGENCE, FIELD
OF VISION) OF 56 DEPARTMENT WORKERS, INCLUDING 9 FEMALE INSPECTORS OF
FINE GRADES OF COILS, WAS CARRIED OUT. THE WORK PERFORMED BY THE LATTER
IS SHOWN TO BELONG TO THE CATEGORY OF HIGH PRECISION OPERATIONS,
PROCEEDING AT THE LIMIT OF THE RESOLVING POWER OF THE EYE.   CHANGES
OCCURRING IN THE VISUAL SYSTEM OF FEMALE INSPECTORS (SUCH AS SHIFTS IN
THE MUSCLE BALANCE TOWARDS EXOPHORIA AND ACCOMODATION SPASMS TAKING
PLACE IN SOME OF THEM) ARE LINKED WITH THEIR OCCUPATIONAL ACTIVITIES.
RECOMMENDATIONS FOR THE IMPROVEMENT OF BOTH GENERAL AND LOCAL
ILLUMINATION WERE WORKED OUT AND PUT INTO EFFECT WITH RESULTANT MATERIAL
AMELIORATION OF WORKING CONDITIONS.   FACILITY: MEDITSINSKIY
INSTITUT, POLITEKHNICHESKIY INSTITUT, TOMSK.

UNCLASSIFIED

UDC: 621.382.3

USSR

ALFEROV, Zh. I., KOROL'KOV, V. I., NIKITIN, V. G., and YAKOVENKO, A. A., A. F. Ioffe Physico-Technical Institute, Leningrad

"Investigating Electroluminescent p-n-p-n Structures Using GaAs-Al$_x$Ga$_{1-x}$As Heterojunctions"

Abstract: This is an experimental paper designed to determine the electrical, electroluminescent, and junction characteristics of four-layer structures using heterojunctions of the following types: p-Al$_x$Ga$_{1-x}$As--n-Al$_x$Ga$_{1-x}$As--p-GaAs--n-Al$_x$Ga$_{1-x}$As, and n-Al$_x$Ga$_{1-x}$As--p-Al$_x$Ga$_{1-x}$As--n-GaAs--p-Al$_x$Ga$_{1-x}$As, p-n-p-n structures in which one of the basic regions is of a narrow-zone material. The methods of growing such structures are discussed and a description of the preparation of the specimens is given together with a table of characteristics of the structure types. With regard to the volt-ampere characteristics, the authors discuss two types of mechanism for the increase in α with increasing current, and curves are plotted for the switching voltages and currents as functions of the temperature. For the electroluminescent characteristics of
1/2

USSR

ALFEROV, Zh. I., et al, Fizika i tekhnika poluprovodnikov, No 7, 1972, pp 1300-1305

the structures, curves are plotted for the radiation recombination spectra for various current densities and for the radiation inten- sity as a function of the current. Appreciation is expressed to to V. M. Tuchkevich for his interest in the work, and to G. A. Andreyev, N. A. Nikitina, and V. P. Dvortsova for their assistance in preparing the specimens and making the measurements.

2/2

UDC: 621.396.6-181.48

USSR

NAZAROV, G. V., NIKITIN, V. G., TSAR'KOV, A. N., MEDVEDEV, Yu.

"Group Mounting of Suspended Elements and External Leads on Integrated Circuit Boards"

Translation: The paper analyzes the basic technological and design requirements for methods of group welding and soldering. Research results are presented on devices developed for group mounting of microcircuit crystals with rigid (ball) leads on substrates. Recommendations are formulated on selecting methods of mounting leads, crystals and substrates for various combinations of materials. Resumé.

1/1   - 45 -

USSR

NIKITIN, V. I., and GRIGOR'YEVA, T. N., TsNIPKI /expansion unknown7 imeni
I. I. Polzunov, Leningrad

"Effect of Calorizing a Nickel Alloy on Its Long-Time Strength in Certain
Media"

Abstract: A study was made to determine the effectiveness of calorizing alloy
EI826 in order to protect it from high-temperature oxidation and from the action
of ash deposits during testing for long-time strength as well to determine the
relationship of long-time strength of the calorized alloy to the scale factor.
Chemical composition of the alloy was (in wt %): 0.037 C, 14.03 Cr, 1.47 Ti,
2.24 Al, 4.06 Mo, 5.89 W, 0.16 Mn, 0.27 Si, 0.015 P, and 0.004 S, balance-Ni.
It was shown that the long-time strength of the alloy exceeds 4000 hours when
tested at 850° C in an ash without NaCl, but when an ash with 10% NaCl is
deposited on samples, their long-t9me strength is 500 hours or less. The basic
conclusion made is that calorizing does protect EI826 samples from the effects
of ash content in that samples without a calorized layer have a much less long-
-time strength than those which are calorized. Also, the thicker the calorized
layer, the better the long-time strength. Six figures, six bibliographic references.
1/1

USSR

SHIBAYEV, V. M., SHEVCHUK, R. M., NIKITIN, V. I.

"Experimental Investigation of Railroad Radio Communications Channels in the Case of Vertical and Horizontal Polarizations of Radio Waves in the 150 MHz Range"

Translation: It is found that the form of polarization of electromagnetic waves as they are propagated along electric railroads has no appreciable effect on signal attenuation; in the case of horizontal polarization, a signal has a narrower dynamic range of oscillations as compared with vertical polarization. The ZhR-5 receiver is taken as a basis for development of a logarithmic measuring device which can be used for automatic recording of signal and interference voltages. Resumé.

1/1

USSR

UDC: 621.396.2:621.371

NIKITIN, V. I.

"Evaluating the Effect Which the Guide Wires Following a Railroad Have on the Propagation of Radio Waves in the Two-Meter Band"

Nauch. tr. Omsk. in-t inzh. zh.-d. transp. (Scientific Works. Omsk Institute of Railway Transportation Engineers), 1970, 119, pp 87-90 (from RZh-Radio-tekhnika, No 6, Jun 71, Abstract No 6A164).

Translation: It is found by computation and experiment that the wires of a contact network and communications lines may operate like an antenna when excited, radiating energy at points of nonhomogeneities. Resumé.

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UDC: 534-8

USSR

KLESHNEV, Yu. A., NIKITIN, V. I.

"A Method of Measuring the Coefficient of Electromechanical Coupling of Multiple-Element Converters of Ultrasonic Surface Waves"

Translation: The coefficient of electromechanical coupling for multielement converters of ultrasonic surface waves may be experimentally determined by a method based on measuring the equivalent electrical parameters of the multielement converter. The coefficient of electromechanical coupling is easily calculated from the known active and reactive components of input conductance and the relative width of the frequency band of the converter. The experimentally found coefficient of electromechanical coupling for multiple-element converters with a quartz acoustic line is equal to 0.043, while that for converters with a lithium niobate acoustic line is equal to 0.2.

1/1

UDC 669.108.45

USSR

NIKITIN, V. I., Civil Aviation Academy, Leningrad

"Calculation of Metal Heat Resistance at Varying Temperature"

L'vov, Fiziko-Khimicheskaya Mekhanika Materialov, No 3, 1973, pp 49-53

Abstract: A new method has been proposed for determining metal loss (corrosion depth) in an oxidizing gas medium with varying temperature. The method is based on the use of parametric equations and a parametric diagram of heat resistance. The parametric method involves replacing the soaking of a metal at a varying temperature by soaking at some constant equivalent temperature for an equivalent time in such a manner that the magnitude of metal loss for these two modes of metal oxidation is the same. Eleven equations are used in describing how to use the new method of determining heat resistance. Five figures, six bibliographic references.

1/1

USSR

UDC 620.193.5

NIKITIN, V. I., KOMISSAROVA, I. P., and PANKRAT'YEVA, N. V., Academy of Civil Aviation; Central Scientific Research, Planning and Design Institute imeni I. I. Polzunov, Leningrad

"Experimental Verification of the Parametric Method of Calculating the Heat Resistance of Metals at Varying Temperature"

Abstract: Steel brands 20, Kh18N10T, and Kh25T were subjected to heat resistance tests in air under steplike changing temperature conditions, the interval of the latter being up to 150°. A graphic variant of the parametric method based on the use of an equivalent time nomogram and the parametric heat resistance diagram were used for the calculation of the characteristic of heat resistance, the mass loss of the metal. Tabulated experimental data of the mass loss of the first two steel brands at two-

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- 42 -

USSR

NIKITIN, V. I., et al., Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 5, 1973, pp 71-75

-step and multistep temperature change are in good agreement with calculated data (maximum difference 22% and 24%, respectively). The correlation of calculated and experimental data for Kh25T steel shows a maximum difference of 15% at relatively complex multistep temperature change conditions. The investigations indicate the possibility of calculating with sufficient accuracy the heat resistance of metals at changing temperature by the parametric method. Three figures, three tables, three bibliographic references.

2/2

Thermomechanical Treatment

UDC 669.715.047

USSR

NIKITIN, V. I., Order of Lenin Academy of Civil Aviation. Department of Physics

"Strengthening of Avial by Thermomechanical Treatment"

Abstract: An evaluation was made of the possibility of strengthening avial grade SAV-1 by means of thermomechanical treatment. A comparison was made of this method with the method of artificial aging of the alloy which is being widely used in industry. The alloy investigated contained 0.68% Mg, 0.83% Si, balance--aluminum. Alloy SAV-1, after quenching in water from 530°C and natural aging had the following mechanical properties for short-time tension: tensile strength = 21.4 kg/mm^2, yield strength = 10.0 kg/mm^2, elongation = 27.6%, and reduction in area = 63.9%. Thermomechanical treatment consisted of four variants: 1) 10% plastic deformation and natural aging at 150°C, 2) 16% deformation and aging at 150°C, 3) 10% deformation and aging at 180°C, 4) 10% deformation and aging at 130°C. Aging times after plastic deformation were 6, 12, 24, and 48 hours. The worst mechanical properties resulted from variant 3, while the best properties were achieved by the thermomechanical treatment of variant 1/2

USSR

4. The investigation revealed that it is possible to substantially increase
the strength of alloy SAV-1 as compared to quenching and natural aging.
Artificial aging after quenching yields a higher level of strength properties
and the thermomechanical treatment yields the best combination of strength and
ductility where values of elongation and reduction in area are doubled. 2
figures, 3 bibliographic references.

2/2

USSR

UDC: 621.374.55; 666.593.5

KLESHNEV, YU. A. and NIKITIN, V. I.

"A Method for Measuring the Coefficient of Electromechanical Coupling of Multi-Element Ultrasonic Surface Wave Converters"

Tr. Leningr. in-t aviats. priborostr. (Works of the Leningrad Institute of Aviation Instrument Building), Leningrad, 1972, vyp.76, pp 78-79 (from RZh-32. Metrologiya i Izmeritel'naya Tekhnika, No 5, 1973, Abstract No 5.32.469)

Translation: Experimentally, the coefficient of electromechanical coupling for multi-element ultrasonic surface wave converters can be determined by a method based on measuring the equivalent electric parameters of a multi-element converter. The coefficient of electromechanical coupling is easily calculated according to the known active and reactive component of the input conductivity and the relative frequency band width of the converter. The coefficient of electromechanical coupling is determined experimentally for multi-element converters with a quartz soundguide and is equal to 0.043, while it is 0.2 for converters with a soundguide made from lithium niobate. Original article: four bibliographic entries.

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USSR

UDC: 621.396.2:621.371

SHIBAYEV, V. M., SHEVCHUK, R. M., NIKITIN, V. I.

"Experimental Investigation of Railroad Radio Communications Channels in the Case of Vertical and Horizontal Polarizations of Radio Waves in the 150 MHz Range"

Nauch. tr. Omsk. in-t inzh. zh.-d. transp. (Scientific Works. Omsk Institute of Railway Transportation Engineers), 1970, 119, pp 78-82 (from RZh-Radio-tekhnika, No 6, Jun 71, Abstract No 6A165)

Translation: It is found that the form of polarization of electromagnetic waves as they are propagated along electric railroads has no appreciable effect on signal attenuation; in the case of horizontal polarization, a signal has a narrower dynamic range of oscillations as compared with vertical polarization. The ZhR-5 receiver is taken as a basis for development of a logarithmic measuring device which can be used for automatic recording of signal and interference voltages. Resumé.

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UDC 547.26'118+547.371

USSR

TROFIMOV, B. A., NIKITIN, V. M., ATAVIN, A. S., and KHIL'KO, M. Ya.

"Vinyl Esters Containing Trivalent Phosphorus. IV. Hydrolysis of Dialkyl (ω-Vinylhydroxyalkyl) Phosphites. Effect of the Vicinal Hydroxyl Group"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(103), No 2, Feb 72, pp 342-346

Abstract: It is shown that uncatalized hydrolysis of dialkyl(ω-vinylhydrox-yalkyl) phosphites goes through a stage of formation of dialkyl- and alkyl (ω-vinylhydroxyalkyl) phosphites in a ratio determined both by the structure of the initial triorganophosphite and by the conditions of the reaction. It is proved that further hydrolysis of alkyl (β-vinylhydroxyalkyl) phosphites is limited by the decomposition of the vinylhydroxy group. It is shown that the vicinal hydroxy radical is a specific accelerator of hydrolysis of alkyl (β-hydroxyalkyl) phosphites.

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UDC 547.37+547.26'118

USSR

TROFIMOV, B. A., NIKITIN, V. M., and ATAVIN, A. S., Irkutsk Institute of
Organic Chemistry, Siberian Department of the Academy of Sciences of the
USSR

"Vinyl Ethers Containing Trivalent Phosphorus. V. Particulars of Hydrolysis
of 2-(ω-Vinylhydroxyalkoxy)-1,3,2-dioxaphospholans"

Abstract: The authors studied the hydrolysis of a new group of five-membered
cyclic triorgano phosphites -- 2-(ω-vinylhydroxyalkyl)-1,3,2-dioxaphospholans
-- in an attempt to define more precisely the hydrolysis of molecules of this
type and to derive additional information on their reactivity as compared with
their acyclic analogs. It is found that 2-(ω-vinylhydroxyalkyl)-1,3,2-diox-
aphospholans are hydrolyzed by the stoichiometric quantity of water, primarily
with the ring intact, giving the corresponding alkylene phosphites regardless
of the presence or absence of substituents in the phospholan ring. The rate
of hydrolytic decay of five-membered cyclic triorganophosphites exceeds the
rate for acyclic analogs both on the stage of conversion to alkylene phosphites
and on the stage of conversion from alkylene phosphites to monoorganophosphites.
It is proved that the first stage of the hydrolysis is autocatalytic, and
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USSR

TROFIMOV, B. A., et al., Zhurnal Obshchey Khimii, Vol 42(103), No 2, Feb 72, pp 346-350

that there are no appreciable stresses in the 1,3,2-dioxaphospholan ring with trigonal phosphorus.

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USSR

NIKITIN, V. M., Candidate of Technical Sciences, Moscow Aviation Technological Institute

"Particulars on the Crystallization of Weld Metal in Fusion Welding of Heterogeneous Materials"

Abstract: Results are presented from studying the particulars on the crystallization of weld metal in joining heterogeneous metals (copper-nickel), forming among themselves a continuous series of solid solutions. Butt welds were made with an argon arc, using a tungsten electrode (direct polarity). The material welded was 1.0-3.0mm thick. The results show that in welding copper and nickel, weld metal crystallization proceeds according to the normal scheme from the nickel side (crystallization based on fused grains). Under these conditions, a pre-boundary band of variable composition is formed in the zone of fusion. a "solid boundary" is formed from the nickel side during the heat propagation process and pool formation within the limits of the liquid metal. Bilateral crystallization is based on the "solid boundary". The formation of a solid boundary in the weld metal pool near the fused grains of copper results in the formation of a thin layer of liquid metal which is bounded from two sides by solid metal. Within the limits of the indicated layer, crystallization proceeds

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USSR

NIKITIN, V. M., Svarochnoye Proizvodstvo, No 5, May 73, pp 53-55

both in the direction from the "solid boundary" and from the fused grains of copper. The constrained conditions for the crystallization of the thin liquid metal layer from the side of copper aid in the formation of defects in that zone.

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UDC: 681.325

USSR

NIKITIN, V. M., Institute of Automation

"A Device for Compressing Input Information"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 2, Jan 72, Author's Certificate No 324638, Division G, filed 18 May 70, published 23 Dec 71, p 158

Translation: This Author's Certificate introduces a device for compressing information for input. The unit contains a code-analog converter, a   control module whose output is connected to the inputs of an analog-code converter, and an increment storage device. As a distinguishing feature of the device, speed is increased by using an increment adder whose output is connected to the input of the code-analog converter. Two inputs of the increment adder are connected to the two outputs for the most significant and least significant digits respectively in the analog-code converter. A third input of the adder is connected to the output of the increment storage device. Connected to the input of this storage device is the output for the least significant digits in the

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USSR

NIKITIN, V. M., Soviet Patent No 324638

analog-code converter. A fourth input of the increment adder is connected
to the output of the control module.

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NIKITIN, V. M.

Forestry Sciences

19. USSR

"V. M. Nikitin"

Moscow, Izvestiya, 28 Oct 70, p 4

Translation: V. M. Nikitin, head of the Chair of the Chemistry of Wood and Cellulose of the Leningrad Forestry Engineering Academy, has become the first Soviet scientist elected a member of the International Academy of Forestry Sciences (IAHS).

The International Academy of Wood was created in 1966, and its main purpose is the coordination and encouragement of scientific research devoted to the problems of forest renewal and the procurement and use of wood. There are 100 representatives of science from many countries in IAHS.

1/1

20. USSR

"Honorary Titles"

Moscow, Meditsinskaya Gazeta, 1 Sep 70, p 1

Translation: By decree of the Presidium of the Supreme Soviet RSFSR, the title Honored Physician RSFSR has been awarded to the following medical workers of Smolensk Medical Institute for services in national health: docents R. P. Belevev; Ye. Y. Burishov; and A. I. Yakusheva, and assistant L. P. Vakhitina.

By decree of the Presidium of the Supreme Soviet Uzbek SSR, the title Honored Physician Uzbek SSR has been awarded to R. Tyahoya for long and productive service in medical institutions of the USSR Ministry of Internal Affairs.

By decree of the Presidium of the Supreme Soviet Kazakh SSR, the title Honored Physician Kazakh SSR has been awarded to the following for services in public health: V. A. Babin, head of the Infection Division of Karmakchy Rayon Hospital, Kzyl-Orda Oblast; Ye. A. Gulyayev, physician of Salmovskiy Hospital, Serectziy Rayon, Semery-Kazakhstan Oblast; X. D. Dzhangakhov, chief physician of the Antituberculosis Dispensary, Lemizskiy Rayon, Chimkent Oblast; G. Kassumgahov, chief physician of the Medical-Sanitary Sector of the Machine Building Plant imeni Voroshilov, Ural'sk

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UNCLASSIFIED   PROCESSING DATE--20NOV70

1/2   029
TITLE--HYDRODYNAMICS OF FALLING LIQUID FILMS ON VERTICAL SURFACES -U-

AUTHOR-(04)-GANCHEV, B.G., KOZLOV, V.M., LOZOVETSKIY, V.V., NIKITIN, V.M.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., MASHINOSTR. 1970, (2), 75-80

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--HYDRODYNAMIC PROPERTY, SURFACE FILM, DISTILLED WATER, METAL TUBE, SURFACE WAVE, THERMAL MEASURING INSTRUMENT, FLOW PROBE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1639   STEP NO--UR/0145/70/000/002/0075/0080

CIRC ACCESSION NO--AT0133544
                              UNCLASSIFIED

PROCESSING DATE--20NOV70

2/2   029

CIRC ACCESSION NO--AT0133544

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A STUDY WAS MADE OF FALLING DISTD. H SUB2 O FILMS CN THE OUTER SURFACE OF A VERTICAL STEEL TUBE. THE MAX., MIN. AND AV. THICKNESS OF THE FILM, THE FREQUENCY AND AMPLITUDE OF WAVES ON ITS SURFACE AND ITS RATE OF FALL WERE MEASURED BY USING AN ELEC. MICROPROBE COMBINED WITH AN OSCILLOGRAPH AND A THERMAL ANEMOMETER WITH A WIRE.
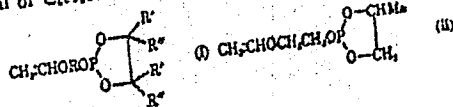
NIKITIN, V. M.

Acc. Nr: AP0049502   Abstracting Service: Ref. Code:
CHEMICAL ABST. 5170   UR 0079

99938h Vinyl ethers of haloalcohols. IV. General method
for synthesizing monohaloalkoxyethylenes. Shostakovskii, M.
F.; Atavin, A. S.; Trofimov, B. A.; Gusarov, A. V.; Nikitin,
V. M.; Skorobogatova, V. I. (Irkutsk. Inst. Org. Khim.,
Irkutsk, USSR). Zh. Obshch. Khim. 1970, 40(1), 70-7 (Russ).
A synthesis of (haloalkoxy)ethylenes was developed from the
Arbuzov rearrangement of vinyloxyalkyl glycol phosphites.
Heating 100 g (CH₂)₄(OH)₂ and 10 g KOH under 70 ml tetrahy-
drofuran in an autoclave 4 hr at 120° gave 54% H₂C:CHO-
(CH₂)₄OH, b₁₁ 95°, d²⁰ 0.8925, n²⁰ᴅ 1.4460. Treating 0.228 mole
vinyl glycol ether in 0.3 mole pyridine and 200 ml Et₂O with
0.228 mole phosphorochloridite of a glycol at 15–20° gave, after
removal of C₅H₅N.HCl, (I) (R, R', and R" given): (CH₂)₂, H,

CH₂CHOROP (I)   (I) CH₂CHOCH₂CH₂OP (II)

REEL/FRAME
19801342

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Me, b, 96.5°, d²⁰ 1.1000, n²⁰ 1.4615; (CH₂)₃, H, Me, b, 86–7°, 1.0730, 1.4580; (CH₂)₄, H, Me, b₁₄ 105°, 1.0599, 1.4583; (CH₂)₄, H, Me, b, 135°, 1.0340, 1.4605; (CH₂)₃, Me, Me, b, 87°, 1.0500, 1.4572; (CH₂)₄, Me, Me, b, 105–8°, 1.0391, 1.4595; (CH₂)₃CHMe, H, Me, b, 90–5°, 1.0511, 1.4520; (CH₂)₄O(CH₂), H, Me, b, 145°, 1.1106, 1.4645; (CH₂)₅, H, H, b, 93°, 1.1705, 1.4710; H, b, 65°, 1.1334, 1.4614. These with 5 moles alkyl halide heated in a sealed tube at 90–150° several hr gave 20–85% H₂C:CHORX (R and X shown): (CH₂)₃, F, b. 79°, 0.9745, 1.3860; (CH₂)₃, Cl, b. 103°, 1.0470, 1.4375; (CH₂)₃, Br, b₁₁ 60°, 1.4051, 1.4710; CH₂CH₂, I, b₁₂ 71°, 1.7585, 1.5263; (CH₂)₃, F, b. 95–8°, 0.9534, 1.4003; (CH₂)₃, Cl, b₁₁ 52–3°, 1.0273, 1.4375; (CH₂)₃, Br, b₁₁ 55°, 1.3484, 1.4705; (CH₂)₃, I, b, 54–5°, 1.6368, 1.5193; (CH₂)₄, Cl, b₁₁ 61–5°, 0.9965, 1.4458; (CH₂)₄, Br, b₁₄ 72–3°, 1.2860, 1.4710; (CH₂)₄, I, b, 70–1.5°, 1.5471, 1.5158; (CH₂)₄, Cl, b₁₁ 84–6°, 0.9718, 1.4478; (CH₂)₄, Br, b, 54–5°, 1.2049, 1.4708; (CH₂)₄, I, b, 84–5°, 1.3947, 1.5015; (CH₂)₃CHMe, Br, b₁₀ 76–8°, 1.2671, 1.4650; (CH₂)₄CHMe, I, b₇ 62–4°, 1.5056, 1.5080; (CH₂)₄O(CH₂)₃, Cl, b, 69–71°, 1.1040,

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AP0049502

1.4535; $(CH_2)_4O(CH_2)_2$, Br, b, 73–5°, 1.3564, 1.4750; $(CH_2)_4O$-$(CH_2)_2$, I, b, 58–9°, 1.5893, 1.5139. Exchange of the iodo members with KF gave the fluoro analogs: $(CH_2)_4$, F, described above; $(CH_2)_2$, F, described above; $(CH_2)_4$, F, b. 115–20°, 0.9272, 1.4045. Rearrangement of I [R = $(CH_2)_2$, $R^1 = R^2 =$ H] with H_2C:$CHCH_2Br$ resulted in ring opening only and gave H_2C:$CHCH_2P(O)(OCH_2CH_2Br)O(CH_2)_2OCH$:$CH_2$ (III); $(PrO)_2POCH_2CH_2OCH$:CH_2 and EtI similarly gave only the open-chain H_2C:$CHO(CH_2)_2CP(O)(Et)OPr$, b, 87–9°, 1.0476, 1.4417. III, b, 144–5°, 1.3630, 1.4890, was obtained above in 67% yield. Reaction of 2 moles chlorohydrin with 2 moles AcH and dry HCl at −5–0° gave the requisite chloro ethers, which with 2.2 mole Et_3N at this temp., then 5 hr at 80–90°, gave the (haloalkoxy)ethylenes H_2C:$CHORX$ (R and X shown): $(CH_2)_4$, Cl; $(CH_2)_2$, Cl and $(CH_2)_4$, Br and $(CH_2)_2$, Cl, described above. Triethylene glycol and Br with red P gave $(BrCH_2CH_2$-$OCH_2)_2$ b, 103–5°, 1.6638, 1.5010, which with powd. KOH in a Cu vessel at 95–110° in partial vacuo gave 18.5% H_2C:CHO-$(CH_2)_2O(CH_2)_2Br$, described above.   G. M. Kosolapoff ⊶

19801344

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PROCESSING DATE--17JUL70

UNCLASSIFIED   GENERAL METHOD FOR SYNTHEZIZING

TITLE--VINYL ETHERS OF HALOALCOHOL. A GENERAL METHOD FOR SYNTHEZIZING
MONOHALCALKOXYETHYLENES -U-

AUTHOR--SHOSTAKOVSKIY, M.F., ATAVIN, A.S., TROFIMOV, B.A., GUSAROV, A.V.,
NIKITIN, V.M.

COUNTRY OF INFO--USSR

SOURCE--ZH. OBSHCH. KHIM. 1970, 40(1), 70-77

DATE PUBLISHED------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--HALOGENATED ORGANIC COMPOUND, ETHYLENE, ORGANIC PHOSPHORUS
COMPOUND, GLYCOL, HETEROCYCLIC OXYGEN COMPOUND, CHEMICAL SYNTHESIS,
FLUORINATED ORGANIC COMPOUND, BROMINATED ORGANIC COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1980/1342

STEP NO--UR/0079/70/040/001/0070/0077

CIRC ACCESSION NO--AP0049502

UNCLASSIFIED

USSR   UDC 621.791.36.01:669.3:532.696.1:669.14.018.8

NIKITIN, V. M., Candidate of Technical Sciences, and MURAV'YEV, R. S.,
Moscow Aviation Technology Institute imeni K. E. Tsiolkovskiy

"Features of Copper Braze Alloy Spreading on the Surface of Stainless Steel"

Abstract: Spreading and interaction of M1 copper, alloys of the Cu-Ag,
Cu-Ni-Ag, and Cu-Mn-Ag alloy systems, and braze alloys VPr1, VPr2, VPr4,
VPr13, VP417, PMl7A, 45A, PSr50, PSr72LMN, and Psr92, with steel SN4
(Kh15N8M2Yu) were investigated. Spreading nature and kinetics were studied
for brazing in argon or in a vacuum. It was determined that copper braze
alloys spread on the surface of the steel in a continuous layer with micro-
flows into the grain boundaries. The copper concentration and adsorption
activity of the molten metal are both increased in the microflows owing to
the vaporization of volatile dissolved components and diffusion transition
of intermediate compounds, formed with the iron, into the steel. To prevent
brittleness, caused by intercrystalline penetration of the braze alloy and
to braze thin-wall materials of stainless steel, which are sensitive to the
action of copper, it is necessary to use a braze alloy with the ratio of
1/2

USSR

NIKITIN, V. M., Svarochnoye Proizvodstvo, No 2, Feb 74, pp 10-12

Ag/Cu+Ag equal to 72%. Also, it is advantageous to braze in argon rather than in a vacuum. Copper-base braze alloys can be satisfactorily used for brazing steel SN4 only when the entire surface of the part being brazed is coated with the braze alloy. Four figures, eight bibliographic references.

2/2

MACROMOLECULES AND ONTOGENY

V. M. Nikitin
State University, Kharkov

A review is presented of data obtained in the authors' and other research labora-
tories on the age changes in the macromolecular composition of cells and tissues of
human and higher vertebrate organisms. Main attention is concentrated on proteins and
nucleic acids. It is established that the "age seal" is insufficiently known till now for
such long-living protoplasm components as scleroproteins and DNA of postmitotic tissues.
Some age changes in macromolecules are more or less authentically established only for
the shifts in monomeric fractions of collagens, increase of β- and probably, γ-components
in them. Age shifts in the program of RNA and proteins synthesis appear to be beyond
doubt. Still greater changes with age are established for molecular bonds in the comp-
lexes of DNA, RNA histones and scleroprotein molecules. Importance of integral-physio-
logical factors is emphasized for a general picture of the organisms ageing.

REEL/FRAME

19820917

USSR

UDC 669.14'24'26:621.17

POPOVA, L. V., LITVINENKO, D. A., NIKITIN, V. N., and GEORGIYEV, M. N., Central
Scientific Research Institute of Ferrous Metallurgy

"Resistance of Low-Alloy Ni-Cr Steel to Crack Development"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 1, Jan 74,
pp 60-62

Abstract: The effect of nickel and chromium in low-alloy normalized steel on
resistance to crack development under impact loading was investigated where
the nickel and chromium were not alloyed together in the same steel samples.
The steel investigated contained (in %): 0.2 C, 0.2 Si, a.2 Mn and nickel
contents of 0.59, 0.93, 1.80, and 2.40, and chromium contents of 0.30, 0.60,
1.40, and 2.20. Better combinations of strength and ductility properties were
observed when Ni and Cr contents are less than 1%. Impact strengths were also
better at the lower alloying contents, and the amount of ferrite and prelite
was almost the same for these alloying component contents. As a result of the
better ductility and lower tendency toward crack development for Ni contents of
0.6-0.8% and Cr contents of 0.5-0.7%, these steels are suitable for use under
conditions of impact loads at positive temperatures, and of the two types of

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·USSR

POPOVA, L. V., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov,
No 1, Jan 74, pp 60-62

steels, low-alloy chromium steel is recommended for use inasmuch as it is not
as scarce as nickel. Four figures, one table, ten bibliographic references.

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Steels

USSR   UDC 669.14.018.292

NIKITIN, V. N., LITVINENKO, D. A., D'YAKONOVA, V. S., SHIFRINA, N. P., and
SLAVOVA, A. I., Central Scientific Research Institute of Ferrous Metallurgy
and the Cherepovets Metallurgical Plant

"Investigation of Steel 23KhG2AFR with a Minimum Yield Strength of 50 kgf/mm^2"

Moscow, Stal', No 7, Jul 73, pp 647-649

Abstract: Steel 23KhG2AFR was developed on the basis of steel 16G2AF with a
guaranteed yield strength of 45 kgf/mm^2. This steel was tested without boron
(A) and with 0.0027% boron (B) and having the following chemical composition
(in %):

	C	Mn	Si	Cr	V	N	S	P
A	0.20	1.40	0.43	0.66	0.086	0.011	0.029	0.024
B	0.17	1.50	0.53	0.50	0.095	0.015	0.020	0.019

In steel 23KhG2AFR the boron is bonded in the carbonitride with a crystal
lattice of the type $B(CN)_{0.35}$ or $B(CN)$. Boron, bonding the nitrogen and carbon,
evidently refines the grain boundary zones of impurities which previously
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USSR

NIKITIN, V. N., et al., Stal', No 7, Jul 73, pp 647---649

influencex the increase of ductility and impact strength of the steel. After an optimum heat treatment -- normalization at $910^{\circ}C$ and tempering at $700^{\circ}C$ -- steel 23KhG2AFR had the following mechanical properties in 4-mm thick sheet: yield strength -- 50 kgf/mm^2 (min), tensile strength -- 70 kgf/mm^2 (min), elongation -- 18% (min), and impact strength -- 4.0 $kgf-m/cm^2$ (min) at $-40^{\circ}C$. Steel 23KhG2AFR is sensitive to notching under static and dynamic loads and is characterized by good engineering properties. This steel can be satisfactorily welded with the weld joint having the same strength as the base metal. Four figures, one bibliographic reference.

2/2

Conferences

USSR

NIKITIN, V. N.

"Scientific and Technical Seminar on Methods for Low-Temperature Testing
of Mechanical Properties and on Evaluation of Cold Brittleness in Structural
Materials"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 1, 1972,
p 77

Abstract: A scientific and technical seminar on methods for testing low-
temperature mechanical properties and assessment of cold brittleness in
structural materials was held 22 through 23 September 1971 in Kiev. The
seminar was attended by 150 specialists representing scientific and
research institutes, design bureaus, plants and higher educational
institutions. The highlights of 13 reports presented by leading special-
ists included: tests on mechanical properties of metals in both short-
and long-term static loading at low temperatures under conditions of
uniaxial and combined stresses; dynamic stresses (impact and cyclic) at
low temperatures; basic cold brittleness features of structural materials;
mechanics of brittle failure; strength criteria under combined stresses;
determination of characteristics of low-temperature elasticity and

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USSR

NIKITIN, V. N., Metallovedeniye i termicheskaya obrabotka metallov, No 1, 1972, p 77

nonelasticity; tests on models and components of full-scale structures; various types of ductile and brittle failures; physical fundamentals of low-temperature strength of metals; typical examples of low-temperature failure in welded structures and techniques for the prevention failures in welded structural components. The reports were followed by animated discussions and resolutions for furthering active research in low-temperature testing of structural materials. The authors of the reports and their associated organizations are cited with each presentation.

2/2

UDC 539.4.01

USSR

GEORGIYEV, M. N., POPOVA, L. V., NIKITIN, V. N., LITVINENKO, D. A., Moscow

"Influence of Titanium on Ductility Properties of Low-Alloy Steel"

Kiev, Problemy Prochnosti, No 5, May, 1971, pp 98-100.

Abstract: The influence of titanium content in low-alloy normalized steel on its ductile properties is studied. It is demonstrated that alloying with 0.025 to 0.16% titanium causes a deterioration in ductile properties, while increasing the titanium content from 0.16 to 0.25% causes a significant increase in impact toughness, primarily by increasing the work of crack formation.

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USSR

NIKITIN, V. N., LITVINENKO, D. A., STETSENKO, B. A., GLADSHTEYN, L. I.,
KACHURIN, D. S., and VOROZHISHCHEV, V. I., Central Scientific Institute of
Ferrous Metallurgy, Kuznetsk Metallurgical Combine

"Increasing the Ductility and Impact Strength of Carbon Steel"

Abstract: A basic structural steel for different structures and machines is
steel St. 3sp which, according to GOST 380-60 has an impact strength of 3 kg-
m/cm^2 at -20°C. Aluminum in the amount of 0.1-0.2% improves its impact
strength and increasing Al content to 0.052% does not improve strength proper-
ties but leads to an increased ductility of hot-rolled steel from 20-25.7%
at 0.0074% Al up to 26-34.0% at 0.052% Al. In studies of steels St. 3 sp
and St. 3Yu in sheet form it was found that aluminum improves their impact
strength at -40°C, although the thicker the sheet the greater the tendency
to cold brittleness. Steel St. 3Yu has a greater impact strength than St. 3sp
due to smaller size of ferrite grains. In all instances (for steel St. 3sp)
strength properties were better for the normalized state than for the hot-
rolled state.

1/1

USSR   UDC 669.017.1:539.56.001.5

NIKITIN, V. N., LITVINENKO, D. A., and ZADUBROVSKIY, A. I.

"Estimate of Tendency of Steel to Brittle Rupture by Method of Rupture Testing of Specimens With Circular Notch at Liquid Nitrogen Temperature"

Spetsial'nyye Stali i Splavy [Special Steels and Alloys--Collection of Works], No 77, Metallurgiya Press, 1970, pp 187-190

Translation: A new method is used to estimate the tendency of low-alloy steels to brittle rupture. It is demonstrated that the least cold brittleness is that of steels having the greatest fibrous component in the fracture produced in impact specimens during serial impact toughness tests. The absolute values of impact toughness are of secondary significance. 1 figure; 2 tables.

1/1

USSR   UDC 669.1.017.018.29.001.5

NIKITIN, V. N., LITVINENKO, D. A., POPOVA, L. V., and GEOGRIYEV, M. N.

"Influence of Molybdenum on Ductile Properties of Low-Alloy Steel"

Spetsial'nyye Stali i Splavy [Special Steels and Alloys--Collection of Works],
No 77, Metallurgiya Press, 1970, pp 190-192

Translation: The influence of molybdenum on the tendency of low-alloy steel of
the same basic composition (0.2% C, 0.2% Si, 1.3% Mn) toward brittle rupture in
the normalized state is studied. It is demonstrated that alloying of this
steel with molybdenum up to 2.0% causes continuous deterioration of a combina-
tion of ductile properties. 1 figure; 1 table; 6 biblio. refs.

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NIKITIN, V. N., LITVINENKO, D. A., and KOBYZEV, V. K.

"Low-Alloy Steel With Increased Brittle Rupture Resistance at Low Temperatures"

Spetsial'nyye Stali i Splavy [Special Steels and Alloys--Collection of Works], No 77, Metallurgiya Press, 1970, pp 197-199

Translation: It is demonstrated that a steel alloyed with 0.07-0.16% Al with addition of titanium has increased resistance to brittle rupture at low temperatures in comparison with low-alloy structural steels.

In the normalized state, the steel had $\sigma_b \geq 510$ Mn/m^2 (51 kg/mm^2; $\sigma_T \geq 370$ Mn/m^2 (37 kg/mm^2; $\delta_5 \geq 24\%$ and impact toughness at -60°C $a_H \geq 400$ kj/m^2 (5 kg·m/cm^2).

The steel is strong down to -70°C in the normalized state, and only when rolled to 25 mm thickness is thermal improvement (hardening + high-temperature tempering) required. 4 figures; 3 tables.

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TITLE--AGE AND ENDOCRINE STATUS OF AN ORGANISM -U-

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 THEIR HARMONEOUS FUNCTIONING.

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ZHURAKOVSKIY, YE. A., NESHPOR, V. S., BONDARENKO, T. N., and NIKITIN, V. P.,
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"X-Ray Spectral Investigation of the Electron Structure of Non-Stoichiometric
Titanium Carbide"

Kiev, Poroshkovaya Metallurgiya, No 6(126), Jun 73, pp 75-79

Abstract: Investigation results are presented of a detailed x-ray spectral
investigation of titanium carbide of limiting composition and in the region
of homogeneity: K-emission lines of titanium and carbon genetically com-
bined with the p-component (with admixture of d-states) of the valent zone
of both atoms in its occupied part, L_{III}-line of titanium emission reflecting
basically d-states of the valent zone of titanium, and K-region of titanium
emission reflecting p- and d-like conditions above the Fermi level. At the
lower boundary of the homogeneity region of the L_{III}-line of emission, in
contrast to other spectra, the parameters of which do not depend on the carbon
concentration, on the top of the L_{III}-line an additional substructure is
observed which is interpreted as a redistribution of d-states in the abundance
of vacancies with respect to carbon. Three figures, one table, twenty-three
bibliographic references. 1/1

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MESHPOR, V. S., NIKITIN, V. P., and SKALETSKAYA, N. A., State Institute of Applied Chemistry

"Electrical Properties of Non-Stoichiometric Titanium Carbide"

Abstract: Electrical conductivity, Hall effect, and thermal emf of titanium carbide in the region of tis homogeneity at low temperatures were studied. Samples were produced by direct synthesis of powder titanium with a purity of 99.5% which contained (in %): 0.068 N, 0.055 C, 0.065 Si, 0.18 Fe, 0.11 Ni, and 0.55 Ca, and acetylene carbon black with a purity of 99.995% in a vacuum of 10^{-5}-10^{-6} mm Hg at 1800°C. Samples for study were made by extrusion of the synthesized powders under a pressure of about two tons/cm^2 and sintering in a vacuum of 10^{-5} mm Hg at 2200°C. It was found that the titanium carbide samples with the composition $TiC_{0.91}$-$TiC_{0.46}$ have a metallic conductivity of the n-type with a strong degeneration of current carriers. With increased concentration of carbon vacancies a decrease of the Hall Coefficient and thermal emf can be observed which changes sign at the lower boundary of the TiC_x region of homogeneity. The electrical resistance of TiC_x is slightly decreased with an increase in the number of 1/2

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NESHPOR, V. S., et al., Poroshkovaya Metallurgiya, No 8, Aug 73, pp 54-57

carbon vacancies which was associated with the increased concentration. The Hall coefficient increases slightly with temperature, and electrical resistance and thermal emf grow linearly in absolute magnitude as the theory of metals requires. An exception to this exists for compositions close to the boundary of the region of homogeneity for which thermal emf changes sign with temperature and deviates somewhat from the linear temperature relationship. The change in sign for the thermal emf in TiC_x with composition

and temperature is explained by assuming a shift in the conductivity strip to the side of the smallest energies relative to the Fermi level for a large increase in the concentration of carbon vacancies. Three figures, one table, eleven bibliographic references.

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