USSR

UDC: 669.243.51:661.937

MURASHOV, V. D., CHERMAK, L. L., TOLSTOGUZOV, A. D., CHERNYSHEV, D. P., and
REZNIK, I. D.

"Experience on Adopting Oxygen in Shaft Melting of Nickel Sinter at the
Yuzhuralnikel' Combine"

Moscow, Tsvetnyye metally, No 3, Mar 72, pp 1-3

Abstract: The use of 24.3% oxygen blast in shaft melting during the first
six months of 1971 increased the absolute fusion of the sinter by 13.4% and
the per-unit fusion by 22.2% against the 1968 level—prior to oxygen
introduction. The per-unit coke consumption dropped by 17%, amounting to
21.9% of the sinter weight. Nickel content in the slags increased from
0.16 to 0.18%, which is ascribed to greater iron contents in the processed
ores. The reduction in operating costs through the use of the two new
oxygen blast lines (with 23.2% O_2) plus the profit from additional produc-
tion outputs in the 1969-70 period show yearly savings of one million
rubles. (2 tables, 7 bibliographic references).

1/1

Food Technology

2

USSR

UDC 612.392.9:612.398.3-083

SLONIMSKIY, G. L., BRAUDO, Ye. Ye., YERTANOV, I. D., TOLSTOGUZOV, V. B.,
BONDAREVA, E. S., and PLASHCHINA, I. G., Laboratory of Physics of Polymers,
Institute of Elementoorganic Compounds, Academy of Sciences USSR

"Susceptibility of Proteins in New Food Products to Attack by Proteolytic
Enzymes"

Abstract: The susceptibility of proteins in different kinds of synthetic
caviar (based on casein, evaporated milk, etc.) and synthetic groats to
attack by proteolytic enzymes of the gastrointestinal tract in vitro was
compared with the susceptibility of the original protein mixtures used to
make the caviar and groats. The susceptibility of proteins to attack by
pepsin in all the kinds of caviar studied was higher than that of the
proteins in the original mixture. The degree of trypsin and chymotrypsin
proteolysis of the pepsin-digested proteins in the caviar was equal to or
higher than the degree of proteolysis of the pepsin-digested original
protein mixtures. The degree of pepsin proteolysis of proteins in the
synthetic groats was equal to or lower than the degree of proteolysis of
1/2

USSR

SLONIMSKIY, G. L., et al, Voprosy Pitaniya, No 6, 1970, pp 25-31

the original protein mixtures. The degree of trypsin proteolysis of the
pepsin-digested proteins in the groats was equal to the degree of pro-
teolysis of the pepsin-digested original protein mixtures.

2/2

1/2   015   UNCLASSIFIED   PROCESSING DATE--18SEP70

TITLE--STRUCTURE OF GELATINE GELS -U-

AUTHOR-(03)-SLONIMSKIY, G.L., TOLSTOGUZOV, V.B., IZYUMOV, D.B.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOLMOL. SOEDIN., SER. B 1970, 12(2), 160-5

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--GEL, MOLECULAR STRUCTURE, PLASTICITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/1199   STEP NO--UR/0460/70/012/002/0160/0165

CIRC ACCESSION NO--AP0104565
                        UNCLASSIFIED

2/2   015

CIRC ACCESSION NO--AP0104565   UNCLASSIFIED   PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PLASTICITY OF GELS CONTG. 10PERCENT GELATINE (I) AND 0.2-1.0PERCENT CA ALGINATE (II) WAS MEASURED BY MEANS OF A MODIFIED DYNAMOMETER AT 10-50DEGREES AND A STRESS OF 3700 DYNES-CM PRIME2. THE PLASTICITY OF THE I-II SYSTEM INCREASED IN THE RANGE OF 29-35DEGREES REACHING A MAX. AT 34-8DEGREES, THEN DECLINED, AND AT 42-4DEGREES CORRESPONDED TO THE PLASTICITY OF II GEL OF SIMILAR CONCN. MAX. PLASTICITY OF THE SYSTEM SHIFTED ON COOLING TOWARDS THE LOWER TEMPS. AND WAS A FUNCTION OF THE COOLING RATE. THE ANOMALOUS BEHAVOIR OF I-II GELS WAS ATTRIBUTED TO A BREAKDOWN OF THE SUPRAMOL. STRUCTURE, WHILE THE MAGNITUDE OF THE MAX. WAS A FUNCTION OF MEASUREMENT CONDITIONS.

UNCLASSIFIED

UNCLASSIFIED
TITLE--VOLUMETRIC TECHNIQUE FOR STUDYING SWELLING AND SYNERESIS AND ITS   PROCESSING DATE--30OCT70
  APPLICATION TO PROTEIN GELS -U-

AUTHOR-(02)-BRAUDO, YE.YE., TOLSTOGUZOV, V.B.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(2), 474-6

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--PROTEIN, GEL, FLUORINATED ORGANIC COMPOUND, CHLOROFLUOROCARBON
  COMPOUND, VOLUMETRIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1995/1222   STEP NO--UR/0459/70/012/002/0474/0476

CIRC ACCESSION NO--AP0116684
                    UNCLASSIFIED

USSR   UDC 669.715.018.8

KLIMKO, A. P., and TOLSTOKOZHEVA, G. N., Kraznoyar Institute of Nonferrous
Metals imeni M. I. Kalinin

"Effect of Zirconium on the Mechanical Properties and Corrosion Resistance of
Alloy Amg6"

Abstract: A study was made on the effect of small additions of Zr and tem-
pering temperature on the change in mechanical properties and corrosion resis-
tance of AMg6 type alloys with a developed porosity. These alloys contained
(in %): 5.96 Mg, 0.6 Mn, 0.01 Ti, and 0.005 Be. AMg6 alloy with 0.3% Zr was
also studied. It was established that development of secondary porosity,
occurring at high temperatures, and partial melting of grain boundaries lowers
the tensile strength and ductility of the alloy by 2-4 kg/mm^2 in comparison
with the hardened state which were, for TS, YS and elongation, 27.5 kg/mm^2,
16.3 kg/mm^2, and 6.6%, respectively, for alloy AMg6 and 38.5, 20.3 kg/mm^2,
and 25% for the alloy with Zr. It was concluded that alloying AMg6 with Zr
increases it corrosion resistance in the 80-200°C tempering interval, which proves
that Zr promotes development of uniform distribution of second-phase particles
1/2

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USSR

KLIMKO, A. P., and TOLSTOKOZHEVA, G. N., Fiziko-Khimicheskaya Mekhanika
Materialov, No 3, 1973, pp 115-116

in the grain volume and inhibits coalescence and precipitation of the beta-
phase along the grain boundaries as well as decreases pore formation. One
figure, five bibliographic references.

2/2

USSR

KOVSHOV, G. N., TOLSTONOGOV, A. A.

"Selection of an Optimal Form for the Pendulum of a Linear Acceleration Sensor"

Tr. Ufim. Aviats. In-ta., [Works of the Ufim Aviation Institute] 1971, vol 18, pp 111-118. (Translated from Referativnyy Zhurnal Mekhanika, No 1, 1972, Abstract No 1A200).

Translation: Among bodies of rotation, a body is sought having the minimum moment of inertia relative to the axis of suspension with a fixed static moment. It is shown that among the shapes described by the equations

$$x^2 + z^2 = f^2(y), \quad x^2 + (y-l)^2 = f^2(z), \quad (y-l)^2 + z^2 = f^2(x)$$

where $f(\cdot)$ is the equation of the generatrix, the last form is optimal.

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USSR

UDC:629.78.015:533.1

MERKULOV, A. P., OGORODNIKOV, N. N., TOLSTONOGOV, A. P.

"Filling of High-Pressure Containers with Chilled Gas"

Tr. Kuybyshev. Aviats. In-t [Works of Kuybyshev Aviation Institute], 1973, No 56, pp 24-35 (Translated from Referativny Zhurnal Raketostroyeniye, No 10, 1973, Abstract No 10.41.81 from the resume)

Translation: Conditions are defined, providing relative isothermicity of the process of filling of a high-pressure container with gas. Based on the energy balance equation for a body of variable mass considering external heat exchange of the system and the influence of the temperature choke effect in the feed line, analytic expressions are produced for the change in temperature of the gas entering the container. The nature of change of the temperature of the working fluid in the container being filled during the initial period of filling is established. The temperature of the incoming gas for which its temperature in the container remains practically unchanged is calculated. A method is presented for calculation of the thermal load on the refrigeration unit in which the feed gas is preliminarily chilled. Graphs of the change in temperature of the working fluid in

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USSR

the container as a function of velocity of entering gas and its temperature
are shown. Calculations and experimental curves of the change in tempera-
ture of the gas with rapid filling of the high-pressure container with
chilled gas are presented. 6 Figures; 1 Table; 7 Biblio. Refs.

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USSR

UDC 614.777:632.95

KOSTOVETSKIY, Ya. I., TOLSTOPYATOVA, G. V., and CHEGRINETS, G. Ya.,
A. N. Marzeyev Kiev Institute of General and Communal Hygiene

"Pollution of Open Bodies of Water by Pesticides Used in Agriculture"

Abstract: Of 456 soil samples, 224 water analyses, and 216 determinations of
bottom sediments from ponds and small streams and adjacent fields and shelter-
belts in different soil and climatic zones of the Ukraine, DDT, sevin,
metaphos, chlorophos, etc. were detected in 97 (21.3%), 16 (7.1%), and 54
(25%), respectively. Mostly organochlorine pesticides were found in the soils
and bottom sediments (in 92.9 and 85.2% of the cases) and organophosphorus
compounds in the ponds and streams (in 75% of the cases). The surface runoff
from the fields and orchards is a major factor in the pollution of the ponds
and streams, for the concentrations of the pesticides are highest after the
first rains following spraying.

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USSR

TOLSTOPYATOVA, G. V., Kiev, Scientific-Research Institute of General
and Municipal Hygiene

"The Toxic Properties of Blue-Green Algae"

Abstract: The toxicity of blue-green algae, mostly Aphanizomenon
flos-aquae and Microcystis aeruginosa, was studied on 45 white rats,
fed in groups: 1) - with concentrated mass of algae (55.10^6 cells/ml)
2) - with algae (420 cells/ml) in water from the water supply after
sanitary treatment, and 3) - with artesian water without algae. On
the second week, after feeding rats of the 1st group showed strong
intoxication with adynamia. Rats died during the fifth week. Animals
of the second and third groups remained normal. Animals of the second
and third groups remained normal. Analysis of rats showed that high
doses of algae increase cholinesterase activity in the blood and cause
plethora of liver and spleen. Protein degeneration in liver was
noted. The content of vitamin C in adrenal glands of rats of the first
group was six times less than in adrenals of other groups. All patho-
logical effects were absent in animals of the second and third groups,
indicating the effectiveness of sanitary treatment of drinking water.
1/1

USSR

BORISEVICH, N. A., KOTOV, A. A., PAVLOVA, V. T., and TOLSTOROZHEV, G. B.,
Institute of Physics, Academy of Sciences Belorussian SSR

"Triplet-Triplet Electron Energy Transfer in Gas Phase"

Abstract: The authors made a kinetic study of triplet-triplet electron ener-
gy transfer for donor-acceptor pairs of aromatic hydrocarbons and ketones,
the lower triplet levels of which have various electron configurations. This
phenomenon of T-T energy transfer was used to study the paths of excitation
energy degradation in anthraquinone and benzophenone molecules in the gas
phase, as well as to obtain sensitized anti-Stokes annihilation retarded
fluorescence.

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USSR

BORISEVICH, N. A., KOTOV, A. A., and TOLSTOROZHEV, G. B.

UDC: 535.373.2

"Radiationless Transition of Electronic Energy in Monatomic Molecules"

Abstract: Special attention is given in this paper to the triplet-triplet transfer of energy of excitation in organic compound vapors, a subject that has been relatively neglected in the literature although it has been studied in detail in relation to condensed media. Because few materials phosphoresce with much intensity in the gaseous phase, the choice of energy donors that can be conveniently studied is difficult. In their experiments, however, the authors used diacetyl donors; the quantum interconversion output for this material in long-wave absorption excitation is close to unity. Anthracene, 9.10 dimethylanthracene, 9.10 diphenylanthracene, and pyrene were used to supply acceptor energy. Tables of the characteristics of these materials are given. In shortwave excitation, the quantum output of the intercombination conversion is found to drop. This indicates that an additional process of highly effective radiationless degradation of the electronic energy is at work without the participation of the lower

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USSR

UDC: 535.373.2

BORISEVICH, N. A., et al, Izvestiya AN SSSR -- Seriya Fizicheskaya,
vol 36, No 5, 1972, pp 935-940

triplet state. The authors are associated with the Physics In-
stitute of the Belorussian Academy of Sciences.

USSR

BORISEVICH, N. A.; TOLSTOROZHEV, G. B.

"Effectiveness of Quenching the Fluorescence of Vapors of Complex Molecules with Oxygen"

Leningrad, Optika i Spektroskopiya; October 1970, pp 701-5.

ABSTRACT: The authors studied the quenching with oxygen of the fluorescence of rarified vapors of anthracene; 9, 10-dimethylanthracene; and 9, 10-diphenyl-anthracene. An evaluation of the effectiveness of quenching was made on the basis of direct measurements of the duration of the fluorescence . For the compounds studied the effectiveness of quenching is less than unity and depends on the supply of oscillatory energy of the excited molecules. It was assumed that in complex molecules the degree of singlet-triplet association increases with an addition of oxygen. As a result, the forbidden singlet-triplet transitions decrease: i.e., additional radiationless transitions occur. The dependence on the supply of oscillatory energy of the effectiveness of the quenching of the fluorescence of vapors of complex molecules by oxygen as well as the dependence of the probability of radiationless transitions in isolated molecules (impossible with oxygen) are related to the structure of the electron levels of the molecules studied.

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USSR

UDC 535.373.2

BORISEVICH, N. A., Academician of the Belorussian SSR Academy of Sciences, and TOLSTOROZHEV, G. B., Institute of Physics of the Belo-Russian SSR Academy of Sciences

"Effect of Foreign Gases on the Fluorescence of Anthracene Derivatives"

Abstract: The effect of pentane on the fluorescence spectra and quantum yield of vapors of anthracene (A), 9,10-dimethylan-thracene (9, 10-DMA); and 9,10-diphenylanthracene (9,10-DPA) was investigated. Fluorescence spectra of dilute vapors of A, 9,10-DMA; and 9,10-DPA excited by radiation of different wavelengths λ_{ex} both in the presence and in the absence of pentane were recorded. With a decrease in the wavelength of the exciting radiation the fluorescence spectra of A vapor shifts toward the long-wave side and its structure becomes blurred. On the addition of pentane, the fluorescence spectra of A excited by radiation

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USSR

BORISEVICH, N. A., et al., Doklady Akademii Nauk BSSR, Vol 14,
No 10, 1970, pp 885-888

with wavelength λ_{exc} = 313 microns shifts toward the short-wave
region and their structure becomes more angular: i.e., the spec-
trum changes just as for an increase in the wavelength of the
exciting radiation. In the presence of pentane, the   fluores-
spectra of 9,10-DMA for λ_{exc} = 313 microns and λ_{exc} = 365 microns
shifts toward the short-wave region. The fluorescence spectrum
excited by radiation with wavelength λ_{exc} = 248 microns (second
absorption band) is continuous and strongly shifted toward the
long-wave region. It is concluded that there is a qualitative
correspondence between change in the fluorescence yield of
9,10-DMA and 9,10-DPA vapor when pentane is added and that this
depends on the vibrational energy reserve.

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1/2   021

UNCLASSIFIED

TITLE—CONVERSION OF ELECTRONIC EXCITATION ENERGY IN VAPORS OF ANTHRACENE
    DERIVATIVES —U-

PROCESSING DATE—30OCT7C

AUTHOR-(02)-BORISEVICH, N.A., TOLSTOROZHEV, G.B.

COUNTRY OF INFO—USSR

SOURCE—IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(3), 654-7

DATE PUBLISHED————70

SUBJECT AREAS—CHEMISTRY, PHYSICS

TOPIC TAGS—EXCITATION ENERGY, ANTHRACENE, FLUORESCENCE, COMPLEX MOLECULE

CONTROL MARKING—NO RESTRICTIONS

DOCUMENT CLASS—UNCLASSIFIED

PROXY REEL/FRAME—2000/0667

STEP NO—UR/0048/70/034/003/0654/0657

CIRC ACCESSION NO—AP0124339

UNCLASSIFIED

CIRC ACCESSION NO--AP0124339   UNCLASSIFIED   PROCESSING DATE--30OCT7(

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. QUANTUM YIELD, GAMMA, AND FLUORESCENCE LIFETIME, GAMMA, IN VAPORS OF COMPLEX MOLS. PROVIDE IMPORTANT INFORMATION ON THE INTERNAL CONVERSION OF THE EXCITATION ENERGY IN A MOL. THESE PROPERTIES WERE EXAMD. OVER A WIDE RANGE OF TEMPS., 420-670DEGREESK, AND WAVELENGTHS OF THE EXCITING RADIATION, 248-365 NM, IN ANTHRACENE AND ITS 9,10 DIMETHYL AND DIPHENYL DERIVS. FOR ANTHRACENE PI EQUALS 5.9 TIMES 10 PRIME9 NEGATIVE SEC IS INDEPENDEN' OF BOTH NU SUBEX (LAMBDA EQUALS 365, 348, 334, 313) AND T (420-520DEGREESK). FOR THE DI ME DERIV. TAU AND GAMMA INCREASE FOR HIGHER NU SUBEX (LAMBDA EQUALS 365 NM) BUT DECREASE FOR LAMBDA EQUALS 254, 248 NM; THESE QUANTITIES INCREASE AND DECREASE WITH TEMP. FOR EXCITATION WITH LIGHT OF LONGER OR SHORTER WAVELENGTH, RESP. FOR THE DI PH DERIV. THE QUANTITIES ARE INDEPENDENT OF NU SUBEX FOR LAMBDA EQUALS 365 NM BUT DECREASE SLIGHTLY FOR HIGHER NU SUBEX VALUES. FOR LAMBDA EQUALS 365 NM NO TEMP. EFFECT, AND FOR LAMBDA EQUALS 334 AND 313 TEMP. QUENCHING IS OBSD.   FACILITY: INST. FIZ., MINSK, USSR.

UNCLASSIFIED

USSR   UDC 617.735-007.281:615.84.19-085.849.19/617.7-018/-092.9

LINNIK, L. A., Candidate of Medical Sciences, and TOLSTOSHEV, A. V., Engineer, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Academician V. P. Filatov

"The Neodymium Laser. The effects of Its Radiation on Eye Tissue as Compared With The Ruby Laser"

Odessa, Oftal'molgicheskiy Zhurnal, No 8, 1971, pp 581-585

Abstract: The eyes of 60 rabbits were irradiated with a neodymium laser with 0.06, 0.09, 0.4, and 0.8 joules. Clinical and histomorphological invwatigations revealed that the neodymium laser causes considerable inflammation in the area of application and the surrounding zone. The severity and duration of the inflammatory reaction is proportional to the energy applied, but eventually a large atrophic area is formed. In contrast to the ruby laser, the neodymium laser produces neither edema nor hemorrhage into the vitreous body, but tends to coagulate the blood in the choroid blood vessels. It is concluded that neodymium lasers may be used for therapeutic purposes in clinical ophthalmology, including treatment of intraocular tumors.

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1/2   024

TITLE--STUDY OF THE ACOUSTIC AND GASODYNAMIC CHARACTERISTICS OF A JET NOISE
MUFFLER -U-

UNCLASSIFIED

PROCESSING DATE--23OCT70

AUTHOR-(04)-KRASHENINNIKOV, S.YU., SORKIN, L.I., TOLSTOSHEYEV, M.N.,
YAKOVLEVSKIY, O.V.

COUNTRY OF INFO--USSR

SOURCE--AKUSTICHESKII ZHURNAL, VOL. 16, JAN.-MAR. 1970, P. 88-95

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS, PROPULSION AND FUELS

TOPIC TAGS--ENGINE MUFFLER, TURBOJET ENGINE, NOISE REDUCTION, EXHAUSE GAS
DYNAMICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1459

CIRC ACCESSION NO--AP0106215

STEP NO--UR/0046/70/016/000/0088/0095

UNCLASSIFIED

CIRC ACCESSION NO--AP0106215   UNCLASSIFIED   PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   STUDY OF A JET NOISE MUFFLER
CONSTURCTED IN THE FORM OF A SET OF ADAPTERS LOCATED AT THE OUTLET
SECTION OF A JET NOZZLE.   IN THIS CASE AIR OR SOME OTHER GAS IS BLOWN
THROUGH THE ADAPTERS PERPENDICULAR TO THE ENGINE EXHAUST JET.   THE
EXPERIMENTALLY OBTAINED REDUCTION IN THE MAXIMUM INTENSITY OF THE NOISE
LEVEL AMOUNTS TO 4 TO 5DB.   IN STUDIES ON MODELS SIGNIFICANT CHANGES IN
THE STURCTURE OF THE EXHAUST JET, UNDER THE ACTION OF THE INJECTED GAS
ARE NOTED NAMELY, A REDUCTION IN THE LENGTH OF THE INITIAL SECTION OF
THE JET, AN INCREASE IN THE TRANSVERSE DIMENSIONS OF THE JET, AND OTHER
CHANGES.

UNCLASSIFIED

USSR

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NAVAKATYKYAN, O. O., KUNDIYEV, Yu. I., LYSYNA, G. G., BUZUNOV, V. P.,
HRYSHKO, F. I., DERKACH, V. S., KAPSHUK, O. P., KYRYENKO, A. Ye., KARAKASHYAN,
A. N., KOVAL'OVA, G. I., RATUSHNA, A. M., TOMASHEVS'KA, L. I., NAGORNA, A. M.,
and MAYDYKOV, Yu. L., Kiev Institute of the Work Hygiene and Occupational
Diseases, Kiev

"Nervous Emotional Stresses as a Problem of Modern Work Physiology"

Abstract: The introduction of machines and automatic control instrumentation
into production lines at plants and factories and at many other institutions
requires of workers rapid coordination of actions combined with mental activity.
The volume of information input which requires a combination of physical and
mental ability has been increasing tremendously for the last decade. This has
produced nervous and emotional stresses and disturbances in the normal functions
of many human organs. Analysis of many workers from various branches of indus-
try as well as people occupied with mental work has shown that modern technology
imposes heavy stresses on an individual which are accompanied by abnormal func-
tion of the adrenal glands, and hypothalamus, and the hypophysial and sympatho-
adrenal systems. Measurements have shown that corticosteroid blood and urine
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levels exceed the norm by as much as 42-57% in people under heavy stress. Emotional stress with distortion in the function of many systems were more often encountered among the young (17-18 year olds). These malfunctions included the secretion of adrenalin and noradrenalin, and disturbances in hemodynamics. Shifts in physiological functions among different occupational groups under identical stresses occur at different times and are closely related to age. They were more pronounced among older people (31-40 years old). The cardiovascular system occupies a prominent place in labor physiology, and there are many methods and approaches to study it. Some literature methods and those of the authors are described, including instrumentation. Mental work which is accompanied by nervous-emotional stresses influences profoundly the cardiovascular system within a wide range of deviations, including pathological functional disturbances and hypertension. The same is true for other occupations as well. The authors recommend the rational use of working hours and rest periods to avoid overstresses.

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USSR

TOLSTOUKHOV, A. S., KOLOMIYETS, V. D.

"Synthesis of Inverter Structures Based on Controlled Semiconductor Devices"

Abstract: A procedure is outlined for synthesizing inverter structures from controlled semiconductor devices operating in the switched mode with respect to a given shape of output signal. Seven illustrations, bibliography of nine titles.

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Converters

USSR

GRAFOV, V.P., KOLOMIYETS, V.D., TOLSTOUKHOV, A.S., USIKOV, V.A.   UDC 621.314.14

"On The Principles Of Construction Of A Static Converter Using Semiconductor Devices"

Vestn. Kiyev. politekhn. in-ta. Ser. radioelektron. (Bulletin Of The Kiev Polytechnical Institute. Radioelectronics Series), 1970, No 7, pp 106-108 (from RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 1B460)

Translation: The main possibilities are considered for construction of the circuits of autonomous inverters, which include a device for regulation of current or voltage, filters, systems for protection, monitoring, etc. Various combinations are compared of electronic and electromagnetic elements in different functional units of the circuit. At present the most common is the synthesized electronic and electromagnetic construction of static transistorized converters. 1 table. I.A.

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USSR   UDC 669.715.018.29 $\sqrt{539.4+539.214}$ 539.374

SMIRNOV, M. A., KAREVA, N. T., AGOSHKIN, N. G., and TOLSTOV, A. M.

"Investigation of the Relation of the Hardening of Aluminum Alloy D16 to Temperature of Plastic Deformation During Thermomechanical Treatments"

V. sb. Materialy XXIII Nauch. - Tekhn. konferentsii Chelyabinsk. politekhn. in-ta. Sekts. Metallurg. Fak. Chelyabinsk (23rd Scientific-technological Materials Conference of Chelyabinsk Polytechnical Institute, Metallurgical Practice Section Chelyabinsk -- Collection of Works), 1970, p 74 (from Referativnyy Zhurnal -- Metallurgiya, No 6, Jun 71, Abstract No 61631 by V. Bochkareva)

Translation of Abstract: Deformation is realized by rolling in the interval of 20-500°. The greatest increase in the stability properties is provided when the plastic deformation occurs at 150° and lower. The best combination of stability and plasticity is achieved by combining plastic deformation at 150° with 12-15% shrinkage with subsequent age hardening.

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Thermomechanical Treatment

USSR

UDC 669.15.018.8:621.785.74

SHTEYNBERG, M. M., SMIRNOV, M. A., TOLSTOV, A. M., and BULANOV, YU. P.

"Effect of the Type of Thermomechanical Treatment on the Structure, Phase Composition and Strengthening of Kh18N10T Steel"

Translation: The effect of low-temperature thermomechanical treatment (LTMT), high-temperature thermomechanical treatment (HTMT), and thermomechanical treatment (TMT) on the structure and mechanical properties of Kh18N10T steel was studied. HTMT was performed at 1000°, LTMT at room temperature and 600°, and TMT at room temperature and 600° with subsequent heating at 600° for 100 hrs. In all cases deformation was effected by 12-15 and 25-28% rolling. X-ray diffraction analysis and electron microscope study by transillumination showed that with increased degree of deformation the dislocation density (DD) increases at all deformation temperatures. There is a slight decline in DD with a change from room temperature to 600°; there is a significant reduction in DD after deformation at 1000°. Cold and thermal deformation gives

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USSR

SHTEYNBERG, M. M., et al., Povysh. konstruktivn. prochnosti staley i splavov, No. 2, Moscow, 1970, pp 202-207

rise to a cellular disloaction structure, which is more pronounced the higher the deformation degree. Deformation at 600° causes precipitation of finely dispersed TiC particles along the dislocations. Annealing of deformed specimens at 600° causes additional precipitation of the carbides TiC and $Cr_{23}C_6$, mainly on the dislocations. Cold 25-28% deformation increases $\sigma_{0.2}$ from 21 to 77 kg/mm², σ_B from 59 to 81.7 kg/mm². The same deformation at 600° increases $\sigma_{0.2}$ to 64 kg/mm² and σ_B to 75.5 kg/mm². Heating at 600° in TMT leads to a slight increase in steel strength. TMT increases the time to rupture at 650° and a stress of 18 kg/mm² sixfold as compared with hardening. This difference disappears at stresses of 14 kg/mm² or below. Two illustrations. One table. Bibliography with two titles.

2/2

1/2   008
TITLE--STRUCTURAL FEATURES OF PRODUCTS OF THE HYDROLYTIC PRECIPITATION OF
VANADIUM, V -U-
UNCLASSIFIED
PROCESSING DATE--13NOV70
AUTHOR-(02)-FOTIYEV, A.A., TOLSTOV, L.K.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(4), 1011-15

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--VANADIUM, CHEMICAL PRECIPITATION, VANADATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1999/1087

CIRC ACCESSION NO--AP0123080

STEP NO--UR/0078/70/015/004/1011/1015

UNCLASSIFIED

CIRC ACCESSION NO--AP0123080   UNCLASSIFIED

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PRODUCTS OF HYDROLYTIC PPTN. OF   PROCESSING DATE--13NOV70
V(V) FROM LI, NA, AND K METAVANADATE SOLNS, AT VARIOUS H PRIME
POSITIVE-VO SUB3 PRIME NEGATIVE RATIOS WERE STUDIED BY IR SPECTROSCOPY.
TWO TYPES OF PPT. WERE OBTAINED: A PPT. HAVING A STRUCTURE ANALOGOUS TO
AMORPHOUS VO SUB5 WITH AN APPARENT PRESENCE OF VO SUB2 PRIME POSITIVE
AND A PPT. HAVING THE STRUCTURE OF HEXAVANADATE.   THE 1ST TYPE PPT. HAD
OH SUBN GROUPS (3510-3600 CM PRIME NEGATIVE1).   SAMPLES DRIED IN ATM.
HAD SORBED H SUB2 O AND H SUB2 O OF CRYSTN.

UNCLASSIFIED

USSR

UDC: 621.787

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BURNAKOV, K. K., SMIRNOV, M. A., BRAZGIN, I. A., BYPRYAZHKIN, V. P., NABIULLIN, N. M., TOLSTOV, A. M., Kurgan

"High Temperature Thermomechanical Treatment of EI 811 Stainless Steel"

Abstract: This work studied the possibility of increasing the strength of
EI 811 steel by high temperature heat and mechanical treatment. The studies
were performed using a steel of the following composition: 0.13% C, 0.33% Mn,
0.37% Si, 0.023% P, 0.077% S, 5.7% Ni, 21.1% Cr, 0.43% Ti, Fe -- remainder.
The material was plastically deformed by rolling at 1100-900° C, 30% compres-
sion, velocity 4.3 m/min. Specimens 20 mm in diameter and 150 mm long were
heated to 1000 or 1100° C, held 30 minutes, then deformed at these temperatures
with subsequent immediate quenching in water. Specimens heated to 1000° C
were allowed to cool in air to 900° C, then rolled at that temperature and
held 5 minutes at that temperature before quenching. It was found that the
selection of the temperature mode for plastic deformation must be based on
consideration of the different tendencies of the ferritic and austenitic
components toward softening. The strength characteristics of this steel were
increased significantly only after deformation at 900° C, which causes ..

1/2

USSR

Burnakov, K. K., Smirnov, M. A., Brazgin, I. A., Bypryazhkin, V. P.,
Nabiullin, N. M., Tolstov, A. M., Izvestiya Akademii Nauk SSSR, Metally,
No 4, Jul-Aug 73, pp 129-131.

hardening of both the γ and α phases. The $\gamma \rightarrow \alpha$ conversion occurring during
aging at 650-700° C has no significant influence on the hardening effect
achieved by high temperature heat and mechanical treatment.

2/2

UNCLASSIFIED

TITLE--PRODUCTS OF THE HYDROLYTIC PRECIPITATION OF V PRIMES POSITIVE
  CONTAINING SODIUM -U-

PROCESSING DATE--02OCT70

AUTHOR-(03)-PLETNEV, R.N., ZOLOTAVIN, V.L., TOLSTOV, L.K.

COUNTRY OF INFO--USSR

SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(2), 427-9

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL PRECIPITATION, METAL ION, VANADIUM, VANADATE, NITRIC
  ACID, MOLECULAR STRUCTURE, VANADIUM PENTOXIDE, SOLUTION ACIDITY, IR
  SPECTRUM, NMR SPECTRUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/0851

STEP NO--UR/0080/70/043/002/0427/0429

CIRC ACCESSION NO--AP0104287

UNCLASSIFIED

CIRC ACCESSION NO--AP0104287   UNCLASSIFIED   PROCESSING DATE--02OCT70

ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT. HYDRATED PPTS. OF V PRIMES
POSITIVE OBTAINED BY ACIDIFICATION OF NA METAVANADATE WITH HNO SUB3
UNDER DIFFERENT CONDITIONS WERE EXAMD. 2 YEARS AFTER PREPN., AND FRESH
PPTS. SHOW QUITE DIFFERENT PROPERTIES. NMR AT 77DEGREESK AND ROOM TEMP.
AND IR SPECTRA WERE STUDIED. STARTING CONCNS. OF V PRIMES POSITIVE WERE
0.2175, 0.0435, AND 0.0184M AND DEGREE OF ACIDIFICATION (RATION (H PRIME
POSITIVE)-(VO SUB3 PRIME NEGATIVE)) WAS CHANGED IN THE REGION 0.7-2.1
FOR EACH. CONCN. TWO TYPES OF PPT. WERE FOUND. THE PRIMARY PRODUCT HAS
A STRUCTURE SIMILAR TO THAT OF V SUB2 O SUB5 IN WHICH THE EXISTENCE OF
VO SUB2 PRIME POSITIVE IS POSSIBLE. THE SECOND TYPE OF PRODUCT, FORMED
ONLY AT 0.2175 AND PH 4.25, SHOWS THE SAME STRUCTURE AS HEXAVANADATE.
PMR AND IR SPECTRA VALENCE OSCILLATIONS OF OH GROUPS AND DEFORMATION
OSCILLATIONS OF H SUB2 O AND OH GROUPS CONFIRM THE COMPN. GIVEN
PREVIOUSLY AS NA SUBX (VO SUB2) SUB5 NEGATIVEX.HV SUB10 O SUB28 ..NH SUB2
O, WHERE 1 IS SMALLER THAN OR EQUAL TO X IS SMALLER THAN OR EQUAL TO 5.

UNCLASSIFIED

USSR

BORODAVKO, Yu. M., TOLSTOV, V. V., KAYNARA, V: N., and GAPONOV,
A. P.

UDC 621.371.332

"Investigating the Structure of Radio Signals Reflected from the
Ionosphere on the Basis of an Analysis of the Statistical Para-
meters for Their Orthogonal Components"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl.
Sekts. 1 (Tenth All-Union Conference on the Propagation of Radio
Waves; Report Theses; Section 1--collection of works) "Nauka,"
1972, pp 321-325 (from RZh--Radiotekhnika, No 10, 1972, Abstract
No 10A329)

Translation: On the basis of a detailed analysis of the character-
istics of a mathematical model represented by a vector with nor-
mally correlated orthogonal components, a method is proposed for
investigating the structure of radio signals reflected from the
ionosphere, based on the measurement of the statistical parameters
of their normal coordinates. Bibliography of four. A. L.

1/1

USSR

TOLSTOV, Yu. V.

UDC: 621.396.2:621.371.1

"Final Devices of the SIIP-F System Which Realize its Transmis-sivity"

V sb. Radioelektron. v nar. kh-ve SSSR, Ch. 2 (Radioelectronics in the National Economy of the USSR, Part 2—collection of works) Kuybyshev, 1970, pp 309-312 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A251)

Translation: The possible applications of the discrete radio com-munications system SIIP-F /expansion unknown7 in transmitting con-tinuous information are discussed. The system permits transmis-sion over a single shortwave channel of a large volume of informa-tion regardless of the number of beams, with partial use of the separation effect of the beams. One illustration, bibliography of one. N. S.

1/1

USSR

POKHMURSKIY, V. I., TOLSTOVA, S. V., and MOKROVA, A. M., Physico-Mechanical Institute, Academy of Sciences Ukrainian SSR, L'vov, and the Tula Pedagogical Institute

"Effect of a Steel's Chemical Composition on Structure of Vanadized Layers"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 6, 1973, pp 16 19

Abstract: Low-, medium-, and high-carbon steels and stainless steels were vanadium coated from which it was found that Fe and V form a continuous series of substitutional solid solutions and the thickness of the diffusion layer was 10-18 microns for the carbon steels, 22-25 microns in steel Kh17N2, 70 microns in Kh18N10T, and 200 microns in steel 2Kh13. The microhardness of the diffusion layer was hardest for the carbon steels, ranging from 1100 to 2800 while steels Kh17N2, Kh18N10T, and 2Kh13 had values of 2000, 800-300, and 200 respectively. The microhardness of steel Kh17N2 with the vanadium coating was lower than that of the base metal and no carbide zone was found. This was explained by the increased concentration of carbide-forming elements which bonded the carbon into carbides as a result of which an alpha-solid solution of
1/2

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USSR

POKHMURSKIY, Y. I., et al., Fiziko-Khimicheskaya Mekhanika Materialov, Vol 9, No 6, 1973, pp 16-19

Cr and V in Fe is formed on the surface with disseminated carbides. From this study it was evident that the growth rate of the carbide phase, its depth, hardness and structure of the near-surface zones are affected by the carbon concentration and diffusion rate into alloys with a different chemical composition. Ine figure, one table, three bibliographic references.

2/2

USSR

UDC 632.95.021.3

SUKHORUCHENKO, G. I., Candidate of Agricultural Sciences and TOLSTOVA, Yu. S., Candidate of Biological Sciences, (VIZR) (All-Union Institute for the Protection of Plants)

"Susceptibility of Assasain Bugs to Insecticides and Acaricides"

Moscow, Khimiya v Sel'skom Khozyaystne, No 7, Vol 11, 1973, pp 35-38

Abstract: The LD_{50}'s of 18 different insecticides and acaricides, including, Seven, DDT, chlorophos and similar compounds were determined for 10 different pests and for phytophage. The most sensitive species were nabid (transliterated) (Nabis palifer Seid.) and ligeid (transliterated) and the least sensitive was mirid (transliterated) (Deraeocoris punctulatus Schill). The toxicity varied with compounds causing systemic poisoning. A rather high degree of selectivity was observed for gardon, fozalon, rogor, mireks, dilor (all transliterated), and methylmercaptophos for nabids and ligeids. The hazards of compounds causing systemic poisoning and possessing a high initial toxicity in natural conditions are reduced due to the rapid loss of insecticidal activity.

1/1

Superalloys

USSR

UDC 54--165:669.107.3

GITGARTS, M. I., TOLSTOY, A. V., and IVASHIN, V. V., Institute of the Pro-
blems of Reliability and Life of Machines of the Academy of Sciences
Belorussian SSR

"Volumetric Changes During Aging of Nimonic Alloy"

Abstract: An experimental investigation was made of the dependence of the
relative elongation Δ 1/1 and the relative change of the lattice constant
Δ a/a of Nimonic alloy (Ni-Cr-Al-Ti) on its volumetric separation share p.
Dilatometric investigations revealed that the decomposition of the solid
solution of Nimonic is accompanyed by a volumetric contraction effect. The
degree of contraction is a linear function of the volumetric content of the
γ'-phase. The lattice constant of the matrix measured by normal reflections
changes equally to the linear dilation. It is demonstrated that the volumetric
effect results from concentration changes and interfacila elastic deformations.
Therefore, the dilation by decomposition of the solid solution of Ni-Cr-Al-Ti
can be described as consisting of compressive and elastic dilations. The
first is caused by impoverishing of the matrix phase by Al and Ti atoms; the
other is determined by the inadequacy of specific atomic volumes of the
1/2

USSR

GITGARTS, M. I., et al., Fizika Metallov i Metallovedeniye, Vol 33, No 4, Apr 72, pp 820-823

separation and the matrix. One illustration, one formula, one table, fourteen bibliographic references.

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Nuclear Physics

ALEYSHVILI, D. I., GRISHAYEV, I. Ya., MOCHESHNIKOV, N. I., and
TOLSTOY, A. Ye.

"Reduction of Idle Time in the Operation of a Linear Accelerator"

Abstract: In this paper it is shown that, by using an accumulator
with no essential structural changes, the pulsed electron beam of a
linear   electron accelerator containing an accumulator trans-
forms to a flow of gamma quanta with an intensity and duration
that may vary within broad limits. The experimentation which led
to this conclusion was conducted with the accumulator of the
Physicotechnical Institute of the Ukrainian Academy of Sciences,
using the first five sections of a linear accelerator with an
energy of 300 Mev acting as injector. In the accelerator, the
electron energy was 70 Mev, the pulse current was 50 ma with a du-
ration of 1.2 μs, and the injection frequency 1-50 Hz. The accele-
rator beam was formed by the rotatory focusing system of the accu-
mulator, introduced into the ring, and then captured by the pulse
field of the inflector before its accumulation in the magnetic
1/2

USSR

ALEYSHVILI, D. I., et al, <u>Atomnaya energiya</u>, vol. 33, No 1, July 1972, pp 593-594

UDC: 621.384.64:539.122

circuit with the high-frequency system operating. A description of the target is given. The radiation obtained from the target's braking the electron stream was picked up by recording equipment. A diagram of the apparatus is given, along with curves of the life-time of the accumulated electron beam as a function of the target position and for the intensity of the braked radiation as a function of time. It is found that by increasing the number of accu-mulated particles to 10^{11}, the photon output can be raised to 10^9 10^{10} per cycle.

2/2

UNCLASSIFIED

.TITLE--OPTICAL CONSTANTS, LUMINESCENCE, AND INDUCED RADIATION OF LANTHANUM
  NIOBATE SINGLE CRYSTALS ACTIVATED BY NEODYMIUM -U-   PROCESSING DATE--18SEP70

AUTHOR-(05)-BAKHSHIYEVA, G.F., KARAPETYAN, V.YE., MOROZOV, A.M., MOROZOVA,
  L.G., TOLSTOY, M.N.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(1), 76-81

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--SINGLE CRYSTAL, OPTIC PROPERTY, THERMAL EFFECT, LUMINESCENCE,
  ANISOTROPY, LANTHANUM COMPOUND, NIOBATE, CRYSTAL STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1980/1315

CIRC ACCESSION NO--AP0049477

STEP NO--UR/0051/70/028/001/0076/0081

UNCLASSIFIED

CIRC ACCESSION NO--AP0049477   UNCLASSIFIED

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LANBO SUB4 SINGLE CRYSTALS DIAM. PROCESSING DATE--18SEP70
8-15, LENGTH 70 MM WERE ISOLATED FROM THE MELT AFTER HIGH TEMP.
TREATMENT OF LANBO SUB4 IN INERT ATM. UNACTIVATED CRYSTALS AND CRYSTALS
ACTIVATED WITH 1 MOLE PERCENT ND PRIME3 POSITIVE WERE STUDIED.
UNACTIVATED CRYSTALS ARE TRANSPARENT IN THE RANGE 0.27-6.5MU; THE LIGHT
ABSORPTION IN THE RANGE 6.5-9.0 MU CORRESPONDS TO THE VIBRATIONAL
FREQUENCIES OF NBO SUB4 TETRAHEDRONS. N WAS OBTAINED AT 5 WAVELENGTHS
IN THE RANGE 435.8-656.3 MMU. STRONG BIREFRINGENCE WAS OBSD.
ACTIVATION OF THE SINGLE CRYSTALS WITH ND PRIME3 POSITIVE CAUSED STRONG
ANISOTROPY OF THE CRYSTALS. LUMINESCENCE SPECTRA WERE RUN AT
77DEGREESK. THE LUMINESCENCE DURATION WAS 120 MUSEC AT ROOM TEMP.; IT
DID NOT CHANGE ON HEATING OF THE ACTIVATED SINGLE CRYSTAL TO 250DEGREES.
THREE AXIAL ELLIPSOIDS WERE CONSTRUCTED FOR THE SEP. LINES IN THE
LUMINESCENCE SPECTRA OF LANBO SUB4 MINUS ND PRIME3 POSITIVE SCANNED IN
POLARIZED LIGHT. GENERATION OF FORCED RADIATION OCCURRED IN THE
ACTIVATED SINGLE CRYSTALS AT A SINGLE FREQUENCY, 1.0624 MU. SHIFT TO
1.0622 MU OCCURRED ON HEATING OF THE CRYSTAL TO 300DEGREES.

UNCLASSIFIED

029

TITLE--OPTICAL CONSTANTS, LUMINESCENCE, AND INDUCED RADIATION OF LANTHANUM NIOBATE SINGLE CRYSTALS ACTIVATED BY NEODYMIUM -U-

UNCLASSIFIED

PROCESSING DATE--18SEP70

AUTHOR-(05)-BAKHSHIYEVA, G.F., KARAPETYAN, V.YE., MOROZOV, A.M., MOROZOVA, L.G., TOLSTOY, M.N.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(1), 76-81

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--SINGLE CRYSTAL, OPTIC PROPERTY, THERMAL EFFECT, LUMINESCENCE, ANISOTROPY, LANTHANUM COMPOUND, NIOBATE, CRYSTAL STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1980/1315

STEP NO--UR/0051/70/028/001/0076/0081

CIRC ACCESSION NO--AP0049477

UNCLASSIFIED

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CIRC ACCESSION NO--AP0049477   UNCLASSIFIED   PROCESSING DATE--18SEP70
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LANBO SUB4 SINGLE CRYSTALS DIAM.
8-15, LENGTH 70 MM WERE ISOLATED FROM THE MELT AFTER HIGH TEMP.
TREATMENT OF LANBO SUB4 IN INERT ATM. UNACTIVATED CRYSTALS AND CRYSTALS
ACTIVATED WITH 1 MOLE PERCENT ND PRIME3 POSITIVE WERE STUDIED.
UNACTIVATED CRYSTALS ARE TRANSPARENT IN THE RANGE 0.27-6.5MU; THE LIGHT
ABSORPTION IN THE RANGE 6.5-9.0 MU CORRESPONDS TO THE VIBRATIONAL
FREQUENCIES OF NBO SUB4 TETRAHEDRONS. N WAS OBTAINED AT 5 WAVELENGTHS
IN THE RANGE 435.8-656.3 MMU. STRONG BIREFRINGENCE HAS OBSD.
ACTIVATION OF THE SINGLE CRYSTALS WITH ND PRIME3 POSITIVE CAUSED STRONG
ANISOTROPY OF THE CRYSTALS. LUMINESCENCE SPECTRA WERE RUN AT
77DEGREESK. THE LUMINESCENCE DURATION WAS 120 MUSEC AT ROOM TEMP.; IT
DID NOT CHANGE ON HEATING OF THE ACTIVATED SINGLE CRYSTAL TO 250DEGREES.
THREE AXIAL ELLIPSOIDS WERE CONSTRUCTED FOR THE SEP. LINES IN THE
LUMINESCENCE SPECTRA OF LANBO SUB4 MINUS ND PRIME3 POSITIVE SCANNED IN
POLARIZED LIGHT. GENERATION OF FORCED RADIATION OCCURRED IN THE
ACTIVATED SINGLE CRYSTALS AT A SINGLE FREQUENCY, 1.0624 MU. SHIFT TO
1.0622 MU OCCURRED ON HEATING OF THE CRYSTAL TO 300DEGREES.

UNCLASSIFIED

UNCLASSIFIED

IN STANNIC CHLORIDE PROPERTIES OF ND PRIME3POSITIVE LUMINESCENCE CENTERS

PROCESSING DATE--04DEC70

AUTHOR-(03)-TOLSTOY, M.N., LYUBIMOV, YE.I., BATYAYEV, I.M.

COUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(4), 722-7

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY, PHYSICS

TOPIC TAGS--SPECTROSCOPY, CHLORIDE, LUMINESCENCE SPECTRUM, TIN COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1719

CIRC ACCESSION NO--AP0125340

STEP NO--UR/0051/70/028/004/0722/0727

UNCLASSIFIED

CIRC ACCESSION NO--AP0125340   UNCLASSIFIED
ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   THE SPECTROSCOPIC CHARACTERISTICS
OF ND PRIME3POSITIVE SOLNS.   IN SNCL SUB4-POCL SUB3 (IN GENERAL, SNCL
SUB4:POCL SUB3 EQUALS 1"10) WERE INVESTIGATED AS ABSORPTION SPECTRA IN
THE RANGE OF 0.4-2.5 MU AND AS LUMINESCENCE SPECTRA IN THE RANGE 0.8-2.0
MU.   THE SPECTRAL PROPERTIES DEPENDED WEAKLY ON THE COMPONENT RATIO
BETWEEN SNCL SUB4 AND POCL SUB3.   BOTH TYPES OF SPECTRA WERE STUDIED IN
THE FROZEN SOLNS. AT 77 AND 4.2DEGREESK.   A DEPENDENCE OF THE RELATIVE
INTENSITY AND LINE WIDTH ON THE FREEZING REGIME WAS OBSD.   THE RESULTS
ARE INTERPRETED ON THE BASIS OF THE EXISTENCE OF COMPLEX ND COMPDS. IN
SOLN.   SEVERAL TYPES OF LUMINESCENCE CENTERS ARE PRESENT, CONNECTED WITH
EACH OTHER THROUGH NONRADIATIVE INTERACTION.

UNCLASSIFIED

PROCESSING DATE--04DEC70

USSR

MILYUKOV, Ye. M., REYSHAKHRIT, A. L., TOLSTOY, M. N.

"Liquation Nature of Activator Segregation in Glasses"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 2, 1970, pp 525-527

Abstract: There is no data on liquation which may cause changes in the structure of alkali-germanate glasses appearing with variations in the spectroscopic characteristics of neodymium due to changes in the state of the glass. This paper obtains this data by making and studying electron microscope photographs which had been spectroscopically investigated in an earlier article. The photomicrographs show that for small alkali metal content, the nature of the nonuniformities is typical of glasses which have undergone microliquation. Five such photomicrographs are reproduced, each for a different composition of Na_2O and GeO_2. The results show that the conclusions drawn in an earlier paper co-authored by two of the writers of the present article (Reyshakhrit and Tolstoy, ZhPS, Vol 12, No 3, 1970) are valid; the conclusions of the earlier article were obtained on the basis of spectroscopic researches. In this paper, the authors conclude that the division of the glass into phases under the microliquation conditions

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USSR

MILYUKOV, Ye. M., et al., Fizika Tverdogo Tela, Vol 12, No 2, 1970, pp 525-527

is accompanied by activator segregation, which can be expressed by changes in its spectroscopic characteristics. They note also that the concept of micro-heterogeneity in the glass structure may explain the formation of multitypical luminescence centers within the limits of the nonuniform widening of the spectral lines.

2/2

UNCLASSIFIED

INFLUENCE OF TEMPERATURE ON THE LUMINOSITY OF CONCENTRATED RUBY -U-

AUTHOR-(02)-GERLOVIN, I.YA., TOLSTOY, N.A.

COUNTRY OF INFO--USSR

SOURCE--OPTIKA I SPEKTROSKOPIIA, VOL. 28, APR. 1970, P. 833-835

DATE PUBLISHED-------70

PROCESSING DATE--27NOV70

SUBJECT AREAS--PHYSICS, EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--LUMINESCENCE, RUBY, SPECTRAL LINE, CHROMIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1289

CIRC ACCESSION NO--AP0124940

STEP NO--UR/0051/70/028/000/0833/0835

UNCLASSIFIED

024

CIRC ACCESSION NO--AP0124940   UNCLASSIFIED

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. INVESTIGATION OF THE SPECTRUM AND   PROCESSING DATE--27NOV70
LUMINESCENCE KINETICS OF SYNTHETIC RUBY POWDER WITH A CHROMIUM
CONCENTRATION OF 2 MOL PERCENT AT TEMPERATURES RANGING FROM 4.2 TO
293DEGREESK. THE RESULTS ARE USED TO DERIVE INFORMATION ON THE
INTERACTION BETWEEN THE LUMINOSITY CENTERS IN RUBY. IT IS FOUND THAT
THE LUMINOSITY OF THE N LINES CHANGES BY ROUGHLY TWO ORDERS OF MAGNITUDE
AS THE TEMPERATURE CHANGES FROM 4.2 TO 293DEGREESK, AND THAT IT EXCEEDS
BY AT LEAST ONE ORDER OF MAGNITUDE THE LUMINOSITY OF THE R LINES WHICH
DOES NOT EXPERIENCE ANY LARGER CHANGES OVER THIS TEMPERATURE RANGE.
THIS INDICATES THAT THE DARKENING OF THE N LINES MAY BE ATTRIBUTED TO
ENERGY TRANSPORT TO THE CENTERS WHICH ARE RESPONSIBLE FOR THE 7800 A
BAND.

UNCLASSIFIED

USSR

GERLOVYN, I. YA., TOLSTOY, N. A.

"Effect of Temperature on the Glow of a Concentrated Ruby"

Leningrad, Optika i Spektroskopiya, Vol 28, No 4, April 1970,
pp 833-835

UDC 535.373.2.096

Abstract: This paper contains additional information about the
interaction of the glow centers in a ruby obtained as a result
of investigating the spectrum and luminescence kinetics of a
powdered sample of synthetic ruby in the temperature range of
4.2-293°K. The chromium concentration in the sample was 2 mole%.
The results of the investigations are presented in a figure from
which the nature of the temperature variations in the luminescence
spectrum is clear. It is pointed out that the behavior of the
leading R-lines emitted by single chromium ions, two relatively
narrow N-lines attributed to paired centers -- dimers -- and the
most intense band in the long-wave region with a maximum about
7,800 Å, is of greatest interest. When the temperature is varied
from 4.2 to 293°K, the brightness of the N-lines varies by approxi-
mately two orders, exceeding the brightness of the R-lines by
1/2

- 126 -

USSR

GERLOVYN, I. YA., et al, Optika i Spektroskopiya, Vol 28, No 4,
April 1970, pp 833-835

more than an order, whereas the latter does not experience
essential changes throughout the entire indicated temperature
range. From this it is concluded that there is an additional
channel for quenching N-lines. This channel is the transfer
of energy to the centers responsible for the long-wave band of
7,800 Å. Use of pulse excitation which did not, in practice,
heat the sample permitted the nature of the temperature varia-
tion of the N-line intensity to be traced in detail. However,
further research is needed to obtain definite information about
the nature of the centers responsible for the 7,800 Å band.

2/2

UNCLASSIFIED

-- APPARATUS FOR THE CHROMATOGRAPHIC SEPARATION OF HIGHLY RADIOACTIVE
ELEMENTS -U-

AUTHOR-(02)-LEBEDEV, N.A., TOLSTOY, N.S.

COUNTRY OF INFO--USSR

SOURCE--RADIOKHIMIYA 1970, 21(1), 112-19

DATE PUBLISHED-------70

PROCESSING DATE--23OCT70

SUBJECT AREAS--NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--ISOTOPE SEPARATION, CHROMATOGRAPHIC SEPARATION, RARE EARTH
ISOTOPE, RADIATION DOSAGE, NUCLEAR SAFETY, CHEMICAL PLANT EQUIPMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/2203

CIRC ACCESSION NO--AP0127565

STEP NO--UR/0186/70/012/001/0112/0119

UNCLASSIFIED

ACCESSION NO--AP0127565   UNCLASSIFIED

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REMOTE CONTROL SHIELDED APP. FOR
THE ION EXCHANGE SEPN. OF RADIOACTIVE RARE EARTH ISOTOPES PRODUCED BY P
BOMBARDMENT OF TA, ER, AND GD IS DESCRIBED. THE APP. HAS BEEN USED OVER
6 MONTHS FOR THE PROCESSING OF SAMPLES WITH A TOTAL ACTIVITY OF LESS
THAN OR EQUAL TO I G EQUIV. RA. THE DOSE ABSORBED BY THE OPERATOR WAS
LESS THAN OR EQUAL TO 10 MR IN THE WORK WITH 3 G EQUIV. RA.

PROCESSING DATE--23OCT70

UNCLASSIFIED

USSR

Rubber and Elastomers

UDC 678.049.002.612

LITVINOVA, T. V., VOL'CHENKO, R. L., and TOLSTUKHINA, F. S.

"New Plasticizer for Cold Resistent Rubbers"

Moscow, Kauchuk i Rezina, No 12, 1972, pp 26-28

Abstract: The nature of the plasticizer is important in producing cold resistance in rubbers. The ester plasticizers usually used are limited by high cost, lack of starting materials, and high volatility. Other plasticizers have lower volatility, but cannot produce the needed cold resistance. A possible solution to this problem lies in the use of a new ester plasticizer, using synthetic monobasic fatty acids(SFA) which are readily available on a large scale from oil refineries from the oxidation of paraffins. Synthesis of these new plasticizers was realized in one instance with diethylene glycol and SFA of various fractions (from C_5-C_6 to $C_{10}-C_{11}$) and in another instance by esterification of a SFA fraction with various alcohols. The effectiveness of these new plasticizers was estimated by comparing the magnitude of the cold resistance coefficients of standard butadienenitrile and nairit B vulcanized rubbers. The maximum coefficient of cold resistance was obtained from SFA fraction C_7-C_9. Plasticizers with normal alcohols,   were much more effective
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LITINOVA, T. V., et al., Kauchuk i Rezina, No 12, 1972, pp 26-28

than those of branched alcohols, with diethylene glycol producing optimal results. The ester from the SFA fraction C_7-C_9 and diethylene glycol is called LZ-7. It is much less volatile than commonly used esters(dibutyl sebacate and dibutyl phthalate). In conditioned cold resistance LZ-7 is close to dibutyl sebacate and surpasses dibutyl phthalate. A definite correlation between the effectiveness of plasticizer action and the degree of change in its viscosity with a lowering of temperature was demonstrated, with LZ-7 showing an insignificant change in its viscosity with a lowering of temperature. The effectiveness of ester LZ-7 was confirmed with resins from both polar and nonpolar rubbers used in production of various rubber materials, in which LZ-7 surpasses dibutyl phthalate and is close to dibutyl sebacate.

2/2

USSR

VIZNYUK, A. N., TOLSTUN, A. I.

UDC: 8.74

"An Algorithm for Laying out Computer Wiring"

Kiev, Konstruirovaniye i vnedreniye novykh sredstv vychisl. tekhn.--
sbornik (Designing and Introducing New Computer Facilities--collection
of works), t. 1, 1971, pp 177-184 (from RZh-Kibernetika, No 7, Jul 73,
abstract No 7V594)

Translation: The paper is devoted to the question of automating the
compilation of wiring tables. An algorithm is proposed for laying out
high-speed computer wiring. The algorithm is based on an attempt to
simulate the thinking of the designer in compiling wiring tables.

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Radar

UDC: 621.396.96.01

USSR

TOLSTUNOV, V. A.

"Concerning the Function of Indeterminacy in Radar. A Survey"

Tr. Sib. fiz.-tekhn. in-ta pri Tomsk. un-te (Works of the Siberian Physi-
cotechnical Institute Affiliated With Tomsk University), 1972, vyp. 62,
pp 173-183 (from RZh-Radiotekhnika, No 8, Aug 72, Abstract No 8G4)

Translation: The paper considers the general properties of the function
of indeterminacy of deterministic and random signals as applied to radar.
Bibliography of 16 titles. N. S.

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Radar

USSR

UDC: 621.391

TERFUGOV, A. F., TOLSTUNOV, V. A.

"Concerning the Uncertainty Function of Random Signals"

Kiev, IVUZ: Radioelektronika, Vol 15, No 3, Mar 72, pp 343-349

Abstract: A new approach is proposed for extending the concept of the uncertainty function to the case of random signals. Let the probing signal $S(t)$ be a realization of a random process which is stored in a radar station and then utilized in reception. Let θ be the parameters and $\hat{\theta}$ be the estimates of the parameters of this signal. If $p(\hat{\theta}/\theta)$ is the probability density function for estimates of the unknown parameters, then for signal reception in normal white noise we have

$$p\,(\hat{\theta}/\theta) = C e^{q g(\hat{\theta}, \theta)},$$

where $g(\hat{\theta}, \theta)$ is the uncertainty function, q is the signal-to-noise ratio, and C is a normalization constant. It is shown that the expression

$$g\,(\hat{\theta},\, \theta) = \frac{1}{q}\,\ln \int_{-\infty}^{\infty} e^{q g(\hat{\theta},\, \theta, S)}\, p\,(S)\, dS$$

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should be used as the uncertainty function for random signals in the general case. If the range and speed of the target are the unknown parameters,

$$g(\tau, \Omega) = \frac{1}{q} \ln \int_{-\infty}^{\infty} e^{\frac{q}{T^2} \left| \int_0^{T-\tau} S(t) S^*(t+\tau) e^{j\Omega t} dt \right|^2} p(S) \, dS.$$

In the case where the autocorrelation function drops abruptly to zero with an increase in the argument, the approximate formula

$$g(\tau, \Omega) = \frac{1}{T^2} \left[\bar{u}^2 + \bar{v}^2 + \sigma_u^2 + \sigma_v^2 + \frac{2q}{T^2} (\bar{v}\sigma_v + r\sigma_u \bar{u})^2 \right]$$

can be used as the uncertainty function, where

$$u + jv = \int_0^{T-\tau} S(t) S^*(t+\tau) e^{j\Omega t} dt.$$

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UDC 619:616.988.43:636.22/.28

TOLSTYAK, I. Ye., BAKUMENKO, M. D., CHECHETKINA, N. P., KONOZENKO, P. A., and OMELAVENKO, A. A., Ukrainian Scientific Research Institute of Experimental Veterinary Medicine

"Epizootiology of Food-and-Mouth Disease Variant A22"

Moscow, Veterinariya, No 5, May 71, pp 45-46

Abstract: The history of foot-and-mouth disease variant A22 in the Ukraine can be separated into two periods: the prevaccination period, when the fight against the infection consists primarily of veterinary sanitation measures, and the vaccination period, characterized by widespread use of aluminum hydroxide formaldehyde vaccine from lapinized A22 virus. Still, active immunization of animals in the Ukraine was required. The development of the disease in recent years (1956-1969) in various regions of the Ukraine is reviewed. It was concluded that the establishment of immune zones for cattle, using the above vaccine, might solve the foot-and-mouth disease problem for all animals within a given region.

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USSR

UDC 621.391.154

TOLSTYAKOV, V. S., Editor

"Error Detection and Correction in Digital Devices"

Moscow, Izd-vo "Sovetskoye radio," 1972, p 2

Translation: This book presents the results of the authors' investigations in developing digital devices with error correction. It considers methods for improving the reliability of the devices, based on the use of correcting codes; explains methods for constructing minimum or near-minimum checks and diagnostic tests; discusses methods for controlling and taking into account functional expressions for the operation of typical units, and analyzes some characteristics of their capabilities. A great deal of attention is devoted to the specific operation of devices for rational use of input redundancy. The theoretical material of the book is illustrated by practical examples.

The book is designed for scientific personnel, engineers, and graduate students specializing in the design of digital devices for electronic systems, computer techniques, automation, and remote control.

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TOLSTYAKOV, V. S., Editor, Izd-vo "Sovetskoye radio," 1972, p 2

Bibliography of 121 titles, 48 tables, 124 illustrations.

Authors: V. S. Tolstyakov, V. N. Nomokonov, I. L. Yerosh, V. V. Losev, V. V. Danilov, D. O. Yakovlev, M. G. Karpovskiy.

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TOLSTYAKOV, V. S., Editor, Izd-vo "Sovetskoye radio," 1972, pp 286-287

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TOLSTYAKOV, V. S., Editor, Izd-vo "Sovetskoye radio," 1972, pp 286-287

Appendix 1. Experimental Data on Errors of Typical Units in Digital Devices

Appendix 2. Tables of Arithmetic Correcting Codes

Appendix 3. Algorithm for Finding the Minimum Form for Recording Numbers

Bibliography

USSR

IVANOV, G. G., TOLST'YEV, V. P.

"Selection of Method and Group Operations for Solution of Systems of Linear Equations"

Vychisl. Sistemy [Computer Systems -- Collection of Works], Novosibirsk, No 46, 1971, pp 153-157, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V.716).

NO ABSTRACT.

1/1

USSR

TOLSTYKH, A. I., Central Aerohydrodynamics Institute imeni N. Ye. Zhukov-
skiy, Moscow

UDC: 533.6.011

"On a Method of Numerical Solution of Navier-Stokes Equations for a Com-
pressed Gas Over a Wide Range of Reynolds Numbers"

Moscow, Doklady Akademii Nauk SSSR, Vol 210, No 1, May 1973, pp 48-51

Abstract: At sufficiently large values of the Reynolds number R calcu-
lation of the field of flow of a viscous compressible gas runs into serious
difficulties involving in particular abrupt changes in the unknown func-
tions in regions with characteristic dimensions $1/\sqrt{R}$ (boundary layers) and
$1/R$ (shock waves). The effectiveness of conventional methods is consid-
erably reduced under these conditions due to the excessive error in ap-
proximating the convective terms of equations, and nonmonotonicity of the
solutions, requiring the use of "smoothing". In this paper an approach is
suggested which obviates these difficulties to a great degree by extending
regions with large gradients of unknown functions and using schemes of a
higher order of accuracy. Cases of plane and axisymmetric flows are con-
sidered for the sake of simplicity, and it is assumed that an orthogonal

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TOLSTYKH, A. I., Dokl. AN SSSR, May 73, Vol 210, pp 48-51

system of coordinates (s,n) can be introduced having the property that regions of boundary layers or shock waves are intersected by lines s = const in the field of flow. The method is illustrated by solving the following three problems: 1) flow in a one-dimensional shock wave; 2) flow in regions of the boundary layer type; 3) flow with shock waves and boundary layers.

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TOLSTYKH, A. N.

into a rectangular region, a difference grid is introduced, and the equations of the problem are represented in difference form with second-order of accuracy. The system of nonlinear difference equations is solved by the method of successive approximations. Each iteration deals with a system of linear equations, to which the method of successive elimination is applied. In contrast to the numerical method of Babenko, et al. (Babenko, Voskresenskiy, Lyubimov, and Rusanov. Prostranstvennoye obtekaniye gladkikh tel ideal'nym gazom. Three-dimensional flow around smooth bodies by an ideal gas. Moskva, Nauka, 1964, RZhMekh, 1965, 4B207K), the system of difference equations in the iteration process is not broken down into equations along individual radial lines, but is solved simultaneously for the entire region. The method of successive matrix elimination is also generalized for the case of cell matrices. Damping is used to accelerate iteration convergence. Some calculation results are presented to illustrate the convergence of the numerical solution.

Molodtsov, V. K., and A. N. Tolstykh.
Calculation of supersonic viscous flow around blunt bodies. IN: Trudy Sektsii po chislennym metodam v gazovoy dinamike 2-go Mezhdunarodnogo kollokviuma po gazodinamike vzryva i reagiruyushchikh sistem. Moskva, v. 1, 1971, 37-54. (RZhMekh, 5/72, no. 5B335)

Supplementary results are presented to calculations using model by methods proposed earlier by the authors (Tolstykh, A. ZhVYSMF, no. 1, 1966, 113-120, RZhMekh, 1966, 8B257; Molodtsov, 1969, 1211-1217, RZhMekh, 1970, 2B384). The calculations were for $M_e = 10$ and various Reynolds numbers, and a temperature factor and index ewithin the law of the relationship of the viscosity coefficient to temperature.

Navier-Stokes equations of hypersonic flow around a spherically blunt

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UDC 629.78.015:533.16

MOLODTSOV, V. K., TOLSTYKH, A. N.

"Calculation of Hypersonic Viscous Flow Around Blunt Bodies"

Translation: In studying the aerodynamic characteristics of blunt bodies in a stream of low-density gas, when the forces of viscosity become significant, numerical integration of the Navier-Stokes equation becomes necessary. Certain results are presented, produced in studies of the flow around the spherical nose portion of blunt bodies by a supersonic flow of a viscous gas. 11 Figures; 10 Biblio. Refs.

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CHEMICAL STUDIES ON SIBIROMYCIN, AN ANTITUMOR ANTIBIOTIC

M. G. Brazhnikova, I. N. Kovsharova, N. V. Konstantinova,
V. V. Proshlyakova, I. B. Tolstykh, A. S. Mezentsev,
Institute for New Antibiotics of USSR Academy of Medical Sciences, Moscow

A new antibiotic named sibiromycin was isolated. It has the following empirical formula: $C_{24-25}H_{33-35}N_3O_{6-7}$, $\lambda_{max}^{CH_3OH}$. 230 and 310 mμ. Sibiromycin possesses amphoteric properties, pKa 7.5 (in 75 per cent ethanol). It contains 1 amine, 3 C-methyl and 2-acetylating groups. A crystalline sulfur containing derivative with a composition of $C_{24-25}H_{33-35}N_3SO_{6-9}$ and a melting point of 203°. was prepared. The ultraviolet spectrum is identical to that of an antibiotic, $[\alpha]_{Д}^{20}$ 100±2°.(c. 0.15, DMPhA).

USSR

UDC: 621.382.002

TOLSTYKH, S. A., SYNOROV, V. F.

"Masking Properties of Silicon Nitride Films"

V sb. Radiofiz. i mikroelektronika (Radio Physics and Microelectronics--collection of works), Voronezh, 1970, pp 86-88 (from RZh-Elektronika i yeye Primeneniye, No 6, Jun 71, Abstract No 6B519)

Translation: Silicon nitride films are produced by rf vacuum vaporization of a silicon electrode onto polished (111) silicon surfaces. A 1,000 Å layer of molybdenum was vacuum deposited by thermal vaporization onto the silicon nitride films as a basis for photolithography. The thickness and index of refraction (2.000-2.105) of the nitride films were checked by an ellipsometric method in monochromatic light with a wavelength of 5461 Å. The electric strength, $(5-9) \cdot 10^6$ V/cm, was measured on $Al-Si_3N_4-Si$ structures. The protective properties of the silicon nitride films against diffusion of boron, gallium and phosphorus were studied by determining the depth of the junction beneath the film, and on unprotected segments. Films with a thickness of 300 Å and more give complete protection against boron diffusion when the junction lies 12 μ beneath the surface on unprotected sec-

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TOLSTYKH, S. A., SYNOROV, V. F., Radiofiz. i mikroelektronika, pp 86-88

tions. The source of boron was B_2O_3; diffusion conditions were 1,000°C for 20 minutes; dispersion conditions were 1150°C for 30 hours. A 200 Å film of Si_3N_4 reacts completely with the diffusing agent after 40 minutes of diffusion. Distillation in a molecular oxygen atmosphere should not last too long since silicon dioxide is formed. After 10-12 hours of distillation in a molecular nitrogen atmosphere, a dense B-Si-B film which is insoluble in hydrofluoric acid forms on the surface. Nitride gives complete protection against prolonged diffusion of gallium at 1200°C from a Ga_2O_3 source in a molecular hydrogen atmosphere. Silicon nitride films 1,000-23,000 µ thick protect silicon against phosphorus diffusion from a P_2O_5 source in an argon atmosphere under 1200°C distillation conditions for the time needed to produce a junction at a depth of 7 µ. Films 300-2500 Å thick give no protection against diffusion since they react with phosphorus anhydride to form phosphoric glass. Compaction of films by annealing for 7 hours at 1150°C in a nitrogen atmosphere improves the protective properties. With a film thickness of 1000-2400 Å, a junction at a depth of 11 µ can be obtained on open sections. Bibliography of 5 titles. I. M.

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UNCLASSIFIED

TITLE--DETERMINATION OF THE COEFFICIENT OF TURBULENT DIFFUSION IN THE FREE
ATMOSPHERE USING DIPOLE REFLECTORS -U-

PROCESSING DATE--11DEC70

AUTHOR-(02)-GORELIK, A.G., TOLSTYKH, V.G.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, IZVESTIYA AKADEMII NAUK SSSR, FIZIKA ATMOSFERY I OKEANA,
VOL VI, NO 6, 1970, PP 635-638

DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., ATMOSPHERIC SCIENCES,
NAVIGATION

TOPIC TAGS--FREE ATMOSPHERE, DIPOLE ANTENNA, DIFFUSION COEFFICIENT,
REFLECTED SIGNAL, CLOUD FORMATION, RADIO ECHO

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605041/E07 STEP NO--UR/0362/70/006/006/0635/0638

CIRC ACCESSION NO--AP0142752

UNCLASSIFIED

CIRC·ACCESSION NO--AP0142752   UNCLASSIFIED   PROCESSING DATE--11DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN 1966 AN ATTEMPT WAS MADE AT
SIMULTANEOUS MEASUREMENT OF THE DIFFUSION COEFFICIENT K AND THE RATE OF
DISSIPATION OF TURBULENT ENERGY EPSILON FROM CLOUDS OF DIPOLE
REFLECTORS. THE DIFFUSION COEFFICIENT WAS MEASURED USING A CLOUD OF
DIPOLE REFLECTORS INTRODUCED INTO THE ATMOSPHERE FROM A HELICOPTER; THE
TEMPORAL CHANGE IN THE EXTENT OF THE CLOUD WAS MEASURED, AS WAS THE
DISTRIBUTION OF THE INTENSITY OF THE REFLECTED SIGNAL IN THE CLOUD AND
ITS SPATIAL TEMPORAL VARIATIONS. IN ADDITION, DURING THE EXPERIMENT IT
WAS POSSIBLE TO DETERMINE THE SPECTRUM OF FLUCTUATIONS OF THE INTENSITY
OF RADIO ECHOES AND VARIATIONS OF THE MEAN DOPPLER FREQUENCY. THIS MADE
IT POSSIBLE TO COMPUTE THE RATE OF DISSIPATION OF TURBULENT ENERGY IN
THE ATMOSPHERE AND ATTEMPT TO FIND A RELATIONSHIP BETWEEN K AND EPSILON.
THE EXPERIMENTAL METHOD IS FULLY DESCRIBED. MEASUREMENT DATA ARE
SUMMARIZED IN A TABLE. THE MEASURED VALUES OF THE DIFFUSION
COEFFICIENT VARY AT ABOUT 10 PRIME5 CM PRIME2-SEC, WHICH IS CLOSE TO
MEASUREMENTS MADE BY OTHER AUTHORS UNDER SIMILAR CONDITIONS. DURING THE
MEASUREMENTS EPSILON VARIED FROM 1.5 TO 10 CM PRIME2-SEC PRIME3; THE
RICHARDSON COEFFICIENT, COMPUTED FOR 300 METER LAYERS FOR THE ENTIRE
LOWER KILOMETER LAYER ON THE BASIS OF RADIOSONDE DATA, VARIED FROM 0.09
TO 0.0045. DURING SOME EVENING DROPS THE SCATTERERS HUNG AT SOME
ALTITUDE (USUALLY 200-400 M) AND THEN DESCENDED NO FARTHER. AT THIS
TIME ONLY HORIZONTAL SCATTERING OF THE CLOUD WAS OBSERVED AND
APPROXIMATELY AN HOUR AFTER THE DROPPING OF THE REFLECTORS THEY OCCUPIED
AN AREA OF SEVERAL SQUARE KILOMETERS.

UNCLASSIFIED

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CIRC ACCESSION NO--AP0142752   UNCLASSIFIED

PROCESSING DATE--11DEC70

ABSTRACT/EXTRACT--THIS BEHAVIOR OF THE CLOUD CAN BE ATTRIBUTED TO THE
PRESENCE OF A CLOSED CIRCULATION IN THE EVENING HOURS IN THE LOWER
LAYERS OF THE ATMOSPHERE. HOWEVER, THIS HYPOTHESIS REQUIRES FURTHER
CHECKING. ON CERTAIN DAYS, WHEN THE REFLECTORS WERE DROPPED AT A LOW
ALTITUDE, CASES WERE OBSERVED WHEN SOME DIPOLES ROSE TO AN ALTITIUDE
EXCEEDING THE INITIAL ALTITUDE OF DROPPING, WHICH IS INTERESTING IN
ITSELF BECAUSE IT CONFIRMS THE RESULTS OF DOPPLER MEASUREMENTS OF "CLEAR
SKY" REFLECTIONS, SHOWING THAT DURING THE DAYTIME HOURS IN THE
ATMOSPHERE THERE ACTUALLY WERE STABLE VERTICAL AIR CURRENTS WHOSE
SPATIAL SCALE WAS SEVERAL HUNDRED METERS AND THE INTENSITY OF ASCENDING
AIR CURRENTS EXCEEDED ONE METER PER SECOND.   FACILITY: CENTRAL
AEROLOGICAL OBSERVATORY.

UNCLASSIFIED

USSR

TOLTYGO, K. B., and SHTAYERMAN, E. Ya., Donets Physical-Technical Institute, Ukrainian SSR Academy of Sciences

UDC 539.21

"Specification of Band Electron Wave Functions and Energies in the s-band of NaCl"

Abstract: Various efforts have been made to calculate parameters of the band structure of NaCl, using quasi-atomic functions X_1 and X_2, centered around the Na^+ and Cl^- nuclei, respectively; it is desirable to choose the most convenient and accurate wave function for calculating the states of polarons, impurity centers, excitons, etc. The enormous calculations of all necessary integrals have caused significant errors in the results. The authors have carried out calculations on a Minsk-22 computer and have selected what they consider a good value of $X_2 = (0.12-r)(0.54-r)$ $[26.03(-2.5r)-4.078(-1.5r)]$. The results appear in three tables: 1) integrals of non-orthogonality and normalization coefficients; 2) matrix elements and integrals of non-orthogonality between the X_1 and X_2 functions of this article and a report by Z. Ya. Yevseyev, STT, No 5, p 2, 3, 4, 5, 1963; the values of energy E and the $-b_2/b_1$ ratio for the

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USSR

TOLTYGO, K. B., and SHTAYERMAN, E. Ya., Ukrainskiy Fizicheskiy Zhurnal, Vol 18, No 11, Nov 73, pp 1914-1917

band electron in NaCl (lower band). There are also two figures: 1) dispersion pattern for the s-zone in NaCl according to the present article and according to the X_2 wave function of Yevseyev; 2) wave function of the electron at the base of the conductivity zone for the direction (100) $Na^+ - Cl^-$ and (110) Na^+-Na^+, with corresponding curves for X_2 from Yevseyev.

The calculations yield better values than previous works, corresponding more closely to various experimental results.

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USSR

TOLUBINSKIY, B. I., KOSTANCHUK, D. M.

"Influence of Pressure on Intensity of Heat Emission During Boiling of Water with Underheating"

Vopr. Tekh. Tellofiz. Vyp. 3, [Problems of Engineering Heat Physics No 3], Kiev, Nauk. Dumka Press, 1971, pp 58-61. (Translated from Referativnyy Zhurnal Mekhanika, No 1, 1972, Abstract No 1B887 by Yu. E. Pokhvalov).

Translation: The influence of pressure p=1-10 bar was experimentally studied during forced flow of water heated to (20°) less than the saturation temperature. Heat flux q varied between 0.14 at 1.2 Mw/m², the fluid flow rate was 0.2 m/sec (p=1 bar) and 0.8 m/sec at high pressures. It was discovered that the mean rate of steam bubble growth $w''=d_m f$ decreases with increasing pressure (primarily due to d_m), while the heat transfer coefficient α increases ($p^{0.15}$). The decrease in w'' with the same heat flux corresponds to an increase in the density of vapor formation centers, which has a stronger influence on heat exchange intensity than decreasing d_m. The results of the experiments are described well by the dimensionless equation of V. I. Tolubinskiy when the experimental values of d_m and f, the maximum diameter and frequency of formation of bubbles, are substituted into it.

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USSR

TOLUBINSKIY, V. I., MATORIN, A. S.

"Heat-Transfer Crisis in the Case of Boiling of Binary Mixtures Under Conditions of Forced Motion"

V sb. Teplo- i massoperenos. T. 2. Ch. 1 (Heat Transfer and Mass Transfer, Vol 2, Part 1--collection of works), Minsk, 1972, pp 62-66 (from RZh--Mekhanika, No 9, Sep 72, Abstract No 9B990)

Translation: The paper presents the results of experiments on the crisis when binary mixtures are boiled in tubes: alcohol - water, acetone - water, alcohol - benzene, ethylene glycol - water. The experiments were done in the following ranges of parameter variation: pressure $P = 3.3-13.2$ bars, rate of circulation $W = 2.5-10$ m/s, underheating $\Delta t_u = 10-110°C$, concentration $C = 0-100\%$. Heat release was done on a tube with inside diameter of $d = 4$ mm and length $l = 60$ mm. It was noted that an increase in underheating and velocity raises the critical thermal load q_{cr}, the effect of underheating being nearly linear, and increasing with an increase in velocity. With an increase in the length of the tube, q_{cr} falls, but changes little beginning with $l/d \geqslant 10-12$. The effect of pressure in the investigated region was in-

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TOLUBINSKIY, V. I., MATORIN, A. S., Teplo- i massoperenos. T. 2. Ch. 1, Minsk, 1972, pp 62-66

significant. In mixtures with azeotron [sic] the dependence of q_{cr} on concentration has maxima coinciding with the maxima of excess content of the high-volatility component in the vapor as compared with the liquid. The increase in q_{cr} is attributed to the reduction in the detachment diameters of bubbles, their average rate of growth, and the number of vapor-generating centers. All this reduces the vapor content of the wall layer.

Another reason for increase of q_{cr} is assumed to be the rise in the gradient of surface tension on the phase interface. Due to the "Marangoni effect", these increased gradients prevent the merging of vapor bubbles and the formation of a stable vapor film. In mixtures without an azeotrope, the dependence of q_{cr} on concentration is monotonic, without maxima, which is due to the fact that there is no reduction in the detachment diameters of vapor bubbles and their rate of formation in this case. A dimensional computational formula which generalizes the results of the experiments to an accuracy of ±20% is proposed. Yu. Ye. Pokhvalov.

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TOLUBINSKIY, V. I., KOSTANCHUK, D. M.

"Influence of Underheating on Heat Exchange During Boiling of Water"

Vopr. Tekh. Tellofiz. Vyp. 3, [Problems of Engineering Heat Physics No 3], Kiev, Nauk. Dumka, Press, 1971, pp 3-6. (Translated from Referativnyy Zhurnal Mekhanika, No 1, 1972, Abstract No 1B882, by Yu. E. Pokhvalov).

Translation: Experiments were performed with forced flow of water in a vertical, circular channel, formed of an external tube 28 mm in diameter (wall thickness 4 mm) and an internal heat-liberating stainless tube 6 mm in diameter. Cold-drawn tubing was used without further treatment (averaging class 4 smoothness), as well as turned tubing (class 6 smoothness) with wall thicknesses of 0.3 and 0.25 mm respectively; the length of the channel was 50 mm. The underheating Δt_H varied from 5 to 60°, heat flux q -- from 0.1 to 2 Mw/m^2. Experiments were performed at atmospheric pressure with a water velocity at the input to the working channel 0.2 m/sec. It was discovered that the characteristic relationship of heat transfer coefficient α and q depends essentially on the underheating $\alpha = 4.2 \ q^{0.7} \ \Delta t_H^{-0.14}$. The exponent with the underheating can be assumed constant only approximately. Increasing underheating increases the mean rate of growth of steam bubbles $\overline{w} = \overline{d_m f}$ (d_m and f are the maximum diameter and frequency of formation of steam bubbles respectively), d_m dropping more slowly than f increases. The heat transfer coefficient changes similarly with

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USSR

TOLUBINSKIY, V. I., KOSTANCHUK, D. M., OCTROVSKIY, Yu. N.,

"Influence of Smoothness of Heating Surface on Intensity of Heat Transfer
During Boiling of Water"

Vopr. Tekh. Tellofiz. Vyp. 3, [Problems of Engineering Heat Physics No 3],
Kiev, Nauk. Dumka Press, 1971, pp 12-14. (Translated from Referativnyy Zhurnal
Mekhanika, No 1, 1972, Abstract No 1B883 by Yu. E. Pokhvalov).

Translation: An experimental study was performed in a circular channel with
internal heating. The internal heated tubes, made of stainless steel, had the
following dimensions: Diameter 6 mm, wall thickness 0.25 mm (precise, class
6 smoothness) and 6 mm and 0.25 mm (cold drawn, averaging class 4 smoothness),
5 mm and 0.2mm (polished, class 11 smoothness). The external tube was made of
organic glass 28 mm in diameter (wall thickness 4 mm); channel length was 50
mm. The limits of change of the modes of the parameters were: heat flux
$q=0.2-2$ Mw/m^2, pressure P=2-6 bar, underheating $\Delta t_H=20°$, water speed at input
to channel V=0.2 m/sec. The divergence in intensity of heat transfer α on
the technical surfaces was found not to be too great, while on the polished
surface α was 25% or more lower, even at high heat fluxes. This effect is re-
lated to the impoverishment of the polished surface in vapor formation centers.
The experimental data were processed as a criterial dependence, suggested
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TITLE--CERTAIN THERMAL AND ELECTRICAL CHARACTERISTICS OF A LIQUID FULE
DIFFUSION FLAME -U-

UNCLASSIFIED

PROCESSING DATE--04DEC70

AUTHOR-(03)-TOLUBINSKIY, V.I., KOCHEREZHKO, A.N., CHARUKHA, L.G.

COUNTRY OF INFO--USSR

SOURCE--TEPLOFIZIKA I TEPLOTEKHNIKA, VOL. 16, 1970, P. 21-25

DATE PUBLISHED-------70

SUBJECT AREAS--PROPULSION AND FUELS

TOPIC TAGS--THERMAL DECOMPOSITION, ELECTRIC PORPERTY, LIQUID FUEL, ETHYL
ALCOHOL, COMBUSTION R AND D, PYROLYSIS, ELECTRON DENSITY, LOW
TEMPERATURE EFFECT, PHYSICAL DIFFUSION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605024/E05 STEP NO--UR/0651/70/016/000/0021/0025

CIRC ACCESSION NO--AP0141364

UNCLASSIFIED

053

UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL STUDY OF THE DISTRIBUTION OF THE LOCAL TEMPERATURE CHARACTERISTICS OF THERMAL DECOMPOSITION PYROLYSIS PROCESSES IN AN ETHYL ALCOHOL DIFFUSION FLAME. THE FREE ELECTRON CONCENTRATION DISTRIBUTION IS ALSO DETERMINED. IT IS SHOWN THAT ELECTRICAL PHENOMENA IN THE FLAME MAY HAVE A CONSIDERABLE EFFECT ON THE MASS TRANSFER PROCESSES OCCURRING DURING COMBUSTION. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, INSTITUT TEKHNICHESKOI TEPLOFIZIKI, KIEV, UKRAINIAN SSR.

UNCLASSIFIED

024

UNCLASSIFIED

TITLE—BOILING CRISIS IN LONGITUDINAL FLOW PAST ROD BUNDLES —U—

PROCESSING DATE—30OCT70

AUTHOR-(03)-TOLUBINSKIY, V. I., MAZKA, S. A., VASILEV, A. A.

COUNTRY OF INFO—USSR

SOURCE—HEAT TRANSFER SOV. RES.; 2: 1-6 JAN 1970

DATE PUBLISHED———70

SUBJECT AREAS—PHYSICS

TOPIC TAGS—HEAT TRANSFER RATE, BOILING, TWO PHASE FLOW, METAL ROD

CONTROL MARKING—NO RESTRICTIONS

DOCUMENT CLASS—UNCLASSIFIED

PROXY REEL/FRAME—2000/1138

STEP NO—US/0000/70/002/000/0001/0006

CIRC ACCESSION NO—AP0124793

UNCLASSIFIED

272   024
CIRC ACCESSION NO--AP0124793   UNCLASSIFIED   PROCESSING DATE--30OCT70
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AS ESTIMATE, OBTAINED BY ANALYSIS
OF SOVIET AND WESTERN PUBLICATIONS ON THE HEAT TRANSFER CRISIS IN ROD
BUNDLES IN LONGITUDINAL FLOW, OF THE POSSIBLE EFFECT OF VARIOUS
GEOMETRIC CHARACTERISTICS OF MULTIROD ASSEMBLIES ON THE CRITICAL HEAT
FLUX DENSITY IS PRESENTED.   FACILITY: INST. OF ENGINEERING
THERMOPHYSICS, KIEV.

UNCLASSIFIED

TITLE--HELICONS IN N TYPE GERMANIUM -U-

UNCLASSIFIED

AUTHOR-(02)-POZHELA, YU.K., TOLUTIS, R.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1), 110-15

DATE PUBLISHED--------70

PROCESSING DATE--18SEP70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--GERMANIUM SEMICONDUCTOR, ELECTRIC CONDUCTIVITY, CRYSTAL ANISOTROPY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/1823

CIRC ACCESSION NO--AP0054657

STEP NO--UR/0449/70/004/001/0110/0115

UNCLASSIFIED

272   015

CIRC ACCESSION NO--AP0054657   UNCLASSIFIED

ABSTRACT/EXTRACT--(U) GP-0-   ABSTRACT.   COMPONENTS WERE DETD. OF THE ELEC.

PROCESSING DATE--18SEP70

COND. TENSOR IN A MAGNETIC FIELD PARALLEL TO THE CRYSTALLOGRAPHIC AXES
(100), (110), AND (111); THE EFFECTIVE MASS ANISOTROPY AND THE
ANISOTROPY OF THE COLLISION FREQUENCIES WERE TAKEN INTO ACCOUNT.   THE
REAL AND IMAGINARY PARTS OF THE WAVE VECTOR AND THE DIMENSIONAL
RESONANCE OF HELICON WAVES WERE CALCD.   A RATIO WAS DETD. BY COMPARING
THE THEORETICAL RESULTS WITH EXPTL. DATA: K EQUALS M SUBL T SUBT M SUBT
T SUBL APPROXIMATELY EQUALS TO 19, WHERE M SUBL, T SUBL, M SUBT, AND T
SUBT CORRESPOND TO MASSES AND RELAXATION TIMES OF ELECTRONS ALONG THE
LONGITUDINAL AND TRANSVERSE AXES OF THE CONST. ENERGY ELLIPSOID, RESP.
THE HELICON WAVE ANISOTROPY WAS FOUND EXPTL. AT 300DEGREESK IN A
DIMENSIONAL RESONANCE REGIME.

UNCLASSIFIED

USSR

POZHELA, YU. K., RYAUKA, V. L., and TOLUTIS, R. B.   UDC [537.226+537.311.33]:[537+535]

"Dimensional Resonances of Helicon Waves in Axially Compressed n-Ge"

Lit. fiz. sb. (Collection of Lithuanian Works on Physics), 1971, 11, No 2, pp 253-261 (summaries in Lithuanian and English) (from RZh-Fizika, No 10, Oct 71, Abstract No 10YE785 by authors)

Translation: An investigation was made of the effect of axial compression P on the frequency of dimensional resonances ω' of helicon waves in n-Se. Curves of ω'/B as a function of the induction of magnetic field B were calculated for axial compression P in the [110] and [1$\bar{1}$0] crystallographic directions when $k /\!/ B /\!/ [110]$, as well as $P /\!/ [111]$ when $k /\!/ B /\!/ [111]$. It was established that the form of curves $\omega'/B=f(B)$ and the absolute values of ω'/B with variation of P reflect the redistribution of current carriers among groups with different mobility. Dependences $\omega'/B=\psi(P)$ were experimentally obtained with the above-mentioned orientations P, B, and k. It was found that the quality factor of the helicon resonator depends on the magnitude and direction of P relative to the crystallographic axes. The experimental results confirm the theoretical calculations.

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USSR

POZHELA, Yu. K., TOLUTIS, R. B., Institute of Physics of Semiconductors, Academy of Sciences of the Lithuanian SSR

UDC 621.396.69:621.314.2

"A High-Frequency Transformer"

USSR Author's Certificate No 254601, Filed 9 Apr 68, Published 11 Mar 70 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10V374 P)

Translation: The proposed high-frequency transformer contains a core, and input and output windings. As a distinguishing feature of the patent, rectifying properties are imparted to the transformer by making the core in the form of a square semiconductor plate of N type ZnSb mounted between the poles of a permanent magnet, and arranging the input and output windings at an angle close to a right angle. The initial ends of the windings are interconnected through a resistor, and the terminal leads are shorted together.

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USSR

Crystals & Semiconductors

TOLUTIS, V. B., Institute of Physics of Semiconductors, Academy of Sciences of the Lithuanian SSR

UDC: 537.216.2+542.65

"Determination of Some Kinetic Parameters of Recrystallization of Thin Films by Mathematical and Graphic Analysis of the Shapes of Grain Boundaries"

Vil'nyus, Litovskiy Fizicheskiy Sbornik, Vol 12, No 3, 1972, pp 445-452

Abstract: The author considers the possibility of determining certain kinetic parameters of recrystallization of thin films in the case of radial growth of grains at a time-constant rate by mathematical and graphic analysis of the forms of boundaries between grains. It is shown that in the given instance the shape of the boundaries of the recrystallized film can be described by a fourth-order equation which can be used to calculate the distance between centers of recrystallization of a given pair of grains, the ratio of their rates of growth, and a quantity which characterizes the difference between their incubation periods, all based on certain data concerning the parameters of the curve describing the boundary. It is shown that in most cases the singularities of the visible structure of recrystallized films is determined by the concentration and the pattern of distribution of

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USSR

TOLUTIS, V. B., Litovskiy Fizicheskiy Sbornik, Vol 12, No 3, pp 445-452

grains which are formed at approximately the same time and grow at approximately the same rate. Practice shows that centers of recrystallization can be found graphically, since they lie on the axes of hyperbolas and ellipses or on the perpendiculars to straight boundaries. Having located at least one center of recrystallization, one can use the proposed equation to determine the kinetic parameters of recrystallization.

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