

USSR

UDC: 51:155.001.57:681.3.06

PROTASOV, K. T., SERYKH, A. P.

"Determination of Informational Characteristics from the Condition of Minimum Risk in the Problem of Pattern Recognition"

V sb. Obnaruzh. i raspoznavaniye. Planir. eksperimentov (Detection and Recognition. Planning of Experiments--collection of works), Moscow, "Nauka", 1970, pp 3-10 (from RZh-Kibernetika, No 1, Jan 71, Abstract No 1V650)

Translation: The authors formulate the extremum problem of finding the vector function which recognizes membership to one of two patterns effectively and with minimum risk. In the final form, consideration is given to search for the informational characteristic u in the class of linear func-

tions $u = \sum_{s=1}^n h_s x_s$, in the case of an ideal observer and a normal law of distribution of probabilities for patterns A_1 and A_2 . Then

$$h_1 = 1, h_s = \frac{\Delta_s \sigma_1^2}{\Delta_s \sigma_s^2}, s = 2, 3, \dots, n, \Delta_s = a_{1s} - a_{2s}.$$

a_{is}, σ_i^2 are the averages and standard deviations of the normal laws of distribution. An example is given of calculations for comparison of methods

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PROTASOV, K. T., SERYKH, A. P., Obnarush. i raspoznavaniye. Planir. eksperimentov, Moscow, "Nauka", 1970, pp 3-10

based on maximum information and on minimum risk as a function of the relative weight of errors of the first and second kind.

Note: The article does not give the explicit dependence of σ_i^2 on σ_{1i}^2 and σ_{2i}^2 .

USSR

UDC: 621.391.822

BANKET, V. L., SERYKH, V. I.

"On the Probability Distribution of Noise at the Output of an FM Demodulator With Band Separation"

V sb. Vopr. elektrosvyazi (Problems of Electrical Communications--collection of works), Kiev, "Tekhnika", 1970, pp 87-90 (from RZh-Radiotekhnika, No 12 Dec 70, Abstract No 12A66)

Translation: The authors determine the probability density of noise at the output of a demodulator with band separation. This demodulator is used for optimum reception of a wide-band analog FM signal in the presence of high level additive jitter. It is assumed that a combination of the unmodulated carrier signal and normal noise is applied to the input of the demodulator with band separation. The analysis is done for the case of demodulator operation in the threshold region. It is shown that the probability density differs from normal in this case. A similar method may be used to find the probability density of noise at the output of a demodulator with band separation in the case of coherent reception. Two illustrations, bibliography of seven titles. N. S.

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USSR

UDC: 621.391.822

BANKET, V. L., SERYKH, V. I., SHCHERBAKOV, A. I.

"On the Probability Distribution of Noise at the Output of a Receiver of FM Signals"

V sb. Metody pomekhoustoychivogo priyema ChM i FM (Methods of Interference-Free FM and PM Reception--collection of works), Moscow, "Sov. radio", 1970, pp 71-79 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A67)

Translation: S. O. Rice's model for noise in FM receivers is used as the basis for finding the probability distribution of noise at the output of the low-frequency filter in a standard demodulator in the case of an unmodulated carrier. It is shown that in the case of operation in the threshold vicinity and below, the noise probability density differs appreciably from normal. The limits of applicability of the resultant expressions for probability density are determined. Resumé.

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USSR

(2)

GRITSYNA, V. V., KIYAN, T. S., KOVAL', A. G., FOGEL', Ya. M., ~~SERVUGIN, A. I., MARTYNOV, I. S.~~, Knar'kov State University imeni A. M. Gor'kiy

"Concerning the Mechanism of Luminescence of Polymer Films Which Arises as They are Being Formed Under Ion-Beam Bombardment of Solids"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 64, No 1, Jan 73, pp 207-216

Abstract: On the basis of experimental results, the authors suggest a new mechanism for luminescence of polymer films forming on a solid as a result of ion-beam dissociation of hydrocarbon molecules adsorbed on the surface of a bombarded target. It is shown that luminescence of atoms and molecules of helium and neon which arises during bombardment of metal targets by ions of He^+ or Ne^+ is emitted by particles of the corresponding gas located inside hollow spherulites formed during growth of the film under bombardment. The influence of the film temperature on the intensity of the emitted luminescence as well as the change in the nature and intensity of luminescence when there is a change in bombarding beams is explained on the basis of the proposed mechanism of luminescence of polymer films. A mechanism is also proposed for luminescence of polymer films
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USSR

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GRITSYNA, V. V. et al., ZhETF, Vol 64, No 1, Jan 73, pp 207-216

formed on the surface of dielectric targets by ion-beam bombardment. It is assumed that luminescence in this case arises as a result of the excitation of gas which has accumulated in the cavities between the substrate and the polymer film where it is peeling off.

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Molecular Physics

USSR

ABRAMENKOV, A. D., ~~SERYUGIN, A. L.~~, MARTYNOV, I. S., SLEZOV, V. V., FOGEL', YA. M., Physicotechnical Institute, Academy of Sciences UkrSSR, Khar'kov

"Formation of Islets From Copper Atoms Diffusing Over a Molybdenum Surface"

Leningrad, Fizika Tverdogo Tela, No. 12, Dec 71, pp 3496-3500

Abstract: The results of a direct study of the formation of islets in the diffusion of copper over molybdenum using optical and electron microscopes are presented. The theory of the formation of islets from atoms diffusing over the surface of a substrate was developed by A. D. Abramenkov, et al. According to this theory, based on the assumption that surface defects in the substrate are the locus for the formation of nuclei of islets, the diffusing material is distributed over the surface of the substrate in three zones if the diffusion times are sufficiently large. In zone III, which is furthest from the source of the diffusing material, there occurs only diffusion by atomic jumps from one adsorption point on the surface of the substrate to another. In this zone the concentration of diffusing material is still too low for the formation of nuclei of islets to occur at defects in the substrate surface. In zone II, where the concentration of diffusing material is higher,

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ABRAMENKOV, A. D., et al, Fizika Tverdogo Tela, No. 12, Dec 71, pp 3496-3500

islets from diffusing atoms are generated at defects in the substrate surface, and the dimensions of these islets increase with the course of time. In zone I, which lies next to the boundary of the source of diffusing material, the dimension of the islets reaches a maximum value which does not change with the further passage of time. The general conclusions of the theory of the formation of islets of diffusing material on a substrate surface were verified, and data were obtained on the formation of copper islets on molybdenum which agree quantitatively with the results of theoretical calculations. The agreement between experimental and theoretical values of the size of the islets was good despite certain assumptions made in the calculations. The direct measurement of the average diameter of the islets gave a value of $\sim 10^{-5}$ cm, while a theoretical calculation yielded the value $3 \cdot 10^{-6}$ cm.

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1/2 028 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--RADIOACTIVE COLLOIDAL SOLUTIONS FOR BETA THERAPY -U-
AUTHOR--(03)-MIKHEYEV, N.B., GRACHEVA, M.N., SERYY, S.V.
COUNTRY OF INFO--USSR
SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 6, PP 74-78
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, NUCLEAR SCIENCE AND
TECHNOLOGY
TOPIC TAGS--YTTRIUM, BETA RADIATION, COLLOID, ISOTOPE, YTTRIUM COMPOUND,
PHOSPHORUS ISOTOPE, RADIATION BIOLOGIC TISSUE EFFECT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1514 STEP NO--UR/0241/70/015/006/0074/0078
CIRC ACCESSION NO--AP0128709
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0128909

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS HAVE ELABORATED METHODS OF OBTAINING RADIOACTIVE COLLOIDAL SOLUTIONS OF YTTRIUM SILICATE WITH Y PRIME90 CIRCONIUM PHOSPHATE WITH P PRIME32 AND CHROMIUM PHOSPHATE WITH P PRIME32. SPECIAL ATTENTION IS PAID TO THE STABILITY OF COLLOIDAL SOLUTIONS. THE AUTHORS CONDUCTED BIOLOGICAL TRIALS OF THE PREPARATIONS OBTAINED WHICH DEMONSTRATE THAT THEY SATISFY THE REQUIREMENTS TO PREPARATIONS FOR INTRATISSULAR BETATHERAPY. FACILITY: INSTITUT BIOFIZIKI MZ SSSR.

UNCLASSIFIED

USSR

UDC: 8.74

BELONOZHKO, P. A., BOYKO, Ye. I., DUPLISHCHEV, A. M., SERYI, Ye. A., editorial staff of "Avtomatika i Vychisl. Tekhnika" AN LatvSSR

"A Device for Solving Difference Equations"

Riga, Ustroystvo dlya resheniya raznostnykh uravneniy (cf. English above), 1972, 13 pp, ill. bibl. of 2 titles (manuscript deposited in VINITI, No 5197-72 Dep. from 8 Dec 72) (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V586 Dep. by the authors)

Translation: An analog-digital complex can be used to study digital automatic control systems most completely. However, such a system is an extremely complicated technical device which is not always accessible to the researcher. The paper describes a device which has been developed and technically realized to be used jointly with an analog computer to simulate the operation of a digital filter described by a linear difference equation. The device incorporates step switches and can be used jointly with the MPT-9 analog computer to solve linear difference equations. Attachment to the given type of model and the order of the equations to be solved are not unique.

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USSR

UDO 621.382.23

LIBERMAN, L.S., ~~SESTRORETSKIY, B.V.~~, SHPIRT, V.A., YAKUBEN', L.M. [Members
Scientific-Technical Society Of Radio Engineering, Electronics, And
Communications imeni A.S. Popov]

"Semiconductor Diodes For Control Of Microwave Power"

Radiotekhnika, Vol 27, No 5, May 1972, pp 9-24

Abstract: The paper discusses the thermal and electrical effects in switching and limiter diodes at high and low levels of microwave power, the system of parameters of the diodes, and the methods for their measurement. The principal statements of the theory of devices for control of microwave power are discussed. Planning of one- and multichannel regulator units based on switching and limiter diodes is described. It is concluded that use of switching and limiter diodes in microwave technology makes it possible to reduce the dimensions and weight of apparatus, to increase its speed of response, to reduce the power with respect to control goals, and to increase the reliability. 15 fig. 22 ref. Received 3 Jan 1972.

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1/2 043 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--FREQUENCY MULTIPLICATION MODE OF OSCILLATION IN GALLIUM ARSENIDE
SAMPLES -U-
AUTHOR--(03)-SHELUDKO, N.A., RYKOV, V.V., SESTROVETSKIY, B.V.
COUNTRY OF INFO--USSR
SOURCE--RADIOTEKNIKA I ELEKTRONIKA, VOL. 15, APR. 1970, P. 859,860
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--FREQUENCY MULTIPLICATION, MICROWAVE OSCILLATOR, FREQUENCY
STABILITY, GALLIUM ARSENIDE, ELECTRON DENSITY, HARMONIC OSCILLATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1996/1472 STEP NO--UR/0109/70/015/000/0859/0860
CIRC ACCESSION NO--AP0118461
UNCLASSIFIED

2/2 043

CIRC ACCESSION NO--AP0118461

UNCLASSIFIED

PROCESSING DATE--13NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF A MICROWAVE OSCILLATOR ARRANGEMENT IN WHICH IT IS POSSIBLE TO ATTAIN A TRANSITION TO STABLE EMISSION AT THE SECOND, THIRD, AND FOURTH HARMONICS WITH POWER LEVELS COMPARABLE TO THAT AT THE FUNDAMENTAL FREQUENCY (0.5 TO 1 GHz). EXPERIMENTS WERE CONDUCTED WITH GALLIUM ARSENIDE SAMPLES FROM 100 TO 200 MICRONS IN LENGTH AND WITH AN ELECTRON CONCENTRATION OF ABOUT 10 TO THE 15TH POWER PER CU CM. A MOVING PISTON ARRANGEMENT IS USED FOR TUNING, AND SPECTROGRAMS OF FUNDAMENTAL AND HARMONIC EMISSIONS ARE SHOWN FOR ILLUSTRATION.

UNCLASSIFIED

USSR

UDC 533.6.013.42

KARGAUDAS, V. I., SETKAUSKAS, V. A., YAKUBAUSKAS, V. V.

"Experimental Studies of the Forms of Free Oscillations of a Plane Deep Gate"

V sb. Dinamika gidrotekhn. sooruzh. (Dynamics of Hydraulic Engineering Equipment -- Collection of Works), Moscow, 1972, pp 116-117 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V409)

Translation: Two geometrically similar models of a gate are investigated, one of which is made from polystyrene and the other from plastic. In studying both models there were observed several frequencies different from the basic natural frequencies of the model. It is proposed that these frequencies correspond to the resonances of individual parts of models of the gate. R. A. Shipov.

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USSR

UDC 541.49:547.1'118:546.711:546.811'131

GINZBURG, A. G., SETKINA, V. N., and KURSANOV, D. N., Institute of Hetero-Organic Compounds, Academy of Sciences USSR

"The Reaction of Manganese π -Cyclopentadienylphosphine Complexes With Tin (IV) Chloride"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, 1973, pp 481

Abstract: π -C₅H₅Mn(CO)₂L (I) was found to react with SnCl₄ in CH₂Cl₂ to form the inclusion complex C₅H₅Mn(CO)₂L·2SnCl₄ (II), where L=PPh₃, AsPh₃, P(i-C₃H₇), and P(C₆H₁₁)₃. Compound II appears as a yellow or brown substance which is stable in an argon atmosphere or in sealed ampules. In solutions containing O or N atoms (water, alcohols, acetone, ether, MeCN), II breaks down instantly to regenerate I. Compound II is insoluble in apolar solvents (benzene, CCl₄, CHCl₃, CS₂), weakly soluble in MeNO₂, and more soluble in PhNO₂. The latter solution conducts electricity. During the formation of II the stretch frequencies of CO increase by 70-100 cm⁻¹, which indicates decreased electron density on the Mn atom.

USSR

UDC 541.49

KHATAMI, A. I., GINZBURG, A. G., NEFEDOVA, M. N., SETKINA, V. N., and
KURSANOV, D. N.

"Cyclopentadienylmanganesedicarbonyltriphenylphosphines Substituted in the
Cyclopentadienyl Ring"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 12, Dec 72, pp 2665-2667

Abstract: Carbonyl ligands in complex transition metal compounds can be easily replaced by PPh₃ group upon irradiation with UV light. This method was used to synthesize derivatives of CpMn(CO)₂PPh₃, where Cp = C₅H₅, containing Et, PhCH₂, MeS, Cl, Br, I, and COOMe substituents in the Cp ring, from the respective derivatives of CpMn(CO)₃. The new products are yellow crystalline compounds with high melting points. In the solid state they are stable in air, dissolve easily in CCl₄, CHCl₃, and CS₂. The structure of these products was confirmed by PMR and IR spectroscopical analysis.

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Organometallic Compounds

USSR

UDC 541.127:546.11.02:547.1*13*118

YAKUSHIN, F. S., SETKINA, Y. N., KISLYAKOVA, N. V., KURSANOV, D. N., and SHATENSHTEYN, A. I., Physico-Chemical Institute imeni L. YA. Karpov, and Institute of Metallorganic Compounds, Academy of Sciences USSR

"Kinetic Isotope Effect of Hydrogen Exchange in Cyclopentadienylmanganesetricarbonyl and Cyclopentadienylmanganesedicarbonyltriphenyl phosphine"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, Feb 72, pp 316-322

Abstract: Experimental results are reported on the determination of the kinetic isotope effect (KIE) of hydrogen exchange in cyclopentadienylmanganesetricarbonyl (CMT) and cyclopentadienylmanganesedicarbonyltriphenyl phosphine (CMDP). In many reactions CMT behaves like benzene. Introduction of an alkyl group lowers the exchange rate of hydrogen. Determinations of KIE of hydrogen exchange with acids were carried out under similar conditions for CMT, CMTD, benzene derivatives and ferrocene, and it was shown that both in the CMT and CMTD it occurs by the same mechanism as in case of aromatic compounds. On the other hand, hydrogen isotope exchange if CMT catalyzed by basic agents has a protophilic mechanism, analogously to ferrocene, the slowest step being the breaking of the C-H bond by the base.

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USSR

UDC 541.49 + 661.718.1 + 546.711

~~SETKINA, V. N.~~, GINZBURG, A. G., KISLYAKOVA, N. V., and KURSANOV, D. N.
Institute of Element-Organic Compounds, Acad. Sc. USSR

"Quantitative Evaluation of the Effect of Triphenylphosphine and
Triphenyl Phosphite Ligands in π -Cyclopentadienyldicarbonylphosphinic
Complexes of Manganese"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2,
Feb 71, pp 434-435

Abstract: Tertiary phosphines and phosphites are stronger donors than
the carbonyl groups in transition metal complexes. When one of the
carbonyl groups of cyclopentadienylmanganetricarbonyl (C₅H₅Mn(CO)₃) was
replaced with PPh₃ or P(OPh)₃, the rate of acid hydrogen exchange was
increased 2000- and 70-fold, respectively. Such an exchange leads
to a higher electron density, increased rate of electrophilic reactions
in the cyclopentadienyl rings π -bonded to the transition metal. Ham-
met's equation holds for the acid hydrogen exchange of C₅H₅Mn(CO)₃.

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USSR

UDC 541.515 + 541.49 + 541.124 + 546.11

GINSEBURG, A. G., SETKINA, V. N., and KURSANOV, D. N., Institute of Element-
Organic Compounds, Acad. Sc. USSR

"Effect of a Radical Bound to a Phosphorus Atom in the $C_5H_5Mn(CO)_2PR$ Complexes
on the Rate of Hydrogen Exchange in the Ring and on the Frequency of Carbonyl
Stretching Vibrations"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 1,
pp 177-179

Abstract: Hydrogen exchange reaction between CF_3COOD and $C_5H_5Mn(CO)_2PR_3$ in
dichloroethane at 25° was studied. The reaction was found to depend on the
radical attached to phosphorus. The rate of hydrogen exchange in the cyclo-
pentadienyl ring increases with a transition from triphenylphosphingl to
trialkylphosphingl substituents. In the series $R = OC_6H_5, C_6H_5, CH_3C_6H_5,$
 $isoC_6H_{11}$ the rate of hydrogen exchange increases and the frequency $\bar{\nu} = \bar{\nu}_0$
decreases.

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172 010 UNCLASSIFIED PROCESSING DATE--30OCT70
 TITLE--EFFECT OF SUBSTITUENTS IN ARENETRICARBONYLCHROMIUM COMPLEXES ON THE
 ISOTOPIC EXCHANGE OF HYDROGEN IN AN ALKALINE MEDIUM -U-
 AUTHOR--(04)--SETKINA, V.N., BARANETSKAYA, N.K., ANISIMOV, K.N., KURSANOV,
 D.N.
 COUNTRY OF INFO--USSR
 SOURCE--IAV. AKAD. NAUK SSSR, SER. KHIM 1970, (2), 473-4
 DATE PUBLISHED--70
 SUBJECT AREAS--CHEMISTRY
 TOPIC TAGS--CHROMIUM COMPLEX, ISOTOPE EXCHANGE, HYDROGEN
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--2000/1680
 CIRC ACCESSION NO--APO125301
 STEP NO--UR/0062/70/000/002/0473/0474
 UNCLASSIFIED

PROCESSING DATE--30OCT70

UNCLASSIFIED

2/2 010

CIRC ACCESSION NO--AP0125301

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE FOLLOWING RATE CONSTS. WERE
 REPORTED FOR ISOTOPIC H EXCHANGE IN BASIC SOLN.: ME SUB2 NPHCR(CO) SUB3
 0.3 (SEC PRIME NEGATIVE1, TIMES 10 PRIME NEGATIVE5), BZONACR(CO) SUB3
 0.7 (SEC PRIME NEGATIVE1, TIMES 10 PRIME NEGATIVE5), FOR THE REACTION
 WITH ETOD IN THE PRESENCE OF ETONA AT 100DEGREES IN A SEALED TUBE.
 EVIDENTLY ELECTRON DONOR AND ACCEPTOR GROUPS SHOW A WEAK EFFECT ON THIS
 EXCHANGE AMONG SUCH COMPS. OF CR. FACILITY: INST. ELEMENTOORG.
 SOEDIN., MOWCOW, USSR.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70
 TITLE--ISOTOPIC HYDROGEN EXCHANGE OF ARENECHROMIUM TRICARBONYLS IN AN ACID
 MEDIUM -U-
 AUTHOR--(05)-KURSANOV, D.N., SETKINA, V.N., BARANETSKAYA, N.K., ZDANOVICH,
 V.I., ANISIMOV, K.N.
 COUNTRY OF INFO--USSR
 SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 1103-5
 DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY
 TOPIC TAGS--ISOTOPE EXCHANGE, CHROMIUM COMPOUND, CARBONYL COMPOUND,
 BENZENE, ORGANOCHROMIUM COMPOUND, ORGANIC PHOSPHORUS COMPOUND, DEUTERIUM
 COMPOUND, CHEMICAL REACTION RATE

CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRA--1993/0497 STEP NO--UR/0020/70/190/005/1103/1105
 CIRC ACCESSION NO--ATJ113388
 UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AT0113388

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RATE CONSTS. OF THE ISOTOPIC HYDROGEN EXCHANGE OF ARENECHROMIUM CARBONYLS IN ACID MEDIA ARE INVESTIGATED. THE EXCHANGES OF C SUB6 H SUB6, C SUB6 H SUB6 CR(CO) SUB3, ME SUB3 C SUB6 H SUB3 CR(CO) SUB3. C SUB6 H SUB6 CR(CO) SUB2 PPH SUB3, ME SUB3 C SUB6 H SUB3 CR(CO) SUB2 PPH SUB3, AND MEOC SUB6 H SUB5 CR(CO) SUB2 PPH SUB3 IN CF SUB3 CO SUB2 D ARE STUDIED. THE RATE CONSTS. OF ALL COMPS. ARE FOUND TO BE ON THE ORDER OF 10 PRIME NEGATIVE 6 TO 10 PRIME NEGATIVE 7 WITH THE EXCEPTION OF C SUB6 H SUB6 WHICH IS 10 PRIME 7 TIMES FASTER. FACILITY: INST. ELEMENTORG, SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

1/2 008 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ORIENTING ACTION OF THE SULFO GROUP ON A CYCLOPENTADIENYL MANGANESE
TRICARBONYL SYSTEM IN THE PROTOPHILIC ISOTOPIC EXCHANGE OF HYDROGEN -U-
AUTHOR-(05)-SETKINA, V.N., KISLYAKOVA, N.V., PETROVSKIY, P.V., KOLOBOVA,
N.YE., KURSANOV, D.N.
COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (3), 698-9

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--MANGANESE COMPOUND, CARBONYL COMPOUND, CYCLIC GROUP, ISOTOPE
EXCHANGE, SODIUM COMPOUND, SULFONIC ACID, ESTER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1999/1905

STEP NO--UR/0062/70/000/003/0698/0699

CIRC ACCESSION NO--AP0123689

UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123689

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. D-H EXCHANGE WAS RUN WITH ETOD
CONTG. A CATALYTIC AMT. OF ETONA, AND CYCLOPENTADIENYLMANGANESE
TRICARBONYL AS THE NA SULFONATE IN THE ALPHA AND BETA POSITIONS. THE
PROTOPHILIC ISOTOPE EXCHANGE REACTION HAD F. VALUES (PARTIAL REACTION
RATES) OF 4.8 AND 1.8, RESP., FOR THE 2 ISOMERS. FACILITY:
INST. ELEMENTOORG. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 541.49+546.11

GINZBURG, A. G., NEMIROVSKAYA, I. B., SETKINA, V. N., KURSANOV, D. N.,
Corresponding Member of the USSR Academy of Sciences

"Characteristic Features of the π -Cyclopentadienyldiphosphine Complexes of
Manganese in Hydrogen Exchange Reactions with Acids"

Moscow, Doklady Akademii Nauk SSSR, Vol 208, No 6, 1973, pp 1353-1355

Abstract: It was demonstrated earlier [D. N. Kursanov, et al., Izv. AN SSSR, ser. khim., 2842, 1969; V. N. Setkina, et al., 434, 1971; A. G. Ginsburg, 177, 1971] that replacement of one of the Co ligands in the $CpMn(CO)_2$ ($Cp = \pi-C_5H_5$) by the tertiary phosphines PR_3 leads to acceleration of the acid hydrogen exchange by 2-4 orders depending on the nature of the R radical. A study has now been made of the reactivity in the acid hydrogen exchange reactions of cyclopentadienyl complexes of manganese containing bidentate ditertiary of phosphines with the structure $Ph_2P(CH_2)_n PPh_2$ ($n = 1 - 3$).

The kinetics of the hydrogen exchange reaction were investigated by the deuterium content in the initial material isolated after interrupting the reaction by pouring the reaction mixture into a soda solution. The values of the chemical shifts are presented on the δ -scale (internal standard -- hexamethyl disiloxane for the paramagnetic resonance spectra and tetramethyl silane for the C^{13} nuclear magnetic resonance spectra).

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Hematology

USSR

UDC 615.381.011.3:532.13

KAVESHNIKOV, A. I., SETT, A. V., URATKOV, Ye. F., ORLOV, Ye. S.,
STRUCHKOVA, K. I., POLUSHINA, T. V., and SUSOVA, G. M.,
Department of Experimental Traumatology and Orthopedics, Central
Institute of Traumatology and Orthopedics, Ministry of Health
USSR, and Laboratory of Blood Substitutes and Fractionation of
Blood Proteins, Central Institute of Hematology and Blood
Transfusion, Moscow

"Changes in the Viscosity of Blood After Dilution with Different
Blood Substitutes Under Hypothermia Conditions"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya
Terapiya, No 1, 1971, pp 70-75

Abstract: Changes in the viscosity of blood were studied after
dilution at different temperatures with the following solutions:
Ringer Locke, glucose, polyglucine [form of dextran],
rheopolyglucine, low-molecular weight dextran, and polyvinyl-
pyrrolidone. The tabulated results can be used as a basis for
selecting a blood substitute and degree of blood dilution in:
1/2

USSR

KAVESHNIKOV, A. I., et al., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 1, 1971, pp 70-75

relation to perfusion temperature. A mathematical formula is proposed for calculating the viscosity of the solution in blood dilution in relation to the hematocrit index, temperature and viscosity of the blood substitute. It is concluded that in case of normothermal perfusion or slight chilling, any of the solutions studied can be used. But under low-temperature conditions, when water moves from the interstitial and intracellular spaces, it is preferable to use rheopolyglucine, low-molecular-weight dextran, or low-molecular-weight polyvinylpyrrolidone because they decrease the viscosity of the perfusate more than the others.

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USSR

UDC 618.492+612.275.1

~~SETTAROV~~, I. A. and RUCHANSKIY, B. Z., Andizhan State Medical
Institute imeni M. I. Kalinin

"Medicogenetic Characteristics of Twins Living in High Mountains"

Frunze, Sovetskoye Zdravookhraneniye Kirgizii, No 1, 1971, pp 28-30

Abstract: Preliminary studies were conducted on twins living in the town of Mayli-Saya (population 24,700) situated 850 to 1,300 m above sea level (Osh Oblast, Kirgiz SSR), including antigenic structure, dermatoglyphics, and intelligence. The population of the town is made up of immigrants from different parts of the country. Most of the twins (chiefly identical) born after 1963 are of Russian nationality (41.67%); then come Tatars (19.44%), Kirgizes (11.11%), and Germans (8.33%). The largest number of twins were born to mothers 26 to 30 years of age and the fewest, to those over 40. A comparison of the results of the intelligence tests with those given to twins born in the low-lying Fergana valley showed them to be almost identical.

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USSR

UDC 535.345.1

MEV¹, A. A., and SEMENOVA, Z. S., All-Union Scientific Research
Institute of Metrology imeni D. I. Mendeleev

"On the Degree of Blackness of Quartz Glass"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 2,
Mar-Apr 72, pp 279—284

Abstract: The degrees of blackness of pure quartz glasses were calculated on the basis of measured values of the spectral absorption coefficient k_{λ} and the refraction index n_{λ} . Relations of k_{λ} and n_{λ} to spectral, integral, directed, and semi-spherical blackness degrees of a plane layer of finite thickness were derived by solving the equation of radiation transfer. The temperature dependence of k_{λ} was previously found for the $2.5-5\mu$ region, where quartz glass possesses a notable transmission. For the $\lambda > 5\mu$ region, the transmission of quartz glass is unimportant and the refraction and absorption indices were approximated by simple algebraic functions. The reflection coefficients of the

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MEN', A. A. and SETTAROVA, Z. S., *Teplofizika Vysokikh Temperatur*, Vol 10, No 2, Mar-Apr 72, pp 279-284

layer boundaries for s- and p-polarization components were calculated from Fresnel formulas considering a strong absorption band of valence Si-O-Si oscillations. The results showed a strong dependence of the spectral blackness degree on temperature in the regions of translucence and high absorption. Deviations from the Lambert law of absorption are most expressed by low optical thickness. By wave lengths over 5μ , the Lambert law is satisfied anywhere for angles of 0-55 deg., except in the 7-11 μ region. The same regularity is observed for the integral blackness degree. In proportion to the temperature increase from 700 to 1100 °K, the integral blackness degree of a one cm thick quartz glass (brand KV) decreases from 0.74 to 0.55. Comparative results of KV and KI quartz glasses in the 2.5-3 μ region are presented. Six illustr., six formulas, one table, thirteen biblio. refs.

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USSR

UDC 533.9.004.12:546.217

KOVAL'SKAYA, G. A., ~~SEVASM'YANENKO, V. G.~~, SOKOLOVA, I. A., Novosibirsk

"Thermodynamic Properties of Air at 12,000-25,000°K and 0.1-100 atm Considering the Reduction in Ionization Potential"

Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 1, 1972, pp 15-22.

Abstract: The composition of air is calculated for pressures of 0.1, 1, 10 and 100 atm and temperatures of 12,000-25,000°K, considering Coulomb interactions, resulting in a significant increase in the electron component in comparison with an earlier work. Physically justified analytic expressions are selected, describing the composition produced and thermodynamic properties with satisfactory accuracy. The approximations produced are convenient for the solution of applied problems, since they require no iterations.

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Acc. Nr.: AN0104551

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Ref. Code: ZLR 9003

TITLE-- WEEK DAYS IN SPACE

NEWSPAPER-- IZVESTIYA, JUNE 7, 1970, P 1, COLS 2-3

ABSTRACT-- THE FIFTH WORKING DAY OF NIKOLAYEV AND SEVAST. YANOV LASTED 18 HOURS AND ENDED AT 5 HOURS MOSCOW TIME. DURING THIS DAY, THE HUMIDITY IN VARIOUS AREAS OF THE SHIP'S QUARTERS WAS DETERMINED. DURING THE 65TH AND 66TH REVOLUTIONS, THE DEGREE OF ACCURACY OF THE ONE-AXIS ORIENTATION WAS DETERMINED UNDER THE CONDITIONS OF PASSIVE ROLLING FLIGHT /BARBEQUE MADE U.S. TERMINOLOGY/. AT THE END OF THE WORKING DAY, NIKOLAYEV ORIENTED THE SHIP IN SUCH A WAY THAT THE PLANES OF THE SOLAR BATTERIES BECAME INCLINED 70 DEGREES TO THE SUN. AFTER THAT THE TRIP WAS ORIENTED IN A CHOSEN DIRECTION BY APPLYING A ROLL RATE OF THREE DEGREES PER SECOND.

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19871185

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SEVAST'YANOV, B. A.

"Limit Rule of Poisson in a System of Sums of Independent Random Quantities"

Teoriya Veroyatnostey i Ee Primeneniya [Theory of Probabilities and its Applications], 1972, Vol 17, No 4, pp 733-738 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V53, by V. Chistyakov).

Translation: In many combinatorial probabilistic problems, integer random quantities ξ are produced, which can be represented as a sum of certain indicators

$$\xi = \eta_1 + \eta_2 + \dots + \eta_n,$$

where η_k takes on values of 0 and 1 and, generally speaking, the values are independent of each other. This work formulates rather general conditions, under which the limit rule for ξ where $n \rightarrow \infty$ is the Poisson rule. This

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Sevast'yanov, B. A., Teoriya Veroyatnostey i Ego Primeneniya, 1972, Vol 17, No 4, pp 733-738.

general result is applied to particular cases related to a polynomial system. It is proven that the number of nonappearing results and the number of pairs of tests with sufficiently similar results in the sense of a certain metrics fixed in the set of results can verge on the Poisson rule.

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USSR

SEVAST'YANOV, B. A.

"Branching Processes"

Vetvyashchiesya Protsessy [English Version Above], Moscow, Nauka Press, 1971,
436 pages, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972,
Abstract No 3 V165K).

NO ABSTRACT.

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1/2 045 UNCLASSIFIED PROCESSING DATE--09OCT70
 TITLE--OPTICAL ORIENTATION OF PRIME65 R8 AND PRIME87 R8 ATOMS BY LIGHT OF
 THE D SUB2 LINE AND RELAXATION IN THE PRIME2 P SUBTHREE HALVES STATE DUE
 AUTHOR--(04)--ZHITNIKOV, R.A., KULESHOV, P.P., OKUNEVICH, A.I., SEVASTYANOV,
 B.N.
 COUNTRY OF INFO--USSR
 SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
 NK 3, PP 831-842
 DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--OPTIC PUMPING, RUBIDIUM, INERT GAS, GAS PRESSURE, ROTATING
 MAGNETIC FIELD, ELECTRON ENERGY LEVEL, HYPERFINE STRUCTURE, EXCITED
 ELECTRON STATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRA--1977/0006

STEP NO--UR/0056/70/058/003/0831/0842

CIRC ACCESSION NO--AP0043606

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0043606

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE DEPENDENCE OF OPTICAL PUMPING SIGNALS OF RB ATOMS ON THE PRESSURE OF THE NOBLE GASES HE, NE, AR, KR AND XE IS INVESTIGATED. BY APPLYING A ROTATING MAGNETIC FIELD FOR SEPARATELY OBSERVING THE RESONANCE SIGNALS FROM TWO HYPERFINE STRUCTURE SUBLEVELS OF THE RB ATOM GROUND STATE ONE CAN FIND THE CHARACTERISTIC PRESSURE OF THE INERT GAS, P SUBO PRIME, AT WHICH THE SIGNAL OF THE HYPERFINE STRUCTURE SUBLEVEL WITH A LARGE Φ VALUE (Φ IS THE TOTAL MOMENTUM) VANISHES. THE VALUES OF P SUBO PRIME OBTAINED ARE EMPLOYED FOR CALCULATING THE CROSS SECTIONS FOR DISORIENTATION IN THE PRIME2 P SUBTHREE HALVES EXCITED STATE OF THE RB ATOMS DUE TO COLLISIONS WITH NOBLE GAS ATOMS.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--MIXTURE FOR INOCULATING IRON MELTS -U-
AUTHOR--(03)-GORBUNOV, A.I., SEVASTYANOV, N.S., SABIUROV, V.P.
COUNTRY OF INFO--USSR
SOURCE--U.S.S.R. 265,138
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--09MAR70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--INOCULATION, IRON, LIQUID METAL, CARBON, CALCIUM, METALLURGIC
PATENT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3003/1059 STEP NO--UR/0482/70/000/000/0000/0000
CIRC ACCESSION NO--AA0130094
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AAC130094

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MIXT. FOR INOCULATING FE,C
MELTS, THAT RAISES THE DEGREE OF CA ASSIMILATION AND REMOVES THE
PYROEFFECT, CONTAINS CA INTRODUCED IN THE FORM OF A METAL AND FLUORSPAR
IN A 1:2 RATIO. FACILITY: OMSK POLYTECHNIC INSTITUTE.

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AN0104975

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UR9022

TITLE-- /CAPTION/

NEWSPAPER-- SOVETSKAYA ROSSIYA, JUNE 2, 1970, P 3, COLS 1-4

ABSTRACT-- A PHOTOGRAPH SHOWS A. NIKOLAYEV AND V. SEVAST, YANOV
AT THE INSTRUMENT PANEL OF A SPACE SHIP SIMULATOR.

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1/4 089 UNCLASSIFIED PROCESSING DATE--30OCT70
 TITLE--SPEECH BY COSMONAUT SEVASTYANOV -U-
 AUTHOR--SEVASTYANOV, V. S
 COUNTRY OF INFO--USSR
 SOURCE--FBIS DAILY REPORT, SOVIET UNION, 14 JULY 1970, VOL III, NR 135, PP
 D6-D7
 DATE PUBLISHED-----70

SUBJECT AREAS--NAVIGATION, SPACE TECHNOLOGY, BIOLOGICAL AND MEDICAL
 SCIENCES
 TOPIC TAGS--STELLAR SENSOR, VESTIBULAR APPARATUS, MANUAL, SPACECRAFT
 CONTROL, ANALOG COMPUTER, SPACEBORNE COMPUTER, SPACECRAFT NAVIGATION,
 GYROSCOPE SYSTEM, LIFE SUPPORT SYSTEM, MANEUVERABLE SATELLITE,
 WEIGHTLESSNESS, COSMONAUT

CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--3003/0618 STEP NO--US/0000/70/003/135/0006/0007
 CIRC ACCESSION NO--AP0129801
 UNCLASSIFIED

PROCESSING DATE--30OCT70

UNCLASSIFIED

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CIRC ACCESSION NO--AP0129801

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEAR COMRADES, LADIES AND GENTLEMEN. IT IS MY DUTY AS FLIGHT ENGINEER TO REPORT ON THE FUNCTIONING OF ON BOARD SYSTEMS. THIS REPORT WILL BE VERY BRIEF: ALL SYSTEMS AND EQUIPMENT OF THE SHIP FUNCTIONED NORMALLY. I WILL, THEREFORE, DWELL ON OTHER POINTS. A NEW, AUTOMATIC STELLAR ATTITUDE SENSOR, DESIGNED TO INSURE A RELIABLE AND PRECISE ORIENTATION OF THE SPACECRAFT AGAINST THE BACKGROUND OF INTERFERENCE OF STRONG LIGHT, WAS TESTED IN FLIGHT. THE INSTRUMENT WAS RUN IN AND ADJUSTED AND ITS CHARACTERISTICS CONVENIENTLY SELECTED. A VISUAL, OPTICAL ELECTRONIC INSTRUMENT DESIGNED TO INSURE MANUAL POSITIONING OF THE SHIP IN FLIGHT OVER THE DARK SIDE OF THE EARTH WAS ALSO TESTED. PRELIMINARY RESULTS OF THE TECHNICAL EXPERIMENTS CONFIRM FULLY WITH THOSE EXPECTED. WE ARE CONFIDENT THAT THE SOYUZ TYPE SPACECRAFT IS SUITABLE FOR EVEN LONGER SPACE FLIGHTS. WE CARRIED OUT EXPERIMENTS DESIGNED TO STUDY THE FUNCTIONING OF THE VESTIBULAR APPARATUS, EXTERNAL BREATHING, ARTERIAL PRESSURE DYNAMICS, SENSITIVITY OF SKIN TO PAIN, CONTRAST SENSITIVITY OF THE EYE, AND EFFECTS OF EXTERNAL FACTORS ON THE EYESIGHT, MUSCULAR STRENGTH OF ARMS, AND MUSCLE AND JOINT SENSITIVITY. THE OBJECT OF THESE EXPERIMENTS WAS NOT JUST TO OBSERVE THE COSMONAUT'S STATE OF HEALTH, BUT MAINLY TO GAIN A DEEPER INSIGHT INTO THE CAPABILITIES OF MAN AND OF ANATOMICAL ORGANS FOR NORMAL FUNCTIONING DURING A LONG SPACE FLIGHT. TO OBTAIN THE NECESSARY DATA FOR DESIGNING OPTIMUM LIFE SUPPORT SYSTEMS AND ALSO FOR DETERMINING SCIENTIFICALLY SOUND DIET ARRANGEMENTS AND WATER CONSUMPTION, ENERGY LOSSES BY THE COSMONAUTS DURING THE FLIGHT WERE ESTIMATED.

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PROCESSING DATE--300CT70

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CIRC ACCESSION NO--AP0129801

ABSTRACT/EXTRACT--AT VARIOUS STAGES OF THE FLIGHT, WE CARRIED OUT EXPERIMENTS DESIGNED TO STUDY THE TRANSIENT PROCESSES OF THE SHIP'S MANUAL CONTROL. THESE EXPERIMENTS WERE CONDUCTED BY USING AN ANALOG COMPUTER ON BOARD THE SHIP TO SIMULATE VARIOUS DYNAMIC CONTROL REGIMENTS WHICH MAKE IT POSSIBLE TO DETERMINE THE TRANSFER FUNCTION OF MAN AS THE MAIN ELEMENT IN A CONTROL SYSTEM. EXPERIMENTS INTENDED TO DEVELOPE THE TECHNIQUE OF INDEPENDENT ORBITAL NAVIGATION CONTINUED. WE DETERMINED THE PERIOD OF MEASUREMENTS WITH REFERENCE TO STARS AND SELECTED POINTS ON THE EARTH. THESE MEASUREMENTS WERE USED TO DETERMINE ALL THE ELEMENTS OF THE SHIP'S ORBIT AND CALCULATE ORBITAL CORRECTIONS. NAVIGATION TECHNIQUE WITH THE AID OF COMPUTERS ON BOARD THE SPACESHIP WAS FURTHER DEVELOPED. IT CAN BE USED FOR CONTROL DUPLICATION AND FOR RAISING RELIABILITY OF THE SHIP'S CONTROL IN FLIGHT. A SERIES OF EXPERIMENTS, ASSOCIATED WITH STUDYING STRUCTURAL ASPECTS OF THE SPACESHIP, WAS CARRIED OUT. DEFORMATIONS OF THE SHIP DUE TO THE EFFECT OF SPACE VACUUM AND ONE SIDED HEATING BY THE SUN WERE MEASURED. THE SHIP'S INERTIAL CHARACTERISTICS WERE DETERMINED WITH GREATER ACCURACY; MOMENTS OF INERTIA AND THE POSITION OF THE MAIN AXIS OF INERTIA WERE DETERMINED. THE ACCURACY OF GYROSCOPIC DEVICES (FOR MEASURING THE ATTITUDE AND STABILIZATION SYSTEMS WAS DETERMINED BY USING OPTICAL INSTRUMENTS. THE NATURE, DYNAMICS, AND BRILLANCE PARAMETERS OF LUMINESCENT PARTICLES WERE FURTHER STUDIED AND NEW TYPE PORTHOLES, DESIGNED TO INSURE RELIABLE FUNCTIONING OF SENSITIVE OPTICAL SYSTEMS THROUGHOUT THE FLIGHT, WERE TESTED.

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PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0129801

ABSTRACT/EXTRACT--THE EFFECT OF AERODYNAMIC AND GRAVITATIONAL DISTURBING MOMENTS ON THE DYNAMIC CHARACTERISTICS AND MANEUVERABILITY OF THE SHIP WAS ASSESSED. WE CARRIED OUT A THOROUGH TESTING OF LIFE SUPPORT SYSTEMS AND OBTAINED VALUABLE INFORMATION. OUR OBSERVATIONS SHOW THAT COSMNAUTS ADAPT THEMSELVES VERY QUICKLY TO THE STATE OF WEIGHTLESSNESS, AND WE EXPERIENCED NO ILLUSORY SENSATIONS. DURING THE FIRST 2 OR 3 DAYS OF THE FLIGHT, HOWEVER, THERE WERE SYMPTOMS OF RUSHING BLOOD AND CERTAIN SENSATIONS OF DISCOMFORT. LATER, THESE SENSATIONS COMPLETELY DISAPPEARED. (PASSAGE INDISTINCT) WE SLEPT SOUNDLY AND HAD THE SAME KINDS OF DREAMS AS BACK ON EARTH. DURING THE FIRST DAY OR TWO WIGHTLESSNESS AFFECTED OUR MOVEMENTS, BUT AFTER 3 DAYS, WHEN WE HAD ADAPTED OURSELVES TO THIS STATE THE MOVEMENTS BECAME EASY AND LIGHT, CONFIDENT AND PRECISE. THE ACT OF MOVING FROM ONE COMPARTMENT TO THE OTHER WAS ALMOST AUTOMATIC.

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USSR

UDC 621.315.592:546.19'681

KOVTONYUK, N. F., KURBATOV, L. N., NOZDRIN, V. V., ORLOV, V. S., RYABENKO, Ye. A., RASKIN, A. A., ROSTUNCVA, R. P., SOLOV'YEV, A. A., SEVAST'YANOV, V. G., UMYAGIN, A. M., SHALUMOV, B. Z., and SHAULOV, Yu. Kh.

"Some Problems of a Technological Formulation of the Process of Obtaining Epitaxial Films of Gallium Arsenide by the Gas Phase Method"

V sb. Protsessy rosta kristallov i plenok poluprovodn. (Procedures for the Growth of Semiconductor Crystals and Films -- Collection of Works), Novosibirsk, 1970, pp 341-350 (from RZh-Elektronika i yeye primeneniye, No 7, July 1971, Abstract No 7B130)

Translation: The epitaxial films of GaAs obtained were produced by the gas phase method with the use of AsH₃, Ga, and HCl. GaAs wafers served as substrates. The surface of a wafer was subjected to chemical-mechanical processing and etching with H₂SO₄: H₂O₂: H₂O in the ratio 3: 1: 1. Synthesis of the GaAs was conducted in a reaction apparatus which was thoroughly scavenged by H₂ and etched by HCl at 950° C for 30 minutes. After cooling, the Ga was loaded into the chamber. The chamber was heated to a temperature of 850° C for activation of the Ga surface. After reduction of the temperature to 100--150° C, the GaAs substrate was introduced into the reaction zone. After heating the Ga area and the GaAs area, etching of the GaS was performed by HCl gas in a stream of AsH₃ and H₂. The films were doped by Se.

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KOVTONYUK, N. F., et al., Protsessy rosta kristallov i plenok poluprovodn.
(Procedures for the Growth of Semiconductor Crystals and Films -- Collection
of Works), Novosibirsk, 1970, pp 341-350 (from RZh-Elektronika i yeye
primeneniye, No 7, July 1971, Abstract No 7B130)

The best specimens of film had n-type conductivity and a mobility of 4000--5000
cm²/v.sec. Films doped by Se had a concentration of $5 \cdot 10^{17}$ -- $5 \cdot 10^{18}$ at/cm³ and
a mobility of 2000 cm²/v.sec. 8 ref. V.B.

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USSR

UDC 666.1.031.22:536.24

SEVAST'YANOV, R. I., Candidate of Technical Sciences, BESPALOV, V. P., Engineer, and PROTSENKO, L. M., Engineer, State Scientific Research Institute of Glass

"The Influence of the Altar in the Swelling Point on the Heat Exchange and the Motion of Glass Mass in the Boiling Basin of the Furnace"

Moscow, Steklo i Keramika, No 2, 1973, pp 4-5

Abstract: The expediency of mounting an altar in the zone of the swelling point of a glass-making furnace of sheet glass is analyzed on a physical analog and by examining the BVVS system of the glass-making factory "Proletariy". On the basis of model tests and measurements of temperature and heat fluxes in the "Proletariy" furnace, the influence of different forms of the altar on hydrodynamic properties of the glass mass were determined. The type of an altar without cooling is considered to be the best. The height of the altar has not to exceed the thickness of the return flux of the glass mass, or not to exceed $2/3$ of the basin depth. Four figures, four bibliographic references.
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USSR

UDC 612.419

SEVAST'YANOVA I. A., GOLANT, M. B., ADAMENKO, V. G., and VILENSKAYA, R. L.,
Institute of Experimental and Clinical Oncology, Academy of Medical Sciences
USSR, and Scientific Research Institute of the Ministry of the Electronics
Industry

"Effect of Microwaves on Change in the Number of Bone-Marrow Cells Caused by
Antineoplastic Chemotherapeutic Agents"

Moscow, Biologicheskiye Nauki, No 6, 1971, pp 58-59

Translation: Experiments were performed on mice to study the effect of the
antineoplastic agents sarcolysin [phenylalanine mustard] and chrysomallin
[antibiotic 2703 - derived from Actinomyces fluorescens and containing 3 acti-
nomycins] combined with microwave radiation on bone marrow. The radiation was
found to weaken the effect of the compounds.

In an earlier work we investigated increased resistance to ionizing
radiation following exposure of bone marrow to microwaves [1]. We showed that
preliminary microwave irradiation weakens the effect of x-irradiation. When
the order of the actions was reversed, the effect of x-irradiation was inten-
sified. In both cases we used microwaves with a wavelength of 7.1 mm and
x-rays at doses of 700, 1,400, and 2,100 r. We were unable to achieve a
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SEVAST'YANOVA, L. A., et al., *Biologicheskiye Nauki*, No 6, 1971, pp 58-59

similar effect in an ultrahigh-frequency field with wavelengths of 5.8, 6.5, and 7.8 mm [2].

This article presents data on the effect of microwaves combined with antineoplastic chemotherapeutic agents on the number of bone-marrow cells.

The experimental animals were 120 male mice ($C_{57}Bl \times CBA$) F_1 weighing 25 to 30 g. The animals were exposed to whole-body irradiation in a microwave field with the following parameters: wavelength 7.1 mm, magnetic field strength 2.5 mv/cm², duration of exposure 1 hour. The millimeter range microwave generator has already been described [1,2]. The first group consisted of animals that had not been exposed to microwaves and antineoplastic agents (control). The second included animals exposed to microwaves and given chrysomallin. The third received only chrysomallin. The fourth were irradiated and given sarcolysin. The fifth included animals that received only sarcolysin. The chemotherapeutic agents were administered once intraperitoneally immediately before irradiation: chrysomallin at the rate of 200 μ g/kg and sarcolysin at the rate of 10 mg/kg. The number of nucleated cells (N) in the bone marrow of the right femur was counted 1, 3, 5 and 10 days after the experimental action of the microwaves and compounds or only of the compounds and in the control

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SEVAST'YANOVA, L. A., et al., *Biologicheskkiye Nauki*, No 6, 1971, pp 58-59
animals (N_0).

There was a change in the N/N_0 ratio with time after the administration of chrysomallin. It decreased after 24 hours to 0.7 and after 3 days to 0.5 of the initial value. After 5 days the number of marrow cells increased, but the N/N_0 ratio did not return to normal, constituting 0.7 of the initial value. Twenty-four hours after the combined action of the microwaves and chrysomallin, the N/N_0 ratio decreased to 0.7 as was the case when chrysomallin alone was used. After 3 days its value rose to 0.8 and after 5 days was normal, whereas after treatment with chrysomallin alone, the N/N_0 ratio remained 0.7.

There was also a change in the N/N_0 ratio with time following the administration of sarcolysin. After 24 hours the ratio decreased to 0.4 and after 3 days to 0.1 of the initial value. After 5 days the number of cells increased; N/N_0 was 0.4. After 10 days the number of marrow cells returned to normal. N/N_0 did not drop as abruptly after the combined action of the microwaves and sarcolysin. The lowest N/N_0 after 3 days was 0.3 instead of 0.1. After 5 days it was 0.6 of the initial value, but after 10 days the number of marrow cells returned to normal.

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SEVAST'YANOVA, L. A., et al., *Biologicheskiye Nauki*, No 6, 1971, pp 58-59

The results of the experiments show that under the influence of micro-waves with a wavelength of 7.1 mm combined with sarcolysin or chrysomallin, the number of bone-marrow cells does not decrease as sharply as when micro-waves are not used. Moreover, the rate of restoration of the cell count increases after the combined action.

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Microbiology

USSR

UDC 576.858.6.083.35.07

(11)

ZHDANOV, V. M., BYKOVSKIY, A. F., AL'TSHTEYN, A. D., LOZINSKIY, T. F.,
URYVAYEV, L. V., VOLKOVA, M. L., YERSHOV, F. I., IL'IN, K. V., BEKTEMIROV,
T. A., IRLIN, I. S., MILLER, G. G., ZAKHAROVA, L. G., PEREKREST, V. V.,
GERASINA, S. F., and SEVAST'YANOVA, M. V., Institute of Virology imeni
D. I. Ivanovskiy, Academy of Medical Sciences USSR, and the Institute of
Epidemiology and Microbiology imeni N. F. Gamaleya, Moscow

"Detection of Oncornaviruses in Continuous Tissue Cultures"

Moscow, Voprosy Virusologii, No 4, 1973, pp 411-414

Abstract: Studies were conducted on a number of human and animal continuous tissue cultures maintained in medium 199 containing 10% bovine serum to determine oncornaviruses. Formation of oncornaviruses in the tissue cultures were followed by the appearance of viral particles in the culture fluid labeled with H³-uridine, susceptibility of their synthesis to low actinomycin D concentrations, appearance of these particles following inhibition of nuclear material synthesis by bromodeoxyuridine or mitomycin, presence of reverse transcriptase in these particles, presence of 60-70 S RNA in these particles, and electron microscopy. Of the 26 human lines investigated 14 contained type B oncornavirus, and 4 lines type C virus. Eight of the

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ZHDANOV, V. M., et al., Voprosy Virusologii, No 4, 1973, pp 411-414

14 animal lines studies also showed the presence of oncornaviruses. The source of these viruses in the human lines remains unclear, but the source may have been bovine serum or porcine trypsin used in the preparation of cell suspension. It is noteworthy that type B viruses were isolated in human cultures of epithelial origin, while type C viruses in human cultures of leukotic or sarcomatous origin.

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USSR

UDC 547.447.7 543.42

VOLODARSKIY, L. B., SEVAST'YANOVA, T. K., Novosibirsk Institute of Organic Chemistry, Academy of Sciences USSR, Siberian Department, and Novosibirsk State University

"Synthesis and Properties of α -Hydroxylaminoketones"

Leningrad, Zhurnal Organicheskoy Khimii, Vol 7, No 8, 1971, pp 1687-1692

Abstract: In searching for physiologically active compounds, two α -hydroxylaminoketones were synthesized by acid hydrolysis of the oximido-group of α -hydroxylaminoketone oximes. Stable α -hydroxylaminoketone hydrochlorides were prepared by a selective N-alkylation of sodium anti-benzaldehyde oxime with α -halophenones at 0-10° and subsequent acid hydrolysis of N-2-(1-aryl-1-oxo)alkyl phenyl nitrones formed by alkylation. Free α -hydroxylaminoketone bases with a secondary or tertiary α -carbon dimerize on standing to alkyl- and aryl-substituted N,N'-dioxo-dihydropyrazines (I). An analog of (I) is obtained by neutralizing a α -hydroxylaminoketone hydrochloride with a primary α -carbon. Compounds (I) 1/2

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VOLODARSKIY, L. B., et al, Zhurnal Organicheskoy Khimii, Vol 7,
No 8, 1971, pp 1687-1692

yielded substituted N-oxypyrazines by reacting with acetic anhydride. N-2-(1-aryl-1-oxo)alkylphenyl- and methyl nitrones were obtained by condensation of α -hydroxylaminoketones with benzaldehyde and acetaldehyde, respectively. Melting points, elemental analysis data, and spectral characteristics of α -hydroxylaminoketones and their derivatives are tabulated.

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USSR

UDC 546.791'221 + 546.791'231

SEVAST'YANOV, V. G., ELLERT, G. V., and SLOVYANSKIKH, V. K., Institute of General and Inorganic Chemistry imeni N. S. Kurnakov, Academy of Sciences USSR

"Chemical Transfer of Uranium Sulfides and Selenides"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol 17, No 1, Jan 72, pp 16-19

Abstract: Using the methods of chemical transport reactions, monocrystals of uranium sulfides and selenides were obtained. The yield of these reactions was studied as a function of initial bromine concentration, as the difference between the hot and cold zones, and, in case of uranium selenide, on the square position of starting selenide, while with the uranium sulfide - on the square of the ampule diameter. The temperature zones were 930° (t_{hot}) and 830° (t_{cold}), the ampule was 16 cm long, the starting sulfide had the formula US_{1.5} and the initial concentration of bromine was 0.4 mg/cm³. The rate of uranium sulfide transfer depends on the diffusion of gaseous reaction products. In the experiment on the dependence of uranium sulfide crystals on the initial concentration of bromine it was shown that when the starting material was US_{1.5} the U₃S₅ crystals grew throughout the entire range of bromine concentration; with US_{1.8}

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SEVAST'YANOV, V. G., et al., Zhurnal Neorganicheskoy Khimii, Vol 17, No 1, Jan 72, pp 16-19

at the starting point, the $US_{1.87}$ and β - US_2 crystals grew in the concentration ranges 0-0.4 and 0.4-1.2 mg/cm³ Br respectively, while the increase of bromine concentration to more than 1.2 mg/cm³ leads to the formation of β - US_2 and UOS mixtures. When the difference between the zone was plotted against the yield of the product, it was found that $US_{1.87}$ increases linearly with the difference, and U_3S_5 goes through a maximum at 200° down to 0 yield at 400° difference between the hot and cold zones. Both phenomena are ascribed to the increase in the difference of partial pressures of gaseous phase components. When U_3Se_5 yield was studied as a function of the composition of starting material the curve showed a complex pattern; depending on the starting material the products changed from U_3Se_5 through $USe_{1.87}$, α - USe_2 , β - USe_2 to USe_3 .

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Abstracting Service:

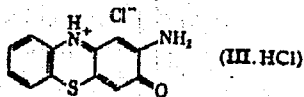
CHEMICAL ABST.

5770

Ref. Code:

4R0366

111397r Synthesis of 3-hydroxy-2',4-diaminodiphenyl sulfide and its oxidation to 2-amino-3-phenothiazone. Sevbo, D. P.; Ginzburg, O. F. (Leningrad. Tekhnol. Inst. ~~III~~ ^{III} ~~Lensoveta~~, Leningrad, USSR). *Zh. Org. Khim.* 1970, 6(2), 345-7 (Russ). The condensation of 2-O₂NC₆H₄Cl with 3,4-(MeO)₂NC₆H₃SH gave 3-methoxy-2',4-dinitrodiphenyl sulfide (I) and 3,3'-dimethoxy-4,4'-dinitrodiphenyl sulfide, which were reduced to the corresponding diamines. Heating I with Na₂S₂ gave 3-methoxy-4-amino-2'-nitrodiphenyl sulfide. The demethylation of I gave 3-hydroxy-2',4-dinitrodiphenyl sulfide which was reduced to 3-hydroxy-2',4-diaminodiphenyl sulfide (II). The oxidn. of II



with O, FeCl₃, KMnO₄, or K₂CrO₇ gave 2-amino-3-phenothiazone (III).

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USSR

ZALESSKIY, I. YE., et al., Doklady Akademii Nauk SSSR, Vol 210, No 2, 1973, pp 312-315

and the absolute quantum yield of Zn-TBP ($S_2 \rightarrow S_0$)-fluorescence were studied. The "blue" fluorescence in the case of the free base TBP is an order weaker. The radiationless transition $S_4 \rightarrow S_1$ is of a cascade character. No "blue" fluorescence was observed in the studied complexes of TBP with transition metals (V, Cu, Pd) or in the case of chlorophyll a.

The authors thank T. F. KACHURA for preparing the tetrabenzoporphin and the metal complexes thereof, M. V. SARZHEVSKAYA for providing the chlorophyll a, and A. T. GRADYUSHKO and M. P. TSVIRKO for valuable advice.

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ZALESSKIY, I. YE., et al., Doklady Akademii Nauk SSSR, Vol 210, No 2, 1973, pp 312-315

this basis the authors undertook to search for "blue" fluorescence in TBP and metal complexes thereof. During their study the authors received from Professor M. GOUTERMAN (United States) the manuscript of an article which reported the detection of "blue" Zn-TBP fluorescence, thus agreeing with the authors' data. The present article describes results of a systematic study of "blue" fluorescence in TBP and a number of its metal complexes (zinc, cadmium, copper, vanadium (VO-TBP), palladium). as well as chlorophyll a.

The "blue" fluorescence spectrum of Zn-TBP at room temperature is approximately mirror-symmetric to the Soret band of the absorption spectrum. The excitation spectrum for this fluorescence in the region accessible to measurements coincides with the absorption spectrum. There is no quenching of "blue" fluorescence by heavy atoms. These data indicate that the fluorescence is ($S_2 \rightarrow S_0$)-fluorescence and is not attributable to an impurity. The effect of a solvent and temperature on ($S_2 \rightarrow S_0$)-fluorescence in Zn-TBP

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USSR

UDC: 535.37

SEVCHENKO, A. N., Academician of the Academy of Sciences of the BSSR,
BUROV, L. I., VOROPAY, Ye. S., ZHOLNEREVICH, I. I., SARZHEVSKIY, A. M.,
Belorussian State University imeni V. I. Lenin

"Polarization Curves of Fluorescence Induced by Two-Photon Excitation"

Minsk, Doklady Akademii Nauk SSSR, Vol 17, No 2, 1973, pp 117-120

Abstract: An expression is derived for the degree of polarization of fluorescence in the case of excitation by two linearly polarized light beams with arbitrarily oriented polarization vectors. The resultant expression can be used not only to calculate the degree of polarization of fluorescence for different orientations of the wave vectors and the vectors of polarization of the exciting fluxes but also to obtain information on the states participating in two photon absorption. Expressions are tabulated for the degree of fluorescence polarization as a function of the angle between the polarization vectors of the incident light beams with oblique recording of fluorescence. Polarization curves plotted from the expressions can give an idea of the kinds of oscillators taking part in processes of absorption and emission.

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USSR

UDC 535.51:535.37

ZALESSKIY, I. Ye., KOTLO, V. N., SEVCHENKO, A. N., Academician of the Belorussian Academy of Sciences; SOLOV'YEV, K. N., SHKIRMAN, S. F., Institute of Physics, Minsk

Variation, with Time, of Porphyrin Fluorescence Polarization and the Shifting of Iminohydrogens in the Porphin Ring"

Moscow, Doklady Akademii Nauk SSSR, Vol 207, No 6, 1972, pp 1314-1317

Abstract: The authors discuss experiments they have performed in which they discovered new characteristics of radiation anisotropy which, when studied in detail, may lead to the solution of certain problems in the structure of porphyrin molecules. These experiments investigated the polarized luminescence of porphyrins in frozen vitreous solutions. The principal subject of this paper is the dependence of that polarization on the time in which the excitation light operates at low temperatures. Measurement of the degree of polarization was made with an ordinary spectropolarimetric device with two monochromators. The fluorescence was excited by monochromatic, linearly polarized light. and was observed
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ZALESSKIY, I. Ye., et al., Doklady Akademii Nauk SSSR, Vol 207, No 6, 1972, pp 1314-1317

at an angle of 40° with respect to the ray of the exciting light. It was found that the fluorescence of etioporphyrin I, tetrabenzoporphin, and phthalocyanine in frozen glass was substantially depolarized with time. Curves showing that variation are given, together with tabulated data. It was also found that the reorientation of the molecular oscillators is connected with the shift in iminohydrogens at the center of the porphin ring. Diagrams of possible isomeric forms of the porphin molecule are shown.

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USSR

UDC: 535.37

VOLOD'KO, L. V., DEMCHUK, M. I., SEVCHENKO, A. N., ZAZHOGIN, A. P.,
and CHERNYAVSKIY, A. F.

"Investigating the Statistical Method for Recording the Laws of
Luminescence Scintillation"

Minsk, Zhurnal Prikladnoy Spektroskopii, vol 16, No 6, 1972, pp
1001-1007

Abstract: The purpose of this paper is to further the development of physical investigation of the processes accompanying luminescence by looking into a better method for statistically recording the laws of luminescence scintillation in the time range of 10^{-9} to 10^{-5} sec, in which there are no principal defects as in the stroboscopic method or in the method of synchronous photon counting. The basic idea of this superior method was first considered in an earlier paper published in this same journal by some of the authors listed above (A. F. Chernyavskiy, et al, 13, 1970, p 840). The present paper gives the results of a thorough investigation into the method and describes an experimental device for investigating luminescence. A block diagram of the device is given and its operation explained. It is found that this method is useful in a practically unlimited range of luminescence intensity and has high resolving power and low error.

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USSR

UDC: 535.373.2

SEVCHENKO, A. N., KUZNETSOVA, V. V., PUKO, R. A., KHOMENKO, V. S., RAZVINA, T. A., and KOZHAN, T. M.

"Intramolecular and Intermolecular Transfer of Excitation Energy in Complex Compounds of Rare-Earth Metals"

Moscow, Izvestiya AN SSSR -- Seriya Fizicheskaya, vol 36, No 5, 1972, pp 1013-1017

Abstract: This paper gives the results of experiments for determining, through the kinetic method, the probability of intramolecular and intermolecular transfers of excitation energy in crystals of rare-earth element (REE) complexes. With excitation by short light pulses, the kinetics of the luminescence reflects the trend of the population and the deactivation of the luminescence level and yields direct information concerning the probability of these processes. A pulsed laser with molecular nitrogen was used as the excitation source, with a pulse duration of $2 \cdot 10^{-8}$ sec and a wavelength of 337.1 nm in the long-wave band of ligand absorption. The authors are connected with the Physics Institute of the USSR Academy of Sciences.

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USSR

UDC 535.33

SEVCHENKO, A. N., OL'DEKOP, YU. A., ZYAT'KOV, I. P., BYLINA,
G. S., SAGAYDAR, D. I., SHINGEL', I. A.

"Investigation of the IR Spectra of Poly-n-Formylstyrene, Styrene Copolymers, n-Formylstyrene, and Some of Their Derivatives"

Minsk, Zhurnal Prikladnoy Spektroskopii (Journal of Applied Spectroscopy), Vol 13, No 4, Oct 1970, p 633-638

Abstract: The authors study the ir spectra of several styrene (S) and n-formylstyrene (FS) copolymers containing various aldehyde groups as well as several aldehyde group derivatives: namely, poly-n-formylstyrene (PFS); copolymers I-V containing 23.8, 31.9, 36.0, 40.2, and 45.6 mole % FS, respectively; Schiff copolymers I and V; phenylhydrazone copolymer IV; azine copolymer I, III, IV, and V; oxime copolymers IV and V; and acetal - methyl alcohol copolymer III. The polymer samples were ground together with a quantity of KBr and then pressed into tablets. The spectra were taken with a UR-10 spectrophotometer. The spectral regions studied were 3100 to 2700 cm^{-1} and 2000 to 700 cm^{-1} .

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SEVCHENKO, A. N. et al, Zhurnal Prikladnoy Spektroskopii, Vol 13,
No 4, Oct 1970, p 633-638

The ir spectra of S, FS, and PFS are analyzed, compared, and interpreted in detail. The ir absorption spectra are plotted and presented in the form of curves. Numerous bands are identified and related to specific bond vibrations and atomic groups.

The authors thank L. K. Burykina for assistance in preparing the samples. Orig. art. has 4 figs. and 7 refs.

2/2

1/2 028 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--LUMINESCENCE AND ABSORPTION SPECTRA OF URANYL CHLORIDE CRYSTALS IN
POLARIZED LIGHT -U-
AUTHOR-(03)-KOMYAK, A.I., SEVCHENKO, A.N., SIDORENKO, M.M.
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(3), 567-81
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--CHLORIDE, CRYSTAL, URANIUM COMPOUND, LUMINESCENCE, ABSORPTION
SPECTRUM, LIGHT POLARIZATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1533 STEP NO--UR/0048/70/034/033/0576/0581
CIRC ACCESSION NO--AP0125161
UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--A0125161

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LUMINESCENCE AND ABSORPTION SPECTRA OF GS SUB2 UO SUB2 CL SUB4 CRYSTALS WERE DETD. AT 77DEGREESK AND THE EFFECT OF LIGHT POLARIZATION DISCUSSED. THE ELECTRON VIBRATION LEVELS OF (UO SUB2 CL SUB4) PRIME2 NEGATIVE WERE DETD. AND THE RESULTS OF KHARITONOV AND KNYAZEVA WERE USED FOR THE ASSIGNMENT OF SPECTRAL LINES TO INDIVIDUAL VIBRATIONS. FACILITY: BELORUSS, GOS. UNIV. IM. LENINA, MINSK, USSR.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--QUASI LINEAR SPECTRA OF PORPHYRINS -U-

AUTHOR--(03)-SEVCHENKO, A.N., SOLOVYEV, K.N., SHKIRMAN, S.F.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(3), 527-35

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--METAL COMPLEX COMPOUND, PORPHYRIN, ELECTRON SPECTRUM,
VIBRATION FREQUENCY, PHTHALOCYANINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--2000/2032

STEP NO--UR/0048/70/034/003/0527/0535

CIRC ACCESSION NO--AP0125620

UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125620

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN ENERGY LEVEL DIAGRAM OF THE PORPHIN RING SYSTEM IN NONMETALATED PORPHYRINS AND THEIR METAL COMPLEXES IS GIVEN. THE VIBRATIONAL STRUCTURE OF THE ELECTRONIC SPECTRA OF PORPHINE DIHYDROPORPHINE, AND THE 2 TETRAHYDROPORPHINES ARE REPORTED. THE QUASI LINEAR SPECTRA OF AZABENZOPORPHYRINS ARE COMPARED, AND THE FUNDAMENTAL VIBRATIONAL FREQUENCIES OF TETRABENZOPORPHINE, ITS MONO, DI, AND TRIAZA ANALOGS, AND PHTHALOCYANINE ARE TABULATED. THE QUASI LINEAR SPECTRA OR PORPHINE DERIVS. TOGETHER WITH LOW TEMP. POLARIZATION MEASUREMENTS YIELDED ADDNL. EVIDENCE FOR THE VIBRATIONAL CHARACTER OF THE BANDS IN THE ELECTRONIC SPECTRUM OF PORPHYRINS AND FOR THE ALMOST EQUAL INTENSITY OF THE VIBRATIONS INDEPENDENT OF THEIR SYMMETRY.
FACILITY: INST. FIZ., USSR.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--CALCULATION OF LUMINESCENCE DEPOLARIZATION DURING CHANGES IN
TEMPERATURE AND CONCENTRATION OF FLORESCENT SUBSTANCES -U-
AUTHOR-(G3)-SEVCHENKO, A.N., POPECHITS, V.I., SARZHEVSKIY, A.M.
COUNTRY OF INFO--USSR S
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 19(15), 1025-7
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--DEPOLARIZATION, TEMPERATURE DEPENDENCE, POLARIZED
LUMINESCENCE, MOLECULAR STRUCTURE, FLUID VISCOSITY, EXCITATION ENERGY,
LUMINESCENCE QUENCHING
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/1638 STEP NO--UR/0020/70/191/005/1025/1027
CIRC ACCESSION NO--AT0133543
UNCLASSIFIED

PROCESSING DATE--20NOV70

UNCLASSIFIED

2/2 027

CIRC ACCESSION NO--AT0133543

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. VAVILOV'S FORMULAS FOR CONCN. DEPOLARIZATION OF FLUORESCENCE (CA 45: 453H) ARE MODIFIED TO INCLUDE AS VARIABLES TEMP. AND VISCOSITY. THE BASIC ASSUMPTIONS FOR THE DERIVATION OF THE FORMULAS ARE: (1) THE FLUORESCENT MOLS. FOLLOW THE EINSTEIN-SMOLUCHOWSKI'S THEORY; (2) THE FLUORESCENT MEDIUM HAS 2 TYPES OF FLUORESCENT MOLS. DEPENDING ON THEIR THERMAL STATE, ORIENTATION, ETC.; (3) EXCITATION ENERGY TRANSFER BETWEEN MOLS. OF EQUAL STATES DOES NOT LEAD TO QUENCHING. EXPLICIT FORMULAS ARE GIVEN FOR: (1) CASES WHERE THE QUENCHING IS NEGLIBLE (LOW CONCN.), AND (2) DECREASE IN FLUORESCENCE POLARIZATION TAKES PLACE IN THE COURSE OF QUENCHING. FACILITY: BELORUSS. GOS. UNIV. IM. LENINA, MINSK, USSR.

UNCLASSIFIED

1/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--FLUOROMETRIC ANALYSIS OF VIBRATORY ENERGY TRANSFER DURING MOLECULAR
IMPACTS -U-
AUTHOR--(04)-PIKULIK, L.G., SEVCHENKO, A.N., YAKOVENO, V.A., KOSTKO, M.YA.
COUNTRY OF INFO--USSR
SOURCE--ZH. PRIKLAD. SPEKTROSK (USSR), VOL. 12, NO. 4, P. 682-90, APRIL
1970
DATE PUBLISHED----APR 70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FLUORESCENCE, ABSORPTION SPECTRUM, GAS STATE, MOLECULAR
PHYSICS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/1114

STEP NO---UR/0368/70/012/004/0682/0690

CIRC ACCESSION NO--AP0136534

UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136534

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTRODUCTION OF GASES INTO FLUORESCENT VAPORS AMPLIFIES THE RADIATION DUE TO LOWER PROBABILITY OF NONRADIATIVE TRANSITIONS. THE PHENOMENON IS EXPLAINED BY VIBRATORY ENERGY TRANSFER FROM EXCITED MOLECULES TO THE INTRODUCED GAS PARTICLES. THE INFLUENCE OF THE OUTSIDE GASES UPON THE LIFE OF PHTHALIMIDE VAPOR EXCITED STATE, SPECTRA AND QUANTUM IS DESCRIBED. THE CHARACTERISTICS PERMIT THE EVALUATION OF ENERGY TRANSFER BY DIRECT FLUOROMETRIC MEASUREMENTS TO BE MADE. CONSTANCY OF OUTPUT AND OF DURATION OF FLUORESCENCE WITHIN A BROAD ABSORPTION SPECTRUM POINT TO ESTABLISHMENT OF THERMODYNAMIC BALANCE OF MOLECULE IN THE MEDIUM. STABILIZATION OF FLUORESCENT MOLECULES IS QUITE EFFECTIVE IN BOTH STOKES' AND ANTI STOKES REGIONS OF THE EXCITATION SPECTRUM.

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SEVCHENKO, A. N. (Academician Academy of Sciences Belorussian SSR), POPECHITS, V. I., and SARZHEVSKIY, A. M. (Belorussian State University imeni V. I. Lenin, Minsk)

"Calculation of Luminescence Depolarization Due to Variation in the Temperature and Concentration of Fluorescent Substance"

Moscow, Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 191, No 5, 1970, pp 1,025-1,027

Abstract: An attempt is made to introduce the variables of temperature and viscosity into Vavilov's theory of fluorescent depolarization. The probability of collision of fluorescing molecules in viscous solutions is calculated. Being much larger than the molecules of the solute, they are considered as Brownian particles.

The probability of excitation energy transfer as a function of time, concentration of fluorescing molecules, and the temperature/viscosity ratio is found for a medium with two sorts of molecules. One sort can accept excitation energy without quenching; the other, possibly with quenching. Each sort can

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USSR

SEVCHENKO, A. N., et al., Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 191, No 5, 1970, pp 1,025-1,027

assume the state of the other (e.g., temperature, orientation), reversibly, without chemical conversion. The equation derived can be used to calculate the concentration depolarization of fluorescence if the types of absorbing and radiating systems are given.

The Vavilov equations with the new variables of temperature and viscosity have not been verified experimentally.

Orig. art. has 1 ref.

2/2

USSR

UDC: 621.7.073

SEVERDENKO, V. P., SUKHODREV, E. Sh., CHELYSHEV, A. P., TYURIN, L. N., and ORLOV, A. R.

"Stability of Gear Matrices Obtained by Plastic Deformation Methods"

Minsk, Izvestiya Akademii nauk BSSR--Seriya fiziko-tekhnicheskikh nauk, No 4, 1973, pp 5-7

Abstract: Results are given of research on the stability of gear matrices under production conditions in the Borisovskiy Plant for Auto-Tractor Electrical Equipment, in the process of stamping out ST-8 starter gears by the method of hot combination stamping. This method, discussed in an earlier paper (V. P. Severdenko, et al, Promyshlennost' Belorusii, No 4, 1969), was investigated in the present paper at a stamping tempo of 25 sec with the specimens heated to 750-800° C. The stability of matrices made of fast-cutting steels R12 and R18, obtained by closed broaching, was investigated. Matrices made by gear-shaping and by broaching were compared. Three causes of matrix failure were found: the appearance of thermal cracks; abrasive wear of the pattern; warping of the matrix pattern. Methods for improving the stability of the matrices are recommended.

1/1

- 98 -

USSR

UDC 621.778-426.04:669.1

SEVERDENKO, V. P. and ZHILKIN, V. Z., Krasnoyarsk Institute of Non-Ferrous Metals imeni M. I. Kalinina and the Physico-Technical Institute of the Academy of Sciences Byelorussian SSR

"Drawing of Wire by the Use of Ultrasound"

Minsk, Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Tekhnicheskikh Nauk, No 4, 1973, pp 12-16

Abstract: This article cites the results of drawing wire from several metals and alloys by applying ultrasonic oscillations on the wire. The authors have established the dependence of the force of drawing on the intensity of the ultrasonic oscillations under various conditions of the drawing process. The influence of ultrasound on the properties of the wire is explained.

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USSR

SEVERDENKO, V. F., and ZHILKIN, V. Z., Izvestiya Akademii Nauk BSSR, Seriya Fiziko-Tekhnicheskikh Nauk, No 4, 1973, pp 12-16

The authors have given one table which compares various metals and alloys with respect to the dependence of drawing force on intensity of ultrasound; a second table compares the mechanical properties of wire from several metals by drawing with ultrasound and without.

Figure 1 shows standard indicator diagrams obtained by ordinary drawing and by drawing with ultrasound. Figure 2 shows the influence of voltage on certain aspects of the described process.

The article contains 2 illustrations, 2 tables, and 5 bibliographic references.

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Composite Materials

USSR

UDC: 669.715:621.002.3

SEVERDENKO, V. P., MATUSEVICH, A. S., CHUTAYEV, I. Kh., RADAYEV, M. A.

"Hardening of Aluminum by Fibers of Stainless Steel"

Moscow, Tsvetnyye Metally, No 12, Dec 73, pp 60-61.

Abstract: A specimen consisting of alternating layers of degreased steel wire and surface-treated aluminum foil was placed in an envelope of copper sheets, the edges of which were sealed by gas welding. The air was extracted from the envelope to a residual pressure of $1 \cdot 10^{-4}$ - $1 \cdot 10^{-5}$ mm hg, after which the packet was heated to 450° C for 30-45 minutes, depending on packet thickness. The residual pressure in the packet before rolling was not over $5 \cdot 10^{-5}$ mm hg. Based on the experiments, a nomogram was constructed which can be used to determine the spacing of wires, foil thickness and minimum necessary degree of compression for fixed values of volumetric content and a diameter of hardening wires. Reinforced sheets measuring (1.0-3.5) by 180 by 220 mm were made. The highest strength values were achieved for a composite material consisting of aluminum plus 44% EP-322 wire.

1/1

Byelorussian SSR

UDC 621.73.043

SEVERDENKO, V. P., PETRENKO, V. V., and PETRENKO, S. I.

"On the Dimensions of Mosaic Units in Steel Types 20 and Kh18N10T after Ultrasonic Working"

Minsk, Vestsi Akademii Navuk BSSR, Series on Physical-Technical Sciences, No 2, 1973, pp 14 - 16

Abstract: The authors deformed samples of No 20 low-carbon steel and Kh18N10T stainless steel with dimensions of 6 x 9 millimeters in a 5-ton press, both without the application of ultrasonics and with ultrasonics at a natural resonant frequency of 19 kilohertz and intensities of 50, 650, and 700 watts per square centimeter. X-ray methods were then used to determine the dimensions of mosaic units in the centers of the samples. As expected, the dimensions of these units decreased with increasing deformation. However, the decreases were less as greater amounts of ultrasonic energy were applied. There was also a significant decrease in the crystal lattice defects of the alloys subjected to ultrasonic energy, which the authors believe reflects the fact that the groups of atoms moving in the deformation process have linear dimensions smaller than the dimensions of the mosaic units, so that there is less elastic deformation of volume elements when obstructions are encountered.

1/1

USSR

UDC: 539.210.2:537.311

SEVERDENKO, V. P., LABUNOV, V. A., TKHAREV, Ye. Ye., and KAZANTSEV, A. P.

"The Two-Temperature Method for Determining the Parameters of the Potential Barrier in Tunnel Metal-Dielectric-Metal Structures"

Tomsk, Izvestiya VUZ--Fizika, No 5, 1973, pp 145-147

Abstract: This brief communication proposes a method for measuring the height of potential barriers in asymmetrical MMI tunnel structures and for determining the barrier heights at the dielectric-metal junction interfaces. The authors claim the advantages of high precision and short measurement time for their method. A mathematical analysis is given, beginning with the Stratten equation for the voltampere characteristic of tunnel structures (R. Stratten, J. Phys. Chem. Solids, vol 23, p 1177. 1962).

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USSR

UDC 621.77.01

SEVERDENKO, V. P., GURSKIY, L. I.

"Structure in Volume and on Surface of Rolled Materials"

Struktura v Ob'eme i na Poverkhnosti Prokatannykh Materialov [English Version Above], Minsk, Nauka i Tekhnika Press, 1972, 308 pages.

Translation of Annotation: This monograph studies the flow of a metal at the deformation center in various rolling and plastic deformation modes with ultrasound. It is demonstrated that the structure and properties result not only from the degree of deformation, but also significantly from the modes of deformation and conditions at the contact surface. The texture, dislocation structure, microdistortions of the lattice, blocks of the mosaic, residual stresses of first and second kind during deformation and annealing in the volume and on the surface of compact and powdered materials are studied.

The stress and strain state during rolling of three-layer packets is analyzed. The peculiarities of the interaction of dislocations with the free surface and boundaries in the metal are studied. Methods are suggested for calculation of lattice defects. Particular attention is given to investigation of the structure of the surface layers of plastically deformed materials and the structures of powder materials.

11 Tables; 167 Figures; 443 Biblio. Refs.

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USSR

UDC 621.77.01

SEVERDENKO, V. P., GURSKIY, L. I., *Struktura v Ob'eme i na Poverkhnosti Prokatannykh Materialov*, Minsk, Nauka i Tekhnika Press, 1972, 308 pages.

Intended for metallurgical engineers and mechanical engineers working in the area of strength and ductility of metals.

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Composite Materials

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SEVERDENKO, V. P., MATUSEVICH, A. S., and GONCHAROV, A. F., Moscow, Minsk

"Drawing of Composite Materials Based on Aluminum and Copper"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 2, Mar-Apr 73, pp 122-124

Abstract: A study was made of the strain hardening of aluminum-Kh18N10T composites and copper-Kh18N10T composites by means of plastic deformation at room temperature and at the temperature of liquid nitrogen. Also investigated was the possibility of plastic deformation of composite materials. The highest permissible deformation of the aluminum-25% Kh18N10T composite is 35% in drawing in a medium of liquid nitrogen and 70% in drawing at room temperature. For the copper-Kh18N10T composite with 20-60% volumetric content of threads, the maximum deformations in the case of the above-mentioned temperatures were 65% and 96%, composite. Applying drawing with subsequent aging made it possible to increase the tensile strengths of the aluminum-Kh18N10T respectively by 1.5-2 times and of the copper-Kh18N10T composite by 2-3 times, in comparison with the initial tensile strength. One figure one table, two bibliographic references.

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USSR

UDC 627.73

SEVERDENKO, V. P., MAKUSHOK, Ye. M., and KLEBANOVICH, N. F.

"Stress-Deformation State in a Deposited Strip"

Minsk, Vestnik Akademii Nauk BSSR -- Seriya Fizika-Tekhnicheskikh Nauk,
No 2, 1972, pp 5-9

Abstract: The article presents results of experiments conducted by the authors in the deposits of specimens made from materials with various types of rheological behavior, such as lead, colophony, and gelatin. The deformed state of the specimens was studied from coordinate grids overlaid on the surface of joints in the specimens splitting them into halves. The halves were then put together and compressed in a stamp with greased walls to reduce the friction. These tests allow one to compare the stress distribution and the deformations observed in optically sensitive materials and to equate the data obtained with the deformed coordinate grids. The authors are associated with the Physico-Technical Institute of the Belorussian Academy of Sciences.

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USSR

UDC 620.172.24

SEVERDENKO, V. P., Academician of the Academy of Sciences BSSR, KAL'NITSKIY, R. M., Physicotechnical Institute of the Academy of Sciences BSSR

"Strength and Plasticity of Molybdenum as Determined from Brief Tests"

Minsk, Doklady Akademii nauk BSSR, No. 4, Apr 72, pp 321-323

Abstract: The strength and plasticity of metalloceramic predeformed molybdenum were determined. Deformation was carried out in the temperature range 20-1000°C and in the range of deformation rates of 13-300 mm/min with rates of initial deformation of $3 \cdot 10^{-2}$ - $6 \cdot 10^{-1}$ sec⁻¹. Smooth and notched samples of diameter (1.49-1.51) ± 0.005 mm and length of the cylindrical section of 9 mm were subjected to tension. The samples were fabricated of 98% deformed molybdenum rod purity 99.9% obtained from aluminum molybdate. The theoretical coefficient of stress concentration for samples with a notch was 1.2. The samples were annealed at 900°C. The results are presented in graphical form. The strength limit of smooth samples decreases at all deformation rates used in the temperature interval from 20 to 100-200°C. With a further rise in temperature the intensity of the increase in strength drops and to a greater degree with a relatively high deformation rate. An increase in deformation rate thus causes a rise in

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SEVERDENKO, V. P., KAL'NITSKIY, R. M., Doklady Akademii nauk BSSR, No. 4, Apr 72, pp 321-323

temperature at which there occur breaks in the graphs of the strength limit of molybdenum. A decrease in the intensity of the change in the strength limit of molybdenum at temperatures above 100-200°C is attributed to exhaustion of the active effect of temperature on its strength and a change in the deformation mechanism. Stabilization of the strength limit values occurs at temperatures of 400-600°C and deformation rates of $3 \cdot 10^{-2} \text{ sec}^{-1}$. The values of the strength limit of smooth samples of molybdenum with an increase in temperature from 20 to 1000°C decrease by a factor of 2-3 from 78-96.5 to 22.5-31.5 kgauss/ mm^2 . It is proposed that these results be used in the design in engineering calculation of molybdenum parts.

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USSR

UDC 629.191.032

SEVERDENKO, V. P., Academician of the Academy of Sciences Belorussian SSR, MURAS, V. S., and ELIMELAKH, S. Z., Physicotechnical Institute, Academy of Sciences Belorussian SSR

"Determination of Thermophysical Properties of Intermediate Graphite Medium in Hot Hydrodynamic Extrusion"

Minsk, Doklady Akademii Nauk BSSR, Vol 15, No 11, Nov 71, pp 981-984

Abstract: The article describes a procedure for determining thermophysical properties of the intermediate graphite medium in hot hydrodynamic extrusion. Brand BG-0 solid electrode graphite was used as the initial material. The thermal diffusivity, coefficient of thermal conductivity and specific heat of the graphite under various process conditions were determined. It is shown that close to isothermal conditions can be created for the hot hydrodynamic extrusion of metals and alloys.

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USSR

UDC 681.034

SEVERDENKO, V. P., Academician, AS BSSR, LABUNOV, V. A., and LESHCHENKO, I. N., Minsk Radio Engineering Institute

"Effect of Ultrasonic Vibrations on the Process of Condensation During Vacuum Vaporization"

Minsk, Doklady AN BSSR, Vol 15, No 8, Aug 71, pp 689-691

Abstract: The authors investigate the effect of ultrasonic oscillations on the formation of thin metal films made by vapor condensation. Specifically, they study the effect of ultrasonic vibration on the thickness of condensed layers of aluminum and copper made by thermal vaporization in a vacuum (i.e., on the change in the coefficient of accommodation which determines the thickness of the deposit during vaporization of an identical amount of material) and on the rate of formation of the deposit. The weight of the samples was 100 mg for aluminum and 130 mg for copper, and the vaporization times were 70 and 45 sec. for aluminum and copper respectively. Glass substrates were used. The thickness of the films was interferometrically measured with an accuracy of 20 Å. Curves are given for film thickness as a function of the amplitude of ultrasonic oscillations and also for film
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thickness as a function of vaporization time with and without ultrasonic vibration. A considerable increase in film thickness is observed as the amplitude of the ultrasonic vibration of the substrate increases. This shows that ultrasonic oscillation increases the coefficient of accommodation. The basic factor which influences the coefficient of accommodation is the increased energy of the substrate surface. It was found also that the rate of growth of the film is increased by the application of ultrasound. This may be attributed to increased mobility of the precipitating atoms. Two figures, bibliography of nine titles.

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UDC: 621.016.3:669.71

SEVERDENKO, V. P., LOZHECHNIKOV, YE. B., and REPIN, R. A., Belorussian Polytechnic Institute

"Structure and Technological Heredity of Rolled Metal From Aluminum Grains"

Kiev, Poroshkovaya metallurgiya, No 12, Dec 71, pp 25-31

Abstract: This study concerns the effects of various factors, including grain size, temperature, degree of cogging, roll gap, structure, resistivity, etc. on the properties of rolled metal made from aluminum grains. The test material was AD-1 granular aluminum produced by centrifugation. Involved were five standard grain sizes of nearly spheroidal shape. The rolling was both cold and heated to 300, 350, 400, 450, 500, and 550°C. Cited are test data on above temperature ranges, annealing temperatures, number of passes, cogging degrees, changes in mechanical properties versus grain size, and changes in resistivities versus grain size. The data show that the optimal rolling temperatures of aluminum granules range from 400 to 450°C. The first cogging of the granules determines the mechanical properties of the end product: with

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pp 25-31

an increase in cogging, both the mechanical and physical properties of the material increase. The highest properties for the material were achieved at 40-50% reductions in area followed by annealing. Inclusions of oxides of the granular boundaries disintegrated during deformation and distributed over the matrix have no appreciable effect on the mechanical properties of the material. A 2% addition of aluminum powder appears to strengthen the material without a perceptible reduction of plasticity. (4 illustrations, 1 table, 7 biblio. references)

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