USSR

UDC 632.95

PUSHKAREVA, Z. V., MURSHTEYN, M. K., and STEPANOVA, L. A.

"Synthesis and Use of 9-Cyanoethyl Derivatives of Carbazole and Some of Their Conversion Products"

Sb. nauch. tr. po khimii Sverdl. in-t nar. kh-va (Collection of Scientific Works on Chemistry of Sverdlovsk Institute of the National economy), Sverdlovsk, 1971, pp 74-79 (from RZh-Khimiya, No 13, 10 Jul 72, Abstract No 13N499 by N. B. Vsevolozhskaya)

Translation: 9-Cyanoethylcarbazole (I), its nitro and amino derivatives, as well as their conversion products possess fungicidal properties. Saponification of I in a mixture of a 20-percent aqueous solution of KOH and ethyl alcohol on boiling for 4-6 hours gives 9-(β-carboxy)-ethylcarbazole (II), yield 80%, melting point 171-3° (60% ethyl alcohol+AcOh). Nitration of II with a mixture of HNO_3 and AcOH gives 3,6-dinitro-9-(β-carboxy)-ethylcarbazole (III), yield, 80%, melting point 295° (dioxane). In nitration of 3-NH_2-II the yield of III is 85%. Saponification of the 3-amino derivative of I is performed in a mixture of 40% KOH and ethyl alcohol, yield of 3-NH_2-II 61.5%, melting point 223°. Boiling of II in $SOCl_2$ gives the acid chloride of II, melting point 40°; the action of $POCl_3$ and PCl_5 on III gives the acid chloride

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PUSHKAREVA, Z. V., et al., Sb. nauch. tr. po Khimii Sverdl. in-t nar. Kh-va Sverdlovsk, 1971, pp 74-79

of III, melting point ~300°. 3,6-$(NO_2)_2$-I is specially active against Fusarium, II has a stimulating effect on the growth of dicotyledons; I and III are used to control root rot.

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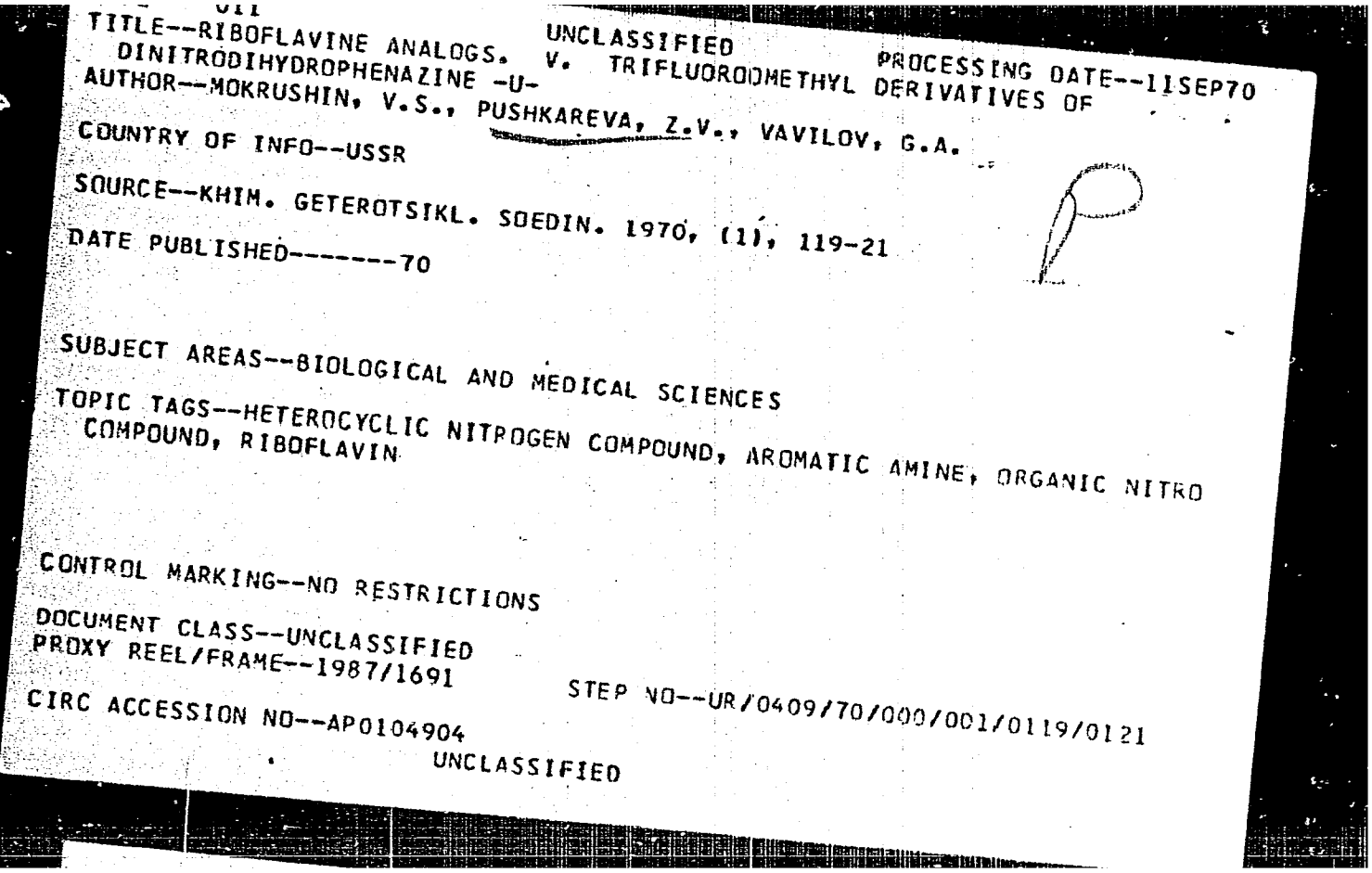

UNCLASSIFIED

TITLE--RIBOFLAVINE ANALOGS. V. TRIFLUOROMETHYL DERIVATIVES OF DINITRODIHYDROPHENAZINE -U-

PROCESSING DATE--11SEP70

AUTHOR--MOKRUSHIN, V.S., PUSHKAREVA, Z.V., VAVILOV, G.A.

COUNTRY OF INFO--USSR

SOURCE--KHIM. GETEROTSIKL. SOEDIN. 1970, (1), 119-21

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HETEROCYCLIC NITROGEN COMPOUND, AROMATIC AMINE, ORGANIC NITRO COMPOUND, RIBOFLAVIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1691

STEP NO--UR/0409/70/000/001/0119/0121

CIRC ACCESSION NO--AP0104904

UNCLASSIFIED

2/2 011 UNCLASSIFIED

CIRC ACCESSION NO--AP0104904 PROCESSING DATE--11SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SERIES OF THE TITLE COMPDS. (I) WAS PREPD. FROM THE CORRESPONDING DIPHENYLAMINES (II). THUS, A MIXT. OF 0.00175 MOLE O-NITROANILINE, 8 ML ETOH, AND 0.5 RANEY NI WAS HYDROGENATED AT ROOM TEMP. AND 1 ATM 12-15 HR, THE CATALYST FILTERED OFF, AND THE FILTRATE DILD. WITH 0.0035 MOLE ACONA IN 10 ML H SUB2 O AND SHAKEN WITH 0.0018 MOLE PICRYL CHLORIDE IN 14 ML ETOH 1 HR TO GIVE THE CORRESPONDING II. THE FOLLOWING II WERE PREPD. (R PRIME1, R PRIME2, R PRIME3, M.P. (ETOH), AND PERCENT YIELD GIVEN): CH SUB2 CH SUB2 OH, ME, CF SUB3, 174DEGREES, 69; CH SUB2 CH SUB2 OH, H, CF SUB3, 176DEGREES, 83; CH SUB2 CH SUB2 OH, CF SUB3, H, 168DEGREES, 54. II(R PRIME1 EQUALS 1,DEOXY,D,GALACTIT,1,YL "D,GALACTYL") FORMED I WHEN CRYSTD. II BOILED WITH ACONA IN ETOH 5 HR GAVE I. THE FOLLOWING I WERE PREPD. (R PRIME1, R PRIME2, R PRIME3, M.P., AND PERCENT YIELD GIVEN): CH SUB2 CH SUB2 OH, ME, CF SUB3, 270DEGREES, 67; CH SUB2 CH SUB2 OH, H, CF SUB3 273DEGREES, 68; CH SUB2 CH SUB2 OH, CF SUB3, H, 248DEGREES, 58; "D,GALACTYL," ME, CF SUB3, 235DEGREES, 74; "D,GALACTYL," H, CF SUB3, 237DEGREES, 69; "D,GALACTYL," CF SUB3, H, 228DEGREES, 52. I HAVE UV LAMBDA SUBMAX. 550-55 NM.

UNCLASSIFIED

USSR

UDC 547.785.1.07

ROZIN, YU. A., BLOKHIN, V. YE., PUSHKAREVA, Z. V., and SUKHOVA, M. YE., The Ural Polytechnical Institute imeni S. M. Kirov, Sverdlovsk

"Heterylimidazoles. I. The Synthesis of 2-Heteryl-4,5-Diarylimidazoles"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 5, 1972, pp 681-682

Abstract: It is recognized that the biimidazoles possess photochromic and thermochromic properties. However, as yet no data are available on the photo- and thermochromic properties of heterosubstituted biimidazoles. In order to make such studies possible, fifteen 2-heteryl-4,5-diarylimidazoles -- which have not been previously described -- were synthesized by condensation of benzyl or p-tolyl solutions with heterocyclic aldehydes in acetic acid in the presence of ammonium acetate. The reactions were carried out as follows: to 20 ml of boiling glacial acetic acid containing 5 g of ammonium acetate was added 30 ml of a warm solution of acetic acid containing 0.01 mole of benzyl (or p-tolyl) and 0.01 mole of the appropriate aldehyde in a dropwise manner over a period of 2 hr. The reaction mixture was boiled for an additional 3 hr., following which it was cooled and poured on 250 g of ice with an excess of NH_4OH. The resultant precipitate was removed by filtration, washed with water, dried, and recrystallized. These preparations were then subjected to IR spectroscopic analyses.

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PUSHKARSKIY, A. S.

TECHNICAL TRANSLATION

FSTC-HT-23- 1023-72

ENGLISH TITLE: THERMOELECTRIC GENERATORS

FOREIGN TITLE: TERMOELEKTRICHESKIYE GENERATORY

AUTHOR: A. S. Okhotin, A. A. Yefremov, V. S. Okhotin, and A. S. Pushkarskiy

SOURCE: Termoelektricheskiye generatory, 1971

Translated for FSTC by ACSI

NOTICE

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PUSHKARSKIY, A.S.

SEMICONDUCTOR/ELECTRONICS

METHODS OF INVESTIGATING THE THERMOELECTRIC PROPERTIES OF SEMICONDUCTORS

Translation of Chapter 5 of Russian-language book by V.N. Glazov, A.S. Okhotin, R.P. Borovikova, A.S. Pushkarskiy: Metody issledovaniya termoelektricheskikh svoystv poluprovodnikov; 1969, Atomizdat Press, Moscow, pp 2, 111-167, UDC 621.314.59.

JPRS 55580

30 March 1972

CONTENTS

1/3 018 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--THERMAL PROFILING APPLICATION OF THERMOELECTRIC GENERATORS FOR THEIR OUTPUT CHARACTERISTICS IMPROVEMENT -U-

AUTHOR-(02)-EFREMOV, A.A., PUSHKARSKY, A.S.

COUNTRY OF INFO--USSR, UNITED STATES

SOURCE--4TH ANNUAL INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE WASHINGTON, U.S.A., SL:2584

DATE PUBLISHED-------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES, ENERGY CONVERSION (NON-PROPULSIVE)

TOPIC TAGS--ELECTRIC ENGINEERING CONFERENCE, THERMOELECTRIC GENERATOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1646 STEP NO--US/0000/70/000/000/0000/0000

CIRC ACCESSION NO--AT0135265

UNCLASSIFIED

2/3 018 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0135265

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE LOSS OF OUTPUT ELECTRIC CAPACITY IS CHARACTERISTIC FOR MANY TYPES OF THERMOELECTRIC GENERATORS AS A RESULT OF IRREGULARITY FACTOR INFLUENCE OF HEAT RELEASE OF HEAT SOURCE ON THERMAL CONTACT SURFACE. ESPECIALLY, IT IS CHARACTERISTIC FOR NUCLEAR REACTOR THERMAL GENERATORS. THE AVAILABILITY OF ALMOST QUADRATIC DEPENDENCE OF THERMAL GENERATOR ELECTRIC CAPACITY ON IRREGULARITY COEFFICIENT OF HEAT SUPPLY TO THERMAL CONTACT SURFACE OF GENERATOR HOT JOINTS MAKES HARD DEMANDS TO HEAT SOURCE DESIGN. ONE OF THE POSSIBLE WAYS TO REDUCE IRREGULARITY INFLUENCE OF HEAT SUPPLY IS THERMAL PROFILING OF THERMAL GENERATORS. THE ESSENCE OF THERMAL PROFILING CONSISTS IN CREATION OF VARIOUS THERMAL RESISTANCE DEPENDING ON THERMOELEMENT ARRANGEMENT IN EITHER SECTION OF THERMOELECTRIC GENERATOR. BY MEANS OF THIS, CONSTANCY OF TEMPERATURE CONDITIONS FOR ALL THERMOELEMENTS IS ACHIEVED, AND CONSEQUENTLY, THE SAME EFFICIE CY. THE METHOD OF PROFILED THERMOELECTRIC GENERATOR CALCULATION IS CONSIDERED IN THE REPORT FOR TWO CASES: 1. PROFILING BY CHANGE OF THERMAL RESISTANCE OF THERMOELEMENTS ALONG HEAT FLOW CHANGE WITH THE HELP OF VARIOUS DEGREE OF FILLING ON THERMOELECTRIC MATERIAL. 2. PROFILING BY ARRANGEMENT, BETWEEN HEAT SOURCE AND HOT JOINTS OF THERMOELEMENTS, OF SUPPLEMENTARY THERMAL RESISTANCE, CHANGING BY VALUE ALONG HEAT FLOW CHANGE (ON CIRCUIT OF HEAT TRANSFER AGENT). THE REPORT CONTAINS FORMULAE OF PITCH BETWEEN THERMOELEMENT SECTIONS AND OTHER CONSTRUCTIVE PARAMETERS FOR THE FIRST CASH. VARIABLE RESISTANCE CHANGE LAW IS SHOWN ON LENGTH OF HEAT TRANSFER AGENT CIRCUIT FOR THE SECOND CASE.

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UNCLASSIFIED PROCESSING DATE--27NOV70

3/3 018

CIRC ACCESSION NO--AT0135265

ABSTRACT/EXTRACT--THE REPORT ALSO CONTAINS ANALYTIC COMPARISON OF OUTPUT PARAMETERS OF PROFILED AND NON PROFILED THERMOELECTRIC GENERATORS FOR VARIOUS CONDITIONS OF HEAT RELEASE. FACILITY: ALL UNION SCIENTIFIC RESEARCH INSTITUTE OF REFRIGERATING INDUSTRY, MOSCOW. FACILITY: USSR STATE COMMITTEE FOR THE UTILIZATION OF ATOMIC ENERGY, MOSCOW.

UNCLASSIFIED

1/3 023 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--POWER EFFICIENCY EVALUATION OF THERMOELECTRIC MATERIALS FOR THERMOGENERATORS OF VARIOUS -U-
AUTHOR-(03)-EFREMOV, A.A., DANILOV, YU.I., PUSHKARSKY, A.S.

COUNTRY OF INFO--USSR, UNITED STATES

SOURCE--4TH ANNUAL INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE WASHINGTON, U.S.A., SL:2584
DATE PUBLISHED-------70

SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES, ENERGY CONVERSION (NON-PROPULSIVE)
TOPIC TAGS--ELECTRIC ENGINEERING CONFERENCE, THERMOELECTRIC POWER, THERMOELECTRIC PROPERTY, THERMOELECTRIC GENERATOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1632 STEP NO--US/0000/70/000/000/0000/0000

CIRC ACCESSION NO--AT0135261

UNCLASSIFIED

2/3 023 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0135261

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXTENSIVE VARIETY OF THERMOELECTRIC FACILITIES AND SPECIFIC CHARACTER OF THEIR WORK UNDER VARIOUS CONDITIONS MAKE, FOR EACH CONCRETE CASE, CERTAIN REQUIREMENTS TO THERMOELECTRIC MATERIALS BEING USED AND CONVERTERS ON THEIR POWER CHARACTERISTICS. GENERALLY, AT THE PRESENT TIME, IN PRACTICE, VALUE OF QUALITY OR IOFFE CRITERION ARE USED FOR EVALUATION OF POWER POTENTIALITY OF THERMOELECTRIC MATERIAL APPLICATION. HOWEVER, NOW, WHEN FIELDS OF THERMOELECTRIC GENERATOR APPLICATION AND CONDITIONS OF THEIR OPERATION ARE CONSIDERABLY EXTENDED, SUCH EVALUATION BECOME EVIDENTLY INSUFFICIENT. THE PRESENT THEORETICAL WORK CONTAINS NEW CRITERIONS OF EFFICIENCY EVALUATION OF THERMOELECTRIC MATERIALS DEPENDING ON SPECIFIC CONDITIONS OF OPERATION. THESE CRITERIONS ARE PRESENTED IN ANALYTIC EQUATIONS, DEDUCED FOR SOME CONDITIONS STATED BELOW WHEN IT IS NECESSARY TO ACHIEVE. 1. MAXIMUM INTERNAL EFFICIENCY OF THERMOELECTRIC MATERIAL. 2. MAXIMUM EFFICIENCY OF CONVERSION. 3. MAXIMUM ELECTRIC CAPACITY FROM CROSS SECTION UNIT OF THERMOELECTRIC CONVERTER FOR A CASE WHEN COLD JOINTS OF THERMOELEMENTS ARE COOLED BY CONVECTIONAL WAY. 4. MAXIMUM ELECTRIC CAPACITY FROM CROSS SECTION UNIT OF THERMOELECTRIC CONVERTER, WHEN COLD JOINTS OF THERMOELEMENTS ARE COOLED ONLY BY RADIANT HEAT EXCHANGE. FOR ALL INDICATED CASES, THE EFFICIENCY OF THERMOELECTRIC MATERIALS WORK IS ESTIMATED BY DIMENSIONAL OR NON DIMENSIONAL COMPLEX WHICH INCLUDES ONLY VALUES OF QUALITY, MAXIMUM OPERATING TEMPERATURE OF THERMOELECTRIC MATERIAL AND MAXIMUM PERMISSIBLE TEMPERATURE DROP ON IT.

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3/3 023 UNCLASSIFIED

CIRC ACCESSION NO--AT0135261 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--THERE IS A TABLE IN CONCLUSION OF THE REPORT WHICH CONTAINS CALCULATED VALUES OF QUANTITY OF COMPLEXES BEING CONSIDERED FOR SOME PRESENT THERMOELECTRIC MATERIALS. FACILITY: ALL UNION SCIENTIFIC RESEARCH INSTITUTE OF REFRIGERATING INDUSTRY, MOSCOW. FACILITY: MOSCOW AVIATION INSTITUTE. FACILITY: STATE COMMITTEE ON THE UTILIZATION OF ATOMIC ENERGY OF THE USSR.

UNCLASSIFIED

USSR

UDC 615.281.8:547.963.32

ATANASOVA, Yu. G., PUSHKARSKAYA, N. L., GALEGOV, G. A., and DEBOV, S. S., Institute of Virology imeni D. I. Ivanovskiy, Academy of Sciences USSR, and Chair of Biochemistry, First Moscow Institute imeni I. M. Sechenov

"Antiviral and Interferogenic Action of Complexes of Polyadenylic and Polyuridylic Acids"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 10, 1971, pp 64-66

Abstract: Sterile solutions of polyadenylic and polyuridylic acids (1:1) at concentrations of 27 to 300 µg/ml inhibited the reproduction of vesicular stomatitis virus in a culture of chick fibroblasts. When the polymers were combined with neomycin, the extent of inhibition of virus reproduction increased from 56.8 to 90.3%. (Neomycin alone did not reduce the infectious titer of the virus). Complexes of polyadenylic and polyuridylic acids also exhibited marked interferonogenic ability in vitro, but less than that of some other inducers.

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USSR

UDC 616.831-07.:617.7-072.7

DOVEDOVA, Ye. L., BOGOLEPOV, N. N., and PUSHKIN, A. S., Brain Institute, USSR Academy of Medical Sciences USSR

"Ultrastructural and Biochemical Characteristics of the Visual Analysor After Prolonged Light Deprivation"

Moscow, Zhurnal Nevropatologii i Psikhiatrii, No 7, 1973, pp 1,070-1,077

Abstract: Keeping rats in total darkness for 7 months caused ultrastructural and biochemical changes mainly in the ergastoplasm of visual analysor neurons. It also reduced the activity of enzymes of mediator and oxidative metabolism in the mitochondria and synaptosomes. The ultrastructural changes included increased numbers of ribosomes, enhanced osmiophilia of the hyaloplasm, deep invaginations of the nuclear membranes, and enlargement of some nucleoli. Abnormal enzyme activity was most pronounced in the lateral geniculate bodies. Monoamine oxidase, acetylcholine esterase, and potassium and sodium adenosinetriphosphatase activities diminished in the mitochondria of the superior colliculus. The commonest change both in the cortex and in the lateral geniculate bodies was the increased quantity of ribosomes in the cytoplasm of the neuron body.
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AA0051852 PUSHKIN B.B. UR-0482

Soviet Inventions Illustrated, Section III Mechanical and General, Derwent, 1-70

241363 SHUT-OFF DEVICE, e.g. for high-temperature air pipes in aircraft, consists of a housing 1 with inlet 2 and outlet 3 pipes, and a shut-off valve 4 surrounded by an annular channel 5. The valve is rigidly attached by rod 6 to the piston 7 of servomotor 8. In order to provide adjustment of the shut-off operation time the bell-shaped top 9 of the valve points towards the inlet pipe, and its cylindrical section 10 encloses the body 11 of the servo-motor, which has channels 12 and 13 to let the pressure fluid in and out. The body of the servomotor and the valve form an insulated chamber 14, which is connected by channel 15 to the inlet. On the free end of rod 6 there is a regulating needle 16, with its point in the aperture of channel 15. To close the valve pressure fluid is fed along channel 12; this operates the servomotor piston and, through the rod, the valve. The time of the operation is determined by the outflow speed from chamber 14, and this can be adjusted within wide limits before installation.

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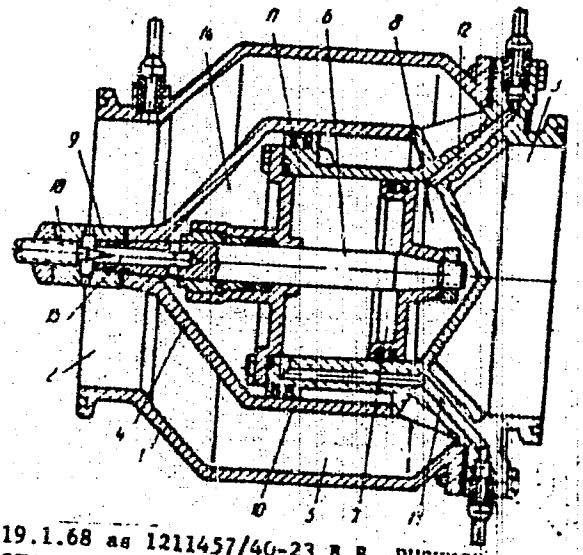

19.1.68 as 1211457/40-23 B.B. PUSHKIN & V.T. SIMANIN (16.9.69) Bul. 16/5.5.69. Class 47g, 62c, Int. Cl. F 06k, B 64d.

19820285

USSR

UDC: 621.382.2:621.317.799

MASLOV, Ye. A., PUSHKIN, F. I.

"A Device for Measuring the Static Current Gain of a Transistor"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 9, Mar 72, Author's Certificate No 331342, Division G, filed 17 Aug 70, published 7 Feb 72, p 140

Translation: This Author's Certificate introduces a device for measuring the static current gain of a transistor. The device contains a source of setting up conditions and a display. As a distinguishing feature of the patent, the measurement process is automated by connecting an operational amplifier to the source of setting up conditions through a resistor. The feedback circuit of the amplifier is connected to the output of the circuit for automatic selection of the measurement range. The range selection circuit is connected to the inputs of the digital display unit. The second inputs of this display are connected through a decoder to a reversible counter. The first input of the reversible counter is connected through an electronic switch and a null indicator to a double integration circuit. The second input of the reversible counter is connected to the output of

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MASLOV, Ye. A., PUSHKIN, E. I., USSR Author's Certificate No 331342

a one-subtraction circuit. The first output of the reversible counter is connected through a measurement mode selection circuit to the operational amplifier, and the second output of the reversible counter is connected to the input of the one-subtraction circuit.

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1/2 012 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--PNEUMATIC HYDRAULIC CONVERTER -U-

AUTHOR-(02)-SHEPOVALOV, V.D., PUSHKIN, V.A.

COUNTRY OF INFO--USSR

SOURCE--USSR AUTHOR'S CERTIFICATE NO 258735

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI NO 1 JAN 70

DATE PUBLISHED----JAN70

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

TOPIC TAGS--PNEUMATIC DEVICE, HYDRAULIC EQUIPMENT, AUTHOR CERTIFICATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/0342 STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0131037

UNCLASSIFIED

2/2 012 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AA0131037

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A PNEUMATIC HYDRAULIC CONVERTER WHICH CONSISTS OF A DISTRIBUTING AND OVERFLOW CHAMBER IS PRESENTED. ITS PECULIAR FEATURE IS THE FACT THAT FOR THE PURPOSE OF INCREASING RELIABILITY AND SIMPLIFYING DESIGN, A CYLINDER BARREL WITH COAXIAL INTERTHROTTLE CHAMBER IS INSERTED INTO IT WHICH IS JOINED WITH THE DISTRIBUTING AND OVERFLOW CHAMBERS BY THROTTLES OF UNIFORM CROSS SECTION OF SMALL AND LARGE DIAMETER RESPECTIVELY, WHICH ARE ARRANGED COAXIALLY ALONG THE AXIS OF THE BARREL. FOR AIR FEED, THE CYLINDER BARREL CONTAINS AN ANNULAR SLIT WITH CHANNELS WHICH ARE TANGENT TO THE INTERTHROTTLE CHAMBER.

UNCLASSIFIED

USSR

UDC 510

PUSHKIN, V. G.

"The Problem of Reliability. A Philosophical Essay"

Problema nadezhnosti. Filosofskiy ocherk (cf. English above), Moscow, "Nauka," 1971, 192 pp, ill., 66 k. (from RZh-Matematika, No 2, Feb 72, Abstract No 2A12K)

Translation: The nature of the reliability of various kinds of systems is considered on a theoretical plane, and a number of questions of philosophical and methodological significance are discussed.

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PUSHKIN, V.N.

JPRS 60103

24 September 1973

IDEATION AND AUTOMATA

Complete translation of the Russian-language book by D. A. Pospelov and V. N. Pushkin, Myshlenive i Avtomaty, 1972, signed to press 17 February 1972, Izdatel'stvo Sovetskoye Radio, Moscow, 224 pages.

CONTENTS

CONTENTS (continued)

PUSHKIN, V.A.

FOREWORD

The distinctive feature of the present stage of development of science and technology is that the efforts of representatives of different branches of science are united to solve problems on the borderline of scientific areas that very recently were considered remote from one another. This applies, first of all, to cybernetic problems, which require the joint work of representatives of mathematics, engineering, and psychology to be solved.

The purpose of this book is to summarize some of the experience of the joint work of a psychologist and mathematician on research dealing with the patterns of human ideation and development of methods of modeling it. Summarizing the results of many years of experimental and theoretic work, the authors realize that the problem of the correlation between ideation and automata is one of the most complex problems of our times, and it cannot be dealt with completely within the framework of a single book. At this stage of research, it is more purposeful to show a wide circle of readers that human ideation, with all its complexity, can be submitted to precise natural scientific analysis, but the intellectual process merits development of new mathematical means of adequate description of objectively established patterns of this process.

Aside from formulation of the theoretical problem, the book also makes an attempt to show that cybernetic implementation of the results of psychological research may yield a certain practical effect. The authors are very grateful to Yu.I. Klykov, who kindly agreed to write a chapter on the practical use of a method, developed with his participation, that stimulates the patterns of human ideation demonstrated experimentally.

ANNOTATION

UDC: 519.95/155.5

This book analyzes the process of solving problem arising when controlling large systems. The results of experimental research on intuition, constructed using new objective methods, are submitted, and they allow us to comprehend the nature of the basic weaknesses in automata theory in modeling human ideation. A psychological concept is formulated that permits the planning of development of new methods of programming in cybernetics, and means of developing devices capable of controlling large systems. One of these methods is described: model control of dynamic situation systems. The practical effectiveness was shown with respect to adoption of this cybernetic method, based on psychological investigation of this activity of man.

The book is intended for specialists dealing with systems analysis, psychology, cybernetics, and applied problems of control theory.

There are 20 tables and 59 figures; the bibliography lists 71 items.

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USSR

PUSHKIN, V. N., Professor, Doctor of Psychological Sciences, Interviewed by V. Anisimov, Correspondent of Sotsialisticheskaya Industriya

"Autogravitation"

Moscow, Sotsialisticheskaya Industriya, 9 Sep 73, p 4

Translation: The room is almost empty: only a table in the middle, and on it a tennis ball, a box of matches, and pencils. A man enters the room and approaches the table. He stretches his hand over the objects. And stands still. But from the expression of his face, and from the tenseness of his posture one can see that he does not simply stand -- he "is working." A minute passes, one more. And all of a sudden the ball on the table began to move, then the matchbox and pencils moved off their places. The man had shifted them without touching them with his hand.

This man is Boris Vladimirovich Yermolayev, a resident of Moscow. He demonstrates his wondrous capacities in the laboratory of Professor V. N. Pushkin, Doctor of Psychological Sciences. An outstanding specialist in the field of psychology, the Moscow scientist performs experiments of exceptional interest and significance. Among them of special interest are tests connected with the phenomenon of telekinesis. What is the mechanism of this

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PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

phenomenon, and what are its mysteries? These questions asked by our Correspondent are answered by Professor V. N. Pushkin.

"Speaking of the nature of telekinesis it is necessary to note that one of the first attempts at explaining the capacity of man to displace objects was attributed to static electricity. Among other things it was supposed that the object near which the man's hand is situated is acted upon by electric charges which make it shift.

I myself had shared this point of view, and I had even found what seemed to be a quite scientific name for this phenomenon, viz, a controlled bioelectric field in the structure of the objective action of man. Under this title the telekinesis had been discussed at the 20th International Congress of Psychologists in Tokyo in August 1972.

The further observations and reflections, however, had led to not very comforting conclusions concerning the role of the static electricity in telekinesis. Those manifestations of the interaction between man and objects, which I could observe, cannot be explained by static charges arising at the surface of the objects.

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PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

In this connection I turned my attention to a hypothesis of the scientist A. P. Dubrov. It is based on the assumption that living systems are capable of generating and perceiving gravity waves. This phenomenon was given the name of a biogravitation.

Hence there arose an alluring idea to consider telekinesis as some form of gravitational interaction. Certainly, we have to face here very considerable difficulties: we have to recognize a highly unusual situation, i.e. that man is capable of generating a gravitational field and with its aid influencing certain surrounding objects. I happened to observe a very strong manifestation of telekinetic capacity of the Moscow resident, Boris Vladimirovich Yermolayev.

The singularity of experiments makes us to examine them in some detail.

The experiments with Yermolayev always began with a "warming-up," that is, he executed things which for ordinary telekinetics is the height of the intensity of their psychic form: he shifted objects. Then, while holding his hand over overturned cards, he determined their suit and numerical value. Whereafter there began the most important part of the experiment. Yermolayev took into his hands some object or other, squeezed it between his palms, and... gradually moved apart his hands. The object hung poised in mid air. And

USSR

PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

the distance between it and palms reached up to twenty centimeters. It is interesting to note one more essential point. The larger was the area of the object, the longer it hung in mid air.

If we try to explain these facts from the viewpoint of the classical physics, we encounter a number of difficulties. In the first place it becomes obvious that in this case the Newton's law of universal gravitation cannot be applied in its direct form.

Therefore, to explain telekinesis and to analyze it physically, we have only one theory of modern physics, viz, the general theory of relativity.

But before considering the question of the possibility of applying the principles of this theory to the organism of man and to the analysis of his psychic activity it is necessary to demonstrate that dynamics of elementary particles entering into the organism is actually involved. An experimental investigation was carried out with the aid of a photographic method using high-frequency currents, developed by Soviet inventors V. and S. Kirlian.

The experiment consisted in placing a finger of the person being tested in a high-frequency electric field for a period of 0.0001 second.

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USSR

PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

After that the surface of the skin began to shine and the luminescence could be fixed on a photographic film. As a rule, it had the form of a crown, composed of a certain number of coronal rays. The photography was performed before and during a pronounced mental activity: the examinees had to execute mental multiplication. As a result, it was found that during increased mental activity the luminescence of the corona discharge is less intensive.

This change in the quantity of discharge rays arising on the surface of the skin means that at the moment of the transition from a quiet state to that of an elevated mental activity there arise in the human organism forces which act on the surface of the skin, bind particles located on its surface, and fix their position.

The role of elementary particles and their dynamics in the information processes of the brain could be already assumed before. But the juxtaposition of the facts of the interaction of man with objects -- telekinesis -- permits us to apply the relativity theory to analysis of the information work of the human brain, and to hypothesize that in the experiments with Yermolayev the gravitational field was acting on the objects, which being dielectric the effect of their hanging in mid-air did not depend on their mass.

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USSR

PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

Of course, the gravitation that could be observed in the experiments with Yermolayev differs from the gravitation in the universe, with which we usually deal. There are several such distinctions, and the principal among them is that the gravitation generated by man has no permanent existence but arises in a definite situation. Having arisen, it fluctuates, alternately increasing and decreasing. As regards its precise scientific definition, the most appropriate one would be that of autogravitation. In this case, autogravitation, being a result of the integral system structure of the organism, is a variety of a wider notion -- biogravitation.

What then is the function that gravitation may fulfill in the organisms of man, if we were to consider it not as a property of a certain piece of matter interacting with its other pieces, but from a biological and psychological viewpoint?

The analysis permits us to distinguish at least two such functions. The first one is connected with the necessity of preserving the physical integrity of the organism. The second permits us to hypothesize that gravitation materially ensures the mental activity of man.

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USSR

PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

As a matter of fact man lives among objects with various degrees of organization. And in order to perceive these objects and to build in his head their models he has to distort the space in accordance with the curvature of the objects being perceived. Thus the autogravitation of man comes into being. Such a connection between psychology and physics is apprently confirmed by these experiments. According to general relativity theory, gravitation arises in systems whose space is being curved.

The traditions of science place under certain taboo those fields which are connected with the disturbance of the fundamental laws of nature. No self-respecting scientists will engage in problems of the construction of a perpetual-motion machine or in developing a theory presupposing noncompliance with the law of conservation of matter. The capacity of man to exert influence upon nearby objects (capacity for telekinesis) is still being considered by some researchers as something within the domain of disturbing the fundamental laws of nature.

One of the results of the analysis carried out is precisely the conclusion that the facts of telekinesis, although so unusual and amazing, are not at variance with the existing physical picture of the world.

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USSR

PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

As regards the scientific prospects of further work on the study of telekinesis, we must in the first place emphasize difficulties that confront us because of the unusualness of this phenomenon.

The principal complication consists in the fact that a person who is in possession of such capacities is not always capable of controlling them. Take for example the case involving so-called skin vision. At one time there was much talk about Roza Kuleshova, who was able to distinguish with her skin colors and even objects. Several commissions, on the basis of experiments carried out with the aid of a high-accuracy spectral apparatus, had acknowledged that the fact of a peculiar "skin vision" actually exists. Later on, it was found that this property had weakened in Kuleshova. And when the next commission began to verify the phenomenon the examinee was unable to demonstrate what she knew. But this effect really exists, and is attested by five volumes of investigations carried out by Ural psychologists on a great number of examinees.

There are also known works of the outstanding Soviet psychologist, Active Member of the Academy of Pedagogical Sciences USSR, A. N. Leont'yev, who succeeded in developing a conditioned reflex to light effect on the

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USSR

PUSHKIN, V. N., Sotsialisticheskaya Industriya, 9 Sep 73, p 4

skin of a man's finger. The examinee did not know at what moment his finger would be illuminated by a flash of light and then would be shocked with current. The experiments showed that the persons participating in them had learned to jerk back their hands following a flash of light.

Therefore telekinesis, as one of the facts of this type, at the given stage of its study requires serious theoretical and experimental elaboration.

We should not be afraid of new facts and complicated problems. In our age of high-speed aircraft and atomic reactors there are still many unknown things. And science must unveil the mysteries of the world.

9/9

USSR

UDC 621.396.67:624.074

LAPTEV, Yu. P., PUSHKIN, V. N., TIMOKHOV, B. V., SHEVLEROV, A. B.

"A Device for Orienting an Antenna With Respect to Azimuth and Polarization"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 5, Feb 72, Author's Certificate No 327545, Division H, filed 11 Sep 70, published 26 Jan 72, p 156

Translation: This Author's Certificate introduces a device for orienting an antenna with respect to azimuth and polarization. The device contains a mechanism for azimuthal rotation fastened on a fixed base, a mechanism for rotation of polarization, and a high-frequency rotating coupler securely fastened to the frame which carries the antenna. As a distinguishing feature of the patent, the overall dimensions are reduced and remote control of antenna orientation is simplified by coupling the output shaft of the polarization rotating mechanism through a differential to the speed reducer of the azimuthal rotation mechanism and through a clutch to the tilting sector regulator. The output shaft of the polarization rotator is coaxial with the movable part of the rotating coupler. The tilting sector regulator is made in the form of a lever-and-linkage mechanism kinematically connected to the azimuthal rotator.

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USSR

UDC 621.314.57(088.8)

PUSHKIN, V.YA. [Vses. n.-i. in-t tokov vysokoy chastoty im. V.P. Vologdina--All-Union Scientific-Research Institute Of High-Frequency Currents imeni V.P. Vologdin]

"Device For Control Of Autonomous Inverter"

USSR Author's Certificate No 259254, filed 16 Sept 66, published 24 Apr 70 (from RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 1B454P)

Translation: A device is proposed for control of an autonomous inverter, which contains a starter unit, a source of negative bias, a feedback unit, provided with an "or" element, and a master oscillator, one end of the secondary winding of the output transformer of which is connected to the control electrode of one of the rectifiers [вентиль] of the inverter. With the object of simplification and an increase of reliability, the other end of the secondary winding of the output transformer of the master oscillator is shunted across an additional source of bias to a quick-break switch connected to the control electrode of the other rectifier of the inverter. The midpoint of the winding, shunted across the main source of bias by the starter unit, is connected to the cathodes of the rectifier, while the input of the "or" element is included in the control circuit of the quick-break switch. 2 ill. Summary.

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1/2 014 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--ELECTROCHEMICAL FLUORINATION OF DIMETHYLANILINE, DIMETHYLCYCLOHEXYLAMINE, AND N,N,DIMETHYLPENTAFLUOROANILINE -U-

AUTHOR-(05)-PLASHKIN, V.S., PUSHKINA, L.N., MERTSALOV, S.L., KOLLEGOV, V.F., SOKOLOV, S.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. ORG. KHIM. 1970, 6(5), 1006-11

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--FLUORINATION, ANILINE, AROMATIC AMINE, NUCLEAR MAGNETIC RESONANCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1345 STEP NO--UR/0366/70/006/005/1006/1011

CIRC ACCESSION NO--AP0135019

UNCLASSIFIED

2/2 014 UNCLASSIFIED

CIRC ACCESSION NO--AP0135019 PROCESSING DATE--13NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTROCHEM. FLUORINATION OF THE TITLE COMPOS. AT MINUS 20DEGREES GAVE IN ALL CASES CF SUB3 (CF SUB2) SUB5 N(CF SUB3) SUB2 AND N,N,DIMETHYLPERFLUOROCYCLOHEXYLAMINE. THE YIELDS AND RELATIVE AMTS. OF THESE COMPOS. VARY WITH THE STARTING MATERIAL AND THE REACTION TIME. NMR SPECTRA OF THE PRODUCTS ARE DISCUSSED. FACILITY: URAL. POLITEKH. INST. IM. KIROVA, SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

UDC: 534.22.0942

PUSHKINA, N. I., and Corresponding Member USSR Academy of Sciences KHOKHLOV, R. V.

"Forced Combination of Sonic Dispersion in Piezoelectrics"

Moscow, Doklady Akademii Nauk SSSR, vol 203, No 2, 1972, pp 318-319

Abstract: The possibility of experimentally investigating the forced dispersion of sound in electric field oscillations in piezoelectrics is theoretically investigated. This type of dispersion is of the class of so-called acoustic combined phenomena, nonlinear interactions of acoustical and other types of wave. Examples of such interactions are sound dispersion in temperature waves, in ferromagnetics, and in eddy waves. The type of dispersion considered in this paper is connected with the term $f_{ijklm}E_iS_{jk}S_{lm}$ in the following expansion of free piezoelectric energy:

$$F = C_{ijkl}S_{ij}S_{kl} + C_{ijklmn}S_{ij}S_{kl}S_{mn} + \varepsilon_{ij}E_iE_j + \varepsilon_{ijk}E_iE_jE_k +$$

$$e_{ijk}E_iS_{jk} + d_{ijkl}E_iE_jS_{kl} + f_{ijklm}E_iS_{ij}S_{lm} + \ldots$$

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UDC: 534.22.0942

PUSHKINA, N. I. et al, Doklady Akademii Nauk SSSR, vol 203, 1972, pp 318-319

Here, S_{ij} are deformation tensors, the E_i are electric field components, the f_{ijklm} are material constants connected with the electroacoustical effect -- the change in the speed of sound as a function of the applied electric field.

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USSR

UDC 534.23:538.113

PUSHKINA, N. I., and KHOKHLOV, R. V., Physics Faculty, Moscow State University

"Scattering of Hypersound by Spin Waves in Ferromagnets"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 5, May 71, pp 977-981

Abstract: The article deals with a theoretical consideration of sound scattering by coherent spin waves in ferromagnets. The scattering is mainly due to the phenomenon of magnetostriction and the so-called internal effect. The case of a cubic ferromagnet (which is of practical interest) is considered. An expression is obtained for a scattered sound field in a wave zone in the form of the vector sum of longitudinal and transverse waves.

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1/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--DISPERSION OF SOUND ON SPIN WAVES -U-

AUTHOR-(02)-PUSHKINA, N.I., KHOKHLOV, R.V.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 1078-9

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SOUND, SPIN WAVE, MAGNETOSTRICTION, GARNET

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0713 STEP NO--UR/0020/70/190/005/1078/1079

CIRC ACCESSION NO--AT0121372

UNCLASSIFIED

2/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AT0121372

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MATH. THE COMBINED DISPERSION OF SOUND ON SPIN WAVES WAS STUDIED, THE MAGNETOSTRICTION AND INTERNAL EFFECTS BEING TAKEN INTO ACCOUNT FOR THE CASE OF A CUBIC FERROMAGNET AND AN EXPRESSION WAS GIVEN FOR THE RATIO, GAMMA, OF THE SOUND OUTPUT, DISPERSED IN THE SOLID ANGLE D THETA FOR THE FREQUENCY RANGE D OMEGA TO THE INTENSITY OF THE INCIDENT SOUND. THE CONTRIBUTION OF THE INTERNAL EFFECT TO GAMMA WAS EVALUATED FOR A Y FERRITE GARNET. THE INTENSITY OF THE DISPERSED SOUND IS DETD. BY THE INTERNAL EFFECT CONSTS.

FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

1/2 027 UNCLASSIFIED

TITLE--ON STIMULATED RAMAN SCATTERING OF SOUND IN FERROMAGNETIC SUBSTANCES -U-

PROCESSING DATE--23OCT70

AUTHOR-(02)-PUSHKINA, N.L., KHOKHLOV, R.V.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58, NR 4, PP 1475-1477

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ACOUSTIC SCATTERING, FERROMAGNETIC MATERIAL, RAMAN SCATTERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1500

STEP NO--UR/0056/70/058/004/1475/1477

CIRC ACCESSION NO--AP0106256

UNCLASSIFIED

2/2 027 UNCLASSIFIED

CIRC ACCESSION NO--AP0106256 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STIMULATED COMBINATIONAL SCATTERING OF SOUND IN FERROMAGNETIC SUBSTANCES IS CONSIDERED. AN EXPRESSION IS OBTAINED FOR THE STIMULATED SCATTERING THRESHOLD AND THE POSSIBILITY OF OBSERVING THE SCATTERING IS DISCUSSED. FACILITY: MOSKOVSKIY GOSUDARSTVENNYY UNIVERSITET IM. M. V. LOMONOSOVA.

UNCLASSIFIED

USSR

UDC 681.325.65

ALEKHIN, V. N., PUSHKINA, N. M.

"Digital Computer Measurement of the Parameters of Voltage-to-Code Converters"

Taganrog, Region. nauch.-tekhn. seminar po stat. analizu, modelir. i avtomatiz. kontrolya ob"yektov s konstrukt. slozhn. strukturoy--sbornik (Regional Scientific and Technical Seminar on Statistical Analysis, Modeling and Automated Monitoring of Objects with a Structurally Complex Design--collection of works), vyp. 6, 1972, pp 72-81 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 72, abstract No 11B309)

Translation: The paper deals with questions of automatic measurement of systematic and random errors in voltage-to-code converters in the static mode when the conversion time is negligibly small in comparison with the intervals of input signal variation. It is assumed that the sources of systematic error are impairments of functional units, regular deviations of the structural elements from rated values, or the effect of regular interference, while the regular instrument noises of the units in the converters usually act as the source of random interference. The control parameters are the average value and mean square deviation of the output code. In case of neces-

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USSR

ALEKHIN, V. N., PUSHKINA, N. M., Region. nauch.-tekhn. seminar po stat. analizu, modelir. i avtomatiz. kontrolya ob"yektov s konstrukt. slozhn. strukturoy--sbornik, vyp. 6, 1972, pp 72-81

sity the monitoring procedure gives histograms of the output code distribution. Four illustrations, bibliography of two titles. L. P.

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PUSHKINA, N. N.

JPRS 55300
1 May 72

SURVEY OF CURRENT METHODOLOGICAL APPROACHES IN HYGIENIC RESEARCH

UDC: 613/.614-07:001.8

[Article by A.I. Bokina, N.N. Pushkina, K.P. Ostanteva, M.I. Dmitriyev; Moscow, Vestnik Akademii Meditsinskikh Nauk SSSR, Russian, No 1, 1972, pp 65-70]

In accordance with the main direction of our institute, investigation of the effect on the human body and on public health of diverse environmental factors, the chief direction of research in specialized laboratories is to determine the patterns of interaction between the organism and environment using physiological, biochemical, morphological, radiological, and physico-chemical investigative methods.

In the last few years, in connection with expanded studies of the effect of diverse environmental factors on the functional state of the organism and on public health, special attention has been given to development and adoption of new methodological approaches in conducting mass examinations. In this respect, a special place is occupied by methods of functional diagnosis of early functional changes in different systems and in the body as a whole. The main objective of mass examinations is not so much to detect overtly pathological consequences as to determine the degree of tension of regulatory mechanisms that prevent impairment of the normal state of the internal medium of the organism. Thus, for clinical and physiological surveys of the population such functional tests are used as the adrenal test, purine load test, diagnostic acid test, Volhard's and McClure-Aldrich tests, cold test, and a number of others.

Particularly fruitful are studies of interaction of different systems in the integral organism, permitting reliable substantiation of environmental conditions most compatible with a physiological state of the body.

Thus, in a mass study of the population for the purpose of investigating the effect of desalinated drinking water on the functional state of the organism, water-salt metabolism, cardiovascular condition, renal activity, gastrointestinal tract function, and complex reflex drinking reactions were examined.

Only the indices that have actual significance for the organism can be characterized as having a criterion of harmful effect. For example, decreased

USSR

UDC 620.197.8

BELYAKOV, V. YE., PUSHKINA, S. V., and ROMANOV, V. V., Institute of Metallurgy imeni A. A. Baykov, Academy of Sciences USSR, Moscow

"Effect of the pH of the Medium on the Lasting Durability of the MA2-1 Alloy"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 6, No 5, 1970, pp 7-10

Abstract: A study was made to determine quantitatively the specific weight of the factors destructive of and tending to shorten the lasting durability of the MA2-1 magnesium alloy. There are two such factors: corrosion splitting and purely corrosive destruction. These factors are active when the metal is in electrolyte solutions, especially chloride solutions, and their activity is a function of the pH of the solutions. The MA2-1 alloy has the following chemical composition: 4.45% Al; 1.12% Zn; 0.56% Mn; 0.006% Fe; 0.07% Si; 0.0011% Ni; 0.002% Be; and the OST standard Mg. It was prepared for the experiments in the form of partially finished sheets 1.5 mm thick. Results of the experiments are given in the form of curves showing the variations of differ-

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USSR

BELYAKOV, V. YE., et al., Fiziko-Khimicheskaya Mekhanika Materialov, Vol 6, No 5, 1970, pp 7-10

ent parameters of the alloy as functions of the pH. It is found that solutions 0.1 normal for chloride ion cause a marked loss in lasting durability of the alloy; this was determined to be 33 hours. The pH for such solutions has a strong effect on the mechanism and extent of the loss, chiefly through the mechanism of purely corrosive destriction.

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1/2 022 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--EFFECT OF PH ON THE CORROSION FATIGUE OF THE MAGNESIUM ALLOY MA,2,1 -U-

AUTHOR-(04)-BELYAKOV, V.E., PUSHKINA, S.V., PROKIN, A.K., ROMANOV, V.V.

COUNTRY OF INFO--USSR

SOURCE--FIZ.-KHIM. MEKHAN. MAT., 1970, 6, (1), 38-41

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CORROSION FATIGUE, SOLUTION ACIDITY, METAL REMOVAL, MAGNESIUM ALLOY/(U)MA2I MAGNESIUM ALLOY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1799

STEP NO--UR/0369/70/006/001/0038/0041

CIRC ACCESSION NO--AP0129167

UNCLASSIFIED

272 022

UNCLASSIFIED

CIRC ACCESSION NO--AP0129167

PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF THE PH OF THE CORROSIVE MEDIUM ON THE CORROSION FATIGUE OF MG ALLOY MA-2-1 IN SOLUTIONS HAVING A STRENGTH OF SIMILAR TO 0.1 N WITH RESPECT TO CL PRIME NEGATIVE IONS WAS STUDIED. THE OVER ALL LOSS OF FATIGUE STRENGTH IN THESE MEDIA WAS DIVIDED INTO TWO COMPONENTS: LOSS OF STRENGTH DUE TO CORROSION FATIGUE PROPER, AND LOSS OF STRENGTH ARISING FROM THE REDUCTION IN THE CROSS SECTION OF THE CORRODED SAMPLE. FOR PH VALUES BETWEEN 1.3 AND 4.0 THE LOSSES AROSE MAINLY FROM THE SECOND FACTOR; FOR PH VALUES BETWEEN 4 AND 14 THEY AROSE MAINLY FROM THE FIRST FACTOR.

UNCLASSIFIED

USSR

Magnesium

UDC: 620.197.8

BELYAKOV, V. YE., PUSHKINA, S. V., PROKIN, A. K., and ROMANOV, V. V., Institute of Metallurgy imeni A. A. Baykov, Academy of Sciences USSR

"pH Effect on the Corrosion Fatigue of MA-2-1 Magnesium Alloy"

Kiev, Fiziko-Khimicheskaya Mekhanika Materialov, Vol 6, No 1, Jan-Feb 70, pp 38-41.

Abstract: A determination was made of the effect of pH on the loss of cyclic strength in the MA-2-1 alloy in working media containing chlorine ions (0.1 N). The composition of the alloy is: 4.45% Al; 1.12% Zn; 0.56% Mn;0.006% Fe; 0.07% Si; 0.0011% Ni; 0.002% Be; the balance Mg. For the study, the alloy was in the form of 1.5-mm sheet. In 0.1 N chloride solutions, the MA-2-1 alloy appears to have low corrosion fatigue strength. In solutions with pH=4 to 14 the alloy's failure is attributed to corrosion fatigue; within this range pH does not control the extent of loss in cyclic strength. At pH=4 to 1.3, the loss in cyclic strength occurs basically due to the reduction in the cross section of the specimen.

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PUSHKINA, V.G.

Medical Sciences

UDC: 612.821-053.7"5":378.9...

ANALYSIS OF EFFICIENCY OF FIRST-YEAR STUDENTS IN DIFFERENT PERIODS OF THE SCHOOL YEAR

[Article by V.G. Pushkina, Candidate of Medical Sciences, Scientific Research Laboratory of Higher Medical Education (headed by A.T. Ivanova, Candidate of Medical Sciences), Second Moscow Medical Institute; Moscow, Sovetskoye Zdravookhraneniye, Russian, No 9, 1972, submitted 28 February 1972, pp 57-64]

Perception and assimilation of educational material depend on the student's mental activity in the learning process. No matter how good the method of offering educational material, the student who is not prepared to perceive the subject will assimilate it poorly. "Readiness" for perception of material consists of the level of prior knowledge, leaning for the chosen specialty, physical and mental condition of the student.

Mental activity is usually associated with nervous stress which is purposeful in the learning process, since it mobilizes the forces of the organism, elevating general biological tonus, sharpening memory, attention, and perception. By following the five principal prerequisites for mental work of N.Ye. Vvedenskiy, i.e. gradual initiation of any work, preservation of measure and rhythm, continuity and systematic activity, alternating it with rest, and experiencing a good attitude on the part of society for the work being done, great productivity can be achieved.

However, the student's desire to obtain as much information as possible or the teacher's desire to offer as much material as possible can lead to overfatigue which has an adverse effect on mental fitness. As a result of excessive stress mental fatigue may occur which is characterized by decrease in productivity of work, diminished attention, difficulty of concentrating, and slower thinking. Constant mental fatigue with a study overload has an adverse effect on the students' health, leading to astheni-zation of the organism and lowering its resistance. Overfatigue is associated with such symptoms as headaches, episodes of palpitations, poor attention, loss of memory, impaired sleep, and could ultimately lead to changes in cerebral circulation and neuropsychic disorders (C. Tisso; N. Semenov et al.; Yu. M. Pratusevich; Origlia; Schneider; Svehlik et al.).

JPRS 57351
27 Oct 72

1/2 020 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--EXCRETION OF 17 KETOSTEROIDS AND 17 OXICORTICOSTEROIDS IN PATIENTS WITH FOOD TOXINFECTIONS, SALMONELLOSIS -U-

AUTHOR--PUSHKINA, V.M.

COUNTRY OF INFO--USSR

SOURCE--TERAPEVTICHESKIY ARKHIV, 1970, VOL 42, NR 6, PP 104-106

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--SALMONELLA INFECTION, FOOD CONTAMINATION, CORTICOSTEROID, EXCRETION, URINE, ADRENAL GLAND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1598 STEP NO--UR/0504/70/042/006/0104/0106

CIRC ACCESSION NO--AP0128988

UNCLASSIFIED

2/2 020 UNCLASSIFIED

CIRC ACCESSION NO--AP0128988 PROCESSING DATE--27NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHOR EXAMINED 55 PATIENTS WITH A NONCOMPLICATED COURSE OF FOOD TOXINFECTIONS WITHOUT MARKED CONCOMITANT DISEASES (31 WOMEN AND 24 MEN). IN THE MAJORITY OF PATIENTS DURING THE FIRST TWO DAYS OF THE DISEASE THE LATTER WAS CHARACTERIZED BY A DROP IN THE EXCRETION OF 17-KETOSTEROIDS IN ALL FORMS OF THE DISEASE. THE GREATEST DROP WAS DETECTED IN SEVERE FORMS OF THE DISEASE. HOWEVER IN SOME OF THE PATIENTS IN THE MENTIONED FORM OF THE DISEASE EXCRETION OF 17-KETOSTEROIDS APPEARED TO BE INCREASED. REGULARITY OF CHANGES IN THE INDICES OF TOTAL 17-OXICORTICOSTEROIDS WAS SIMILAR IN THE URINE. THEIR MOST EXPRESSED DECREASE WAS FOUND IN THE SEVERE FORM. ON THE BASIS OF THE DATA OBTAINED ONE MAY ASSUME THAT IN MOST PATIENTS WITH FOOD TOXICOINFECTION OF SALMONELLASE ETIOLOGY THE FUNCTION OF THE CORTICAL LAYER OF THE ADRENALS WAS DECREASED. FACILITY: KAFEDRA INFEKTSIONNYKH BOLEZNEY I MOSKOVSKOGO MEDITSINSKOGO INSTITUTA IM I. M. SECHENOVA.

UNCLASSIFIED

Acc. Nr.: AP0042378

Ref. Code: UR0203
JPRS 50162

Work Aboard the Nonmagnetic Schooner "Zarya"

(Abstract: "Some Results of Work with the Electromagnetic Current Meter on the Nonmagnetic Schooner 'Zarya' in the Indian Ocean," by A. N. Pushkov and G. A. Fonarev, Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation; Moscow, Geomagnetizm i Aeronomiya, Vol X, No 1, 1970, pp 177-180)

A study was made of the effect of diurnal variations of telluric currents on the operation of the electromagnetic current meter in the Indian Ocean during the voyage of the schooner "Zarya" during 1966-1967. The article is accompanied by a map of the stations occupied. The schooner averaged 6 knots. The vessel carried a GM-15 electromagnetic current meter. The measurement base was 50 m. The recording potentiometer had a response of 0.1 mV/graduation. The graduation of the current meter varied in a wide range from ∞ at the magnetic equator to 4 cm/sec with Z = 0.5 oe. Elements of the geomagnetic field were registered continuously. The H-component was registered with a sensitivity of 10 γ, D -- 0.2° and Z -- 10 γ. The diurnal variation of D has the form of a simple wave with a maximum in the morning hours and a minimum in the evening hours in the northern hemisphere. In the southern hemisphere the diurnal variation of D has a minimum in the

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AP0042378

morning hours and a maximum in the evening hours. The diurnal variation of the H component is a simple wave with a maximum in the midday hours in the zone ~30°N-30°S. To the south and north there is a minimum in the diurnal variation of H during the midday hours. The diurnal variation of the northerly component H_K is close to the diurnal variation of H whereas the diurnal variation of the easterly component Hy is similar to the variation of magnetic declination D. Quiet solar-diurnal variations attain maximum values in the H component (and also in H_X) in the low latitudes -- several hundred gammas, an order of magnitude greater than the amplitudes of these variations in the middle latitudes. There is a good correlation between electric and magnetic variations in the ocean. The results indicated that the electromagnetic current meter is subject to the influence of diurnal variations of electric currents in the ocean. Due to diurnal variations the errors in current velocities can attain tens to hundreds of cm/sec. It is desirable that the EMIT be used in measuring electric fields. In this way the electromagnetic current meter can be useful in magnetotelluric reconnaissance in the oceans. It can evidently also be used in a marine magnetic survey for separating spatial and temporal variations.

19760338

USSR

UDC 551.463:352.13/.14:537.311

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

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

Leningrad, Zhurnal Prikoladnoy Khimii, Vol 46, No 8, Aug 73, pp 1865-1868

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

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END

USSR

UDC 621.371:551.510.535

ZEVAKINA, R. A., KISELEVA, M. V., PUSHKOVA, G. N., CHERNOVA, V. A.

"Effect of Ionospheric and Magnetic Disturbances on Shortwave Radio Communications"

V sb. Ionosfer. vozmushcheniya i ikh vliyaniye na radiosvyaz' (Ionospheric Disturbances and Their Effect on Radio Communications -- collection of works), Moscow. Nauka Press, 1971, pp 182-192 (from RZh-Radiotekhnika, No 1, 1972, Abstract No 1A335)

Translation: A study was made of the variation of the signal intensity as a function of disturbances of the F2 region and magnetic activity according to the data from recording the Moscow transmitter in Murmansk, Magadan and Irkutsk. The transmitter operated round the clock on directional antennas on 10 fixed frequencies from 1.5 to 24 megahertz. It was demonstrated that under quiet and disturbed conditions, the highest signal intensities are observed on frequencies 10-30 percent below the maximum usable frequency. During the disturbances, the signal intensity at all stations drops most significantly when the ionospheric and magnetic disturbances are observed simultaneously. In the case of a significant drop of f_0F2 accompanied by high magnetic activity, communications are interrupted. There are 4 illustrations and 1 table.
1/1

172 013 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--INCREASE IN THE ADHESIVE PROPERTIES OF BRAND V BLACK POROUS SOLE RUBBERS -U-

AUTHOR-(05)-GUDIMENKO, V.I., PUSHKOVA, V.V., SANDLER, G.A., KUZNETSOVA, V.A., MARKICHEVA, N.V.

COUNTRY OF INFO--USSR

SOURCE--KOZH.-OBUV. PROM. 1970, 12(5), 47-51

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS, MILITARY SCIENCES

TOPIC TAGS--RUBBER, VULCANIZATION, ADHESION, FOOTGEAR/(U)101K RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605012/D06 STEP NO--UR/0498/70/012/005/0047/0051

CIRC ACCESSION NO--AP0140292

UNCLASSIFIED

2/2 013 UNCLASSIFIED

CIRC ACCESSION NO--AP0140292 PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AT CONST. RUBBER COMPN. THE ADHESION OF POROUS SOLE RUBBER TO CLOTH INCREASED WITH ITS D. THE D. WAS VARIED BY CHANGING THE RELATIVE VULCANIZATION TIMES AT LOW AND HIGH PRESSURES WHILE MAINTAINING THE TOTAL VULCANIZATION TIME CONST. ALTERNATIVELY, THE D. WAS VARIED BY CHANGING THE AMT. OF THE BLOWING AGENT (DINITROSOPENTAMETHYLENETETRAMINE). THE ADDNS. OF RESIN 10LK, RESOTROPIN, OR RESORCINOL TO THE STD. RUBBER MIXES INCREASED THEIR ADHESION TO CLOTH 20-60PERCENT WITHOUT IMPAIRING OTHER PROPERTIES.

UNCLASSIFIED

UDC 541.13

USSR

SHPUNT, L. B., KOMAROV, YE. V., and PUSHLENKOV, M. P.

"Thermodynamic Equilibrium Constants and Heat Effects of the Extractions of Uranyl Nitrate with Trialkylphosphates in Inert Solvents. VII. Tri-n-Octylphosphate (TOP)"

Leningrad, Radiokhimiya, Vol 13, No 5, 1971, pp 766-768

Abstract: The structure of the extracted complex of tri-n-octylphosphate (TOP) with uranyl nitrate was determined; it is the same for $UO_2(NO_3)_2 \cdot 2TOP$ as it is for $UO_2(NO_3)_2 \cdot 2TEP$; the NO_3 groups are in trans-position with coordination capacity of 2. Thermodynamic equilibrium constants for the extraction of uranyl nitrate with TOP solutions in carbon tetrachloride and in n-decane were determined for the temperature range 10-50°C, as well as other thermodynamic functions: ΔH, ΔG, and ΔS for $t = 25°C$.

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UDC 576.851.45.095

USSR

GURLEVA, G. G., DOMARADSKIY, I. V., KHALYAPINA, Ye. Ye., ALUTIN, I. M., TARANOVA, V. N., PUSHNITSA, N. P., KOL'TSOVA, Ye. G., MARCHENKOV, V. I., SHCHEGLAKOVA, N. M., and GRIGOR'YAN, E. G., Rostov-on-Don Scientific Research Antiplague Institute

"Biological Properties of Pasteurellae Isolated From Various Species of Animals"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 11, 1971, pp 54-58

Abstract: A comparative study was performed on P. avicida, P. cuniculicida, B. avisepticus, B. suisepticus, B. bovisepticus, and B. ovisepticus (a total of 27 strains) isolated from chickens, pigs, suckling pigs, calves, steers, sheep, house mice, and rabbits in various geographic areas in 1936-1967. The tinctorial, cultural, morphological, and biochemical properties of these strains as well as their sensitivity to antibiotics, nucleotide DNA composition, and virulence to albino mice, albino rats, and pigeons revealed that they constitute a homogeneous group and belong to a single species -- P. multocida. Significantly, all the strains investigated are sensitive to colicines E+J, F, G, J+C, and S_5. If the findings are confirmed by supplementary investigations, the colicin test may well be used for a differential diagnosis of P. multocida.

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USSR

UDC 542.61:546.791

PUSHLENKOV, M. F., KUZNETSOV, G. I., SHCHEPETIL'NIKOV, N. N., POPKOV, G. P., and ZELENIN, B. I.

"Study of the Extraction Rates in Systems Containing Tributyl Phosphate. IV. Extraction of $UO_2(NO_3)_2$ While Mixing it in a Centrifugal Field"

Leningrad, Radiokhimiya, Vol 14, No 2, 1972, pp 235-241

Abstract: A study was carried out on the extraction rate of uranium in the system $UO_2(NO_3)_2$-HNO_3-H_2O-tributyl phosphate-solvent in a centrifugal field. It has been shown that under these conditions the kinetics of mass transfer depends to a great extent on the rotation rate. With a 4000 rpm rate the extraction process is practically completed in 0.8 sec. The effectiveness of the extraction is about 1.3 times greater when carbon tetrachloride is used as a solvent instead of the usual mixture of saturated hydrocarbons boiling in the range 110-270°C. Hydrodynamic properties of the centrifugal extraction apparatus have been studied; formulas were developed for the calculations in layer separation chamber. It has been established that the completeness of phase separation is determined by the velocity of phase flows, rotation rate of the apparatus, and the difference in phase densities.

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USSR

UDC 541.13

SHPUNT, L. B., KOMAROV, YE. V., and PUSHLENKOV, M. F.

"Thermodynamic Equilibrium Constants and Reaction Heat Effects of the Extraction of Uranyl Nitrate with Trialkylphosphates in Inert Solvents. IX. Tri-n-Decylphosphate (TDP)"

Leningrad, Radiokhimiya, Vol 13, No 6, 1971, pp 895-897

Abstract: The structure of $UO_2(NO_3)_2 \cdot 2TDP$ has been established from infrared spectroscopical data, and found to be identical with the triethylphosphate complex: the molecules of TDP are in trans-position coordination capacity of NO_3^- groups being 2. Thermodynamic equilibrium constants of the extraction of uranyl nitrate with TDP in CCl_4 and n-decane were determined from the temperature range of 10-50°C. The values of ΔH, ΔG, and ΔS were obtained from equilibrium constant of the extraction expressed as a function of temperature.

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USSR

UDC 541.121:536.7:542.61

KOMAROV, Ye. V., SHPUNT, L. B., and PUSHLENKOV, M. F.

"Thermodynamic Equilibrium Constants and Thermal Effects of the Extraction Reactions of Uranyl Nitrite with Use of Trialkylphosphates in Inert Solutions: I. Tri-N-Butylphosphate (TBPh)"

Leningrad, Radiokhimiya, Vol XIII, No 3, 1971, pp 380-385

Abstract: Various parameters in addition to bond energy exert a substantial effect on the equilibrium of chemical reactions; these include mass, size, symmetry, and others. Owing to the complexity of this problem, a simplified approach was applied here in the study of such parameters. The structure of the solvate $UO_2(NO_3)_2 \cdot 2TBPh$ was determined, along with the thermodynamic equilibrium constants of the extraction reactions for tri-n-butylphosphate in carbon tetrachloride and in n-dekane, at temperatures of 10-15°C. The thermodynamic extraction functions ΔH, ΔG and ΔS, at t = 25°C were also determined.

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Organophosphorous Compounds

USSR UDC 541.123.012.5:536.753+542.61:661.726.661.63

KOMAROV, Ye. V., KOMAROV, V. N., and PUSHLENKOV, M. F.

"New Method of Describing the Distribution of Metal Ions in Extracting Systems Containing Monoaryl- and Monoalkylphosphoric Acids"

Leningrad, Radiokhimiya 12, No 3, 1970, pp 455-460

Abstract: The quantitative aspects of the extraction of metals by dibasic aryl- and alkylphosphozic acids were studied and theoretically interpreted. It was found that the conventional treatment of experimental data does not suffice to elucidate the extraction mechanism for metals which form a strong association with the extractants. The equations derived were experimentally confirmed with the example of the extraction of europium by solutions of mono-n-octylphosphozic acid in various solvents.

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1/2 019 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--RATE OF EXTRACTION IN SYSTEMS CONTAINING TRIBUTYLPHOSPHATE. II. EXTRACTION OF URANYL NITRATE -U-

AUTHOR-(02)-PUSHLENKOV, M.F., SHCHEPETILNIKOV, N.N.

COUNTRY OF INFO--USSR

SOURCE--RADIOKHIMIYA 1970, 12(1), 23-33

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--URANYL NITRATE, SOLVENT EXTRACTION, ORGANIC PHOSPHATE, TRIBUTYLPHOSPHATE, ACTIVATION ENERGY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1208 STEP NO--UR/0186/70/012/001/0023/0033

CIRC ACCESSION NO--AP0128626

UNCLASSIFIED

2/2 019 UNCLASSIFIED PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0128626

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EXTN. OF UO SUB2 (NO SUB3) SUB2 FROM AQ. HNO SUB3 SOLNS. BY USING BU SUB3 PO SUB4 SOLNS. IN CCL SUB4 IS A REACTION OF THE 1ST ORDER. THE RATE OF EXTN. K (WHEN USING A 1.1 MOLAR BU SUB3 PO SUB4 SOLN. AS EXTRACTANT AT 20DEGREES) IS PRACTICALLY INDEPENDENT OF THE INITIAL HNO SUB3 CONCN. IN THE AQ. PHASE (BETWEEN 0 AND 4N) AND DECREASES FROM 0.024-0.026 TO 0.010-0.014 CM-MIN WHEN THE INITIAL UO SUB2 (NO SUB3) SUB2 CONCN. IN THE AQ. PHASE IS INCREASED FROM 0.1 TO 0.5 MOLE-L.; THE BU SUB3 PO SUB4 CONCN. IN THE ORG. PHASE (BETWEEN 1.1 AND 3.4 MOLE-L.) HAS A SLIGHT AND IRREGULAR EFFECT ON K. THE VALUE OF K INCREASES SLIGHTLY WITH INCREASING RATE OF AGITATION OF THE SYSTEM, AND DECREASES SHARPLY WITH DECREASING TEMP., E.G., IN THE EXTN. FROM 0.42M UO SUB3 (NO SUB3) SUB2 SOLNS. IN 1M HNO SUB3 (BY 1.1M BU SUB3 PO SUB4), K DECREASES FROM 0.024 TO 0.011 CM-MIN WHEN THE TEMP. IS REDUCED FROM 21.2 TO 9.5DEGREES; K IS PRACTICALLY INDEPENDENT OF THE H SUB2 O CONCN. IN THE ORG. PHASE (UP TO 3.5 MOLE-L.). THE ACTIVATION ENERGY OF THE EXTN. REACTION IS 9.5-11 KCAL-MOLE; THE RATE OF EXTN. DECREASES WHEN CHLOROFORM OR DICHLOROETHANE ARE USED AS THE ORG. DILUENTS INSTEAD OF CCL SUB4. THE EXPTL. DATA INDICATE THAT THE HNO SUB3 IS EXTD. INTO THE ORG. PHASE BEFORE THE UO SUB2 (NO SUB3) SUB2, BUT SUBSEQUENTLY THE UO SUB2 (NO SUB3) SUB2 DISPLACES THE HNO SUB3 FROM THE ORG. PHASE.

UNCLASSIFIED

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UDC 615-373.576.851.315.098.31].015.4:612.111

USSR

SOLOV'YEV, V. D., KOBRINSKIY, G. D., DOMARADSKIY, I. V., LAVRUSHKO, V. S., LOBANOV, V. V., BICHUL', K. G., GAL'TSEVA, G. V., RASSUDOV, and PUSHNITSA, N. P., Institute of Epidemiology and Microbiology imeni Gamaleya, Academy of Medical Sciences USSR, and Rostov-on-Don Antiplague Institute

"Effect on Erythrocytes of the Receptor-Destroying Enzyme from Filtrates of Cholera Vibrio Cultures"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, No 10, 1972, pp 42-46

Abstract: Erythrocytes treated with filtrates of cholera vibrio cultures lose their capacity for agglutination by certain viruses. The authors studied this phenomenon of the "receptor-destroying enzyme" (neuraminidase) to determine the possibility of using it as an aid in diagnosing cholera. In in vitro experiments with guinea pig erythrocytes, filtrates of classic IMG, and El Tor vibrio cultures prevented the cells from being agglutinated by swine influenza virus, whereas filtrates of the control cultures (Comamonas, Pseudomonas, and E. coli) did not do so. The same effect was observed in the case of erythrocytes from the intestinal contents of suckling rabbits infected with various cholera vibrio strains. An investigation of the intestinal contents of 279 patients

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USSR

SOLOV'YEV, V. D., Zhurnal Mikrobiologii, Epidemiologii i Immunob ologii, No 10, 1972, pp 42-46

suffering from gastritis, dysentery, and other gastrointestinal disorders with symptoms resembling those produced by El Tor cholera showed that the hemagglutination reaction was negative in 94% of those over 1 year of age and in 46% of the infants.

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USSR

UDC 53.088:519.24

PUSHNOY, B. M., CHEYDO, G. P.

"Method of Using Structural Redundancy of a Measuring System when Processing Experimental Data with Systematic Errors"

Tr. IV Vses. soveshch. po avtomat. upr. 1968. Tekhn. sredstva avtomatiki (Works of the 4th All Union Conference on Automatic Control, 1968. Technical Automation Media), Moscow, Nauka Press, 1971, pp 369-377 (from RZh--Metrologiya i Izmeritel'naya Tekhnika, No 3, Mar 72, Abstract No 3.32.36)

Translation: If in accordance with the mathematical expectation of the investigated process it is defined by a minimum number of basic parameters, it is usually possible to indicate a number of additional (redundant) parameters which are functionally related to the basic ones. The possibility of using this redundancy for lowering the systematic measurement errors is demonstrated. It was proposed that the results of measuring each parameter contains independent additive normal random errors with known correlation functions and also slowly varying systematic errors which are represented by finite series. The problem of estimating the coefficients of these series was stated. The presence of redunancy was imposed on the results of measuring the restrictions and control conditions the number of which is equal to the number of parameters. Violation

USSR

PUSHNOY, V. M., et al., Tr. IV Vses. soveshch. po avtomat. upr. 1968. Tekhn. sredstva avtomatiki, Moscow, Nauka Press, 1971, pp 369-377

of the control conditions in the presence of errors has led to the occurrence of discrepancies. If the control conditions are nonlinear, by means of statistical processing of the discrepancies estimates were found for the coefficients of the series describing the systematic errors, and corrections were made to the measurement results. For small relative errors in the measurement results, linearization of the discrepancies is possible and it is possible to use linear methods of mathematical statistics. The method is easily implemented when processing experimental data on digital computers. The bibliography has 2 entries.

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USSR

UDC: 621.317.08+519.281

PUSHKOV, B. N. and CHEYDO, G. P., Novosibirsk

"Method of Using Structural Redundance in a Measuring System in Processing Experimental Data with Systematic Errors"

Novosibirsk, Avtometriya, No. 5, 1970, pp 20-28

Abstract: Because of the conditions under which measuring systems usually work, when an analytic expression for the measured process cannot be specified or when a checking signal specified with an accuracy exceeding that of the system cannot be introduced into it, the usual methods of analyzing system errors are ineffective. The authors therefore suggest an entirely different approach in which the structural redundance of the measurement system is used. An expression is found for measurement discrepancies which is used to solve the basic problem, that of obtaining information concerning the system error for each measured function. The problem is solved first for the case of minimum redundance, in which the number of controlling equations is unity, and then for the generalized case when there are more than one such equation. The authors assert that this method is designed for use in processing the results of a single experiment, when there is no a priori information concerning the nature of the signal and the system error.

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USSR

UDC 621.3161361.621.317.69

PUSHNYAK, V. A.

"A Digital-Counting Method of Frequency Measurement"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 35, Soviet Patent No 287192, class 21, filed 12 Apr 69, published 19 Nov 70, p 82

Translation: This Author's Certificate introduces: 1. A digital-counting method of measuring frequency and periodic time intervals. The procedure is based on comparing the period of the frequency to be measured with reference periods, and counting the number of oscillations of the frequency to be measured with an optimally selected reference time interval. As a distinguishing feature of the patent, the precision of the measurement process is improved and speed is increased by triggering one of a discrete series of reference measurement intervals uniquely associated with a discrete series of reference periods, using a signal formed when the period of the frequency to be measured is compared with the reference period, the duration of this signal being of one order of magnitude with that of the period of the frequency to be measured. 2. A modification of this

USSR

PUSHNYAK, V. A., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 35, Soviet Patent No 287192, class 21, filed 12 Apr 69, published 19 Nov 70, p 82

method is distinguished by the fact that the precision of the measurement process is improved and speed is increased by triggering one of a discrete series of reference filling frequencies uniquely associated with a discrete series of reference time intervals, using a signal formed when the duration of the time interval to be measured is compared with the reference interval, the duration of this signal being of one order of magnitude with that of the interval to be measured.

USSR

UDC: 624.131.43+539.21.084-492.3

PUSKOV, V. I.

"On the Formation of Freeze Buckling Forces in the Plane of the Footing of Foundations and a Procedure for Calculating Them"

V sb. VI Soveshchaniye-seminar po obmenu opytom str-va v surovykh klimat. usloviyakh, 1970. T. 5, vyp. 1 (Sixth Seminar and Conference on Exchange of Experience in Construction Under Severe Climatic Conditions, 1970--collection of works, Vol. 5, No 1), Krasnoyarsk, 1970, pp 82-93 (from RZh--Mekhanika, No 4, Apr 71, Abstract No 4V505)

Translation: The paper deals with the problem of formation of forces of freeze buckling normal to the surface of a foundation footing. Formulas are presented which permit determination of the following quantities for strip foundations and for those which are circular in the plan view: a) the magnitude of the external pressure on the foundation which inhibits freeze buckling at any depth within the limits of the freezing layer under a free standing foundation which is capable of unlimited displacement along the vertical (loading of the foundation takes place before the base begins to freeze); b) the force of freeze buckling which develops under a foundation whose freedom of vertical displacement is limited. Bibliography of 11 titles. V. M. Pavilonskiy.

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UDC 519.2

USSR

BODNARCHUK, P. J., PUSTOMEL'NIKOV, J. P., SLON'OVS'KIY, R. V., YAROVIY, S. S.

"Some Applications of Branch Continued Fractions when Studying Markov Processes"

Dopovidi AN URSR (Reports of the Ukrainian SSR Academy of Sciences), 1972, A, No 5, pp 391-394, 475 (from RZh-Kibernetika, No 9, Sep 72, Abstract No 9V37)

Translation: The distribution components at the time n for the Markov chain with a finite number of states are represented in the form of branched continued fractions. This representation is convenient for calculating such probabilities by computer.

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USSR UDC 621.793.72.016-982:[669.58+669.738

ROYKH, I. L., Doctor of Chemical Sciences, Professor, RAFALOVICH, D. M., Candidate of Physical and Mathematical Sciences, Reader, RYBIN, B. S., Engineer, PUSTOTINA, S. B., Candidate of Technical Sciences, and BELORITSKAYA, Ye. L.

"Increasing the Adhesion Strength of Zinc and Cadmium Coatings Applied to Steel by Vacuum Evaporation"

Moscow, Vestnik Mashinostroyeniya, No 1, Jan 71, pages 62-64

Abstract: It is demonstrated that good adhesion between coating and steel can be produced after heating of steel in a vacuum. In order to produce good adhesion of zinc and cadmium coatings on chemically pure steel (when strong heating is undesireable), thin sublayers of lead can be used. Three condensation modes are presented, all providing satisfactory adhesion of zinc and cadmium to steel. The modes consist of chemical or electrochemical surface preparation, heating in a high vacuum (10^{-4}-10^{-5} mm Hg) to 450°C and higher and at 10^{-3} mm Hg to 620°C and higher, then cooling of the steel to 50-200°C, followed by application of the coating; heating of the steel in a vacuum chamber to 270-300°C, then application of a lead layer 2-4 microns

USSR UDC 621.793.72.016-982:[669.58+669.738

ROYKH, I. L., Doctor of Chemical Sciences, Professor, RAFALOVICH, D. M., Candiate of Physical and Mathematical Sciences, Reader, RYBIN, B. S., Engineer, PUSTOTINA, S. R., Candidate of Technical Sciences, and BELORITSKAYA, Ye. L., Moscow, Vestnik Mashinostroyeniya, No 1, Jan 71, pages 62-64

thick under a vacuum of 10^{-3}-10^{-5} mm Hg, after which the steel is cooled to 50-200°C and the zinc or cadmium is applied; chemical or electrochemical preparation of the surface, heating to 250-300°C under a vacuum of 10^{-3}-10^{-5} mm Hg, followed by application of the zinc to the heated surface of the steel. The last mode can be used when the parts will not be strongly deformed.

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USSR

UDC 546.834'185-386

SUKHAREV, Yu. I., YEGOROV, Yu. V., and PUSTOVALOV, N. N.

"Synthesis and Composition of Niobium Phosphate Ion Exchange Resins"

Moscow, Zhurnal Neorganicheskoy Khimii, Vol 16, No 4, Apr 71, pp 1026-1030

Abstract: The material was synthesized by a rapid mixing of an acid solution of sodium phosphate and basic solution of potassium niobate. The amount of concentrated HCl added to the solution of disubstituted sodium phosphate was governed by the optimal pH required at the equilibrium point. In the applicational synthesis the applicator was added in the amount needed to reach equilibrium in respect to the agent being applied. To prevent precipitation of Ce''', Fe''' and Cr''' phosphates, the coprecipitation was carried out in a medium in which these phosphates could not precipitate. To prevent coprecipitation of the applicator phosphate with niobium phosphate, the third component was added after precipitation of niobium phosphate. The gel obtained was left overnight for completion of the process. Then the material was decanted, filtered, dried and milled, the 0.1-0.2 mm fraction being collected. The applicator was then washed out with 0.5 N HCl until a negative test was obtained for the applicator ions.

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USSR

SUKHAREV, Yu. I., et al., Zhurnal Neorganicheskoy Khimii, Vol 16, No 4, Apr 71, pp 1026-1030

Finally the exchange resin was washed with acid for a period of 6-8 weeks. The applicational synthesis gave material with considerably higher phosphorus content in the solid phase of hydrated niobium phosphate. Structures for the material obtained by the two methods have been proposed.

PUSTOVALOV, V. N.

TECHNICAL TRANSLATION

FSTC-HT-21-735-72

ENGLISH TITLE: Determining Mean Heat Transfer Coefficients with Built in Alphacalorimeters

FOREIGN TITLE: Opredeleniye Srednikh Koeffitsiyentov Teploobmena Vstroyennymi Al'fakalorimetrami

AUTHOR: V. M. Kaptsov, V. N. Pustovalov, and A. P. Ruil'ko

SOURCE: Inzhenerno-Fizicheskiy Zhurnal, Volume 19, No. 2, 1970, pp 236-242

Translated for FSTC by Eric Peabody, Leo Kanner Associates

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USSR

UDC: 621.378.9:533.9.02

VINOGRADOV, A. V., PUSTOVALOV, V. V.

"Plasma Heating by Stimulated Laser Emission (Survey)"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972, pp 3-22

Abstract: Formulas are derived and analyzed for the coefficients of diffusion of light-scattering electrons at any velocities (in a nonrelativistic plasma); the rates of heating of the electrons and ions of the plasma are determined and discussed in detail. Some of the results are compared with data published previously. In the authors' opinion, the proposed theory is of interest from the viewpoint of the problem of laser heating of a dense plasma to thermonuclear temperatures. The authors thank B. Ya. Zel'dovich, V. S. Zuyev, O. N. Krokhin, V. B. Rozanov, V. P. Silin, and J. I. Sobel'man for reading the manuscript and for constructive criticism. Seven illustrations, bibliography of sixty-one titles.

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USSR

UDC 539.4

PUSTOVALOV, V. V.

"Methods of Studying the Plasticity and Strength of Solid States at Low Temperatures"

Metody izucheniya plastichnosti i prochnosti tverdykh tel pri nizkikh temperaturakh (cf. English Above), Kiev, Naukova Dumka Press, 1971, 95 pp, ill., 61 k. (from RZh-Mekhanika, No 11, Nov 71, Abstract No 11V1077K)

Translation: A study was made of the structural elements of low-temperature devices used for low-temperature studies of the mechanical properties of solid states and also the procedural problems connected with low-temperature measurements on these devices. Numerous schematics are presented for cryostats, experimental devices, attachments for them, low-temperature extensometers and other measuring devices and attachments known from literature. Classification of the existing data permits definite conclusions to be drawn regarding the principles of designing experimental machines and attachments for them and also determination of the modern requirements on low-temperature test units which is especially important inasmuch as the success of studying the physical, elastic and strength characteristics of the materials, the parameters of work-hardening, plasticity and creep, and fatigue and other characteristics depends to a great extent on the capabilities and quality of the low-temperature

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USSR

PUSTOVALOV, V. V., Metody izucheniya plastichnosti i prochnosti tverdykh tel pri nizkikh temperaturakh, Kiev, Naukova Dumka Press, 1971, 95 pp, ill., 61 k.

equipment. Specific problems for low temperature measurements such as obtaining stable intermediate temperatures under conditions of low heat capacity of the test piece, the study of several test pieces in the presence of single cooling and also problems connected with studying the mechanical properties of solidified gases play a definite role in the book. The book comprises an introduction, five chapters and a bibliography. The first chapter is devoted to studying the mechanical properties of solid states at low temperatures by static methods. Cryogenic attachments to standard test machines, low temperature deformation units, devices for studying creep and also measurements of hardness and microhardness at low temperatures are described in it. The second chapter is devoted to studying the mechanical properties of solid states at low temperatures and under dynamic loads. A study is made of devices for determining the impact toughness of test pieces at low temperatures in it. In the third chapter some of the characteristic features of studying the plasticity and strength at low temperatures are discussed, including problems of measuring the strain of the test piece during low temperature deformation, studying the plasticity and strength at temperatures differing from the boiling points of the cooling liquids and also devices for studying several test pieces during single

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USSR

PUSTOVALOV, V. V., Metody izucheniya plastichnosti i prochnosti tverdykh tel pri nizkikh temperaturakh, Kiev, Naukova Dumka Press, 1971, 95 pp, ill., 61 k.

cooling and for changing test pieces during low temperature tests. Data connected with studying the plasticity and strength of solidified gases are generalized in the fourth chapter, and instruments for measuring friction and elastic constants and studying the tension of solid gases are described. The fifth chapter contains a discussion of some other methods of studying plasticity and strength at low temperatures. The structures of cryostats for electronographic studies, studies at helium temperatures and pressures to 100 kilobars, and for tension of whiskers and foil at temperatures to 1.3° K are investigated. An instrument for determining the ultimate strength in the temperature range up to 0.05° K is described. The bibliography has 88 entries.

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USSR UDC 539.5

DOTSENKO, V. I., PUSTOVALOV, V. V., STATINOVA, V. F., Kar'kov.

"Deformation Hardening of Copper at Low Temperatures"

Kiev, Problemy Prochnosti, No. 4, Apr 71, p. 41-46.

Abstract: The temperature dependences of the parameters of the hardening curves of copper monocrystals of various orientation and copper polycrystals of various purity are studied. It is demonstrated that as the temperature drops from 4.2 to 1.4°K, the critical shear stress of copper monocrystals of all three main orientations decreases. Two types of uneveness of the hardening curve of monocrystals are studied, observed at low temperatures. The stress relaxation method is used to produce values of the activation energy and activation volume of the process controlling plastic deformation.

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Single Crystals

USSR UDC 669.791:539.382

PUSTOVALOV, V. V., VERSHININA, V. V., TSIVINSKIY, S. V., and ALEKSANDROV, B. N., Physics Technical Institute of Law Temperatures, Academy of Sciences UkrSSR

"Plastic Deformation of Mercury Single Crystals"

Moscow, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 991-998

Abstract: Plastic deformation of mercury single crystals was studied by recording the extension curve at 77.3, 4.2, and 1.4-1.6°K. It was demonstrated that crystals of mercury have high plasticity down to very low temperatures (1.5-4.2°K). At 4.2 and 1.5°K, a multistage hardening curve was observed, which does not differ in principle from crystals with a different crystalline structure.

1/2 047 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--PLASTIC DEFORMATION OF LEAD IN THE NORMAL AND SUPERCONDUCTING STATES -U-

AUTHOR-(03)-PUSTOVALOV, V.V., STARTSEV, V.I., FOMENKO, V.S.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS ARE GIVEN OF A SYSTEMATIC INVESTIGATION OF THE DIFFERENCES BETWEEN THE MACROSCOPIC CHARACTERISTICS OF PLASTICITY OF LEAD SINGLE AND POLYCRYSTALS OF 99.9992 AND 99.9995PERCENT PURITY IN THE SUPERCONDUCTING STATE AND IN THE NORMAL STATE AT THE SAME TEMPERATURE. IN THE SUPERCONDUCTING STATE THE CRITICAL RESOLVED SHEAR STRESS OF SINGLE CRYSTALS, THE YIELD POINT OF POLYCRYSTALS, AND THE FLOW STRESS FOR DIFFERENT STAGES OF DEFORMATION ARE LOWER THAN IN THE NORMAL STATE. NEAR THE FRACTURE AND AT THE TENSILE STRENGTH NO DIFFERENCE BETWEEN THE FLOW STRESS IN THE NORMAL AND SUPERCONDUCTING STATE WAS OBSERVED. A TEMPERATURE DEPENDENCE OF MACROSCOPIC PROPERTY CHANGES WAS NOT FOUND IN THE TEMPERATURE RANGE OF 1.8 TO 4.2DEGREESK. THE RESULTS OBTAINED REVEAL AN ESSENTIAL CONTRIBUTION FROM THE DRAG DUE TO CONDUCTION ELECTRONS TO THE RESISTANCE TO DISLOCATION MOTION. THE ESSENTIAL INTERACTION WITH CONDUCTION ELECTRONS IMPLIES THAT IN PURE METALS THE DISLOCATIONS MOVE WITH RATHER LARGE VELOCITIES (10 PRIME2 TO 10 PRIME5 CM-S) AT LOW TEMPERATURES.

FACILITY: PHYSICO-TECHNICAL INSTITUTE OF LOW TEMPERATURES.

FACILITY: ACADEMY OF SCIENCES OF THE UKRAINIAN SSR, KHARKOV.

UNCLASSIFIED

USSR

UDC 595.42:598.2:576.851.13

PUSTOVAYA, L. F., Tadzhik Scientific Research Institute of Veterinary Science

"Role of the Argas persicus Mites in Transmitting Listeriosis to Birds"

Dushanbe, Doklady Akademii Nauk Tadzhikskoy SSR, No 5, 1971, pp 72-73

Abstract: Cockerels, mynas, and turtledoves were infected with cultures of a standard Listeria strain. Argas persicus imagoes allowed to feed on these birds transmitted the disease to healthy birds through bites. Microscopic examination of Listeria isolated from infected mites showed them to be smaller than the standard strains and different from them in virulence and in a number of morphological, biochemical, and biological properties (they fermented lactose and sucrose more slowly). However, these altered cultures regained their original properties after being passaged in the birds.

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UDC 576.851.136:576.895.42

USSR

PUSTOVAYA, L. F.

"Transphase Transmission of Listeriosis by Argas persicus Ticks"

Dushanbe, Izvestiya Akademii Nauk Tadzhikskoy SSR, No 2 (43), 1971, pp 78-81

Abstract: It is known that Argas ticks transmit listeriosis (Listeria monocytogenes). The object of this study was to establish that the pathogen is transmitted transphasally. A. persicus larvae and pupae were infected via roosters dying of listeriosis, and subsequently kept in test tubes for 7-11 days, until a generation of pupae in the first, second, and third instars was obtained. Eight roosters, were divided into four groups, including a control group; three groups were exposed to 50 infected pupae at different stages of development and received an additional 30 pupae in their feed. One rooster infected by first instar pupae contracted the disease, as well as 2 roosters infected with third instar pupae; listeriosis cultures were obtained from 18.3% of the remaining fowl. It was concluded that A. persicus pupae are able to transmit listeriosis for at least 20-27 days following initial infection.

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USSR

KURSHIN, L. M., PUSTOVOY, N. V.

"Supercritical Behavior of a Cylindrical Envelope with Combined Application of Loads"

4-ya Vses. Konf. po Probl. Ustoychivosti v Stroyit. Mekh., Tezisy Dokl. [Fourth All-Union Conference on Problems of Stability in Structural Mechanics, Theses of Reports -- Collection of Works], Moscow, 1972, pp 133-134, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 V328).

Translation: The supercritical behavior of a cylindrical shell under the influence of axial forces and a circular load is studied. The solution is presented on the basis of nonlinear equations of smooth shells with fixed form of bending function, using the Bubnov method. The bending function is selected so that it contains components reflecting the subcritical curvature of the generatrix of the shell, plus terms describing the bifurcation at the moment of loss of stability. The system of nonlinear algebraic equations produced for bending amplitudes is studied from the point of view of development of the equilibrium shapes of the shell arising upon loss of stability. The results of calculations show that the decrease in loads with increasing bending in the supercritical area occurs even with values of axial compression parameter $p > 0.13$ ($p = N/N_e$, where N is the

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KURSHIN, L. M., PUSTOVOY, N. V., 4-ya Vses. Konf. po Probl. Ustoychivosti v Stroyit. Mekh., Tezisy Dokl., Moscow, 1972, pp 133-134.

intensity of the compressive load, N_e is the Euler critical load).

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USSR

PUSTOVOYT, V. I. and MUKHORTOV, Yu. F.

"Theory of Acoustical Wave Generation in a Magnetic Field"

Leningrad, Fizika Tverdogo Tela, vol. 13, No. 10, October 1971, pp 3059-3069

Abstract: In this discussion of the ultrasonic movement of carriers in semiconductors resulting in the amplification or spontaneous generation of acoustical waves, the authors use the solution of the kinetic equation for phonons to find the spectral and angular distribution of the acoustical waves, and they demonstrate that the directional diagram of phonon radiation in a strong magnetic field is sharply compressed in the plane perpendicular to the field. This sensitivity of the directional diagram to the field is especially interesting, since the behavior of the crystal under external electric and magnetic fields is primarily a function of the spatial and angular distribution of the generated phonons. It is also shown that the thermodynamic theory of fluctuations can be used with the kinetic equation for finding the sources of the phonons. Finally, the authors show that in a semiconductor with anisotropic interaction in a strong electric field when phonons are generated, an eddy current and a magnetic moment result.
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Acc. Nr: AP0043690 Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 2, pp 647-650

SELF-FOCUSING AND FOCUSING OF ULTRASOUND AND HYPERSOUND IN METALS AND SEMICONDUCTORS

Askar'yan, G. A.; Pustovoyt, V. I.

Propagation of intense ultrasound and hypersound waves in metals is considered. The possibility of self-focusing is demonstrated and the conditions for its existence are elucidated. It is shown that in a number of metals of practical interest the velocity of sound decreases upon heating; this leads to self-focusing and focusing of the sound waves as a result of heating of the medium near the surface by the factor producing the intense sound wave (modulated laser or electron beam). The sound velocity may also decrease during absorption of the sound wave itself. Mechanisms of variation of the velocity of sound in a semiconductor due to heating are analyzed. It is shown that appreciable changes may occur as a result of variation of the carrier concentration. Some practical applications of the effects which influence conditions of destruction of metals are indicated. Some possibilities of explaining the anomalies in propagation of sound and destruction of the media in the focusing regions are discussed.

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