

USSR

UDC 632.95

~~BAITRISHIS~~ R. S., BERESNEVICHYUS, Z.-I. G., MORKUNAS, A. V., and MORKUNENE, M. P., Kaunas Polytechnic Institute and Botanical Garden of the Institute of Botany of the Academy of Sciences Lithuanian SSR

"Legume Growth Stimulant"

USSR Authors' Certificate No 317367, Cl. A 01 n 5/00, filed 23 Apr 70, published 22 Dec 71 (from RZh-Khimiya, No 14, 25 Jul 72, Abstract No 14N550P by T. A. Belyayeva)

Translation: The authors suggest the use of the sodium salt of N-(4-quinoly)-beta-alanine as a biologically active substance to stimulate the growth and development of legumes. The increase in the number of pods per plant is 16.5-18.2%, in yield per plant 34.2-40.7%, and in the weight of 1000 seeds 6.5-6.9%.

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1/2 009 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--HEAT STABILIZED POLYCAPROLACTAM -U-  
AUTHOR--(02)-BALTRUSHIS, R.S., BERESNEVICHYUS, Z.G.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 260,679  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--06JAN70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--THERMAL STABILITY, CAPROLACTAM, ORGANIC AZOLE COMPOUND,  
CHEMICAL PATENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1992/0243 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0111437  
UNCLASSIFIED

2/2 009  
CIRC ACCESSION NO--AA0111437

UNCLASSIFIED

PROCESSING DATE--02OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HEAT STABILIZED POLYCAPROLACTAM  
WAS TREATED WITH DIAZOLES TO GIVE A COLORED POLYMER.

USSR

UDC 535.376:621.382

BALUKOVA, G.N., FUTILOVSKAYA, M.YU., TISHKIN, A.N.

"Thermal Resistance Of Gallium Arsenide Light-Emitting Diodes In A Static Regime"

Elektron.tekhnika. Nauch.-tekhn.sb. Poluprovodn. pribory (Electronics Technology. Scientific-Technical Collection. Semiconductor Devices), 1972, Issue 4(68), pp 81-85 (from RZh:Elektronika i yeye primeneniye, No 11, Nov 1972, Abstract No 11B355)

Translation: The paper studies the thermal regime of noncased small-sized light-emitting diodes of GaAs obtained by the diffusion method. A calculation of the thermal resistance is presented as well as an evaluation of the maximum excess of the temperature of the light-emitting diode above the environment with a given dissipated power. The calculated data are compared with the experimental. Summary.

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BALUKOVA, V.D.

DISPOSAL OF RADIOACTIVE WASTES

Collection of papers sponsored by the State Committee for the Use of Atomic Energy of the USSR, 1972, Moscow

JPRS 58764

17 April 1973

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- 3 - [I - USSR - K]

TECHNICAL AND ECONOMIC ASPECTS OF HANDLING LIQUID WASTE WITH INTERMEDIATE AND HIGH LEVELS OF RADIOACTIVITY

Paper by V. I. Sulteyn, A. A. Khonikovich, V. D. Balukova, L. M. Nosova, and N. A. Kakov, State Committee for the Use of Atomic Energy of the USSR, IAEA publication SM-163/10, Vienna, Russian, pp 1-23.

In this paper problems of handling wastes of high and intermediate levels of radioactivity, obtained in the regeneration of TVEL (fuel elements) of the VVER (water-cooled water-moderated power reactor) type are considered. Some data are given with respect to the chemical and radiochemical compositions of the wastes. For highly active wastes it is advisable to extract the strontium, cesium, and possibly also other isotopes. For the remaining part of the waste, the following ways of rendering them harmless are considered:

- 1) holding them in special depositories for a prolonged period of time, necessary for reduction of the general activity of the fission products contained in the waste;
- 2) solidification of highly active wastes by one of the well-known methods tested in experimental plants;
- 3) burial of highly active wastes in geological water-bearing strata similar to underground burial of wastes of intermediate activity as developed in the Soviet Union.

Since in this case the concentration of fission products in the soils and the gas and heat liberation associated with this as a result of the radiation processes presents the greatest hazard, the basic attention in underground burial of highly active waste is devoted to the preparation of the waste for burial. The preparation lies either in separating

the precipitating substances from the waste, or by converting them into complex compounds which are stable in the conditions of the geological bed.

In the paper certain calculated technical and economic data on the storage of liquid highly active wastes are given, also concerning underground burial of wastes of high and intermediate levels of activity, and also a comparison of these methods with other methods of the storage and processing of radioactive wastes is made.

In the processing of used nuclear fuel, more than ninety-nine percent of the radioactive isotopes arriving at a radiochemical plant are concentrated in liquid wastes.

In the USSR liquid wastes with a specific activity of more than 1 curie per liter are called highly active wastes, those with from 1 to  $1 \times 10^{-5}$  curies per liter are wastes of intermediate activity, those with  $1 \times 10^{-5}$  and below are wastes with a low level of activity. The greatest potential hazard is presented by wastes with a high level of activity. At the present time in the entire world, with the exception of China, more than 300 thousand cubic meters of concentrated highly active wastes have been accumulated [1]. Naturally, normal operation of a plant for regeneration of nuclear fuel depends upon the successful solution of the problem of handling highly active wastes.

The use of water-cooled water-moderated reactors is provided in a considerable part of the program for the development of atomic power engineering in the USSR. In this paper certain basic principles with respect to rendering wastes from the regeneration of VVER TVEL harmless are considered, and the basic attention is devoted to wastes with a high level of activity. Out of methods of processing and burial of wastes of an intermediate level of activity, only those which may partially be used also for highly active wastes are given.

Nuclear fuel of reactors of the VVER type is sintered uranium dioxide enriched with uranium-235 up to 1.5%. The average life of the fuel is about three calendar years, and the depth of burn-up reaches 30,000 megawatt-hours per ton [2]. The holding of used VVER TVEL before regeneration at a radiochemical plant may vary--from half a year to three years depending upon the necessity of the fastest return of uranium to the fuel cycle. However, we should consider that a longer holding will lead to a decrease in the general activity of the TVEL and, consequently, the technological scheme of the regeneration plant may be simplified.

BALUKOVA, V. D.

DISPOSAL OF RADIOACTIVE WASTES

Collection of papers sponsored by the State Committee for the Use of Atomic Energy of the USSR, 1972, Moscow

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[I - USSR - X]



SCIENTIFIC PERSPECTIVES FOR BURYING HIGHLY ACTIVE LIQUID WASTES IN DEEP GEOLOGICAL FORMATIONS

Paper by V. I. Shilaya, V. D. Malukova, E. P. Yevan, and M. B. Elinov, State Committee for the Use of Atomic Energy of the USSR, IAEA Publication SK-163/40, Moscow, 1972.

In the USSR storage spaces have been created for liquid wastes of intermediate and low radioactivity in deep aquifers of the Earth, composed of jointed and porous rock, reliably isolated by water-tight clay layers (1, 2, 3).

The storage areas in operation are engineering structures, the basis of which is found in definite hydrodynamic schemes, constructively outfitted wells and apparatus making it possible to regulate the filling of the storage space and to monitor the state of the wastes taken into it.

A complex of scientific research work performed and the results of the operation of such storage spaces at the present time make it possible to make a definite evaluation of the possibility of such burial for highly active liquid. It is necessary to comment that with the removal of liquid highly active wastes into a geological medium it is not their simple discharge into some formation or other that is considered, but the creation of a storage area of definite dimensions and operating regime with a series of devices controlling its operations: wells, special plants, and instruments.

The introduction of highly active liquid wastes, which are, as a rule, nitric-acid solutions in which corrosion products and a considerable quantity of soluble salts (such as nitric-acid salts, for example) are contained, into underground strata is accompanied by a number of physico-chemical processes, which may cause undesirable consequences.

This communication is devoted to the basic physico-chemical factors determining the operation of underground storage areas for the type of wastes under consideration.

1. Chemical Effect

The collector strata, with respect to their characteristics, differ basically from the physico-chemical system of the highly active discharged and all chemical reactions in the reaction of such systems are directed toward geochemical equilibrium of the strata. However, in this case essential changes occur both in the composition of the wastes and in the system of strata.

The basic changes in the solid phase of the strata are associated with the effects of hydrogen ions and with the salinization of the surfacelayers of the rock particles. The effects of the acid, in the final analysis, turn out to be most effective and leads to the formation of a mechanical composition of the rocks. A decrease in the dimensions of the coarse particles and solution of the fine particles occurs, which for aluminosilicate rocks with an effective porosity of the strata of 5-12%, may cause destruction of 30-35% of the solid phase.

In a moderate effect of acid no failure of the skeleton of the rocks occurs, but the ion-exchange capability of the rocks for radioisotopes decreases sharply.

For carbonate rock failure occurs, practically completely, with possible gas formation.

The reaction of the liquid phase is also associated mainly with the change in the acidity and as a function of the composition of the ground waters is accompanied by: for carbonate and bicarbonate waters, their decomposition; for chloride waters, a sharp increase of their chemical activity.

The decrease in the acidity of the waste occurring causes hydrolysis of the corrosion products contained in the waste water, and also secondary sediment formation due to the dissolved components of the rocks, i.e., the stability of the liquid phase is disrupted, and a deposition of sediments in the threshold space occurs. In this case, the distribution of radionuclides between the phases varies sharply and the processes of heat and gas liberation become uncontrolled factors, which in the burial of highly active wastes is intolerable.

Thus, the first requirement for the accomplishment of the burial of highly active liquids is the provision of their compatibility with the stratum material and the preservation of homogeneity of the liquid phase. The solution of such a problem may be performed by two methods: special preparation of the wastes or preliminary preparation of the stratum.

USSR

UDC 681.325.65:525

1

BARYKIN, N. A., ZAYGERMAKHER, D. M., KHOKHLOV, G. N., BALUSHKIN, K. S.,  
KOZOBRODOV, V. A.

"Logic Circuits Based on Pneumatic Relay Elements"

Pnevmatich. Privody i Sistemy upr. [Pneumatic Drives and Control Systems  
-- Collection of Works], Moscow, Nauka Press, 1971, pp 267-272, (Translated  
from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya  
Tekhnika, No 11, 1971, Abstract No 11 A74 from the Resume).

Translation: The basic characteristics and nomenclatures of pneumatic relay  
automation elements (PERA) are presented, as well as typical logic device  
circuits based on these elements. A modular-element method of planning of  
devices based on PERA and the experience of the application of the standard  
circuits are studied. 6 Figures; 1 Table; 1 Biblio. Ref.

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UDC: 8.74

BALUYEV, A. N., BRATCHIKOV, I. L.

"Some Peculiarities of the Intermediate Translation Language of ALGOL-68"

Teoriya Yazykov i Metody Postroyeniya Sistem Programmir. [Theory of Languages and Methods of Construction of Programming Systems], Kiev-Alushta, 1972, pp 391-396 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V553, by V. Mikheyev)

Translation: The structure of an arbitrary machine is studied to determine some of the peculiarities of the intermediate translator language of ALGOL-68. The result of translation of the program from ALGOL-68 to the intermediate language is a program for an arbitrary machine. It has the following parts: 1) the program itself; 2) the table of identifiers; 3) the table of routines; 4) special tables (table of connections with input program, etc.). The program itself is a sequence of instructions for the arbitrary machine. Each instruction consists of the operation and operand parts. The operands are divided into explicit and implicit. An explicit operand may be only a value of an identifier or a tag marking one of the instructions of the arbitrary machine. An explicit operand identifier indicates a reference to a corresponding row

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Baluyev, A. N., Bratchikov, I. L., Teoriya Yazykov i Metody Postroyeniya Sistem Programmir., Kiev-Alushta, 1972, pp 391-396

in the table of identifiers. An implicit (understood) operand may be one or more values at the top of the service register, or the value in the service register of the arbitrary machine (for example, at the top of the service register). The nature of the instructions of the arbitrary machine is such that running of the program can be reduced to successive performance of instructions of the program itself in the sequence in which they occur, broken only by jumps called for by explicitly indicated original or service tags. The table of identifiers for translation from ALGOL-68 to the intermediate language is only partially filled. A table of routines is completely formed upon translation of the program to the intermediate language. During operation of the arbitrary machine, it does not change. Each row of this table contains the equivalent of a certain terminal generation of the metaconcept TYPE. In case of a multiple value, a row may contain additional information on the properties of the boundaries necessary to check the agreement of the formal and actual parameters. The connection table to the input program is also fully formed upon translation to the intermediate language.

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UDC: 8.74

BAKONIN, V. N., BALUYEV, A. N., BELOVA, K. M., KURKOV, V. L., RABININ, V. N.

"Packet Processing System for the BESM-3M Computer"

V sb. Metody vychisleniy (Methods of Computations--collection of works), vyp. 7, Leningrad, Leningrad University, 1971, pp 139-147 (from RZh-Kiber-netika, No 6, Jun 72, Abstract No 6V538)

Translation: The authors consider an operational system for packet processing of a stream of small problems. The system is a development of the "Avtooperator" system worked out at the Computing Center of the Siberian Department of the Academy of Sciences of the USSR. In accordance with this system, a supervisory program is placed in the memory of the BESM-3M to control packet processing, and each problem of the packet is provided with an instruction written in a special language. The supervisory program reads each instruction and prints out the number and time of reception of the problem on the alphanumeric printer. The instruction is then verified, translated into the internal language, and execution begins. It is noted that the supervisory program can model both operations in accordance with the set of codes on the control panel register and on the halt register.

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BAKONIN, V. N. et al., Metody vychisleniy, vyp. 7, Leningrad, Leningrad University, 1971, pp 139-147

However, if commutation between external devices, changing of magnetic tapes and so forth is required, the supervisory program signals to the operator and prints out the appropriate request on the alphanumeric printer. When a situation arises in which a client's problem is interrupted, the supervisory program prints out standard information on this interruption, performs the next point of the instruction, and returns control to the program of the problem. After a new interruption, the supervisory program goes on to the next point if there has been no special instruction to interrupt this order. Taking the problem from the computer, the supervisory program records its number, the date and elapsed time in a special register, and prints out the time of day and the reason for the removal. Reasons may be: 1) completion of a job in accordance with instructions; 2) lapse of requested time; 3) a situation has arisen which is not provided for in the instructions. The operation of the computer in the packet processing mode is described. Instructions on the supervisory program are given.

2/2

1/3 015 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--THE EFFECT OF THE APERTURE ON THE ERROR OF MICROINTERFEROMETER  
READINGS -U-  
AUTHOR-(02)-BALUYEVA, N.N., OSMOLOVSKAYA, YE.P. **B**  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, IZMERITEL'NAYA TEKHNIKA, NO 2, 1970, PP 37-40  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--INTERFEROMETER, ERROR CORRECTION/(U)MI14 INTERFEROMETER,  
(U)MI19 INTERFEROMETER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1994/1461 STEP NO--UR/0115/T0/000/002/0037/0040  
CIRC ACCESSION NO--AP0115392

UNCLASSIFIED



2/3 015

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0115392

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN MICROINTERFEROMETERS OF THE MII TYPE, USED FOR MEASURING ROUGHNESS AS WELL AS INTERFEROMETERS FOR MEASURING LENGTH AND FLATNESS, THE MEASURE OF COMPARISON IS THE WAVE LENGTH LAMBDA OF THE EMPLOYED LIGHT. THE PRINCIPLES OF MEASUREMENT ON THE INDICATED INSTRUMENTS CONSISTS IN THE FACT THAT THE VALUE IS EXPRESSED IN A FORMULA ACCORDING TO WHICH THE "BAND WIDTH" IS EQUAL TO HALF THE WAVE LENGTH. HOWEVER, THIS FORMULA IS VALID ONLY FOR ROUGH MEASUREMENTS. WHERE HIGH PRECISION IS REQUIRED, THE SO CALLED BAND WIDTH CAN NO LONGER BE ASSUMED EQUAL TO THE HALF THE WAVE LENGTH AND THE CALCULATION IS CONDUCTED OTHERWISE. THEORETICAL AND EXPERIMENTAL DATA SHOW THAT IN INTERFERENCE CIRCUITS EFFECTED ACCORDING TO THE PRINCIPLE OF BANDS OF EQUAL SLOPE, THE APERTURE OF THE ILLUMINATING PENCIL OF RAYS DOES NOT AFFECT THE WIDTH OF THE INTERFERENCE BAND. CONSEQUENTLY, THE INTRODUCTION OF CORRECTIONS WHICH TAKE INTO ACCOUNT THE VALUE OF THE APERTURE INTO MEASUREMENT RESULTS OF THE MII-4 INSTRUMENT IS NOT ONLY SUPERFLUOUS, BUT IS COMPLETELY IMPERMISSIBLE. INTERFERENCE CIRCUITS EFFECTED ACCORDING TO THE PRINCIPLE OF BANDS OF EQUAL THICKNESS, THE WIDTH OF THE INTERFERENCE BAND IS LINKED IN A CONSISTENT MANNER TO THE APERTURE OF THE ILLUMINATING PENCIL OF RAYS. IN MEASUREMENTS WITH INSTRUMENTS OF THIS TYPE (MII-9), A CORRECTION TAKING INTO ACCOUNT THE VALUE OF THE APERTURE MUST BE INTRODUCED INTO THE RESULT OF THE MEASUREMENTS.

UNCLASSIFIED

3/3 015

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0115392

ABSTRACT/EXTRACT--EXPANSION OF THE INTERFERENCE BAND AS THE APERTURE INCREASES WITH INTERFERENCE OF EQUAL THICKNESS PERMITS THE ASSUMPTION TO BE MADE THAT IN SUCH A CASE, IN THE REGION OF THE LOCALIZATION OF INTERFERENCE BANDS THERE TAKES PLACE A RESUPERPOSITION OF INTERFERENCE MAXIMA (OR MINIMA) DUE TO RAYS OF DIFFERENT DIRECTIONS. IN SUCH A CASE A COMPLEX INTERFERENCE PATTERN ORIGINATES, WHICH REQUIRES ADDITIONAL THEORETICAL AND EXPERIMENTAL RESEARCH.

USSR UDC 616.988.75+616.988-06:616.981.25]-06:616.127-092.9

MAKSIMOV, V. A., Balyabin, A. A., DYGIN, V. P., Pervomayskiy, A. G., and Topleninova, K. K., Chairs of Faculty Therapy, Microbiology and Pathological Anatomy, Military Medical Academy imeni S. M. Kirov, Leningrad

"Myocardial Lesions in Experimental Influenza and Mixed (Viral-Staphylococcal Infection"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 1, 1971, pp 21-25

Abstract: EKG examination of mice several days after intranasal infection with influenza A1 virus revealed pronounced bradycardia, marked slowing of intraventricular conduction, lengthening of electric systole, and deviation of the electric axis of the heart to the right. Histological study of the myocardium showed evidence of circulatory disorders, edema of connective tissue, and degenerative changes in the muscle fibers. Influenza combined with staphylococcal infection produced more severe degenerative and inflammatory changes in the myocardium. Similar changes occurred when staphylococcal infection preceded influenza.  
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MAKSIMOV, V. A., et al., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 1, 1971, pp 21-25.

In the 3rd week of the mixed infection, antibodies to the heart were found in the serum of several animals whose EKG's showed substantial changes caused by inflammatory and sclerotic phenomena in the myocardium. This suggests that autoimmune mechanisms may be involved in the myocardial lesions resulting from mixed influenza and staphylococcal infection.

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1/2 . 010 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--CONDENSATION OF AROMATIC COMPOUNDS WITH ALLYL TYPE HALIDES. X.  
CATALYTIC ALPHA REARRANGEMENT OF 4,3,CHLORO,2,BUTENOXY,TOLUENE -U-  
AUTHOR--(04)-BUNINAKRIVORJKOVA, L.I., YAGODIN, V.G., MARTYNOVA, V.P.,  
BALYAN, KH.V. B  
COUNTRY OF INFO--USSR  
SOURCE--ZH. ORG. KHIM. 1970, 6(5), 991-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ZINC CHLORIDE, CATALYST, CONDENSATION REACTION, TOLUENE,  
CHLORINATED ORGANIC COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1342 STEP NO--UR/0366/70/005/005/0991/0995  
CIRC ACCESSION NO--AP0135016  
UNCLASSIFIED

2/2 010

UNCLASSIFIED

PROCESSING DATE--13:0V70

CIRC ACCESSION NO--AP0135016

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CLAISEN REARRANGEMENT OF P-MEC  
SUB6 H SUB3 OCH SUB2 CH:CCLME GIVES P-MEC SUB6 H SUB4 OH, HOC SUB6 H  
SUB4 (CH SUB2 CH:CCLME) ME-2,4, AND HOC SUB6 H SUB2 (CH SUB2 CH:CCLME)  
SUB2 ME-2,6,4, SHOWING THAT THE REACTION IS INTERMOL. THE REARRANGEMENT  
INVOLVES THE ALPHA-C ATOM OF OCH SUB2 CH:CCLME (L. I. DUNINA-KRIVORUKOVA  
ET AL., 1968). THE REARRANGEMENT RATE DEPENDS ON THE AMT. OF CATALYST  
(ZNCL SUB2), SOLVENT POLARITY (DECALIN, PHNO SUB2, O-HOC SUB6 H SUB4 NO  
SUB2), AND TEMP. FACILITY: LENINGRAD. TEKHNOL. INST. IM.  
LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--CONDENSATION OF AROMATIC COMPOUNDS WITH ALLYL HALIDES. IX.  
ALKENYLATION OF NITROPHENOLS BY 4 CHLORO 2 PENTENE -U-  
AUTHOR--(03)--MARTYNOVA, V.P., BUNINAKRIVORUKOVA, L.I., BALYAN, KH.V.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 775-81  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ORGANIC NITRO COMPOUND, PHENOL, CHLORINATED ORGANIC COMPOUND,  
ALKYLATION, CHEMICAL REDUCTION, CATALYST, PALLADIUM  
CCNTRGL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--2000/1944 STEP NO--UR/0366/70/006/004/0775/0781  
CIRC ACCESSION NO--AP0125533  
UNCLASSIFIED

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2/2 017

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0125533

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. THE ALKENATION OF O, M, AND P NITROPHENOLS WITH MECHCLCH:CHME (I) IN ACETONE SOLN. CONIG. K SUB2 CO SUB3 GAVE O, M, AND P O SUB2 NC SUB6 H SUB4 OCHMECH:CHME (II) AND SMALL AMTS. OF O SUB2 NC SUB6 H SUB3 (OH)CHMECH:CHME 2,3 (III). THE FORMATION OF III IS DUE TO THE REARRANGEMENT OF O II ISOMER AND NOT TO C ALKYLATION. HEATING II IN DECALIN AT 150-60DEGREES GAVE III AND ITS OTHER 2 ISOMERS. THE REDN. OF II OVER PO-CACO SUB3 CATALYST G'VE H SUB2 NC SUB6 H SUB4 OCHMECH:CHME. THE ATTEMPTED ALKENYLATION OF NITROPHENOLS WITH I IN MEQH GAVE ONLY 4 METHOXY 2 PENTENE; THE ALKENYLATION WITHOUT SOLVENTS GAVE THE STARTING NITROPHENOLS AND TARS. FACILITY: LENINGRAD. TEKHNOL. INST. IM. LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED



USSR

UDC: 582:616-001.4

KAMYSHKO, O. P., LESHCHENKO, V. M., and BALYASNIKOV, V. I., All Union Institute of Plant Protection, Leningrad, and Central Dermato-Venereological Institute, Moscow, and Leningrad Scientific Research Institute of Antibiotics

"Mycoflora Wound"

Leningrad, Mikologiya i Fitopatologiya, Vol 4, No 6, 1970, pp 523-524

Abstract: A patient was observed who had an ulcer of the shin for 20 years following a traumatic injury. *Aspergillus clavatus*, *A. niger*, *Penicillium chrysogenum*, *Scopulariopsis brevicaulis*, and *Rhizopus* sp. were isolated from the ulcer and the bandages. The cultures of all of these species except *Rhizopus* sp. had a strong proteolytic activity, completely liquifying gelatin within 7 days at 24°C. Local application of fungicides expedited healing of the ulcerous wound. The lasting presence of fungi in the wound in this case and in similar cases cannot be explained by saprophytism on dead tissue; one must assume that the fungi bring about death of living cells through the action of enzymes, toxins, and other substances and that they thus function as parasites. Fungi may become adapted to parasitism

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KAMYSHKO, O. P., et al, Mikologiya i Fitopatologiya, Vol 4, No 6, 1970, pp 523-524

of this sort and should then be regarded as infectious agents. Therapeutic measures for the treatment of slowly healing wounds should be devised on the basis of a consideration of the composition of mycoflora present in them.

2/2

USSR

UDC: 531.383

BALYASNIKOVA, A. N., KOROVKIN, A. M., PEVZNER, Ye. M., Leningrad Institute of Precision Mechanics and Optics

"Calculating the Potential of the Rotor in an Electrostatic Gyroscope"

Leningrad, Izvestiya VUZov: Priborostroyeniye, Vol 16, No 2, 1973, pp 72-77

Abstract: A procedure is outlined and expressions are derived for calculating the potential of the rotor of an electrostatic gyroscope in the case of arbitrarily directed displacements of the rotor which are small in comparison with the electrode-rotor gap for geometrically distinct electrode systems. An electrode system classification is proposed which enables determination of the general properties of a given system. In accordance with the proposed classification, conditions are found which guarantee zero rotor potential for electrode systems of various geometry.

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UDC: 531.383

BALYASNIKOVA, A. N., KOROVKIN, A. M., FEVZNER, Ye. M., Leningrad Institute of Precision Mechanics and Optics

"Concerning the Influence of Orthogonal Axes of the Suspension of an Electrostatic Gyroscope in the Case of Zero Rotor Potential"

Leningrad, Izvestiya VUZov: Priborostroyeniye, Vol 16, No 2, 1973, pp 84-87

Abstract: The paper deals with the question of determining the mutual influence of a system of electrodes in a suspension with three mutually perpendicular axes, assuming conditions of zero rotor potential for small rotor displacements. The proposed formulas can be used to derive expressions for the forces acting on all three axes at large rotor displacements as well.

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BAL YASNIKOVA, A.N.

COMPUTING THE ROTOR POTENTIAL OF AN ELECTROSTATIC GYROSCOPE  
Article by A. N. Bal'yasnikova, A. M. Kazepkin, and Ye. M. Petrova, Leningrad,  
Institute of Electrodynamics and Systems, Leningrad, Izvestiya Vuzov,  
Elektrotekhnika, No. 1, January 1971, recommended by Chair of Elec-  
trical Engineering, submitted 13 April 1972, pp 72-77

UDC 531.383

Handwritten notes: 12.11.73, 12.11.73

Handwritten circled number: 3

In the article the problem of the determination of a rotor potential of an electrostatic gyroscope is considered, with respect to motions of the rotor that are arbitrary with respect to direction and small with relationship to the clearance between the electrode and the rotor. A classification of systems of electrodes is proposed, which makes it possible to determine the general properties of some system either. In accordance with the proposed classification, conditions are derived for provision of a zero potential of the rotor for systems of electrodes that differ with respect to geometry.

As is well known, the magnitude of the drift of an electrostatic gyroscope is determined basically by the moments of the forces of electrostatic and magnetic origin. The moments of the forces of the electric field depend upon the potential induced in the rotor, the value of which varies in the motion of the rotor. Thus, for an estimate of the moment acting on the rotor of a gyroscope it is necessary to know the magnitude and the sign of the rotor potential.

The problem of the determination of the rotor potential is considered with reference to a suspension (gimbal) operating on direct voltage, with the following conditions and assumptions: the electrodes are arranged along the three mutually perpendicular axes of the gimbal; the displacements of

The rotor are small in comparison with the electrode-rotor clearance boundary effects do not exist and the electrical field is homolized in the clearance between the electrode and the rotor.

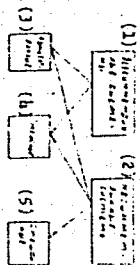


Figure 1. Classification of electrodes. 1) axially symmetrical systems; 2) asymmetrical systems; 3) concentric; 4) contiguous; 5) mixed.

Systems of electrodes are encountered in practice, providing for suspension of the rotor, which, with respect to design formulation, may be divided in the following manner (Figure 1):

1) axially symmetrical systems--systems in which the dimensions and mutual arrangement of the electrodes along each of the axes of the suspension coincide (Figure 2, a, b);

2) asymmetrical systems--systems in which, for the purpose of giving the design, are whole some definite properties, the dimensions or mutual arrangement of the electrodes along one of the axes of the suspension do not coincide with the dimensions or mutual arrangement of the electrodes along the other axes (Figure 2, c, d).

Depending upon the design formulation of the electrodes, along the axes of the suspension, the systems listed above may be: cont. (Figure 2, a)--systems in which some axis of the suspension is the axis of symmetry of all the electrodes, providing for suspension of the rotor along this axis; contiguous (Figure 2, b)--systems in which the pairs of electrodes providing the forces in the direction of some axis of the suspension are arranged contiguously relative to this axis, which is also the axis of symmetry of the pairs of electrodes; or mixed (Figure 2, c, d).

Such a classification makes it possible to determine the general properties proper to some system or other of electrodes.

BALYASNIKOVA, A.N.

Electromechanics

Electromechanics

JPRS 56238

12 June 1972

CALCULATION OF CAPACITANCE OF SPHERICAL ELECTRODE-ROTOR

UDC 621.317.7

Article by A. N. Balyasnikova, A. M. Korovkin, Leningrad Institute of Precision Mechanics and Optics; Leningrad, Izvestiya Vseshikh Nauchno-Issledovatel'skikh Prikladnoyestroyeniye, Russian, Vol 15, No 3, 1972, signed to press 12 October 1970, pp 83-86

Equations are proposed for calculating the capacitance of a spherical electrode-rotor with arbitrary displacement of the latter. Graphs are presented that give the dependences of capacitance on the relative displacement of the rotor for electrodes in the form of a spherical ring and segment.

As we know, information on the position and direction of the motion of the rotor of an electrostatic gyroscope can be obtained by means of optical, capacitance or induction sensors. When a capacitance sensor is used change in the position of the rotor of a gyroscope leads to change in the capacitance of the electrode-rotor, and consequently to change of the output signal of the rotor position sensor. Moreover, the displacement derivative of capacitance enters in the expression for the mechanical force acting on the rotor, from the electrodes [1]. Therefore the question of deriving an expression for the capacitance of the electrode-rotor as a function of rotor displacement, sufficiently accurate and convenient for practical use, is very important.

In many sources the authors replace the spherical electrode-rotor capacitor with a flat one [2]. This introduces, as illustrated in [3], considerable error in the expression for capacitance, even for small rotor displacements.

A general expression was derived [3] for determining spherical electrode-rotor capacitance with consideration of the curvature of the surface of displacement of the rotor in an arbitrary direction. The problem, however, was solved for small rotor displacement.

USSR

UDC 911.3.613.11(98)

BALYASNIKOVA, I. V.

"The Physiological Level of Intra-Ocular Pressure in Residents of the Far North"

V sb. Akklimatiz. i krayev. patol. cheloveka na Severa (Acclimatization and Pathology of Man in the Far North--collection of works), Arkhangel'sk, 1970, pp 19-20 (from RZh-36. Meditsinskaya Geografiya, No 1, Jan 71, Abstract No 1,36.52 by T. Koretskaya)

Translation: Intra-ocular pressure was measured with a Maklakov tonometer in 1,000 Northerners aged 20-60 years and older. Intra-ocular pressure from 16 to 26 mm Hg was found in 98.4% of the cases, while a pressure of 27 mm Hg was found infrequently (1.6%). Age and intraocular pressure are correlated: people under 40 had lower pressure than older people. Residents of Arkhangel'sk Oblast have intra-ocular pressure within high normal limits. Assymetry of intra-ocular pressure between one eye and the other is found fairly frequently (from 2 to 4 mm Hg in 32.7%). Great assymetry is very rarely observed.

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USSR

UDC: 51

SHOSTAK, V. F., YAZIK, A. V., BALYASNY, L. M.

"Two-Level Structure of Solution of Optimization Problems in Complex Automated Control Systems Using Models of Subsystems"

Pribory i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Devices and Systems of Automation. Republic Interdepartmental Thematic Scientific and Technical Collection), 1973, vyp. 26, pp 63-72 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V555 by the authors)

Translation: The problem of optimizing a complex system designated by models of subsystems is considered. A formalized description is presented, and the structural singularities of solution of the optimization problem are analyzed. Two-level optimization structure is considered, the advantages of realization of such a structure are pointed out, and an example is given.

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VSSR

UDC: 51

SHOSTAK, V. F., YAZIK, A. V., and BALYASNYI, L. M.

"Two-Level Structure of the Solution to Optimization Problems in Complex Automated Systems of Control Using Subsystem Models"

Pribery i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Automation Systems and Instruments, Republic Interdepartmental Thematic Scientific-Technical Collection) No 26, 1973, pp 63-72 (from RZh--Matematika, No 7, 1973, Abstract No 7V555)

Translation: The problem of optimizing a complex system specified by subsystem models is examined. Formalized description and analysis of the structural characteristics of the problem's solution are given. A two-level optimization structure is considered, its superiority is demonstrated, and examples are given. Authors' abstract.

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USSR

UDC: 51

IL'IN, V. D., KUROV, B. N., and SALYGA, V. I.

"Effectiveness of the Optimal Control of Energy Systems"

Pribory i sistemy avtomatiki. Resp. mekhan. temat. nauch.-tekhn. sb. (Automation Instruments and Systems, Republic Interdepartmental Thematic Scientific-Technical Collection) No 26, 1973, pp 112-116 (from RZh--Matematika, No 7, 1973, Abstract No 7V573)

Translation: The model of a thermal energy system is examined with respect to its application to the problem of optimizing the distribution of the active loads among electric power stations. Various algorithms in the form of programs for an electronic computer are presented. A combination of algorithms in the FORTRAN-4 language is devised. Authors' abstract.

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USSR

UDC: 51

IL'IN, V. D., KUROV, B. N., and SALYGA, V. I.

"Synthesis of Algorithms for Controlling Complex Systems"

Priboiy i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Automation Systems and Instruments, Republic Interdepartmental Thematic Scientific-Technical Collection) No 26, 1973, pp 107-111 (from RZh--Matematika, No 7, 1973, Abstract No 7V553)

Translation: The problem of comparing competitive algorithms with a standard algorithm is considered. Criteria of comparative effectiveness and of the comparison condition are formulated. The problem of determining the number of tests for comparing the algorithms in a specified time interval is examined. Conditions are given for comparing solutions; these can be used to choose the most effective algorithm for a given energy system. Authors' abstract.

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USSR.

UDC 539.4

GEMINOV, V. N. and BALYBERDIN, V. S., Institute of Metallurgy imeni A. A. Baykov, USSR Academy of Sciences (Moscow, Chelyabinsk)

"Generalization of the Fatigue Equation and its Application to the Analysis of Unsteady Regimes"

Kiev, Problemy Prochnosti, No 11, Nov 73, pp 68-72

Abstract: A mathematical model of the accumulation of injuries, which also takes hardening into account, is developed on the basis of a kinetic equation of the dislocations. A method for the extrapolation of fatigue-test data is proposed, as well as a method for the determination of longevity under unsteady operating conditions. Containing four determining parameters in its complete form, in its simplified version the equation contains three. Statistically processed experimental evidence on the basis of alloys D16T and D16 and steel 3 confirms the fact that the summation of injuries can be conducted in accordance with the simplified version of the formula for low-hardening materials. 4 figures. 2 tables. 3 references.

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USSR

UDC 621.039.8.629.7.036.8

BALYBERDIN, V. V.

"Application of Short-Lived Isotopes to Heat Working Bodies"

Samoletostr. i tekhn. vozd. flota. Resp. mezhved. nauchno-tekhn. sb.  
(Aircraft Building and Air Fleet Engineering, Republican Interdepartmental Scientific-Technical Collection), 1970, vypusk 18, pp 35-37 (from Referativnyy Zhurnal-Aviatsionnyye i raketnyye dvigateli, No 12, Dec 70, Abstract No 12.34.186, Resume)

Translation: M. Namias' proposal on the possible use of the short-lived  $Al^{27}$  isotope to heat the working body in jet engines is examined. With existing concepts of the activation of specimens in jet irradiators taken into account, a relationship was obtained for specimen activity as a function of neutron flux, cross-section of irradiated core for thermal neutrons, and several other variables. The irradiation time was assumed to be five times the half-life. It was established that for thermal neutron fluxes in the center of a reactor, with a value of  $10^{15}$  neutrons/cm<sup>2</sup>, the mass of the irradiated specimen must be  $3.64 \cdot 10^6$  kg. The energy released in radioactive beta-decay will be adequate only for a 100-sec flight of a rocket with a lift-off weight of 30 tons. Illustrations: 2. Bibliography: 3 entries.  
1/1

1/2 015 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--METHOD OF INVESTIGATING ENERGY DISSIPATION IN MATERIALS UNDER  
STATIONARY CYCLIC LOADING -U-  
AUTHOR-(03)-TROSHCHENKO, V.T., BALYDERDIN, V.S., KOKOVIN, A.G.  
COUNTRY OF INFO--USSR  
SOURCE--PROBLEMY PROCHNOSTI, VOL. 2, MAY 1970, P.18-20  
DATE PUBLISHED-----70  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS, METHODS AND  
EQUIPMENT  
TOPIC TAGS--HYSTERESIS, STRESS, FATIGUE TEST, CYCLIC LOAD TEST  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3006/1434 STEP NO--UR/3663/70/002/000/0018/0020  
CIRC ACCESSION NO--AP0135105

2/2 015

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--A0135105

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISCUSSION OF A FACILITY DEVELOPED FOR MEASURING THE ENERGY DISSIPATION IN MATERIALS DURING FATIGUE TESTING. A DISTINCTIVE FEATURE OF THE FACILITY IS THAT ENERGY DISSIPATION IS MEASURED BY MEASURING THE DISPLACEMENT ANGLE BETWEEN THE STRESS AND STRAIN IN THE SAMPLE UNDER CONDITIONS OF UNIFORM STRESSED STATE. THIS MAKES IT POSSIBLE TO MEASURE ENERGY DISSIPATION BY THE DYNAMIC HYSTERESIS LOOP METHOD AT VERY LOW STRESS LEVELS. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, INSTITUT PROBLEM PROCHNOSTI, KIEV, UKRAINIAN SSR.



USSR

UDC: 531.1

BALAYEVA, I. A., Moscow

"Problem of Controlling the Motion of a Solid Body in the Absence of Information on Angular Velocity"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Tverdogo Tela, No 4, Jul-Aug 73, pp 15-21

Abstract: A problem is studied of controlling the motion of a solid body about a mass center. The problem requires the coincidence of one of the body axis with a given direction in space and the reduction of the absolute angular velocity to zero. The author assumes the direction cosines of the angles between a given direction and two axes which are rigidly connected to the body as the only known values in contrast to the ordinary way of setting up the problem using total information on the angular position and the absolute angular velocity of the body. The author proposes some real system for controlling the motion of a body which can solve the postulated problem in order to explain the possibility in principle for setting up such a system.

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EQUIPMENT  
Aeronautical

USSR

UDC 629.7.028.25

BALYKIN, M. S., GOLUBEV, Yu. V.

"A Device for Loading Containers Onto Aircraft"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 21, Jul 73, Author's Certificate No 380536, Division B, filed 28 Jul 69, published 15 May 73, p 67

Abstract: This Author's Certificate introduces a device for loading containers onto aircraft. The device contains a winch with a system of cables passing over rollers. The cables are fastened by pairs to the flanges of girders mounted on the containers. As a distinguishing feature of the patent, the working reliability of the device is improved by including a transfer link with one end connected by a cable to the winch, while the other end is connected to the hoisting cables on the container. This transfer link is made with a T-head which fits in a guide groove on girders in the deck of the aircraft.

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A0052389 - BALYKIN M.S.

UR 0482

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

243414 LIFTING DEVICE FOR AEROPLANES consists of truck, with loading platform 2, and is distinguished by mounting a polypast on the loading platform. The polypast lower block 3 is fixed to the platform, whereas the upper one is used to fix the aeroplane into the board. The polypast cable are connected to the hoist 9 fixed to the truck.

17.2.68 as 1218674/40-23.M.S.BALYKIN et al.(15.9.69)  
Class 62c.Int.Cl.B 64E.

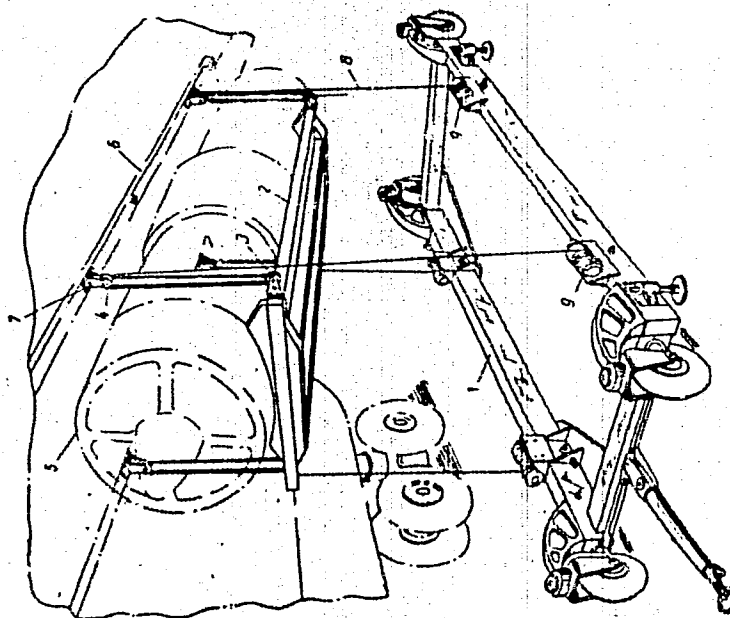
Balykin, M. S.; Golubev, Yu. V.; Nikiforov, L. A.;  
Chernyshev, A. S.; Shekhterman, Ye. I.

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AA0052389



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1/2 008 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--STATE OF THE SURFACE LAYER OF QUARTZ PLATES DURING DIAMOND GRINDING  
-U-  
AUTHOR--(02)-POPOV, S.A., BALKOV, A.V. *B*  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, VESTNIK MASHINOSTROYENIYA, NO 2, 1970, PP 73-76  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, EARTH SCIENCES AND  
OCEANOGRAPHY, MATERIALS  
TOPIC TAGS--QUARTZ, DIAMOND, ABRASIVE, MATERIAL GRINDING  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3003/1872 STEP NO--UR/0122/70/000/002/0073/0076  
CIRC ACCESSION NO--AP0130699  
UNCLASSIFIED



USSR

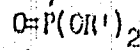
UDC 547.57

KOZLOV, N. S., PAK, V. D., GARTMAN, G. A., and BALYKOVA, I. A.

"The Direction of the Reaction of Arylidenemethylamines with Diphenyl and Dialkyl Phosphites"

Leningrad, Zhurnal Obshechey Khimii, Vol 43, No 11, Nov 73, pp 2360-2363

Abstract: It had been established in earlier work by Kozlov et al (Izv. AN Beloruss. SSR. Ser. Khim., No 3, 95, 1967; No 2, 199, 1968; No 2, 113, 1968) that aminophosphonic esters are the principal products of the reaction of aromatic azomethines with diphenyl and dialkyl phosphites. In this instance the reaction of arylidenemethylamines  $RC_6H_4 CH=NMe$  with diphenyl and dialkyl phosphites was studied. In the majority of cases monophenyl- and monoalkyl-phosphite ammonium complexes of azomethines formed:  $RC_6H_4 CH=NMe + (R'O)_2POH + H_2O \rightarrow (RC_6H_4 CH-NHMe)^+ \overset{-}{O}P(OR')OH$  (I) +  $R'OH$ . In some instances, however, amino-phosphonic esters formed under identical conditions from arylidenemethylamines and dialkyl phosphites:  $RC_6H_4 CH=NMe + (R'O)_2 POH \rightarrow RC_6H_4 CHN(OR')_2$  (II). The dual



direction of the reaction of arylidenemethylamines can be explained by the  
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USSR

KOZLOV, N. S., et al., Zhurnal Obshchey Khimii, Vol 43, No 11, Nov 73, pp 2360-2363

higher basicity of arylidenemethylamines as compared with aromatic azomethines. As a result, the nucleophilic activity of the azomethines was reinforced. The properties of the compounds I and II that were synthesized are listed in tables.

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USSR

UDC: 681.3.001:518.5

BALYUKEVICH, E. D.

"Determination of Optimal Sequences of Stages in Data Processing"

Tr. Mosk. Ekon-statist. In-ta. Fiz-mat. N. [Works of Moscow Economic-Statistical Institute. Physical and mathematical sciences] Part 1, 1970, pp 20-29 (translated from Referativnyy Zhurnal Avtomatika, Telemekhanika I Vychislitel'naya Tekhnika, No 3, 1971, Abstract No 3 B80 by B. G.)

Translation: The following mathematical model of a sequence of stages in data processing is studied. A certain sequence of stages  $x_{i_1}, x_{i_2}, \dots, x_{i_n}$ , called the specific realization of the operation of processing, is selected. The expenditures of resources on transition from stage  $x_k$  to stage  $x_e$  is represented by  $C_{kl}$  and is equal to  $C_{kl} = C_{kl}(x_{i_1}, x_{i_2}, \dots, x_{i_p})$ : where  $k = 0, 1, 2, \dots, n$ ;  $l = 1, 2, \dots, n$ ,  $x_{i_1}, x_{i_2}, \dots, x_{i_n}$  are stages preceding  $x_e$  in the specific sequence selected.  $C_{0l}$  represents the expenditures of resources on performance of stage  $x_e$  when it occupies the first position in the sequence. Of all possible sequences, we must select that

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USSR

UDC: 681.3.001:518.5

BALYUKEVICH, E. D., Tr. Mosk. Ekon-statist. In-ta. Tiz-mat. N., Part 1, 1970, pp 20-29

for which the quantity

$$W = C_{i_0 i_1} + C_{i_1 i_2} + \dots + C_{i_{n-1} i_n} = \sum_{t=0}^{n-1} C_{i_t i_{t+1}}$$

is minimal. It is suggested that the problem be solved by an algorithm of dynamic programming, based on the recurrent expression

$$W_{ik}(i_{k+1}, \dots, i_n) = \dots \\ = \min_{k+1 < m < n} [C_{i_k i_m} + W_{im}(i_{k+1}, \dots, i_{m-1}, \dots, i_n)].$$

The basic specifics of the realization of the algorithm suggested, related to placement of the matrices of initial and intermediate data in machine memory, are discussed. 2 biblio. refs.

2/2

USSR

UDC 512.25/.26+519.3.330.15

BALYUKEVICH, E. D.

"Determination of Optimal Sequence of Data Processing Steps"

Tr. Mosk. Ekon.-Statist. In-ta. Fiz-mat. n. [Works of Moscow Economics-Statistics Institute, Physical and Mathematical Sciences], Part 2, 1970, pp 20-29  
(Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V561).

No Abstract.

1/1

Aeronautical and Space

USSR

BAM-ZELIKOVICH, G. M. (Moscow)

"Concerning Criteria of the Separation of a Three-Dimensional Boundary Layer"

Moscow, Mekhanika Zhidkosti i Gaza, No 4, Jul-Aug 70, pp 50-54

Abstract: Under the assumption that the character of the flow in a given profile of a boundary layer depends only upon the behavior of the external flow in a small neighborhood of the profile under consideration, criteria have been derived for the separation of the laminar and turbulent boundary layer in the case of three-dimensional flow. The obtained separation criteria are a corrolary of a necessary condition for the separation of a three-dimensional boundary layer obtained in a very recently published paper. 4 bibliographic entries.

1/1

Oscillators & Modulators

USSR

UDC 621.385.633:621.376.5

BALYUK, V.S., BONDARENKO, A.A., KOTENKO, YE.G., LESHCHENKO, A.F.

"Thyristorized Modulator Of Control Electrode Of Type M Backward-Wave Tube"

Elektron.tekhnika. Nauch.-tekhn. sb. Elektron. SVCh (Electronics Technology. Scientific-Technical Collection. Microwave Electronics), 1972, Issue 4, pp 100-101 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 1972, Abstract No 9A151)

Translation: The paper describes a simple thyristorized modulator of the control electrode of a Type M backward-wave tube, fulfilled on the basis of semiconductor devices. The distinctive feature of the modulator is the use of a thyristorized relaxator for production of a series of pulses. The output parameters of the modulator are: amplitude of voltage pulse, 1.5--20 kV; duration of series, 1--40 microsec. with the frequency of the pulse sequence, 100--2.5 GHz. Summary.

1/1

Construction

USSR

OKULOVA, M. N., BALLYURA, M. V.

"Lateral Thrust and Its Significance in the Settling of Foundations"

Tr. Novocherkas. Politekhn. In-ta [Works of Novocherkask Polytechnical Institute], Vol 238, 1971, pp 88-92, (Translated from Referativnyy Zhurnal, Mekhanika, No 4, 1972, Abstract No 4 V808 by Yu. M. Lychko).

Translation: Results are presented from experiments on measurement of horizontal displacements developing upon loading of soils with a vertical load. The experiments were performed in a metal box measuring 1.4 x 1.4 x 1.4 m using sands and clay soils of broken structure. The load on the soil was applied through a rigid concrete stamp measuring 40 x 40 cm in stages of 0.25-0.50 kg/cm<sup>2</sup> to a relative impression of 0.5 to 1. Horizontal displacements were measured by a depth using five marks of special design with an accuracy of 0.01 mm. The curves of horizontal displacements produced in testing the soils are analyzed. It is noted that horizontal displacements in loaded bases depend on the type and density of the soil and are significant in general volumetric deformation.

1/1

USSR

UDC: 621.372.85

KRAVCHENKO, V. F., ZHILKOV, V. S., SALYGA, V. I., USTIMENKO, V. V., ~~BAKLANOV, O. D.~~  
ZAMOV, B. H., BAKLANOV, O. D.

"On the Possibility of Constructing Automatic Matching Circuits in the Microwave Band"

Pribory i sistemy avtomatiki. Respubl. mezhved. nauch.-tekhn. sb. (Devices and Systems for Automation. Republic Interdepartmental Scientific and Technical Collection), 1971, vyp. 15, pp 75-77 (from EZh-Radiotekhnika, No 6, Jun 71, Abstract No 6B188)

Translation: The authors consider circuit designs for automatic matchers for waveguide channels. Possible versions for practical realization of these circuits are considered, and it is also pointed out that impedance transformers based on using bodies of the proper shape can be used in automatic matchers. It is concluded that adaptive automatic matchers can be made for operation over a wide frequency band. Resumé.

1/1

- 36 -

Waveguides

USSR

UDC: 621.372.852.6

BAKLANOV, O. D., BAL'ZAMOV, B. N., USTIMENKO, V. V., IVANOV, N. S., KRAV-  
CHENKO, V. F., ~~ZHIBROV, V. S.~~, KHIZHNIK, N. A., PIROTTI, Ye. L.

"An Impedance Transformer Based on a Cylindrical Waveguide"

Pribory i sistemy avtomatiki. Resp. mezhved. nauch.-tekhn. sb. (Devices and  
Systems for Automation. Republic Interdepartmental Scientific and Technical  
Collection), 1970, vyp. 14, pp 11-15 (from RZh-Radiotekhnika, No 5, May 71,  
Abstract No 5B152)

Translation: The paper describes the design of an impedance transformer based  
on a cylindrical waveguide. An analysis of the results of experimental  
studies shows that practical realization of the device is feasible in micro-  
wave technology. The proposed design may find application in synthesis of  
automatic lines based on cylindrical waveguides. Resumé.

1/1



USSR

UDC: 621.372.852.6

PIROTTI, Ye. L., BAKLANOV, O. D., BAL'ZAMOV, B. N., KRAVCHENKO, V. F.,  
ZHILKOV, V. S., KHIZHNIK, N. A., USTIMENKO, V. V.

"A Method of Calculating Impedance Transformers Based on Rectangular Waveguides"

Pribory i sistemy avtomatiki. Resp. mezhved. nauch.-tekhn. sb. (Devices and Systems for Automation. Republic Interdepartmental Scientific and Technical Collection), 1970, vyp. 14, pp 11-15 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5B151)

Translation: The authors proposed a fundamentally new method of calculating an impedance transformer on the basis of a strict solution of the internal problem of electrodynamics using integrodifferential equations. An analysis of the results of computational and experimental research shows that the procedure for calculating and designing the proposed model may find extensive practical application in a number of microwave devices as well as in the development of an automatic waveguide line. Five illustrations, bibliography of five titles. Resumé.

1/1

USSR

UDC 612.014.482-087.  
891.6

MOISEYEV, I. E., FEDOROV, G. A., and BAMBLEVSKIY, V. P., Moscow Engineering-Physical Institute, Moscow

"A Method of Recording by Means of a Spectrometer of Gamma-Quanta Emitted From the Human Body"

Moscow, Meditsinskaya Radiologiya, Vol 18, No 8, Aug 73, pp 42-47

Abstract: A method was developed which makes it possible to record gamma-quanta emitted by a radionuclide in the human body with results independent of the location of the source of radiation in the body. Calculations carried out on a computer on the basis of results obtained by measuring with an eight-crystal gamma spectrometer radiation emitted by 140-1460 keV  $^{137}\text{Cs}$  sources placed in various locations within the phantom showed that at a distance of the eight (NaI(Tl) crystals amounting to 10-30 cm from an elliptical cylinder air- or water-filled phantom (20-40 cm from the main axis of the phantom) the error in determinations of absolute activities in the range of  $\sim 10^{-7}$  C did not exceed 5%. The crystals were placed in a straight line parallel to the main axis of the phantom at distances of 25 cm from each other. The time of measurement was 2.5 min. The ellipse forming the cross-section of the phantom had a short axis of 20 and a long axis of 30 cm,  
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USSR

MOISEYEV, I. E., et al., Meditsinskaya Radiologiya, Vol 18, No 8, Aug 73, pp 42-47

respectively. A geometric mean of two measurements (above and below the phantom) was taken. On placement of the eight crystals along a straight line at a height of 10 cm from the phantom surface, a distance of 25 cm between the detectors, and gamma radiation in the 300-700 kev range, the ratio of the lengths of time of recording had to be 1.25:1:1:1:1:1:1:1.25. At this ratio the maximum variation of the count was 9 and 35% with changes of the position of the source in the direction of the length and over the cross-section of the phantom, respectively.

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06023

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UDC: 621.741.4.66.044.51:660.741

SIDOROV, Yu. I., ~~KAMENEVICH, V. R.~~ STARUSEV, V. A., MALYGIN, Ye. M.,  
KAZAKOVA, I. I., ZONOV, V. Ye., and UMRICHIN, P. V., Ural Polytechnic  
Institute

"Surface Alloying of Steel Castings With Boron"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya, No 8, 1970,  
pp 132-134

Abstract: A method of surface alloying of steel castings with boron regenerated from dehydrated borax ( $\text{Na}_2\text{B}_4\text{O}_7$ ) in the process of filling the mold is discussed. The reducing agents are aluminum, calcium, and silicon. The mechanism of boron reduction from borax comprises two stages: a) decomposition of borax into  $\text{Na}_2\text{O}$  and  $\text{B}_2\text{O}_3$ ; b) reduction of boron from its oxides. Data are given on changes in the free energy of boron reduction from borax. The results of a thermodynamics analysis and the study of kinetics regularities indicate silico-calcium and aluminum to be the most efficient reducing agents. The method of surface alloying with boron has been tested on experimental batches of low-carbon steel and has demonstrated its applicability under industrial conditions. The boron content on the surface of the casting was 0.5 to 0.7% and at a depth of 15 mm about 0.008 to 0.009%. The wear resistance of surface-alloyed parts was found to be two to three times that of ordinary parts.

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1/2 016 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--THERMAL BEHAVIOR OF EUROPIUM OXIDES -U-  
AUTHOR--IGNATYEVA, N.I., BAMBUROV, V.G. B  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, NEORG. MATER.; 6: 154-5(JAN 1970)  
DATE PUBLISHED----JAN70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--THERMAL EFFECT, OXIDATION, EUROPIUM COMPOUND, OXIDE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1981/0855 STEP NO--UR/0363/70/005/000/0154/0155  
CIRC ACCESSION NO--AP0050849  
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0050849

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMAL STUDIES WERE MADE OF THE LOWER EUROPIUM OXIDES IN THE AIR. X RAY ANALYSES SHOWED THAT OXIDATION PRODUCTS OF  $\text{EuO}$  AT 310DEGREESC ARE  $\text{EuO}$  AND  $\text{Eu SUB3 O SUB4}$ ; AT 310 TO 420DEGREESC  $\text{EuO}$ ,  $\text{Eu SUB3 O SUB4}$ , AND  $\text{B-Eu SUB2 O SUB3}$ ; AND AT 420 TO 710DEGREESC  $\text{Eu SUB3 O SUB4}$  AND  $\text{B-Eu SUB2 O SUB3}$ . SINTERING OF THE LOWER EUROPIUM OXIDES AT 710DEGREESC RESULTED IN A SINGLE PHASE MONOCLYNIC SPECIMEN OF  $\text{Eu SUB2 O SUB3}$  FOLLOWING THE CONVERSION OF  $\text{EuO}$  YIELDS  $\text{Eu SUB3 O SUB4}$  YIELDS  $\text{B Eu SUB2 O SUB3}$ .

UNCLASSIFIED

USSR

UDC 547.241

RAZUMOV, A. I., LIORBER, B. G., ZYKOVA, T. V., BAMBUSHEK, I. YA.,,  
Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan,  
Ministry of Higher and Secondary Specialized Education RSFSR

"Studies in the Series of Phosphinous and Phosphinic Acids. LXXIV.  
Intermediate Products of Arbuzov's Rearrangement of the Esters  
of Monoalkylphosphinous Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70,  
pp 2009-2010

Abstract: In the reaction of methyl iodide with saturated mono-alkylphosphinous esters having branched alkoxy groups, intermediate products may be isolated provided the reaction is carried out at a cold temperature. These compounds are colorless crystalline materials which can be stored for prolonged periods in cold. They are soluble to a limited extent in benzene and more soluble in chloroform and methylene chloride. At room temperature or on heating they decompose according to the second phase of the Arbuzov rearrangement, forming esters of alkylmethylphosphinic acids. According to the data from NMR spectroscopy these intermediate products 1/1 exist in the ionized form in both polar and nonpolar solvents.

USSR

UDC 538.27:547.341

RAZUMOV, A. I., LIORBER, B. G., ZYKOVA, T. V., BAMBUSHEK, I. YA.,  
Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan,  
Ministry of Higher and Secondary Specialized Education RSFSR

"Studies of the Derivatives of Phosphinic and Phosphinous Acids.  
LXVI. The Problem of Interaction Between the Double Bond and the  
Phosphorus Atom in Allylphosphinates and Phosphonites"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70,  
pp 1704-1707

Abstract: As a continuation of earlier studies, the previously  
synthesized derivatives of allylphosphinous- and -phosphinic acids  
were subjected to NMR spectroscopic analysis and compared with  
propyl analogues. It was determined that for all pairs examined  
the chemical shift of the phosphorus nucleus in the allyl deriva-  
tives was higher than in propyl analogues. Introduction of another  
allyl group resulted in a further shift of  $\delta_p$  towards the stronger  
field. Since the symmetry around the phosphorus atom was retained,  
the effect observed was due exclusively to the double bond intro-  
duced. Evidently the  $\beta$ -electrons of the C:O bonds interacted with  
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RAZUMOV, A. I., et al, Zhurnal Obshchey Khimii, Vol 40, No 8,  
Aug 70, pp 1704-1707

free phosphorus electrons from the d-orbitals, thus increasing its  
electron density. This was accompanied by delocalization of the  
electron cloud in the allyl radical, and the C:C bond electrons  
affect the d-orbitals.

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BAMDAS, A.M., ROGINSKAYA, L.E.

"A-C Voltage Regulator"

V sb. Entsiklopediya izmereniy kontrolya i avtomatiz. (Encyclopedia Of Measurements, Control, And Automation--Collection Of Works), No 14, Moscow, "Energiya," 1970, pp 31-34 (from RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12B558)

Translation: In a review article, a classification is made of various types of a-c voltage regulators (R) which is divided into parametric, compensation, and combined. Of the parametric R the most wide-spread is the ferroresonance which has an efficiency of 80-90 percent with a weight of 40 kg/kwt. Compensation R represent a closed system of automatic control. The types are described of control elements, measuring units [organ], sources of a reference signal, comparison units, and amplifier elements. In R of the combined type, the control element is controlled, both parametrically and with the aid of a control unit [blok]. R have been disseminated, the operating units of which are magnetic based elements: controlled choke coils, magnetic biased transformers and autotransformers, the weight of which is smaller than ferroresonance R, with powers exceeding 1 kw. The efficiency of R with magnetic biased elements is 80-90 percent. In the event of use of transistors in R a key [klyuch] regime of operation is advisable. The weight of one such R with an output power of 500 w amounts to 9 kg. It is possible to use thyristors in R. In one such R regulation is assured of the effective and average values of the output voltage with a weight of 4.6 kg for an output power of 500 w. 8 ill.19 ref. V.8h.

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USSR

UDC 621.396.69:621.314.2

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BAMDAS, A. M., SAVINOVSKIY, Yu. A.

"AC Chokes of Radio Electronic Equipment"

Drosseli peremennogo toka radioelektronnoy apparatury. (Katushki so stal'y).  
(AC Chokes of Radio Electronic Equipment (Steel-Core Coils)), Moscow,  
"Soviet Radio," 1969, 248 pp (from RZh-Radiotekhnika, No 1, Jan 70, Abstract  
No 1V333K, Ye. M.)

Translation: This book contains the basic information on very widespread low-power ac chokes with ferromagnetic cores -- simple steel-core coils -- and the processes in them. The operating theory of the choke is discussed. Theoretical investigations are performed considering nonlinearity of the ferromagnetic core and losses in the steel. An original procedure is presented for designing optimal ac chokes with standard and arbitrary codes based on using the parameters determined by the authors on digital computers. The book is intended for a broad class of engineers engaged in planning and designing various electrical devices and radio electronic equipment and also for postgraduates and students of the electrotechnical and radio technical departments. The bibliography has 81 entries and there are 84 illustrations.  
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BAM-ZELIKOVICH, G. M.

10.843  
CSOI 804/0633-M

SPATIAL MAGNETOHYDRODYNAMIC BOUNDARY LAYER IN AN INCOMPRESSIBLE LIQUID  
[Abstract of a Paper by G. M. Bam-Zelikovich, Given at a Magnetohydrodynamic Conference, pp 61-62]

The equations of the spatial boundary layer in an incompressible liquid in the presence of electric and magnetic fields were analyzed. A study was made of some general problems — the necessary conditions of the occurrence of a three-dimensional flow as a result of the effect of electromagnetic forces, the correctness of the theorem of secondary flows in the case of flow around a distorted surface and the presence of electromagnetic forces, and so on.

Examples are presented of three-dimensional flows in a magnetohydrodynamic boundary layer which can be encountered in the magnetohydrodynamic devices used in practice. These examples include, above all, flow into a corner where one wall is an electrode and the other, an insulator, and the electric current flows perpendicular to the electrode; but the magnetic field is perpendicular to the insulator (or the more general case where the electric field is perpendicular to the electrode as a result of which in the boundary layer the current can flow in one direction next to the insulator and at the edge of the boundary layer, in the other direction).

The three-dimensional flow also arises in the boundary layer on an insulator with Hall currents not equal to zero and a magnetic field perpendicular to the insulator (this case can be encountered, for example, in the Hall magnetohydrodynamic generator, the mixed type generator and the Wondard generator). The presence of the electric current component along the flow in this case leads to the occurrence of a secondary current perpendicular to the primary flow in the boundary layer at the insulator. This case, in turn, leads to the formation of a path vortex in the channel, the intensity of which becomes perceptible for large values of the parameter of the magnetohydrodynamic effect.

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SPRS 60634  
27 November 1973

USSR

UDC 532.526

BAM-ZELIKOVICH, G. M., Moscow

"Equations of the Spatial Boundary Layer in Areas with High Pressure Gradient"

Mekhanika Zhidkosti i Gaza, No 5, 1971, pp 49-55.

Abstract: Assuming that in areas with high pressure gradient the change in flow parameters in the direction perpendicular to the pressure gradient is slight in comparison with the change along the pressure gradient, calculation of the spatial boundary layer can be reduced to integration of equations similar to the equations for a two dimensional boundary layer along lines tangent to the pressure gradient.

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BAM-ZELIKOVICH, G. M., Moscow

"Necessary Condition of Separation of a Three Dimensional Boundary Layer"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti I Gaza, No 2, March-April 1970, pp 109-113

Abstract: In this article the deficiencies of the earlier proposed definitions of the separation line of a three dimensional boundary layer are pointed out. On the basis of analysis of the phenomena occurring on separation of the boundary layer, it is discovered that the necessary condition of separation of a three dimensional boundary layer is the presence of a line on the surface around which flow is taking place in which the current lines next to the wall are perpendicular to the pressure gradient. Possible configurations of the return current zone of the three dimensional boundary layer are investigated.

Different definitions of the separation line in the presence of three dimensional flow in the boundary layer are discussed. In one paper the separation line was defined as the envelope of the current boundary lines (that is, the lines which form the boundary of the current lines with approximation with respect to the normal to the surface around which the flow is taking place). In other papers the separation line was defined as the current boundary line passing through the point where the frictional stress on the wall  $\tau_w = 0$ . In another

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BAM-ZELIKOVICH, G. M., Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti I Gaza, No 2, March-April 1970, pp 109-113

paper the separation line was the line separating the flows from different regions. It is pointed out that the first two definitions of the separation line are not correct for an arbitrary three dimensional flow with separation although they may be satisfied in individual cases. For example, when flow with slip takes place around a cylinder of finite length there is separation of the boundary layer but there is no envelope of current boundary lines and no point at which  $\tau_w = 0$ . The third definition is also highly provisional. The separation line separates the regions with different nature of flow. However, the gas particles close to the separation line can be close in a large segment or even over the entire path even though they are on different sides of the separation line.

The practical examples where  $\tau_0 \text{ grad } p = 0$  and the forward limit of the return current zone is the separation line are investigated. The possible location of the forward boundary of the return current zone is investigated in detail.

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1/2 035 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--THE NECESSARY CONDITION FOR THE SEPARATION OF A THREE DIMENSIONAL  
BOUNDARY LAYER -U-  
AUTHOR--BAMZELIKOVICH, G.M. **B**  
COUNTRY OF INFO--USSR  
SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, MEKHANIKA ZHIDKOSTI I GAZA,  
MAR.-APR. 1970, P. 109-113  
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--BOUNDARY LAYER, FLOW SEPARATION

CCNTRCL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1331

STEP NO--UR/0421/70/000/000/0109/0113

CIRC ACCESSION NO--AP0124981

~~UNCLASSIFIED~~



2/2 035

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124981

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ANALYSIS OF FLOW CONDITIONS CONNECTED WITH THE SEPARATION OF THE THREE DIMENSIONAL BOUNDARY LAYER TAKING INTO CONSIDERATION THE TWO DIMENSIONAL CASE. SOME IMPERFECTIONS CONCERNING PREVIOUSLY PROPOSED DETERMINATIONS OF THE LINE OF SEPARATION FOR A THREE DIMENSIONAL BOUNDARY LAYER ARE SHOWN. THE CONDITIONS CONNECTED WITH THE SEPARATION OF THE THREE DIMENSIONAL BOUNDARY LAYER ARE INVESTIGATED. IT IS FOUND THAT THE PRESENCE AT THE SURFACE OF A LINE AT WHICH THE STREAMLINES CLOSE TO THE WALL ARE PERPENDICULAR TO THE PRESSURE GRADIENT IS A NECESSARY CONDITION FOR THE SEPARATION OF THE THREE DIMENSIONAL BOUNDARY LAYER.

UNCLASSIFIED

USSR

UDC 534

BANAKH, L. YA., PERMINOV, M. D., PETROV, V. D., SINEV, A. V.

"Methods of Calculating the Rigidity, the Inertia and Damping of Matrices for Complex Three-Dimensional Systems"

V sb. Vibrozolyatsiya mashin i vibrozashchita cheloveka-operatora (Vibration Insulation of Machines and Vibration protection of the Human operator-- collection of works), Moscow, Nauka, 1973, pp 67-81 (from RZh--Mekhanika, No 6, Jun 73, Abstract No 6A154)

Translation: A study was made of the methods of calculating the rigidity, inertia and damping matrices required to construct the solution of natural and forced oscillations of dynamic models of complex three-dimensional mechanical structures. It is proposed that the real structural element is replaced by a spatial system of solid states and lumped masses joined to each other by elastic couplings of the beam element type and joined to the foundation by means of shock absorbers. The formulas were derived which permit definition of the complete rigidity matrix of the system using the rigidity characteristics of individual elastic elements and the coordinate transformation matrices. It is demonstrated that in order to determine the complete damping matrices it is possible to use analogous formulas. Methods of compiling the inertial matrices were analyzed for a spatial system of solid states, and a study was made of the characteristic features of

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USSR

BANAKH, L. YA., et al., Vibroizolyatsiya mashin i vibrozashchita cheloveka-operatora  
Nauka, 1973, pp 67-81

calculating the matrices in the absence of inertial properties by a number of  
coordinates. A study was made of the problem of limiting the number of degrees  
of freedom in general case of the three-dimensional system. Several parameters  
of this restriction are presented. The bibliography has 7 entries.

2/2

- 115 -

USSR

UDC 621.373.826:550.3

BANAKH, V. A., KREKOV, G. M., and MIRONOV, V. L.

"Numerical Investigation of the Degree of Coherence in a Gaussian Beam Field Propagated in a Turbulent Atmosphere"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl. (Tenth All-Union Conference on the Propagation of Radio Waves; Report Theses--collection of works) "Nauka," 1972, pp 191-195 (from RZh--Radiotekhnika, No 10, 1972, Abstract 10D359)

Translation: Results of the computation of the degree of coherence are put in the form

$$\gamma(x, \vec{R}, \vec{\rho}) = \frac{|\Gamma_2(x, \vec{R}, \vec{\rho})|}{\langle I(x, \vec{R} + \vec{\rho}/2) \rangle^{1/2} \langle I(x, \vec{R} - \vec{\rho}/2) \rangle^{1/2}}$$

where  $\Gamma_2$  is the coherence function in integral form, and  $\langle I(x, \vec{R} \pm \vec{\rho}/2) \rangle = \Gamma_2(x, \vec{R} \pm \vec{\rho}/2, 0)$  are the average intensities. It is established that no dependence of  $\gamma(x, R, \rho, \Psi)$  on the position

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USSR

BANAKH, V. A., et al., V sb. X Vses. konf. po rasprostr. radiovoln. Tezisy dokl., "Nauka," 1972, pp 191-195

of the observation points relative to the beam center exists up to values of R equal to the diffraction radius of the beam. The length of coherence drops off with increasing focal length of the beam. Three illustrations, bibliography of five. A. L.

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- 26 -

USSR

UDC 621.314.58(088.8)

BANANOV, I.V., YERMOLIN, YU.A., KOZLOV, L.G., MASLYUKOV, O.A., SAVUSHKIN, A.K.  
~~MOB. in-t inzh. zh.-d. transp.~~---Moscow Institute Of Railroad Transportation Engineers

"Device For Control Of Frequency Converter"

USSR Author's Certificate No 251670, filed 23 May 68, published 30 Jan 70 (from  
RZh--Elektronika i yeye primeneniye, No 12, December 1970, Abstract No 12B524P)

Translation: The device proposed for control of a frequency converter contains a master unit with a multicell shift register and triggers. In order to simplify the device and to obtain optimum power, the output of one of the cells of the shift register is connected to one of the inputs of each trigger and the other input of each trigger is connected to the output of one of the next cells with respect to the performance of the shift register. 1 ill.

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USSR

UDC 539.562:669.27:62-426

BAHAS, F. P., NATAPOVA, A. B., SHEGAY, A. A., and SUKHAHOV, YU. V., Zaporozh'ye  
Machine-Building Institute Imeni V. L. Chubarya

"Tungsten Wire as a Reinforcement for Heat-Resistant Composite Materials"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 7, 1973, pp 45-46

Abstract: The strengths of VA, VT7, and VT15 alloys and of composite materials based on them were experimentally investigated. The results are presented in diagrams showing the temperature dependence of short-duration strength of tungsten wires and reinforced plates and the recrystallization of VT7 alloy wires. The wire of VA brand recrystallizes in the composite after 120-150 hr aging at 1100°C. In wires of VT7 alloy, a partial recrystallization takes place after 500-hr aging at 100°C. The 20-50 hr aging at 1200°C of the composite with tungsten reinforcement VA and VT7 results in complete collecting recrystallization in the wires. In wires of VA, VT7, and VT15 alloys, the process of collecting recrystallization begins at 1300°C after 6-7 hr aging. Two figures, two tables.

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- 11 -

USSR

UDC 69-419.4:669.24'26'28'27

BANAS, F. P., GAYDUK, V. V., NATAPOV, B. S., ALEKSANDROV, B. V.,  
and YEFIMENKO, L. N., Zaporozh'ye Machine Building Institute

"Nichrome-Molybdenum, Tungsten Composites"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8,  
1971, pp 6-11

Abstract: The article describes a process for obtaining composite sheet material based on nickel-chromium alloys reinforced with refractory metals and their alloys in the form of unidirectional wires and different types of gauze. Packs of alternating sheets of the matrix and reinforcing fibers with superimposed wire contour frame undergo isothermal hot pressing in a vacuum chamber. During pressing the wire contour frame seals the pack, which permits subsequent rolling of the pressed material in air at 1100-1150° C. Scale-resistant sheet alloys KhN78T (EI435) (20% Cr, 78% Ni, 1% Fe, 1% the balance) and VZh98 (29% Cr, 14%

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BANAS, F. P., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, 1971, pp 6-11

W, 56% Ni, 1% the balance) are used as the matrix material, 0.2-0.5-mm-diameter molybdenum and tungsten wire gauze as the reinforcement. The described method permits the fabrication of compact materials.

A white unetched zone is formed at the "fiber-matrix" interface. This zone apparently is a solid solution of chromium based on the intermetallides  $WNi_4$  and  $MoNi_n$ . The hardness of the zone is greater than that of the fiber and matrix. The distribution of tungsten, molybdenum, nickel, and chromium along the width of the transition zone shows that the total interdiffusion depth can be characterized by the width of the white unetched zone. The rate of interdiffusion between fibers and matrix is stabilized in 250 hours for tungsten fibers and 500 hours for molybdenum

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USSR

HANAS, F. P., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 8, 1971, pp 6-11

fibers. The width of the transition zone is approximately ten times greater for molybdenum fibers than for tungsten fibers. The solubility of molybdenum in both matrices is considerably higher than that of tungsten. The degree of dissolution of tungsten fibers is considerably lower in the VZh98 matrix containing tungsten than in the tungsten-free KhN78T matrix. The solubility of molybdenum fibers is approximately the same in both matrices. The regularities of the interdiffusion between fibers and matrix in nickel-chromium materials reinforced with molybdenum and tungsten fibers make it possible to select the fiber diameter and the thickness of the outer protective layer of the matrix in relation to the required temperature and service life.

3/3

USSR

UDC 620.178.38:620.197

ISHCHENKO, I. I., OMEL'CHENKO, V. I., SINAYSKIY, B. N., POGREBNIYAK, A. D.,  
BANAS, P. S., REINIK, M. I., Kiev, Zaporozh'ye

"Study of Influence of Heat Resistant Coatings on Fatigue Strength of Refractory Alloy"

Problemy Prochnosti, No 10, 1971, pp 76-81.

Abstract: This work presents results of studies of the influence of certain types of heat resistant coatings on the fatigue strength of ZhS6K nickel alloy, widely used for aviation engine turbine blades. None of the coatings studied were found to increase fatigue resistance without preliminary heating of the specimens. Preliminary heating without application of the coatings caused a decrease in fatigue resistance. However, the combination of preliminary heating to 950°C for 1,000 hours with application of coatings (nitriding and application of aluminozirconium coatings) caused an increase in fatigue resistance.

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BANAS, P. S.

UDC 630.178.38:620.197  
INVESTIGATION OF THE INFLUENCE OF OXIDATION-RESISTANT COATINGS ON THE FATIGUE  
STRENGTH OF HEAT-RESISTANT ALLOY

JPRS 55972  
12 May 1972

[Article by I. I. Ishchenko, V. I. Omelchenko, R. N. Stetskiy, A. D. Pogrebnyak, P. S. Banas, M. I. Koznik (Kiev, Zaporozh'ye); Kiev, Problemy Prochnosti, Russian, No 10, 1971, signed to press 8 February 1971, pp 76-81]

The use of heat-resistant alloys with good strength properties increases the service life of gas turbine engines.

Service life can be increased even further by certain design and technological measures, one of which is the use of oxidation-resistant coatings for protecting parts from oxidation. This is particularly important in connection with high working temperatures in an engine. The most reliable results can be obtained from tests of an engine with coated parts. Such tests, however, are extremely expensive and take a long time. Therefore they must be preceded by investigations of specimens and structural components under laboratory conditions.

A great deal of work has been done on investigation of the structure of coatings, their oxidation resistance in the unstressed state, development of the technology of application of coatings. However, evaluation of the effectiveness of oxidation-resistant coatings according to data on their structure, composition and oxidation resistance is not sufficiently reliable without additional determination of the strength properties of materials and structural components with coatings under conditions of mating operating conditions, i.e., under the influence of working stresses and temperatures, real media and other factors [1-3]. Moreover, the use of many heat-resistant materials depends largely on the choice of coating. Consequently the effectiveness of an oxidation-resistant coating is determined largely on the basis of results of investigation of the strength characteristics of heat-resistant materials with coatings. In such investigations great attention should be devoted to evaluation of the effectiveness of the coatings under conditions of variable stresses. When the state of the surface layer plays a particularly important role.

It has been demonstrated [4-7] that the influence of oxidation-resistant coatings on the fatigue strength of heat-resistant materials is

USSR

UDC: 539.1.07.55:621.565

BIGANT, A. Ya., BAWASHEK, V. E., RUDIK, M. P., SKAKODUB, G. A.

"A Cryostat Housing for Semiconductor Detectors of Radioactive Emission"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obratzsy, Tovarnyye Znaki, No 26, 1970, Soviet Patent No 278907, Class 21, filed 31 Jul 67, p 70

Abstract: This Author's Certificate introduces a cryostat housing for semiconductor detectors of radioactive emission. As a distinguishing feature of the patent, thermal coupling with the ambient atmosphere is reduced by making the unit in the form of an evacuated glass tube with metal vessels fastened to the end by means of glass-to-metal seals. A metal bulb is attached to one of these vessels with a vacuum-tight seal, and a metal refrigerator tube with radioactive emission detector attached is fastened to the other vessel. The radiation emission detector is fastened to the metal bulb by means of a spring contact, and a sorption pump is enclosed in the above-mentioned refrigerator tube.

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USSR

ARUTYUNOV, A. V., BANCHILA, S. N., FILIPPOV, L. P., Moscow State University imeni M. V. Lomonosov

"Measurement of the Electrical Conductivity of Tin in the Temperature Range 1000-2500°K"

Moscow, Teplofizika vysokikh temperatur, No. 3, May/Jun 72, pp 547-550

Abstract: A technique is described for measuring electrical conductivity that makes it possible to obtain fairly reliable data in the temperature range 1000-2500°K and is based on the use of high-frequency induction heating of metal ampoules filled with the liquid metal to be studied. It is noted that the study of the specific electrical conductivity of liquid metals is an important element in investigating the nature of the liquid-metal state of a substance, but that the problem of the electrical resistance of liquid metals has been little studied up to the present time. The use of induction heating in the measurement device makes it possible to obtain a homogeneous temperature field in the heated sample and the device is convenient to use because of its low inertia, so that measurements can be carried out fairly rapidly. A description and circuit

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ARUTYUNOV, A. V., et al, Teplofizika vysokikh temperatur, No. 3,  
May/Jun 72, pp 547-550

diagram of the device are given. A basic source of systematic error in measuring the specific resistance was the error in determining the geometry of the ampoule. The total maximum systematic error of the experiment varied from  $\sim 1$  to  $\sim 2\%$  in the temperature range 1000-2500°K. The electrical conductivity of tin of the following composition (in wt. %) was measured: 99.9995 Sn,  $5 \cdot 10^{-5}$  Sb,  $10^{-5}$  (Fe, Co, Au, Ag, Zn, Ar),  $10^{-6}$  (Cu, Bi, Al). The results are shown graphically. The data agrees with the data of Cusac, Roll, and Motz within the limits of the systematic error of the experiment. The least squares method was used to obtain the following temperature dependence for the electrical resistance:

$$\rho = 54.42 - 0.661 \cdot 10^{-2} T + 1.522 \cdot 10^{-5} T^2 - \\ - 2.346 \cdot 10^{-9} T^3.$$

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USSR

UDC 536.242+3:546.832

ARUTYUNOV, A. V., ~~BANCHILIA, S. N.~~, and FILIPPOV, L. P., Moscow State University, Kaliningrad Technical Institute of the Fish Industry and Fisheries

"Thermal, Electric, and Emissive Properties of Hafnium in the High-Temperature Range"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 2, Mar-Apr 72, pp 425-428

Abstract: Recent results of multiple investigations by the method of variable induction heating of thermal, electric, and emissive properties of hafnium (by wt. %: 99.3 Hf; 0.65 Zr; 0.04 SiO<sub>2</sub>; 0.006 Al<sub>2</sub>O<sub>3</sub>) in the temperature range over 1000 °K are discussed. The investigated Hf-specimen, 98 mm long and 10 mm in diam., was calcined in vacuum by 1900 °K for ~2 hrs. The results are discussed by reference to tabulated data and diagrams showing the temperature dependences of the heat conductivity  $\lambda$ , the heat capacity  $c_p$ , the specific electric resistance  $\rho$ , and the monochromate coefficient  $\epsilon_{\lambda, \tau}(\lambda=0.65\mu)$ , in

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ARUTYUNOV, A. V., et al., *Teplofizika Vysokikh Temperatur*, Vol 10, No 2, Mar-Apr 72, pp 425-428

comparison with data of other authors. Some characteristic properties of titanium, zirconium, and hafnium are singled out. Two illustr., one table, seven biblio. refs.

2/2

USSR

UDC: 536.711/.715

ATALLA, S. R., ~~BANCHILA, S. N.~~, and FILIPPOV, L. P., Moscow State University imeni M.V. Lomonosov

"Studying a Complex of the Thermal Characteristics of Liquid Metals at High Temperatures"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 1, Jan-Feb 1972, pp 72-75

Abstract: This article was presented at a conference on transfer properties in electron melts held during March 1971 at the Institute of Semiconductors of the USSR Academy of Sciences, Leningrad. The authors describe an improved unit for measuring the thermal conductivity and heat capacity of liquid metals in the 1100-2100°K temperature range. The unit is based on the utilization of the method of radial temperature waves during the variable, periodic heating of a specimen by electron bombardment. Results are given from the study of liquid indium, neodymium, and cerium. Values obtained for the Lorentz number of liquid neodymium are close to the theoretical value of  $2.45 \cdot 10^{-8} \text{ w} \cdot \text{ohm/degree}^2$ . Within the studied range, the temperature around the melting point holds with respect to the Wiedemann-Franz-Lorentz law. The coefficient of heat conductivity for liquid indium shows a strong dependence on temperature. Original article: two formulas, three figures, and 11 bibliographic entries.

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1/2 C13 UNCLASSIFIED PROCESSING DATE--20NOV70  
 TITLE--REGION OF THE FORMATION OF INTERNAL CONVERSION COEFFICIENTS IN THE  
 UPPER ATOMIC SHELLS -U-  
 AUTHOR-(03)-BAND, I.M., SLIV, L.A., TRZHASKOVSKAYA, M.B.  
 COUNTRY OF INFO--USSR **B**  
 SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 1970, 11(6), 306-8  
 DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS  
 TOPIC TAGS--CONVERSION ELECTRON SPECTRUM, ELECTRON SHELL STRUCTURE,  
 ELECTRIC FIELD, NUCLEAR SPIN, PARITY PRINCIPLE

CONTROL MARKING--NO RESTRICTIONS  
 DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAME--1994/0995 STEP NO--UR/0386/70/011/006/0306/0308  
 CIRC ACCESSION NO--AP0115016

2/2 013

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PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0115016

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FROM A STUDY OF THE RADIAL INTEGRALS FOR THE FORMULAS USED TO CALC. THE INTERNAL CONVERSION COEFFS., IT WAS CONCLUDED THAT THE VALUES OF THE COEFFS. ON ALL AT. SHELLS ARE FORMED WITHIN THE INNER LAYERS OF THE ATOM AND THEREFORE THEIR VALUE IS NOT DEPENDENT ON ANY CHANGES IN THE ELEC. FIELD ON THE PERIPHERY OF THE ATOM. THE DETN. OF THE COEFFS. ON THE HIGH AT. SHELLS, AS WELL AS ON THE INTERNAL SHELLS, CAN BE USED TO FIND THE SPIN AND PARITY OF THE NUCLEAR LEVELS. THE COEFFS. ON THE HIGH SHELLS SHOULD NOT CHANGE MUCH FOR CHANGES IN THE NO. OF ELECTRONS IN THE OTHER SHELLS BUT SHOULD CHANGE MARKEDLY FOR A CHANGE IN THE TOTAL NO. OF ELECTRONS ON THE SHELL FROM WHICH THE CONVERSION TAKES PLACE.

FACILITY:

FIZ.-TEKH. INST. IM. IOFFE, LENINGRAD, USSR.

C I R C A C C E S S I O N

USSR

VOROB'YEV, A. A., et al., *Meditcina*, 1972, 104 pp

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Pharmacology and Toxicology

USSR

UDC: 543.545+615.843

BANDARIN, V. A., KOLB, V. G., and ULASHChIK, V. S.

"Studying the Effect of Biologically Active Materials on the Permeability of Skin"

Minsk, Doklady Akademii nauk BSSR, No 3, 1973, pp 283-285

Abstract: Results are given of an investigation into the effect of several bioactive compounds on the permeability of human skin. For this study, the ionophoresis method was used in the way specified in an earlier paper (V. G. Kolb, Avtoref. kand. kiss., Minsk, 1959) with the standard mode of 0.3 mA/cm<sup>2</sup> current density and an operating period of 20 minutes. A formula is given for the coefficient of ionophoretic skin permeability, a factor characterizing the degree of penetration of material from the outside medium into the organism in terms of the quantity of electricity, the equivalent of the introduced ion, and the weight of the admitted material. Tables are given of the effect of hyaluronidase and urotropin on this factor and the changes in the factor wrought by acetylcholine, novocain, and chlorethane. It is found that the effect of biologically active materials on the factor depends on the pharmacological activity of the material and the physical-chemical parameters of the introduced ions.

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1/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--THE STATE OF THE BIOGENIC AMINO METABOLISM IN PATIENTS WITH ACUTE  
LEUCOSIS -U-  
AUTHOR-(03)-KAMYSHNIKOV, V.S., IVANOV, YE.P., BANDAKIN, V.A. *B*  
COUNTRY OF INFO--USSR  
SOURCE--ZDRAVDOKHRANENIYE BELORUSSII, 1970, NR 3, PP 48-51  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--AMINO ACID METABOLISM, NORADRENALINE, ADRENALINE, SEROTONIN,  
WHOLE BLOOD, BLOOD DISEASE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1982/1551 STEP NO--UR/0477/70/000/003/0048/0051  
CIRC ACCESSION NO--APO052755  
UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0052755

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KATECHOLAMIN, TIRAMIN AND SEROTIN METABOLISM HAS BEEN INVESTIGATED IN PATIENTS WITH ACUTE LEUCOSIS IN THE DYNAMICS OF THE DISEASE. AT THE LEVEL OF EXPRESSIVE CLINICAL INDICATIONS A DECREASED EXCRETION OF NORADRENALINUM, OF ADRENALINUM, VANILIN ALMOND AND 5, OXYINDOL, ACETIC ACIDS, A DECREASE OF THE SEROTONIN LEVEL IN THE WHOLE BLOOD AND AN INCREASE OF THE TIROSIN CONTENT IN THE PLASMA HAVE BEEN MARKED. AN EXCRETION OF TIRAMIN, DIOXYPHENILALANINUM AND DOPHAMINE IN THE PATIENTS WHO HAVE BEEN IN THE STATE OF CLINICO HAEMOTOLOGIC REMISSION HAS NOT DIFFERED FROM THE USUAL NORM. IN THE COURSE OF TREATMENT, ENDED BY REMISSION A TENDENCY TOWARDS NORMALIZING THE KATECHOLAMINOUS AND SEROTINOUS METABOLISM HAS BEEN FOUND.

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USSR

UDC 547.241

SUMINOV, S. I., BANDEROVA, L. V., SHATROVA, T. G.

"New Derivatives of Cyclohexenyl-1 and 2-phosphonic Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 239-240

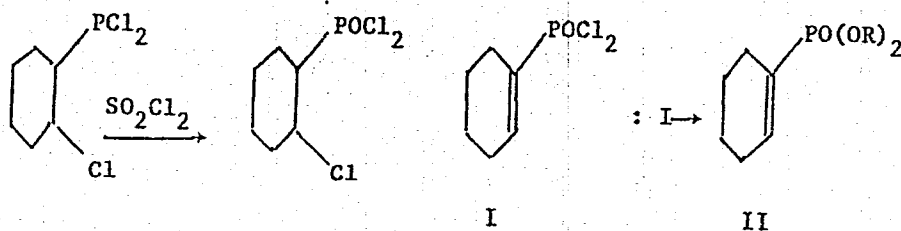
Abstract: A study was made of new derivatives of cyclohexenyl-1 and 2-phosphonic acids. When oxidizing 2-chlorocyclohexyldichlorophosphine (obtained by addition of  $\text{PCl}_3$  to the cyclohexene under the effect of  $\gamma$ -radiation) [L. L.

Shchukovskaya, et al., DAN SSSR, No 179, 892, 1968] by sulfuryl chloride in an inert organic solvent at  $0-10^\circ$ , the formation of a mixture of acid dichlorides of 2-chlorocyclohexylphosphonic acid and cyclohexene-1-ylphosphonic acid (I) with predominance of the latter was observed for the first time. By analysis for the "common" and "hydrolyzable" chlorine, the content of (I) in the mixture is greater when the reaction is performed in ether than in  $\text{CCl}_4$  or benzene. When treating the (I) isolated by redistillation with aliphatic alcohols ( $\text{C}_1\text{C}_5$ ) in the presence of pyridine, the corresponding esters of cyclohexene-1-ylphosphonic acid were obtained with a 65-85% yield. The infrared spectra of all the substances reveal a C-C absorption band at  $1,630\text{ cm}^{-1}$ :

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SUMINCV, S. I., et al., Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 239-240



Physical characteristics and comparative data are presented for the mentioned products.

USSR

UDC 911.3:616.9:576.895.771(47+57)

SHIPITSINA, N. K., ANUFRIYEVA, V. N., BANDIN, A. I., VINOGRADSKAYA, O. N.,  
GORNOSTAYEVA, R. M., KUPRIYANOVA, Y. S., MARKOVICH, N. Ya., RASNITSYN, S. P.,  
and TIMOFEYEVA, L. V.

"Study of the Biology of Blood-Sucking Diptera as Basis for Combating  
Vectors of Infection and Blood-Sucking Insects in the Soviet Union"

V sb. Materialy Nauchn. konferentsii posvyashch. 50-letivu In-ta Med.  
parazitol. i tropich. Med. 1970 (Proceedings of the Scientific Conference  
Devoted to the 50th Anniversary of the Institute of Medical Parasitology  
and Tropical Medicine 1970 -- collection of works), Moscow, 1970, pp 48-49  
(from RZh-Meditsinskaya Geografiya, No 2, Feb 71, Abstract No 2.36.48)

[No abstract]

1/1

USSR

UDC 911.3.616.936(47 57)

DUKHANINA, N. N., SARIKYAN, S. Ya., ZHUKOVA, T. A., and BANDIN, A. I.

"Characteristics of Malaria Foci During the Final Period of Its Elimination in the USSR"

V sb. Materialy Nauchn. konferentsii, posvyashch. 50-letiyu In-ta med. parazitol. i tropich. med., 1970 (Proceedings of the Scientific Conference Commemorating the 50th Anniversary of the Institute of Medical Parasitology and Tropical Medicine, 1970 -- collection of works), Moscow, 1970, pp 14-16 (from RZh-36. Meditsinskaya Geografiya, No 1, Jan 71, Abstract No 1.36.129 by V. Maslovskaya)

Translation: Cases of malaria brought into the country from abroad are most often recorded in the central zone and in the south RSFSR. Isolated residual foci persist in only a few rayons of the Azerbaydzhan, Georgian, Uzbek and Tadzhik SSRS, where 5-7 parasite life cycles are possible per season. In areas with residual foci, the vectors were *Anopheles m. maculipennis*, *A. m. sacharovi*, *A. superpictus*, and *A. pulcherrimus*. New foci almost always appeared only where residual foci remained or in adjacent regions, or in areas associated through population migration. Only five populated centers had local cases of three-day malaria following return

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