"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

VASYURIN, S. T., Khimiya v Sel'skom Khozyaystve, Vol 9, No 3, 1971, pp 45-50

no concrete conclusion on the effect of the number of ethyleneimino groups can be drawn. It is proposed that the length of the alkyl groups is related to the toxicity of the compounds for butterflies: the shorter the alkyl chain the higher the toxicity. Substitution of oxygen atoms by sulfur atoms does not alter the sterilizing effect, but the toxic effect of the sulfur-containing compounds on the butterflies was weaker. Also, the water-solubility of the thio analogs was considerably lower. The phosphoethyleneimides did not exhibit a stronger sterilizing effect on either male or female butterflies, whereas the ethyleneimine derivatives (afolat, tefa, thiotefa, metafa and others)have a more pronounced effect on males.

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USSR UDC 595.786:614.449

USPENSKAYA, N. V., and VASYURIN, S. Ye., Central Asian Scientific Research Institute of Phytopathology, Tashkent

"Chemosterilant Food Bait as a Possible Means of Controlling the Turnip Moth (Agrotis segetum)"

Moscow, Zoologicheskiy Zhurnal, Vol 49, No 7, Jul 70, pp 1088-1090

Abstract: Feed boxes containing 0.1% Thio-TEPA (thiophosphamide) solution, 10% fermenting molasses solution, and 0.005% eosin (to serve as a marker) were set out on the Lenin farm in Syr-Dar'ya Oblast, Uzbek SSR in 1963 to attract male turnip moths. Of the virgin females mated with males caught on the experimental plot, an average of 35% in June and July and 23% in August and September laid eggs which were more than 90% nonviable. By comparison, only 11 to 20% of the eggs laid by females mated with males caught on the control plot were nonviable.

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USSR UDC 616.988-614.4

RETINA, T. N., POVALISHINA, T. P., MARTSINKEVICH, Ch. I., VASYUTA, Yu. S., KLUG, L. S., and FILIPPENKOVA, Ye. D., Republic Sanitary Epidemiological Station of the Bashkir SSR, Institute of Poliomyelitis and Viral Encephalitides of the USSR Academy of Medical Sciences, Main Sanitary Epidemiology Administration, of the RSFSR Ministry of Health, and the Ufa City Sanitary Epidemiological Station

"Epidemiological Analysis of Hemorrhagic Fever Diseases With a Renal Syndrome Observed in Health Institutions in the City of Ufa"

Kazan', Kazanskiy Meditsinskiy Zhurnal, No 1, Jan/Feb 71, pp 74-76

Abstract: The 1964-1965 epidemic of hemorrhagic fever with a renal syndrome in the Bashkir ASSR was thoroughly analyzed to elucidate the source and route of infection. A total of 99 cases of the disease were recorded in the resort city of Ufa among students, employees, and tourists: 11 cases in the pioneer camp, 13 in the Sanitary Forest School, 34 in the Children's Tuberculosis Sanatorium, and 41 cases at the rest home. During

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

RETINA, T. N., et al., Kazanskiy Meditsinskiy Zhurnal, No 1, Jan/Feb 71, pp 74-76

the epidemic, the Ufa region was infested with rodents; field and house mice and voles were found in attics and basements and under porches of poorly constructed houses and in the forest. The pathogen was transmitted mainly through the air to individuals who breathed air with dust-containing particles emitted by infected rodents. This included persons working within buildings, sleeping in tents, or employed in field work. The main preventive measure is eradication of rodents living in buildings and in natural environments.

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USSR

UDC 621.315.592:546.28

CHETYRKINA, N.A., KARACHENTSEVA, Z.V., MITROFANOV, V.V., DEDEGKAYEV, T.T., BELOV, N.A., ERLIKH, R.N., VASYUTINA, Z.V.

"Carbon Insertion In Epitaxial Layers Of Silicon And Effect Of Growth Conditions On Their Formation"

Elektron.tekhnika. Nauch.-tekhn.sb. Poluprovodn.pribory (Electronics Technology. Scientific-Technical Collection. Semiconductor Devices), 1971, Issue 1(58), pp 47-50 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 1972, Abstract No 9B79)

Translation: A study is made of the defectiveness of epitaxial layers of Si connected with a high carbon content. It is shown that in the initial state epitaxial layers grown by hydrogen reduction of tetrachlorated silicon have a microuniformity characteristic of the presence of finely-divided insertions of the second phase. In the process of heat treatment at 1150° C in an oxygen atmosphere, a decrease takes place of the density of microdefects and an increase of separation of the second phase containing carbon and oxygen. The results are presented of tests of preparation of epitaxial layers with a reduced carbon content. 6 ref. Summary.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR UDC 669.15-194.3:621.793:543.422

KRIVCHIKOVA, E. L., VASYUTINSKIY, B. M., and KOSTRITSA, T. V.

"Application of Local Spectral Analysis in Studying Heat-Resistant Coatings on Kh25N20S2 Steel"

Moscow, Zavodskaya Laboratoriya, Vol 36, No 9, 1970, pp 1065-1068

Abstract: A study was made of two types of heat-resistant coatings on type Kh25N20S2 austenitic steel obtained by vacuum-condensation calorizing and chromizing. The distribution of Al, Cr, Ni, Fe, and Si with respect to depth of the calorized layer was investigated by the method of local spectral analysis with the application of a line and point source. A comparative estimate of the two methods on the basis of experimental data showed good agreement. During the process of depositing Al and Cr on Kh25N20S2 steel a significant concentration of these elements are formed in the surface layers, and this promotes an increase in heat resistance of the steel. Comparison of the local spectral analysis data with microstructural and X-ray micrographic studies showed the possibility of discovering the basic structural components in the diffusion zone of the steel.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

KRIVCHIKOVA, E. L., et al, Zavodskaya Laboratoriya, Vol 36, No 9, 1970, pp 1065-1068

The advantages of the method of analysis using a line light source are its localization, shallow depth of penetration, and the possibility of determining the concentration by any point; consequently, it reveals a continuous picture of variation of the concentration with respect to depth of the coating. However, the layer method of analysis has greater sensitivity and accuracy, and where it is necessary to analyze small admixtures and high localization is not required (~5-10 microns), it is more expedient to use a point source of excitation of the spectrum.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

Titanium

USSR

UDC 669.295.046.43

VASYUTINSKIY, N. A.

"Effect of Some Impurities on the Chlorination of Oxides"

Sb. tr. Vses n.-i. i proyektn. in-t titana (Collection of Works of the All-Union Scientific Research and Design Institute of Titanium), 1970, 5, pp 43-49 (from RZH-Metallurgiya, No 11, Nov 70, Abstract No 11G148)

Translation: On the basis of experiments and an analysis of data from the literature a review is made of the mechanism of action of low-chlorinating impurities on the chlorination of the basic oxide (for example TiO_2). The activating action of impurities (chlorides) is manifested during their absorption on the surface of chlorinating oxide. Many chlorides activate gasification of C in the presence of CO_2. Poor chlorination of impurities found in coal is explained by chemisorption of the forming chlorides. 2 ill., 8 bibl. entries. Author's abstract

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR UDC 669.295.053.24

SIDORENKO, A. P., VASYUTINSKIY, N. A., PECHENKIN, V. P., and LUKHMANOV, L. S.

"Change in the Mass of Titanium Slag During Cooling of Ingots"

Sb. tr. Vses. n.-i. i proyektn. in-t titana [Collected works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, 18-22, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No.1 G186 by the authors).

Translation: The change in slag mass in ingots during cooling depends on the degree of reduction of the slag, the porosity and the quantity of slag, and, most of all on the cooling conditions. Methods are described for determining the increase in slag mass during cooling. Numerical data are presented on the increase in the mass of Ti slag ingots during cooling under industrial conditions. 1 figure; 1 table.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR UDC 669.295.046.43

VASYUTINSKIY, N. A., LYSTSOV, A. I., ZAKHAREVICH, A. A., and SIDORENKO, A. P.

"Some Specifics of Chlorination of Chunk Titanium Slag"

Sb. tr. Vses. n.-i. i proyektn. in-t titana, [Collected works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, 41-47, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No. 1 G179 by the authors).

Translation: During chlorination of chunk Ti-slag, a dense, gas-impermeable layer of rutile is formed, which retards the chlorination reaction. The kinetic curves for chlorination of chunk titanium slag show an autocatalytic period. It is assumed that the reason for the autocatalysis is an increase in the reaction surface resulting from development of microfissures in the chunks of Ti-slag. 3 figures; 8 biblio. refs.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR UDC 669.295.053.24

VASYUTINSKIY, N. A., and SIDORENKO, A. P.

"Structure and Phase Composition of Titanium Slag Ingots"

Sb. tr. Vses. n.-i. i proyektn. in-t titana, [Collected works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, 22-27, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No.1 G187 by the authors).

Translation: The processes of cooling and oxidation of Ti slag ingots form several phase-structure varieties. The outer zone of the ingot consists of rutilized slag, followed by a zone of lamellar oxidized consisting primarily of anatase. Deeper there is a zone of grainy oxidized slag, while the center of the ingot consists of anosovitic slag. The nature of the phase-structural conversions of the slag during cooling of ingots depends on the composition of the slag, size of ingots, and cooling conditions. 1 figure; 1 table.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR UDC 669.295.05

VASYUTINSKIY, N. A., LYSTSOV, A. I., ZAKHAREVICH, A. A., and SIDORENKO, A. P.

"Certain Features of Chlorinating Lump Titanium Slag"

Moscow, Metallurgiya i Khimiya Titana (Institut Titana), Metallurgiya Publishing House, Vol 6, 1970, pp 41-47

Translation: It is established that during chlorination of lump titanium slag, a solid, gas-proof layer of rutile is formed which slows down the chlorination reaction. The kinetic curves of chlorinating lump titanium slag are characterized by the presence of an autocatalytic period. It is suggested that the cause of the autocatalysis is the increase in the reaction surface through the development of microcracks in the lumps of titanium slag. Three illustrations and eight bibliographic entries.

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Titanium

USSR

UDC 669.295.046.43

LYSTSOV, A. I., VASYUTINSKIY, N. A., and CHUMAK, T. A.

"Chlorination of Titanium Slag Coated With Hydrocarbon"

Sb. tr. Vses. N.-i. i proyektn. in-t titana (Collection of Works of the All-Union Scientific Research and Design Institute of Titanium), 1970, 5, pp 37-43 (from RZh-Metallurgiya, No 11, Nov 70, Abstract No 11 G147)

Translation: A study is made of the special features of chlorination of ground Ti-slag whose particles are coated with a hydrocarbon shell. Slag coated with sooty C, can be chlorinated just as well as a slag-coke mixture; slag coated with pyrolytic C cannot be completely chlorinated. A mixture consisting of coated C of the initial slag, can be well chlorinated. Briquettes produced from slag coated with pyrohydrocarbon can be chlorinated at almost the same rate as the ordinary briquettes. 6 ill. Author's abstract.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC 669.017.11

VASYUTINSKIY, N. A., and SIDORENKO, A. P.

"The Structure and Phase Composition of Titanium Slag Ingots"

Moscow, Metallurgiya i Khimiya Titana (Institut Titana), Metallurgiya Publishing House, Vol 6, 1970, pp 22-27

Translation: It is shown that, as a result of the processes of cooling and oxidizing titanium slag ingots, several structural-phase variations are formed. The external zone of the ingot is composed of rutilized slag, which is followed by the zone of flakey oxidized slag, consisting primarily of anatase. The zone of granular oxidized slag is located deeper, and the anosovitovyy [translation unknown] slag is preserved in the center of the ingot. It is shown that the nature of structural-phase transformations of the slag during the process of cooling ingots depends on the composition of the slag, the size of the ingots, and conditions of their cooling. One illustration, one table, and five bibliographic entries.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC 669.017.11

SIDORENKO, A. P., VASYUTINSKIY, N. A., PECHENKIN, V. P., and LUKHMANOV, L. M.

"Change in the Mass of Titanium Slags During Ingot Cooling"

Moscow, Metallurgiya i Khimiya Titana (Institut Titana), Metallurgiya Publishing House, Vol 6, 1970, pp 18-22

Translation: It is shown that change in the mass of slag in ingots with cooling depends on the degree of slag restoration, the porosity and size of the ingot, and, most of all, on cooling conditions. Methods of determining the increase in mass of slags when they are cooled are described. Numerical data on increase in the mass of ingots of titanium slags during cooling under industrial conditions are given. One illustration, one table, and five bibliographic entries.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC 669.295.051

VASYUKINSKIY, N. A., and SIDORENKO, A. P.

"Anosovite Composition"

Sb. tr. Vses. n.-i. i proyektn. in-t titana (Collection of Works of the All-Union Scientific Research and Design Institute of Titanium), 1970, 5, pp 22-32 (from RZh-Metallurgiya, No 11, Nov 70, Abstract No 11 G146)

Translation: A detailed study is made of the chemical-mineralogical composition and some properties of anosovite from high-titanium industrial slags. Structural-chemical formulas of anosovites, which differ according to the degree of reduction, are calculated. A regular presence is anosovite os excess TiO_2 from 4-6 to 60% (mol.) is established, which can be treated as a presence of cation vacant sites in the crystal lattice of anosovite. The electrical and magnetic properties of different anosovites are studied. A classification of anosovites according to their chemical composition is proposed. 4 ill., 2 tables, 20 biblio. entries.

Author's abstract

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UNCLASSIFIED

TITLE--CHANGE IN A TITANIUM SLAG DURING THE COKING OF BRIQUETS -U-

PROCESSING DATE--18SEP70

AUTHOR-(04)-VASYUTINSKIY, N.A., LYSTSOV, A.I., BEREZHKO, A.V., SIDORENKO, A.P.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, METAL. 1970, (1) 247

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--COKE, PETROLEUM PRODUCT, TITANIUM, METALLURGIC SLAG, PHASE ANALYSIS, THERMAL EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0599

STEP NO--UR/0370/70/000/001/0247/0247

CIRC ACCESSION NO--AP0105582

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

2/2 025 UNCLASSIFIED

CIRC ACCESSION NO--AP0105582 PROCESSING DATE--18SEP70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THREE TYPES OF TI SLAGS WERE STUDIED: NONOXIDIZED TI SLAG, ANATASE SLAG, AND RUTILE SLAG. THE EFFECT OF TEMP. (800-1200DEGREES) ON THE PHASE COMPN. OF THE BRIQUETS MADE FROM THE SLAGS AND PETROLEUM COKE WAS DETD.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR.

UDC: 669.046.58'295

VASYUTINSKIY, N. A.

"Titanium Slags"

Titanovyye Shlaki [English version above], Moscow, Metallurgiya Press, 1972, 208 pp.

Translation of Foreword: Titanium ores and concentrates are used as raw material for the production of metallic titanium and pigment titanium dioxide. At the present time, rutile concentrates occupy a secondary position in the world's production of titanium; ilmenite and other iron-titanium ores are considered more promising. The reserves of these types of ore are great enough to support the rapidly growing production of titanium and titanium pigment.

Many different methods have been suggested for the separation of iron and titanium in iron-titanium concentrates. One of the most common is electric melting of iron-titanium concentrates in ore-melting furnaces, producing titanium slag and cast iron or steel. The content of titanium dioxide in the titanium slag is 70-90%, as against 35-60% in the concentrates. Titanium slags are widely used as raw materials for the production of metallic titanium.

In the Soviet Union, industrial production of titanium slags was organized in the 1950's. Since then, the technology of production of titanium slags has been considerably improved. The method of electric melting has allowed the production of titanium slags using various types of iron-titanium concentrates.

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USSR

Vasyutinskiy, N. A., Titanovyye Shlaki, Moscow, Metallurgiya Press, 1972, 208 pp.

Along with the development and mastery of the technology of production of titanium slags, their composition and properties have also been studied. The works of K. Kh. Tagirov, V. A. Reznichenko, A. V. Rudnevaya, G. S. Zhdanov, A. A. Rusakov, V. V. Lapin, M. S. Model' and other researchers have laid the foundation for the detailed study of the composition of titanium slags produced under laboratory and industrial conditions. The technological properties of titanium slags, particularly of their chlorination, were studied by V. A. Reznichenko, A. B. Bezukladnikov, A. N. Zelikman, I. A. Karyazin, V. A. Il'ichev and G. V. Seryakov.

In the foreign literature, the results of the study of the composition and properties of titanium slags have been little publicized. Only the works of Moore and Sigurdson have presented detailed data on the composition, structure and certain properties of titanium slags melted under industrial conditions.

This book studies problems related to the production of titanium slags as a new type of raw material. The book is based on data from the literature and the results of studies performed by the author at the Institute of Titanium in creative cooperation with the workers of the Institute and the Zaporozhe Titanium-magnesium Combine. The purpose of this book is to summarize the results of all research on the composition and properties of titanium slag. The reader can judge the extent to which this goal has been reached.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

Vasyutinskiy, N. A., Titanovyye Shlaki, Moscow, Metallurgiya Press, 1972, 208 pp.

The author is deeply grateful to various workers at the Institute of Titanium, including A. P. Sidorenko, Yu. I. Rys'yevaya, A. I. Lystsov, A. V. Berezhko and O. Ya. Shashlo, who took part in the studies of the composition and properties of titanium slags.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

Vasyutinskiy, N. A., Titanovyye Shlaki, Moscow, Metallurgiya Press, 1972, 208 pp.

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

Acc. Nr: AP0044858 Ref. Code: UR0531

PRIMARY SOURCE: Khirurgiya, 1970, Nr 1, pp 62-66

THROMBOSIS OF MESENTERIC VEINS

T. V. Narisissov, V. Ya. Vasyutkov, Z. M. Murasheva

Problems relative to the diagnosis and treatment of obstruction of mesenteric vessels are the most complicated in emergency surgery of the abdominal cavity. On the basis of analysis of 13 observations of thrombosis of mesenteric veins the authors arrived at the conclusion that the high lethality and severity of this affection are associated with the diagnostic difficulties and late hospitalization of patients for the operation. The most typical symptoms of obstruction of mesenteric veins are given. An early operation (thrombectomy or resection of the intestine) is the main method of treatment. Early and wide employment of direct anticoagulants is indicated in view of the fact that progressing thrombosis and affection of the portal vein is the cause of lethal outcomes.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 006 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--COMPLEXES OF BISMUTH WITH MALIC AND TARTARIC ACIDS -U-

AUTHOR-(02)-CHIKRYZOVA, E.G., VATAMAN, I.I.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(2), 424-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--MALIC ACID, TARTARIC ACID, BISMUTH COMPOUND, METAL COMPLEX COMPOUND, SOLUTION ACIDITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/0774 STEP NO--UR/0078/70/015/002/0424/0428

CIRC ACCESSION NO--AP0104220

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

2/2 006 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0104220

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STUDY WAS MADE BY CLASSICAL POLAROGRAPHY AND OSCILLOGRAPHY. AT PH 4.5, K SUBH OF BI MALIC ACID COMPLEX WAS 4.3 TIMES 10 PRIME NEGATIVE17 AND 3.0 TIMES 10 PRIME NEGATIVE17, WHEN DETD. BY THE 1ST AND 2ND METHOD, RESP. ANALOGOUSLY, AT PH 3, THE K SUBH VALUES OF BI TARTARIC ACID COMPLEX WERE 2.5 TIMES 10 PRIME NEGATIVE8 AND 3 TIMES 10 PRIME NEGATIVE8, RESP.

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

VATAMANYUK, N. M., TURKEVICH, V. V., GRITSAY, N. I., and VAS'KOV, A. P.,
Lvov Forestry Technology Institute and Lvov State University Imeni Ivan Franko

UDC 547.26'118

"Selenothiophosphoric Acid Esters. VI. Alkylthiomethyl Esters of O,O-Diphenylselenothiophosphoric Acid"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 8, Aug 73, pp 1713-1715

Abstract: The reaction of the potassium salt of O,O-diphenylselenothiophosphoric acid with α-chloromethylallylthioesters goes in two directions, forming a mixture of thione and thiol isomers.

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USSR

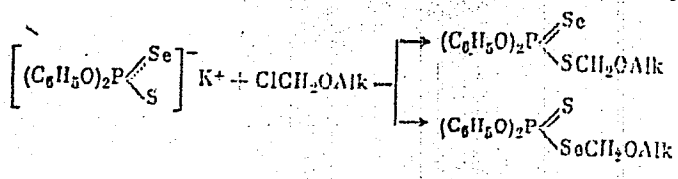
UDC 547.26'118

VATAMANYUK, N. M., TURKEVICH, V. V., and VAS'KIV, A. P., L'vov Forestry-Engineering Institute

"Esters of Selenothiophosphoric Acid. V. Alkoxymethyl Esters of O,O-Diphemylselenothiophosphoric Acid."

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 8, Aug 71, pp 1693-1695

Abstract: Continuing the study of the chemical properties of O,O-dialkyl-(aryl)selenothiophosphoric acids, the authors investigated the reaction of the potassium salt of O,O-diphenylselenothiophosphoric acid with some chloromethyl ethers. The reaction can proceed in two ways:



Chromatography and IR spectra indicate the presence of a thion and a thiol isomer.

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USSR

UDC 669.295.053.2

GALITSKIY, N. V., KONDRATENKO, A. V., LEBEDEV, G. N., VATAMANYUK, V. I., and PISAREV, L. V., PECHENIK, T. S.

"Pilot Plant Study of Production of Pigment Titanium Dioxide by Burning Titanium Tetrachloride in a Hydrogen Flame"

Sb. tr. Vses. n.-i. i proyektn. in-t titana [Collected Works of All-Union Scientific-Research and Planning Institute for Titanium], 6, 1970, 47-54, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No.1 G189 by the authors).

Translation: Results are presented from pilot plant studies of the production of pigment TiO_2 in a reconstructed installation at the Kaluga Chemical-Metallurgical Combine. The possibility is demonstrated of producing TiO_2 by burning $TiCl_4$ in an air-hydrogen flame on equipment used for production of Aerosil, although the individual units and apparatus require considerable reconstruction. The TiO_2 specimens produced have good whiteness, dispersion, covering power and oil number, but high Cl content, low pH of aqueous extract and rutile content below the requirement of the state standard. 2 figures; 2 tables.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 057 UNCLASSIFIED

TITLE--SEPARATION PARAMETER OF A TURBULENT MAGNETOHYDRODYNAMIC BOUNDARY LAYER -U-

PROCESSING DATE--23OCT70

AUTHOR-(02)-VATAZHIN, A.B., GOTOVTSEV, A.V.

COUNTRY OF INFO--USSR

SOURCE--TEPLOFIZIKA VYSOKIKH TEMPERATUR, VOL. 8, JAN.-FEB. 1970, P. 123-129

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--TURBULENT BOUNDARY LAYER, BOUNDARY LAYER HEAT TRANSFER, ELECTRIC FIELD, FLOW SEPARATION, MAGNETOHYDRODYNAMIC FLOW

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/0383

STEP NO--UR/0294/70/008/000/0123/0129

CIRC ACCESSION NO--AP0111576

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

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2/2 057

UNCLASSIFIED

CIRC ACCESSION NO--AP0111576 PROCESSING DATE--23OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DERIVATION OF SEMIEMPIRICAL EQUATIONS FOR DETERMINING THE SEPARATION PARAMETERS OF TURBULENT MAGNETOHYDRODYNAMIC BOUNDARY LAYERS OF COMPRESSIBLE AND INCOMPRESSIBLE CONDUCTING FLUIDS WITH ALLOWANCE FOR HEAT TRANSFER. DIMENSIONLESS VARIABLES CHARACTERIZING THE EFFECT OF AN ELECTRIC FIELD ON THE SEPARATION PROCESS ARE DETERMINED, SHOWING THAT FLOW SEPARATION CAN BE CONTROLLED BY APPLYING AN ELECTROMAGNETIC FIELD. CONDITIONS ARE DEFINED UNDER WHICH THE SEPARATION OF A TURBULENT MAGNETOHYDRODYNAMIC BOUNDARY LAYER CAN BE DELAYED OR EVEN PREVENTED BY SUBSTANTIALLY INCREASING THE SEPARATION PARAMETER WITH THE AID OF THIS TECHNIQUE. FACILITY: ISENTRAL'NYI NAUCHNO-ISSLEDOVATEL'SKII INSTITUT AVIATSIONNOGO MOTOROSTROENIIA, MSOCOW, USSR.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC 538.4

VATAZHIN, A. B., GRABOVSKIY, V. I., Moscow

"Propagation of Unipolaraly Charged Streams in Hydrodynamic Flows"

Moscow, Prikladnaya Matematika i Mekhanika, Vol 37, No 1, Jan-Feb. 1973, pp 57-64.

Abstract: The propagation of unipolaraly charged streams in hydrodynamic flows is studied as applicable to problems of electrohydrodynamic flows beyond the mouth of a charged-particle source ("open" streams), in channels and in the pipes of electrohydrodynamic devices ("closed" streams). The basic dimensionless parameters are defined, on which the intensity of expansion of the stream depends. Numerical solution of the two-dimensional electrohydrodynamics equations is used to find the distributions of electrical parameters (charge density, electrical potential) in the stream and in the surrounding space.

Earlier works have studied flows in which the area of the hydrodynamic flow coincided with the area occupied by the charged component. This work clarifies the basic singularities of propagation of electric streams under various conditions. It is significant that in the analysis of these problems it is necessary to consider heterogeneity of the electric field both in the area of the charged stream and in the charge-free hydrodynamic flow and the surrounding space.

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USSR

VATEL', I. A., KUKUSHKIN, N. S.

"Optimal Behavior of a Player having the First Move with Inprecise Knowledge of the Interests of the Opponent"

Zh. vychisl. mat. i mat. fiz [Journal of Computer Mathematics and Mathematical Physics], 1973, 13, No 2, pp 303-310 (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V454 by the authors)

Translation: A two-man game is studied when the goals of the players are not opposite. A strategy is constructed for player 1 (as a function of the moves of player 2), guaranteeing the maximum result under conditions of incomplete information concerning the interests of player 2. The computational aspects of the problem are analyzed.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

VATEL', I. A., KUKUSHKIN, N. S., Moscow

UDC: 518.90

"Optimum Behavior of a Player Who Has the Right of the First Move With Inexact Knowledge of His Partner's Interests"

Moscow, Zhurnal Vychislitel'noy Matematiki i Matematicheskoy Fiziki, Vol 13, No 2, Mar/Apr 73, pp 303-310

Abstract: The interrelation of levels in a hierarchical system is interpreted as a game with two persons pursuing different but (in general) non-opposed goals. It is assumed that player 1, having information on the interests of player 2 and on his choice, formulates his own strategy as a function of the possible choices of player 2. An optimum strategy is constructed which guarantees player 1 the maximum result, assuming that his information concerning his partner's interests is incomplete. It is shown that computation of the best guaranteed result amounts to finding the maximum of some unimodal function. Recommendations are made on constructing a numerical algorithm for finding the maximum of this function.
The authors thank Yu. B. Germeyer for continued interest in the work.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC 621.771.35.001.5

RYMOV, V. A., POLUKHIN, P. I., ISAYEV, L. M., VATKIN, Yu. Ya., and NEMTSOV, A. S.

"Determining the Basic Parameters of the Process of Continuous, Roll-Less Shaping of Skelp"

Plasticheskaya Deformatsiya Metallov i Splavov, Moscow, No 64, "Metallurgiya," 1970, pp 152-158

Translation: Proceeding from the condition of continuity of the deformation area, the basic parameters of the process of roll-less shaping of skelp are found: the work of shaping; the length of the deflecting area; the traction force of the circular-pass stands; and their drive power. Two figures and three bibliographic entries.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

VATOLIN, N. A.

metallurgy

JPRS 55013
25 Jan 72

UDC: 669.011

PHYSICOCHEMICAL PROPERTIES OF MELTS AND IMPROVEMENT OF METALLURGICAL PROCESSES

[Article by Corresponding Member AS USSR N. A. Vatolin; Moscow, Vestnik Akademii Nauk SSSR, Russian, No 11, November 1971, pp 63-69]

A rapid growth in demand for ferrous, nonferrous and rare metals has compelled the metallurgical industry not only to increase production by conventional methods but has also forced the industry to develop new and to improve old processes, as well as to develop high-productivity automated units. Certain additional tasks have also developed: processing of low-grade and polycomponent ore with full utilization of all components. These problems cannot be resolved without a substantial expansion of physicochemical research, without a thorough knowledge of the processes which take place in the liquid phases of production operations. The principal phases of metallurgical production -- metal and slag -- are multicomponent systems; for this reason considerable attention in metallurgical science is devoted to problems of theory of solutions.

Since pyrometallurgical operations are carried out at high temperatures, the chemical processes involved run comparatively fast and sometimes approach an equilibrium state. For this reason a thermodynamic emphasis in study of metallurgical processes initially enjoyed the greatest development. Metallurgical scientists investigated the reactions of deoxidation, desulfuration, dephosphoration, refining, gas dissolving, reduction, oxidation, etc. Research results indicated that in spite of the high temperatures the majority of metallurgical alloys had properties which were far from ideal. In order to describe the properties of real solutions it is necessary to determine the activity of the components. Reliable experimental data have not [illegible] on the thermodynamic behavior of the components of [illegible] higher temperature melts. The nature of the forces of interparticle interaction, [illegible] the causes of deviation by solution properties from ideal cannot be [illegible] by thermodynamic methods alone.

A. A. Baylov [illegible] liquid metals do not constitute physically "transparent" fluids. [illegible] considered formations are created in them, particularly near the [illegible] interval, but even tiny microcrystals, some of which may break down and form anew under the effect of fluctuations

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 016 UNCLASSIFIED

TITLE--NONSTOICHIOMETRY AND MIXED CONDUCTION OF MELTS CONTAINING VANADIUM PENTOXIDE -U-

PROCESSING DATE--30OCT70

AUTHOR-(03)-PASTUKHOV, E.A., YESIN, O.A., VATOLIN, N.A.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKHIMIYA 1970, 6(4), 453-60

DATE PUBLISHED-------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--VANADIUM PENTOXIDE, VANADIUM OXIDE, LEAD OXIDE, CALCIUM OXIDE, ELECTROMOTIVE FORCE, ELECTRICAL CONDUCTIVITY, THERMAL EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/1150

STEP NO--UR/0364/70/006/004/0453/0460

CIRC ACCESSION NO--AP0121709

UNCLASSIFIED

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CIRC ACCESSION NO--AP0121709 PROCESSING DATE--30OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYSTEMS V SUB2 O SUB5-PBO, V SUB2 O SUB5-CAO, AND V SUB2 O SUB5-M SUBX O SUBY WERE STUDIED TO INVESTIGATE THE TRANSITION FROM ELECTRONIC TO IONIC CONDUCTION. THE EMF. AND ELEC. COND. WERE MEASURED AS FUNCTIONS OF TEMP., COMPN., AND O PARTIAL PRESSURE, PO. THE FRACTION OF ELECTRONIC CONDUCTION IS TABULATED FOR PO EQUALS 0.95, 0.21, AND 0.03 ATM, 0-100 MOL. PERCENT PBO, AND 830-1030DEGREES FOR V SUB2 O SUB5-PBO; 26-69 MOL. PERCENT CAO AND 730-1030DEGREES FOR V SUB2 O SUB5-CAO; 0-50 MOL. PERCENT AL SUB2 O SUB3 AND 730-1030DEGREES FOR V SUB2 O SUB5-AL SUB2 O SUB3; 42 AND 95 MOL. PERCENT B SUB2 O SUB3 AND 730-1030DEGREES FOR V SUB2 O SUB5-B SUB2 O SUB3; AND 32 MOL. PERCENT K SUB2 O AND 730-1030DEGREES FOR V SUB2 O SUB5-K SUB2 O. A TRANSITION FROM ELECTRONIC TO IONIC CONDUCTION TAKES PLACE AFTER THE OXIDE ADDNS. THE SMALLER THE POLARIZING STRENGTH OF THE ADDN., THE MORE EASILY IONIC CONDUCTION APPEARS. THE COMPN. DEPENDENCE OF THE ACTIVITY OF V USB2 O SUB5 IS ALSO PLOTTED.

FACILITY: INST. MET., SVERDLOVSK, USSR.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

VATUTIN, N. T., GONCHAROV, V. P., and MALYUTINA, L. M., Rudnichnaya Hospital

UDC 615.285.7-099-07

"A Case of Acute Chlorophos Poisoning"

Kiev, Vrachebnoye Delo, No 9, 1971, pp 140-141

Abstract: A 44-year-old man accidently swallowed 30 mg of a concentrated solution of the organophosphorus insecticide chlorophos and within 10 min developed nausea, vomiting, weakness, and vertigo. He was brought to the hospital unconscious. After gastric and intestinal lavage with 2% salt solution and bleeding, he received intravenously 40% glucose, strophanthin, atropine, cordiamine, hydrocortisone and subcutaneously cytiton [a stimulant used in the treatment of respiratory disorders] and ephedrine. The medication restored consciousness within 3 hours, reduced dyspnea, and elevated arterial pressure to 110/70 mm Hg. Subsequent treatment included the administration of atropine intravenously and subcutaneously, daily intravenous injections of a mixture consisting of physiological saline, theophylline, and strophanthin, and intramuscular injections of hydrocortisone and vitamins B_1, B_6, B_{12}, C, penicillin, and neomycin. The patient was discharged in satisfactory condition after 2 weeks in the hospital.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

BOYCHUK, M. N., GAVRILOV, B. G., and VAULIN, V. YE. UDC:

"Frequency Stability of Self-Excited Oscillators of Ultrasonic Oscillations"

Kiev, Akustika i Ul'trazvukovaya Tekhnika, No 5, 1970, pp 45-52

Abstract: The authors study the effect of the active components of transistor emittances on the frequency stability of generators. Based on the analysis of a three-point self-excited oscillator, it was shown that the effect of the active emittances of an excitation circuit on the selective circuit can be significant and must be taken into consideration in calculations. Experimental results are given which support the theoretical position. Original article: five figures, 16 formulas, and 11 bibliographic entries.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC: 621.375:621.396.66(088.8)

VAULIN, V. Ye., KRISILOV, Yu. D., TARASOV, N. I., Odessa Polytechnical Institute

"A Device for Automatic Amplifier Control"

USSR Author's Certificate No 267704, filed 30 Aug 68, published 16 Jul 70 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1D113 P)

Translation: This Author's Certificate introduces an amplifier AGC device which contains an AC reference voltage oscillator connected through an attenuator to the amplifier input, a subtraction stage which compares the level of the reference voltage from the amplifier output to the level of the reference voltage from the oscillator output and generates a gain control signal, and also a signal filter connected at the amplifier output. As a distinguishing feature of the patent, the device is designed for increased control depth and decreased instability of the amplification factor with a change in climatic conditions. The unit is equipped with an additional ring for gain control by automatically increasing the level of the high-frequency reference voltage. To this end, the output of the signal filter is connected through an amplitude detector to the controlling input of a stage with variable transmission ratio which is connected between the output of the reference voltage oscillator and the attenuator.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

JPRS 59208

6-73

XV-8. EFFECT OF THE CRYSTALLIZATION CONDITIONS ON THE DISLOCATION STRUCTURE AND PROPERTIES OF HOMOEPITAXIAL LAYERS OF GERMANIUM

[Article by Yu. D. Vaulin, N. N. Migal', V. P. Migal', L. N. Aleksandrov, S. I. Stenin, Novosibirsk; Novosibirsk, III Simpozium po Protsessam Rosta i Sinteza Poluprovodnikovykh Kristallov i Plenok, Russian, 12-17 June 1972, p 219]

Epitaxy was realized by the iodide transport reaction in a sealed ampoule. The deposition temperatures of the layers were 500, 550 and 600° C, the initial iodine concentrations defining the supersaturation varied within the limits of 0.1-6.0 milligrams/cm^3, and the substrate orientation was (111). The crystallographic imperfections arising in epitaxial germanium were studied by x-ray Borman topography using symmetric and asymmetric surveys.

The variation of the dislocation structure is observed as a function of supersaturation at constant deposition temperature. For small iodine concentrations the dislocations are located in the transit ion layer with an increase in supersaturation these dislocations are transformed by sliding into a system of half loops fastened in the film-substrate junction. Closed loops are also detected. A further increase in iodine concentration leads to the disappearance of the dislocations. The variation of the deposition temperature shifts the described picture along the supersaturation scale. An analysis of the topograms demonstrated that for deposition temperatures of 500 and 550° C in the layer, dislocations with the <111> axis perpendicular to the substrate surface predominate, and at 600° C-60°, dislocations.

In this paper the mechanism of the formation of dislocations in the junction and the causes of the evolution of the dislocation structure as a function of supersaturation and temperature are discussed.

VALLIN, Yu. D.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 029 UNCLASSIFIED

TITLE--RELATION BETWEEN THE DISLOCATION AND ELECTRON STRUCTURES OF SOLIDS -U-

PROCESSING DATE--27NOV70

AUTHOR-(02)-SAMSONOV, G.V., VAULIN, YU.S.

COUNTRY OF INFO--USSR

SOURCE--POROSHKOVAYA MET., MAR. 1970, (3), 67-71

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, MATERIALS

TOPIC TAGS--ELECTRON STRUCTURE, SEMICONDUCTOR MATERIAL, SILICON, GERMANIUM, SINGLE CRYSTAL, CRYSTAL LATTICE STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/0624

STEP NO--UR/0226/70/000/003/0067/0071

CIRC ACCESSION NO--AP0134386

UNCLASSIFIED

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2/2 029 UNCLASSIFIED PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134386

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RELATION BETWEEN THE DISLOCATION STRUCTURE OF SOLID MATERIALS (METALS AND SEMICONDUCTORS) AND THE ELECTRON STRUCTURES OF THE CORRESPONDING ELEMENTS IS DISCUSSED IN THE LIGHT OF THE LATEST THEORETICAL AND EXPERIMENTAL DATA. THUS FOR EXAMPLE A TYPICAL DISLOCATION DENSITY IN SI AND GE, WHICH HAVE STABLE SP PRIME3 ELECTRON CONFIGURATIONS, IS 10 PRIME2-10 PRIME3 CM PRIME NEGATIVE2, WHEREAS IN METAL SINGLE CRYSTALS, WHICH HAVE STABLE CONFIGURATIONS OF THE D PRIME5, D PRIME10, ETC. TYPES, TYPICAL DISLOCATION DENSITIES ARE FAR HIGHER (10 PRIME8 CM PRIME NEGATIVE2 AFTER ANNEALING).

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

SHEVCHENKO, V. A., PYATYSHEV, D. R., VAULINA, E. M., and ANIKEYEVA, I. D. UDC 581.167

"Application of the Sector Mutant Colonies Test in the Study of the Mutation Process in Chlorella"

Moscow, Byulleten' Moskovskogo Obshchestva Ispytateley Prirody, Novoya Seriya, Otdel Biologicheskiy, Vol 75, No 3, May/Jun 70, pp 133-145

Abstract: The mutation process of Chlorella vulgaris (strain LARG-1) was studied by the method of sector mutant colonies. A synthronous culture of the algae in the pre-synthetic stage (young autospores) was exposed to the short-lived action of ethylenimine. Mixed mutant clones giving rise to sector colonies predominated over pure mutant clones. Study of the sector mutant colonies indicated an ordered spatial distribution of the daughter nuclei within the mother cells. This distribution was preserved in the solid nutrient medium after passage of the autospores from the mother cell. Ethylenimine induced mass formation of sectors of the aberrant types 3/8 and 5/8 and others that were present to only a minor extent after the action of X-rays or UV light on Chlorella. Formation of the aberrant types cannot be explained satisfactorily at this stage. The data obtained on the types of sectors and their quantitative distribution supported the hypothesis of the cyclic polytene nature of chromosomes in Chlorella.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

Physiology

UDC 612.82.014.21.013.7.014.46:547.2'133

KHVATOVA, Ye. M., and VAULINA, V. A., Chair of Biochemistry, Gor'kovskiy Medical Institute

"The Effect of Sodium Oxybutyrate on Energy Metabolism in Brain Mitochondria Under Normal Conditions and During Circulatory Hypoxia"

Moscow, Voprosy Meditsinskoy Khimii, Vol 19, No 2, Mar/Apr 73, pp 163-166

Abstract: In intact white rats, sodium gamma-oxybutyrate (1.5 g per kg body weight, given intraperitoneally) accelerates oxidation and phosphorylation in brain mitochondria by about 30% without changing the ratio between controlled and phosphorylative respiration. Circulatory hypoxia (ligation of both carotid arteries for 1 1/2 hr) reduces the rate of controlled respiration and phosphorylation by about 15%. Sodium oxibutyrate administered 15-20 min prior to ligation of the carotid arteries maintains controlled respiration at the initial level but increases the phosphorylation rate to about the same degree as in intact animals. Thus, in cerebral ischemia causing an acute deficiency in the supply of oxygen and substrates, preliminary administration of sodium gamma-oxybutyrate exerts a beneficial effect on energy metabolism in brain cell mitochondria.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 007 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--DIOL LIPIDS. XIII. SYNTHESIS OF COIXENOLIDE, THE DIOL LIPID FROM COIX LACRYMA SEEDS -U-

AUTHOR-(03)-VAVER, V.A., PROKAZOVA, N.V., BERGELSON, L.D.

COUNTRY OF INFO--USSR

SOURCE--KHIM. PRIR. SOEDIN. 1970, 6(2), 170-3

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PROCESSED PLANT PRODUCT, LIPID, VEGETABLE OIL, ESTER, CHEMICAL SYNTHESIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605002/D01 STEP NO--UR/0393/70/006/002/0170/0173

CIRC ACCESSION NO--AP0139445

UNCLASSIFIED

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

2/2 007

CIRC ACCESSION NO--AP0139445 UNCLASSIFIED

PROCESSING DATE--04DEC70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COIXENOLIDE (I), A MIXED ESTER OF CIS,9,HEXADECENOIC (PALMITOLEINIC) ACID (II) AND TRANS,11,OCTADECENOIC (VACCENIC) ACID (III) WITH 2,3,BUTANE,DIOL, ISOLATED BEFORE FROM C. LACRYMA-JOBI SEEDS, WAS SYNTHESIZED. THE ISOMERIZATION OF 1.5 G CIS,ME(CH SUB2) SUB5 CH:CH(CH SUB2) SUB9 CO SUB2 ME WAS CARRIED OUT BY HEATING 2 HR AT 200DEGREES WITH 0.1 G SE UNDER N, TO GIVE 0.45 G ME ESTER OF III, SAPOND. TO GIVE 0.4 G III, M. 40-20EGREES. THE ACID CHLORIDE OF II (PREPD. FROM II AND OXALYL CHLORIDE) WAS TREATED WITH 2,3,BUTANEDIOL IN ETHER IN THE PRESENCE OF PYRIDINE AT 0DEGREES TO GIVE 405.PERCENT 2,(CIS,9,HEXADECENOYLOXY),3,BUTANEDIOL (IV), N PRIME20 SUBD 1.4650, D PRIME20 0.9049. SIMILARLY, IV AND THE ACID CHLORIDE OF III GAVE 48.4PERCENT I, N PRIME20 SUBD 1.4594, D PRIME20 0.8945. OVER ADAMS CATALYST IN N HEPTANE, I WAS HYDROGENATED TO TETRAHYDROXOIXENOLIDE, M. 54-5.5DEGREES.

FACILITY: INST. KHIM. PRIR. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

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USSR Industrial & Mining

VAVILIN, A. N., BERLINSKIY, YU. N., NOSOV, B. N., Engineers, and GOL'DBERG, YU.A., Candidate of Technical Sciences (Kirishskaya State Regional Electric Power Plant)

UDC 621.18.004

"First Period of Operation of the Gas-Tight TGMP-324 Boiler Unit"

Moscow, Energetik, No 6, June 1973, pp 3-5

Abstract: The single-pass, single-unit TGMP-324 boiler unit, with a steam productivity of 1000 t/hour at a superheated-steam temperature of 545/545°C, was designed for operation with pressure charging at an efficiency of 94.7% with the combustion of mazut M100. The unit is described, and its distinguishing features are enumerated. In its first year of operation, the unit was in service for more than 4500 hours, including over 3600 hours with pressure charging. The following conclusions are drawn from an analysis of its first year of operation:

1. The decisions adopted in designing the gas-tight features of the TGMP boiler unit are satisfactory; the unit was viable for operation with pressure charging. With attentive and skilled installation, difficulties were not encountered in providing the seals with the requisite tightness.

2. Unsatisfactory design of hatches for observation of the heating

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VAVILIN, A. N., et al., Energetik, No 6, June 1973, pp 3-5

regime of the boiler, during operation with pressure charging, hinders the determination of flaws and breaches on the pipes of the heating surfaces.

3. The design of the joints of the combustion-chamber screens is in need of improvement.

4. The adopted burned devices with steam-mechanical nozzles permit operation within the load range of 10 to 100% of D_{nom} without turning the burners off.

5. The temperature regime of the heating surfaces has been satisfactory.

6. Increasing the capacity of the unit to the nominal value during operation of the boiler with pressure charging was attained by decreasing the resistance of the gas-air channel and increasing the thrust of the blower fans.

7. By means of appropriate adjustments, it became possible to attain economical operation of the unit with a unit consumption of standard fuel of 336 g/kwh at a capacity utilization factor of 70% and a preparedness factor pf 88% (in separate months). 5 figures.

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VAVILIN, G. I., VASIL'YEV, A. V., IL'INA, T. B., KROPACHEV, V. A., LAVRENT'YEVA, Ye. M., RABINOVICH, I. M., and TRUKHMANOVA, L. B., Institute of High-Molecular Compounds, Academy of Sciences USSR; State Scientific Research Institute of Tuberculosis, Ministry of Health of RSFSR; Leningrad Scientific Research Institute of Antibiotics, Ministry of Medical Industry USSR

"Use of Polymers for Modification of Antibacterial Preparations"

Riga, Fiziologicheski i Opticheski Aktivnyy Polimernyye Veshchestva, "Zinatne," 1971, pp 175-180

Abstract: Antibacterial preparations were modified by forming strong chemical bonds with polymers, and by protective coatings. Mixtures of p-aminosalicylic acid (PASA), streptomycin and hydrazine of isonicotinic acid (HINA) with polyvinyl alcohol (PVA) and polyvinylpyrrolidone (PVP), gels of iodopolyvinyl alcohol, as well as polymer preparations with PASA and HINA were studied. Coating of streptomycin, PASA, and HINA were accomplished with acetylphthalylcellulose (APC) and with its ammonium salt (NH_4-APC). All prepared antitubercular preparations preserved their potency in vitro for not less than 1 year. Therapeutic properties of PASA, tubaside, and streptomycin with polymers were tested on dogs and guinea pigs. The long-lasting effect of preparations depended first of all on the polymer-carrier, its mol. wt.,

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VAVILIN, G. I., et al., Fiziologicheski i Opticheski Aktivnyye Polimernyye Veshchestva, "Zinatne," 1971, pp 175-180

and the method of administration into the animal organism. Best results were shown by polymers with mol. wt. of 50,000-60,000. Coating of tubaside, PASA, and streptomycin with APC and NH_4-APC eliminated some side effects, excessive production of gastric juices, increased tolerance by patients who could not take them without coatings, and prolonged effectiveness of all drugs tested. PASA pills with APC coating preserved their antimicrobial effect for 2 years (1.5 years for uncoated pills). Solubility of APC and NH_4-APC coatings in artificial gastric juices at pH 7.4 was 20 and 15 min, respectively, and 3 hr at pH 1.2. Some coated pills reached small intestine before being completely decomposed. NH_4-APC coatings were more penetrable by fluids than APC coatings.

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JPRS 55569
19 Mar 72

VAVILINA, G. P.

ABSTRACTS OF ARTICLES PUBLISHED IN THIS ISSUE

[Abstracts; Moscow, Vestnik Akademii Meditsinskikh Nauk SSSR, Russian, No 2, 1972, p 96]

"Medicobiological Investigations Dealing with the Use of Estrogens as Growth Stimulating Agents," by A.A. Pokrovskiy, M.F. Nesterin, G.P. Vavilina, Ye.Ye. Ryazantseva, L.Ya. Solov'yeva, p 3.

As a result of medicobiological examination of meat products obtained from bull calves stimulated with diethylstilbestrol, it was shown that the recommended method of using this hormone does not rule out the possibility of retention in subproducts of meat of residual quantities of this agent. When feeding laboratory animals on experimental meat there was manifestation of some adverse effects on their development and change in sex gland function. On the basis of the data obtained and the literature, with due consideration of worldwide experience in using diethylstilbestrol to fatten various species of animals, the authors conclude that it is impossible to use this preparation in animal breeding.

There are eight tables, one illustration; bibliography lists 118 items.

"Experience with Vitamin E Supplement for Bicycle Racers and Skiers," by Ye.A. Sakayeva, V.V. Yefremov, p 52.

A study was made of the effect of different intensities of physical stress on vitamin E availability in the organism of cyclists and skiers during winter sport meets. As a result of the study it was found that 1.5-2 and especially 3-4-hour training induces a considerable decline in vitamin E content in the blood serum of the athletes. Additional intake of this vitamin in doses of 50-150 mg for cyclists who trained for 1.5-2 hours and 200-300 mg for skiers who trained for 3-4 hours raises the blood serum vitamin E level and results in greater efficiency of the athlates.

Two illustrations; bibliography lists nine items.

(over)

"A True Antrumectomy Technique in Surgery for Peptic Ulcers," by Yu.M. Pentsyrev, A.A. Grinberg, T.T. Laktionova, p 72.

A method is described for pinpointing the boundaries of the antral portion of the stomach during surgical interventions using 2% solution of Congo red dye as an indicator on the gastric mucosa. The method has been developed experimentally and used in clinical practice on 30 patients with duodenal and gastric ulcers; this revealed that it is simple, safe, and permits performance of a true antrumectomy, in other words, it permits the performance of a functionally substantiated sparing operation on the stomach. The precision of the method was confirmed by histological examinations.

Two illustrations; one table; bibliography lists 24 items.

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VAVILINA, G. P.

JPRS 55569
29 Mar 72

UDC: 613.281:636.084.52:615.357.651

MEDICOBIOLOGICAL INVESTIGATIONS DEALING WITH THE USE OF ESTROGENS AS GROWTH STIMULATING AGENTS

[Article by A.A. Pokrovskiy, M.F. Nesterin, G.P. Vavilina, Ye.Ye. Ryazantseva, L.Ya. Solov'yeva, Institute of Nutrition, USSR Academy of Medical Sciences, Moscow; Moscow, Vestnik Akademii Meditsinskikh Nauk SSSR, Russian, No 2, 1972, pp 3-15]

In the last few years there has been intensive discussion in the special literature of the desirability of using various growth stimulants on farm animals (K.I. Barulin and Yu.K. Shamberev, 1966; Yu.P. Fomichev, 1967; Yu.N. Shamberev, 1970).

Among such biostimulants, some attention is being given to sex hormones and especially the synthetic analogues of estrogens. Proposals made in this area are based on experimental investigations conducted in the 1940s which revealed that androgens and estrogens (Kochakian, 1935, 1946; Albright, 1942; Kruskemper, 1953) have a definite anabolic effect.

It was shown that when using the same number of fodder units, administration of androgens and estrogens leads to a reliable increase in weight increment related mainly to accumulation of protein substances for androgens and with increased moisture and fat content in tissues, in addition, for estrogen, the nature of stimulation of biosynthetic processes in this case is determined by species-related distinctions.

In the early 1950s, the research foundation of Iowa College received a patent for using diethylstilbestrol, a synthetic estrogen analogue, to fatten bull calves, and soon after this their suggestion was sanctioned by the Food and Drug Administration. This method consisted of adding 10 mg diethylstilbestrol daily to the animal's fodder. In 1955, the practice was also adopted of subcutaneous implantation of a diethylstilbestrol pill.

It must be noted that an increased weight gain is obtained when using this hormone only if a specific fodder composition is used, in particular a specific protein level, as well as proportion of protein to other components. Thus, it was noted that with an 11 percent protein content in the diet there was a marked anabolic effect, with 8 percent and more (12%) diethylstilbestrol did not have a beneficial effect on weight gain (Snapp and Neumann, 1962). The

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USSR

UDC 615.214.31.015.4:612.823.5

POPOVA, E. N., VAVILOV, A. M., KRIVITSKAYA, G. N., and TUMANOV, V. P., Brain Institute and Institute of Surgery imeni A.V.Vishnevskiy, Academy of Medical Sciences USSR, Moscow

"Effect of Amphetamine Sulfate on the Structure of Interneuronal Connections"

Moscow, Zhurnal Nevropatologii i Psikhiatrii, No 3, 1973, pp 382-387

Abstract: Intraperitoneal injection of rats with 1 mg/kg of amphetamine sulfate had little effect on the dendrites of most neurons in the caudate nucleus or cerebral cortex. Following a dose of 2.5 mg/kg, a dense network of fibrils of different sizes was seen in slices from the caudate nucleus stained with silver by Golgi's method. Along the thinnest fibrils could be seen varicosities of irregular shape and size that stained more intensely with silver. The number of spines per unit of dendrite length increased markedly. In this axonal network were intertwined thicker fibers branching out in arboreal fashion. The cortex also exhibited an axonal network, denser in the lower layers. Injection of 10 mg/kg of amphetamine sulfate intensified the staining of the fibrillar structures. The number of spines on the dendrites was somewhat larger than when the moderate dose was used and there were more axodendritic contracts on the trunk and spines. Thus, the number of spines per unit of

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POPOVA, E. N., et al., Zhurnal Nevropatologii i Psikhiatrii, No 3, 1973, pp 382-387

dendrite length regularly increased as the dose of amphetamine sulfate was boosted, showing that both the caudate nucleus and the sensorimotor cortex were stimulated by the drug.

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cybernetics

GLORIA

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23 May 70

UDC 62-50

AUTOMATA BEHAVIOR IN RANDOM MEDIA WITH RESTRICTED LENGTH OF INPUT WORDS

[Article by E. M. Vavilov and K. L. Kostov; Kiev, Avtomatyka, Ukrainian, No 6, 1971, pp 50-54]

Carrying through to the end [1], let us look at the determined automaton which functions in a stationary random medium. The output variable of the automaton (activity) can acquire two values: y_1 and y_2. The input variables also acquire two values -- x_0 (gain) and x_1 (loss). If the automaton performs activity y_1, the medium forms the input variables for it: x_1 with the probability p_1 and x_0 with probability $q_1 = 1 - p_1$. In activity y_2 the variables x_1 and x_0 are formed with the probabilities p_2 and $q_2 = 1 - p_2$ respectively.

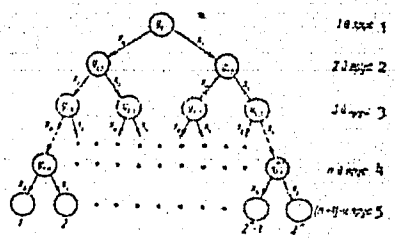

Figure 1

Key:
1. 1st layer
2. 2nd layer
3. 3rd layer
4. nth layer
5. (n + 1)th layer

VAVILOV, E. M.

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USSR UDC 621.165.74.001.5

MAKSUTOVA, M. K., VAVILOV, G. A., TARASOV, V. N., Kazan Aviation Institute

"Influence of Geometry of Turbine Blades on Structure of Flow Before Wheel"

Moscow, Teploenergetika, No 11, Nov 72, pp 37-40

Abstract: This work presents an experimental estimate of the influence of elements of the geometry of the drivewheel of a turbine on the distribution of parameters in the axial gap between the nozzle apparatus and the drivewheel. In stages with identical nozzle apparatus but different methods of twisting of drive blades, the difference in the distribution of parameters around the radius in the space between crowns is significantly less than the difference between calculated and actual values. In stages with untwisted blades, as the rotating frequency decreases, a significant increase is noted in the difference between calculated and experimental values of parameters. The distribution of parameters in stages with broad twisted blades remains practically unchanged as the rotating frequency decreases. In a stage with a rim around nontwisting blades, a change in relative radial clearance of 2-5% has little influence on the nature of change of the flow parameters. As the radial clearance increases, the divergence between calculated and true parameters increases. The absolute

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USSR

MAKSUTOVA, M. K., et al., Teploenergetika, No 11, Nov 72, pp 37-40

velocity increases significantly; therefore, in planning stages with large radial clearances, it is desirable to consider the influence of clearance on angles of attack. When drive blades do not have rims, an increase in clearance causes reinforcement of radial leakage, and the difference between calculated and true values of parameters increases.

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1/2 011 UNCLASSIFIED PROCESSING DATE--11SEP70

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

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

COUNTRY OF INFO--USSR

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

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

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

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1691 STEP NO--UR/0409/70/000/001/0119/0121

CIRC ACCESSION NO--AP0104904

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

2/2 011 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0104904

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

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USSR

UDC 546.791.6

VDOVENKO, V. M., and VAVILOV, N. G.

"Investigation of the Uranyl Ion Complexes With di-n-Heptylphosphinic Acid"

Leningrad, Radiokhimiya, Vol 14, No 4, 1972, pp 558-563

Abstract: A study of the complexes forming between di-n-heptylphosphinic acid and uranyl ion was carried out by means of cryoscopic and IR-spectroscopic methods. A diagram has been proposed for the transition from one complex to the next along the saturation of the substrate being extracted with uranium:

$$UO_2X_2 \cdot 2HX \longrightarrow UO_2X_2 \cdot HX \longrightarrow (UO_2X_2)_n \cdot HX \longrightarrow (UO_2X_2)_m$$

where $1 < n < m$. It has been established that in the complex $(UO_2X_2)_m$ the m value is about 10-12. Keeping such solutions stored for 10 days leads to an increase in m of up to 25. It was shown to be possible to extract concurrently both the uranyl and the nitrate ions from aqueous solutions containing less than 1M nitric acid.

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VAVILOV, V. S., GUZEYeV, N. V., ZAYaTs, V. A., KONONENKO, V. L., MANDEL'ShTAM, T. S., and MURZIN, V. N.

"The Spectra of Photo Excitation of Free Excitons by Submillimeter Radiation in 'Ultra Pure' Germanium"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 17, No 9, 5 May 73, pp 480 - 483

Abstract: Recent experiments have been successful in the study of characteristics of excitons in the long-wave infrared band. Absorption in the region of 2 - 5 Mev was observed in 1971. Subsequent experiments with a backwards wave tube recorded absorption by free excitons in germanium of a triplet with a maximum at 3.42 Mev. In both cases the germanium had residual impurities of 10^{12} - 10^{13} cm^{-3}, which does not completely exclude possible impurity effects. The authors have made tests at impurity levels no greater than $5 \cdot 10^{10}$ cm^{-3} with a backward wave tube at 340 - 455 and 510 - 730 micrometers, as well as with a diffraction spectrometer at the far infrared region of 60 - 700 micrometers. The experiments were at 1.5 - 4.2 degrees K.

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VAVILOV, V. S., et al., Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 17, No 9, 5 May 73, pp 480 - 483

Results indicate that the binding energy of the exciton in the ground state is 3.7 Mev and that the distance between the lowest two states is 0.7 Kev, a result which agrees fairly well with theoretical predictions and with measurements in the interzonal transition region. The narrowness of the absorption lines measured indicates that kinetic energy of the excitons does not substantially contribute to broadening these lines. The broadness is apparently related to interactions between the excitons and null oscillations of the crystal lattice.

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USSR UDC: 621.315.592

VAVILOV, V. S., GUKASYAN, M. A., KONOROVA, Ye. A., and MILYUTIN, Yu. V.

"Ionic Insertion of Antimony into Diamonds"

Leningrad, Fizika i tekhnika poluprovodnikov, No 12, 1972, pp 2384-2391

Abstract: In the experiments described in this paper, ions of arsenic, antimony, and bismuth were introduced into diamond. The method of an earlier paper (V. S. Vavilov, et al, FTP, 4, 10, 1970) in which phosphorus ions were introduced into a diamond layer with n-type conductivity, was followed. Since ions like those used in the experiments of the present paper have high masses, the concentration of radiation defects created in the introduction process is high, and even slight radiation doses result in graphitization of the layer during annealing. For that reason, the introduction process took place at high temperature levels, around 800° C. Curves are given for the electrical conductivity of specimens treated with antimony ions as functions of the annealing temperature and the thickness of the treated layer. Reproductions of electronograms of the irradiated diamond surfaces for specimens receiving various

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USSR UDC: 621.315.592

VAVILOV, V. S., et al, Fizika i tekhnika poluprovodnikov, No 12, 1972, pp 2384-2391

dosages are shown; they indicate that higher doses of irradiation lead to destruction of the crystal lattice while annealing restores the crystallinity. It is noted that the electronograms were taken and interpreted by R. I. Nazarova of the Institute of Physical Chemistry, USSR Academy of Sciences. Others credited with assisting the authors are B. M. Vul and V. N. Vinogradov for their comments and discussions, V. V. Krasnopevtsev for his assistanc with the ion insertions, and V. A. Mizonova and N. A. Shuvalova for preparing the specimens.

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USSR UDC [537.226+537.311.33]:[537+535]

VAVILOV, V. S., PLOTNIKOV, A. F., SOKOLOVA, A. A., and SHUBIN, V. E.

"Electron Injection From Semiconductor and Metal Into Dielectric Due to Illumination of Au-InSb Oxide-InSb Structures"

Kratkiye soobshch. po fiz. (Brief Communications on Physics), 1971, No 4, pp 40-47 (from RZh-Fizika, No 10, Oct 71, Abstract No 10YE791 by V. B. S.)

Translation: An investigation was made of illumination-induced electron injection from a semiconductor (and metal) into a dielectric, as well as intrinsic and extrinsic photoconductivity of the dielectric in Au-InSb oxide-InSb structures. The authors consider the processes of charge exchange of traps localized in the dielectric under the action of the illumination of MDP [metal-dielectric-semiconductor (?)] structures by IR and visible radiation.

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USSR UDC 537.311.33

VAVILOV, V. S., GUKASYAN, M. A., GUSEVA, M. I., KONOROVA, Ye. A., and SERGIYENKO, V. F.

"Electron-Hole Junction in a Diamond Obtained Through the Infiltration of Boron and Phosphorus Ions"

Moscow, Doklady Akademii nauk SSSR, No. 4, vol. 200, 1971, pp 821-824

Abstract: The results are given of experiments performed to establish a p-n junction in diamonds by the ion impurity method. Boron was used as the acceptor impurity and phosphorus as the donor. The reasons for this choice were that, as one of the elements of the V group in the Mendeleyev table of elements and consequently as a "natural" donor, phosphorus has the greatest amount of interest; and that, on the basis of the graph of the annealing of layers infiltrated by phosphorus, it can be assumed that a greater number of active donor centers can be obtained with the same dosage of phosphorus doping than can be obtained with such interstitial atoms as lithium and carbon. Curves are plotted for the voltampere characteristic of the junction and for the photovoltage of the junction as a function of the excitation light wavelength. The authors conclude that they have proved the possibility of obtaining p-n junctions in diamonds, and express their gratitude to B. M. Vul,

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USSR

VAVILOV, V. S., et al, Doklady Akademii nauk SSSR, No. 4, vol. 200, 1971, pp 821-824

Corresponding Member of the USSR Academy of Sciences, for his support of the work, to V. M. Gusev for his assistance with the infiltration experiments, and to Yu. A. Kuznetsov and Yu. A. Salikov for their help with the measurements. The authors are associated with the Lebedev Physics Institute, USSR Academy of Sciences, Moscow.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

Crystals & Semiconductors

USSR UDC 539.293:538.3

BONCH-BRUYEVICH, V. L., and VAVILOV, V. S.

"Problems of Modern Semiconductor Physics"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy --Fizika, No 4, 1971, pp 7-13

Abstract: This article deals with the standard problems of semiconductor physics limited to those which focus on the theoretical aspect rather than on the practical. The report was presented at the extended session of the section on semiconductor physics and chemistry under the scientific and technical council of the USSR Ministry of Higher and Secondary Special Education.

The discussion is divided into two basic areas of study: experimental and theoretical investigation of the energy spectrum of matter and investigation of essentially nonequilibrium processes in a charge carrier system. Accomplishments in the field of semiconductor physics are reviewed briefly, and some of the most interesting problems under study today are listed. It would be of interest experimentally to check the new ideas regarding the nature of "ionization" energy losses as the transmission of energy, not to individual

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BONCH-BRUYEVICH, V. L., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy --
Fizika, No 4, 1971, pp 7-13

electrons of a stopping material, but to collective oscillation quanta -- plasmons. A sharply defined minimum of the reflectance of a semiconductor is observed near plasma resonance, the study of which requires use of volumetric excitation by pulses of accelerated electrons and the study of the optical absorption, electrical conductivity, and other parameters of the excited semiconductor. The study of domain instabilities such as the Gunn effect is of great interest in view of probable applications such as microradio wave generation, modulation of light fluxes, and the possibility of creating theoretically new radiation receivers. The broader understanding of the classical concept of phase transitions by which a set of charge carriers in semiconductors can be considered as a "multiphase" system has opened up new areas of study. Experimental data needs to be obtained for various states of a set of nonequilibrium carriers for crystals with large widths of the forbidden zone in connection with the nature of forces causing condensation of carriers into plasma drops.

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USSR

BONCH-BRUYEVICH, V. L., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy — Fizika, No 4, 1971, pp 7-11

Some approaches to the theoretical and experimental investigation of the above-mentioned and other related problems are briefly outlined. It is noted that the physics of semiconductors, which once dealt with uncontrollable materials, is now converting to the study of controlled, disordered systems. Biological materials are considered to fall within this category, permitting semiconductor physics to build a bridge between physics and biology.

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USSR

GIPPIUS, A. A., VAVILOV, V. S., PANASYAN, Zh. R. and USHAKOV, V. V.

"Exciton Luminescence Line Reversal and the Fine Structure of Exciton Absorption in CdTe"

Kratkiye Soobshcheniya po Fizike (Brief Communications in Physics), No. 7, July 1970, pp 8-14

Abstract: Detailed measurements were made of photoluminescence, cathode luminescence, and reflection spectra at temperatures between 4.2 and 77°K. Spectral resolution was 10^{-4} ev. The reflection data was processed on the BESM-4 digital computer of the Physics Institute of the USSR Academy of Sciences. The spectral dependence of the absorption coefficient and the refraction index, found with the aid of the Kramers-Kronig relation, were used to calculate the luminescence spectrum. Certain features of self-absorption which were formerly ignored are taken into account. A layer of approximately 10^{-4} cm is excited during photo- and cathode luminescence. At 77 and 4.2°K the absorption coefficient is 5×10^4 and 2×10^5 cm^{-1}. The optical density of the excited layer is therefore extremely large (5 to 20) and the luminescence intensity is greatly weakened by self-absorption. Conditions, therefore, exist for reversal of the exciton lines, and such reversal was obtained both theoretically and experimentally. The

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USSR

GIPPIUS, A. A., et al, Kratkiye Soobshcheniya po Fizike, No 7, July 1970, pp 8-14

reversal is slightly to one side of the center of the luminescence line, shifted in the direction of larger energies. The negative absorption observed at low temperature disappears at higher temperature. The temperature-dependent doublet structure observed in the absorption spectrum is not clearly understood. It is suggested that the observed features may be due to the fact that the Kramers-Kronig relation does not account for the spatial dispersion of optical constants and special boundary conditions at the crystal surfaces. An unknown new effect may be in operation. Comparison of absorption and emission spectra shows that both absorption maxima coincide with the emission minimum, and, thus, self-reversal appears to exist in this case as well. Orig. art. has 2 figs. and 7 refs.

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 042 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--ELECTRICAL CONDUCTIVITY OF N AND P TYPE SEMICONDUCTOR DIAMONDS PREPARED BY AN ION INJECTION METHOD DURING STEPPED ISOCHRONOUS ANNEALING

AUTHOR-(04)-VAVILOV, V.S., GUSEVA, M.I., KONOROVA, E.A., SERGIYENKO, V.F.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1) 10-16

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--DIAMOND, LITHIUM, COPPER, POTASSIUM, ALUMINUM, BORON, IONIZATION, ELECTRIC CONDUCTIVITY, SEMICONDUCTOR CRYSTAL, ANNEALING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/1469 STEP NO--UR/0449/70/004/001/0010/0016

CIRC ACCESSION NO--AP0054325

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

UNCLASSIFIED

PROCESSING DATE--18SEP70

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CIRC ACCESSION NO--AP0054325

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELEC. COND. OF SEMICONDUCTOR DIAMOND LAYERS OBTAINED BY INJECTION OF LI, C, P, AL, AND B IONS WAS STUDIED. INJECTION OF LI, C, AND P IONS LEADS TO THE FORMATION OF AN N TYPE LAYER, WHILE THE INJECTION OF AL AND B LEADS TO A RHO TYPE LAYER. THE ELEC. COND. ACTIVATION ENERGY IS 0.25-0.45 EV. DURING ISOCHRONOUS STEPPED ANNEALING, THE ELEC. COND. OF THE LAYERS DOPED WITH B FALLS, AND THEN INCREASES WITH INCREASING TEMP. TO A VALUE SEVERAL ORDERS OF MAGNITUDE HIGHER THAN THE ORIGINAL. ON PROLONGED ANNEALING AT 1200DEGREES, THE COND. OF PREVIOUSLY ANNEALED LAYERS DOES NOT CHANGE. THREE VALUES OF THE ELEC. COND. ACTIVATION ENERGY WERE OBSD: 0.2 PLUS OR MINUS 0.02, 0.29 PLUS OR MINUS 0.02, AND 0.4 PLUS OR MINUS 0.02 EV. THIS ATTRIBUTED TO THE PRESENCE OF RADIATION DEFECTS. IN SPECIMENS DOPED WITH LI, C, P, AND AL, THE COND. BEGINS TO DECREASE AT AN ANNEALING TEMP. OF 600DEGREES, WHILE AT HIGHER TEMPS. THE RESISTANCE OF THE LAYERS IS RESTORED ALMOST TO THAT OF THE UNDOPED CRYSTAL.

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USSR

V

VAVILOV, V. S.; BOBROVA, Ye. A.; GALKIN, G. N. (Lebedev Physics Institute of USSR Academy of Sciences, Moscow)

"Light Reflection in the Infrared Region from Silicon with a High Concentration of Nonequilibrium Carriers"

Leningrad, Solid State Physics; April, 1970; pp 1232-5

ABSTRACT: The variation of the coefficient of reflection R from unalloyed silicon at room temperature on a wave length of 10.6 μ as a function of the level of excitation with a ruby laser was studied. It was observed that with an increase in the level of excitation R decreased from 30 to 19%, then increased to 50%. From data on the minimum on the reflection curve it was possible to draw a conclusion concerning the predominence of electron-hole scattering. A relaxation time on the order of 10^{-14} seconds was obtained for the minimum value of R. The concentration of nonequilibrium carriers $\Delta n = \Delta p = 2 \cdot 10^{19}\ cm^{-3}$, corresponding to the minimum on the reflection curve, was determined.

The article includes 5 equations and 2 figures. There are 9 bibliographic references.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 041 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--HALL EFFECT IN P TYPE SEMICONDUCTOR DIAMONDS DOPED WITH BORON BY THE ION INJECTION METHOD -U-

AUTHOR-(04)-VAVILOV, V.S., GUSEVA, M.I., KONOROVA, E.A., SERGIENKO, V.F.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1) 17-22

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--HALL EFFECT, SEMICONDUCTOR MATERIAL, DIAMOND, BORON, IONIZATION, IMPURITY SEMICONDUCTOR

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/1468 STEP NO--UR/0449/70/004/001/0017/0022

CIRC ACCESSION NO--AP0054324

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

2/2 041 UNCLASSIFIED PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0054324

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE HALL EFFECT AND CARRIER MOBILITY IN SEMICONDUCTOR DIAMOND LAYERS DOPED WITH B BY ION INJECTION WERE STUDIED THE MEASUREMENTS WERE CARRIED OUT AT 300-1200DEGREES K. THE PLOT OF THE LOG R SUBS (THE MEASURED HALL CONST.) VS 1-T EXHIBITS A MAX. IN THE SAME TEMP. REGION IN WHICH A DISCONTINUITY IS OBSD. IN THE PLOT OF LOG SIGMA VS. 1-T (WHERE SIGMA IS THE ELEC. COND.), THIS BEING A CONSEQUENCE OF THE FORMATION OF AN IMPURITY ZONE. AT THE DOPING LEVEL USED, THE IONIZATION ENERGY OF THE B ACCEPTOR LEVEL WAS 0.19 EV. THE OBSD. ACCEPTOR LEVELS OF THE RADIATION DEFECTS HAD IONIZATION ENERGIES OF 0.29 AND 0.4 EV. AT 500-600DEGREES K, THE MOBILITY IS 30-50 CM PRIME 2-V_SEC, AND DECREASES WITH RISE IN TEMP. THE OBSD. RELATION BETWEEN MOBILITY AND TEMP. CAN BE EXPLAINED BY THE INTERACTION BETWEEN THE CARRIERS AND THE IONIZED IMPURITIES AND LATTICE VIBRATIONS, ASSUMING DUE ALLOWANCE IS MADE FOR THE FACT THAT THE IMPURITY CONCN. IS NOT UNIFORM OVER THE LAYER THICKNESS.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

VAVILOV, V. S., IVANOV, V. S., KOPYLOVSKIY, D. B., STOPACHINSKIY, V. B.

"Methods of Studying Thermal Reflection in Semiconductors"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 6, June 1970, pp 1678-1681

Abstract: Research on the thermal reflection spectra of GaAs at a temperature of about 500°K and CdTe at about 80°K as carried out. Various methods of effecting temperature modulation as well as the system for recording $\Delta R/R$ are described. In the thermal-reflection spectrum of GaAs, with the use of a CO_2-based laser for temperature modulation, $\Gamma_{15} \rightarrow \Gamma_1$, $\Lambda_3 \rightarrow \Lambda_1$, $L_3' \rightarrow L_1$ optical transitions were observed. On the basis of the example of CdTe it is shown that at low temperatures, in the analysis of thermal-reflection spectra, electron-hole interaction must be taken into account.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC 621.315.592

VAVILOV, V. S., KLYAVA, YA. G., KOSHELEV, O. G., TYAPKINA, N. D., Moscow State University imeni M. V. Lomonosov

"Effect of Temperature and Superhigh Frequency on the Conductivity of Germanium with Beryllium at Helium Temperatures"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 9, Sep 70, pp 1683-1688

Abstract: The authors investigate the temperature dependence of conductivity (σ) and the effect of superhigh frequency (λ = 3 cm) on σ in P-type germanium doped with beryllium and phosphorus at 1.45-4.2°K. In this region the relationship $\sigma(T)$ may be approximated by the formula $\sigma = \sigma_0 \exp(-\varepsilon/kT)$. Both ε and σ_0 are studied as functions of $r_A = [3/4\pi(2N_{Be} - N_P)]^{1/3}$ (N_{Be} and N_P are the concentrations of beryllium and phosphorus). With a reduction in r_A, ε decreases, disappearing when r_A = 40-50 Å. Within the limits of measurement precision, the relationship $\sigma_0(r_A)$ may be represented by the expression $\sigma_0 = C \exp(-2r_A/a_2)$, where $C \approx 3 \cdot 10^3 \Omega^{-1} \cdot cm^{-1}$, and $a_2 \approx 17$ Å. An increase in σ ($\Delta\sigma$) was observed which was proportional to the SHF power. In the linear region of voltage-current characteristics, $\Delta\sigma$ is independent of the amplitude of the DC field, and $\Delta\sigma/\sigma$ changes by only an order of magnitude with a change in σ by seven orders of magnitude. The relationship

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

VAVILOV, V. S., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 9, Sep 70, pp 1683-1688

between $\Delta\sigma$ and the SHF modulation frequency is studied. In low-resistance specimens, $\Delta\sigma$ decreases by half when f = 30 kHz. This inertness indicates that $\Delta\sigma$ is chiefly bolometric in nature. The authors thank V. L. Bonch-Bruyevich and N. A. Penin for interest in the work and for discussing it, T. Yu. Lisovskaya for assisting with the experiment, and V. Ye. Kuvshinova for preparing the specimens and carrying out the Hall measurements.

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

1/2 063 UNCLASSIFIED PROCESSING DATE 20AUG70

TITLE--INFRARED LIGHT REFLECTION FROM SILICON WITH A HIGH CONCENTRATION OF NONEQUILIBRIUM CARRIERS -U-

AUTHOR-(03)-BOBROVA, YE.A., VAVILOV, V.S., GALKIN, G.N.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1232-5

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--CARRIER LIFETIME, IR LIGHT, LIGHT REFLECTION, SILICON, LIGHT REFLECTION COEFFICIENT, RUBY LASER, LASER EXCITATION, ELECTRON HOLE, ENERGY SCATTERING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1303 STEP NO--UR/0181/70/012/004/1232/1235

CIRC ACCESSION NO--AP0124954

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5"

"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

2/2 063 UNCLASSIFIED

CIRC ACCESSION NO--AP0124954 PROCESSING DATE--20NOV70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. VARIATION WAS INVESTIGATED OF THE REFLECTION COEFF. R FROM UNDOPED SI AT ROOM TEMP. AT 10.6 MU AS A FUNCTION OF THE LEVEL OF EXCITATION WITH A RUBY LASER. WITH INCREASED LEVEL OF EXCITATION A DECREASE IN R WAS OBSD. FROM 30 TO 19PERCENT AND THEN AN INCREASE TO 50PERCENT. DATA ON THE DEPTH OF THE MIN. ON THE REFLECTION CURVE ALLOWED CONCLUDING ABOUT THE PREVAILING ELECTRON HOLE SCATTERING. FROM THE VALUE OF R IN THE MIN. THE RELAXATION TIME WAS EVALUATED; IT IS 10 NEGATIVE PRIME14 SEC. CONCN. WAS DETD. OF NONEQUIL. CARRIER CORRESPONDING TO THE MIN. ON THE REFLECTION CURVE DELTA N EQUALS DELTA P EQUALS 2 TIMES 10 PRIME19-CM PRIME3. FACILITY: FIZ. INST. IM. LEBEDEVA, MOSCOW, USSR.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC: 8.74

BUZUNOV, Yu. A., VAVILOV, Ye. N., Kachalov, P. T.

"Tabular Method of Construction of Distribution of Control Signals in Micro-programmed Automaton"

Kibern. Tekhn. [Cybernetic Equipment--Collection of Works], Kiev, 1971, pp 184-197, (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V506, by V. Mikheyev)

Translation: The following problem is studied. Given is a set of operations $O_1, O_2, \ldots, O_n$, performed by a digital operating automaton. Each operation O_i corresponds to microprogram M_n, composed of a fixed set of microoperations $A_1, A_2, \ldots, A_j, \ldots, A_r$, where r is the number different microoperation in the set. The problem is to construct a microprogrammed controlling automaton (MPCA) with the minimum output control signal distributor, corresponding to the fixed set of microoperation. The MPCS is constructed in the form of two units: the control signal former (CSF) including, in addition to memory, logic circuits realizing the excitation functions; the control signal distributor (CSD), realizing the output functions corresponding to the output control

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USSR

Buzunov, Yu. A., Vavilov, Ye. N., Kachalov, P. T., Kibern. Tekhn., Kiev, 1971, pp 184-197

signals u_j. The CSF develops a sequence of pulses $q_1, q_2, \ldots, q_n, \ldots, q_s$, forming the operating cycle of the MPCA. The operating cycle refers to the time interval, during which the automaton develops the necessary sequence of microoperations allowing performance of the microprogram corresponding to operation O_i. The operating cycle is divided into microcycles, during each of which one of the signals q_h appears at the input of the CSD. The outputs of the MPCA then carry a sequence of control signals u_j, distributed in time and space. Illustrative examples are presented.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC: 621.374.335

VAVILOV, Ye. N., YEGOROV, B. M., LANTSEV, V. S., TOTSENKO, V. G.

"Synthesis of Circuits Based on Threshold Elements"

Sintez skhem na porogovykh elementakh (cf English above), Moscow, "Sov. radio", 1970, 368 pp, ill. 1 r. 30 k. (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1G203 K)

Translation: The authors consider conditions for realizability of a switching function by one threshold element. Methods are outlined for synthesizing logic circuits and automata based on threshold elements. The different kinds of threshold elements are described. A number of standard discrete-action units and circuits based on threshold elements are considered. Methods are given for synthesizing circuits based on threshold elements with regard to reliability requirements. A table of threshold functions of six variables is presented. Methods of synthesis are reduced to algorithms which are convenient for use in engineering practice, and illustrative examples are given. Bibliography of 29 titles. Annotation.

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

USSR

UDC:681.325.65:512.932

VAVILOV, Ye. N., YEGOROV, B. M., LANTSEV, V. S., TOTSENKO, V. G.

"Synthesis of Systems Using Threshold Elements"

Sintez Skhem na Porogovykh Elementakh [English version above], Moscow, Sovetskoye Radio Press, 1970, 368 pp

Annotation: Conditions are analyzed under which a switching function can be realized by one threshold element. Methods are presented for synthesis of logic circuits and automata based on threshold elements. Varieties of threshold elements are described. A number of standard units and discrete circuits based on threshold elements are analyzed. Methods are presented for synthesis of circuits based on threshold elements. Methods are presented for synthesis of circuits based on threshold elements considering the requirements of reliability. A table of threshold functions of six variables is presented.

The methods of synthesis are reduced to algorithms convenient for use in engineering practice and are illustrated with examples.

116 tables; 92 figures; 29 biblio. refs.

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USSR

VAVILOV, Ye. N. et al., Sintez Skhem na Porogovykh Elementakh, Moscow, Sovetskoye Radio Press, 1970, 368 pp

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USSR

VAVILOV, Ye. N. et al., Sintez Skhem na Porogovykh Elementakh, Moscow, Sovetskoye Radio Press, 1970, 368 pp

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VAVILOV, Ye. N. et al., Sintez Skhem na Porogovykh Elementakh, Moscow, Sovetskoye Radio Press, 1970, 368 pp

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"APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002203510003-5

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VAVILOV, Ye. N. et al., Sintez Skhem na Porogovykh Elementakh, Moscow, Sovetskoye Radio Press, 1970, 368 pp

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VAVILOV, Ye. N. et al., Sintez Skhem na Porogovykh Elementakh, Moscow, Sovetskoye Radio Press, 1970, 368 pp

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VAVILOV, Ye. N. et al., Sintez Skhem na Porogovykh Elementakh, Moscow, Sovetskoye Radio Press, 1970, 368 pp

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VAVILOV, Ye. N., CHOBANOV, S. G.

"Use of the Theory of Automata to Evaluate Accelerated Methods of Multiplication in Computers"

Teor. Kibernetika [Theoretical Cybernetics -- Collection of Works], Kiev, 1971, pp 24-40 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V789 by O. Belkin).

Translation: Formulas are concluded for calculation of the mean number of additions, subtractions and shifts per digit of a factor for various methods of accelerated multiplication. The formulas consider computer word length. A method is presented for utilization of the theory of finite automata for evaluation of methods of accelerated multiplication.

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USSR UDC 8.74

VAVILOV, Ye. N., CHOBANOV, S. G.

"Using the Theory of Automata to Evaluate Accelerated Methods of Multiplication in Digital Computers"

Kiev, Teor. kibernetika--sbornik (Theoretical Cybernetics--collection of works), 1971, pp 24-40 (from RZh-Matematika, No 1, Jan 73, abstract No 1V789 by O. Belkin)

Translation: Formulas are derived for calculating the average number of additions, subtractions, and shifts per digit of the multiplier for various methods of accelerated multiplication. The methods take the word length of the digital computer into account. A procedure is outlined for using the theory of finite automata to evaluate methods of accelerated multiplication.

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UDC 681.3.06(07.8)

VAVILOVA, A. V., LEN'KO, V. I.

"Experience in the Composition of a Programming Aid for a Course in the Autocode Algorithmic Language 'INZHENER'"

Matem. Mashiny i Programmir. Obucheniye (Mathematical Machines and Programmed Learning -- Collection of Works) Minsk, Belorussk. Univ. Press, 1969, pp 190-194 (from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 5, 1970, Abstract No 5B121 by G. S.)

Translation: It was assumed in composing this aid that the course has anumber of specific features allowing all the capabilities of the "Minchinka" teaching machine to be used. The entire course was divided into six assignments by degree of complexity. Each assignment consists of five main problems and three supplementary problems for each main problem. The course is divided into parts as follows: the first assignment includes writing of individual formulas in the automatic coding program, numbers to base 10, 2-dimensional arrays and elementary functions in an autocode program, and filling in of numbers on an information blank. The second assignment includes

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VAVILOVA, A. V., et al., Matem. Mashiny i Programmir. Obucheniye, Minsk, Belorussk. Univ. Press, 1969, pp 190-194 (from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 5, 1970, Abstract No 5B121)

the operators INPUT, ARRAY and NAME. The third assignment -- the operators: CALCULATE, ALGEBRAIC INTEGRAL, EQUATIONS, SYSTEM. The fourth assignment -- the operators: REPEAT, IF, TRANSFER, PERFORM, END. The fifth assignment -- the operators: PRINT OUT ON PRINTER, PRINT OUT ON TELETYPE, PRINT TABLE, PRINT TEXT. The sixth assignment -- the correcting operators: INSERT, REMOVE, REPLACE. Each assignment includes five different versions of problems. An example of such an assignment is presented. The advantages of performing practical exercises using the teaching machines are described.

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