

USSR

UDC 636+576.8.094.29

ORLYANKIN, B. G., RAKITSKAYA, A. YA., KOSHELEVA, R. V., SERGEYEV, V. A. and  
MAKAROV, V. V., All-Union Institute of Veterinary Virology and Microbiology,  
Pokrov, Vladimirskaya Oblast

"The Biosynthesis of Components of the Aujeszky Virus Under Nonpermissive  
Conditions"

Moscow, Sel'skokhozyaystvennaya Biologiya, Vol 8, No 5, Sep/Oct 73, pp 761-  
764

Abstract: The synthesis of nucleic components and virus-specific proteins  
in a chick embryo cell culture synchronously infected with Aujeszky virus,  
BYK strain, was studied for one cycle of multiplication under conditions  
excluding reproduction of infectious viruses. Nucleic acid synthesis was  
measured by incorporation of  $^{14}\text{C}$ -Thymidine, while virus-specific proteins were  
determined by immunofluorescence. It was found that at  $20^{\circ}$  or  $41^{\circ}\text{C}$  nucleic  
acid synthesis is inhibited, said to be due to a virus-induced suppression of  
cell metabolism. At  $24^{\circ}\text{C}$  nucleic synthesis proceeds but at a slower rate.  
Virus specific particles were formed only at  $37^{\circ}$ , under those conditions lead-  
ing to the formation of infectious viruses. These results are said to indi-  
cate the presence of a virus-induced process.

1/1

USSR

UDC 541.128+546.21

SOKOL'SKIY, D. V., DORFMAN, YA. A., and BAKITSKAYA, T. L., Institute of Organic Catalysis and Electrochemistry, Academy of Sciences KazSSR, Alma-Ata

"Oxidation of Phosphine with Oxygen in Presence of Ironiodosulfate and Ironiodophosphate Catalysts"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 1, 1972, pp 155-158

Abstract: In a previous study it was determined that phosphine is oxidized with oxygen in following solutions:  $\text{FeCl}_3\text{-FeCl}_2\text{-H}_3\text{PO}_4\text{-HClO}_4\text{-NaI-H}_2\text{O}$  and  $\text{FeCl}_3\text{-FeCl}_2\text{-Na}_2\text{SO}_4\text{-HClO}_4\text{-NaI-H}_2\text{O}$ . A detailed mechanism for this oxidation is proposed. Phosphine does not react directly with oxygen in this reaction. It reacts with elemental iodine which is liberated during oxidation-reduction breakdown of the mixed iodophosphate and iodosulfate complexes with iron (III), while oxygen converts the phosphate and sulfate complexes of iron (II) into respective iron (III) complexes. The reaction rate depends on individual components of a series of subreactions in a complex way, making it impossible to select optimal reaction conditions on an experimental way. On the basis of theoretical considerations it was possible to develop equations for the calculation of kinetic parameters. Calculated and experimentally determined

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USSR

SOKOL'SKIY, D. V., et al., Doklady Akademii Nauk SSSR, Vol 203, No 1, 1972,  
pp 155-158

values for the kinetics of phosphine oxidation with oxygen have been compared  
and found to be in good agreement.

2/2

- 30 -

Organophosphorous Compounds

USSR

UDC 546.18+546.143

SOKOL'SKIY, D. V., DORFMAN, YA. A., and RAKITSKAYA, T. L., Institute of Organic Catalysis and Electrochemistry, Kazakh Academy of Sciences, Alma-Ata

"Oxidation of Phosphine with Hydrogen Peroxide in the Presence of Bromide Ions"

Moscow, Zhurnal Fizicheskoy Khimii, Vol XLV, No 11, Nov 71, pp 2771-2774

Abstract: Though almost inactive with hydrogen peroxide in ordinary aqueous solutions, phosphine is strongly oxidized by  $H_2O_2$  if KBr is present in the solution. But this catalytic oxidation of  $PH_3$ , important both for the chemistry of hydrogen peroxide and in the theory of homogeneous catalysis, has so far gone unstudied. Potassium bromide was added to an  $H_2O_2$  aqueous solution surrounded by an atmosphere of  $C_2H_2 + PH_3 + N_2$ . Oxidation rates were determined as affected by acidity, KBr concentration,  $H_2O_2$  concentration, and partial  $PH_3$  concentration. Energy of activation was computed, and a tentative mechanism for phosphine oxidation suggested. The entire reaction is described quantitatively, and stability constants for the intermediate complexes formed are calculated. Optimal concentrations for  $PH_3$ , the hydrogen ion, KBr and  $H_2O_2$  are arrived at.

1/1

Single Crystals

USSR

UDC 669.26-172

ABAMIN, D. D., (DECEASED), YEBSTYUKHIN, A. I., MASLOV, V. P., RAKITSKIY, A. N., and TREFILOV, V. I., Moscow, Kiev

"Structure and Mechanical Properties of Chromium Iodide Single Crystals"

Moscow, Izvestiya Akademii Nauk SSSR, Metally, No 1, Jan/Feb 74, pp 143-149

Abstract: The structure and mechanical properties of chromium iodide were studied to determine why chromium is extremely brittle at room and low temperatures. Single crystals of chromium were produced from the thermal dissociation of chromium iodide which had a high degree of perfection (ratio of electrical resistances measured at 300 and 4.2° K was equal to  $(1.5-3.0) \times 10^2$ ). Bend tests of the single crystals showed that the modulus of elasticity for chromium has a minimum value in the  $\langle 111 \rangle$  direction which is caused by the accumulation of dislocations in the  $\{111\}$  plane, being higher than in planes  $\{100\}$  and  $\{110\}$ . It was also noted that with increased purity of the single crystals from interstitial impurities the specific surface energy minimum transfers from plane  $\{111\}$  to plane  $\{100\}$ . Therefore, brittle slip in chromium single crystals occurs in these two planes. Six figures, two tables, 32 bibliographic references.

USSR

UDC 669.265'786'787.018.2:621.785.362  
BUTYLENKO, A. K., and RAKITSKIY, A. N., Institute of Metal Physics, Academy  
of Sciences Ukr SSR

"Chromium Ductile Wire"

Kiev, Metallofizika, No 40, 1972, pp 103-108

Abstract: Data are presented for an investigation of the mechanical properties and structure of chromium wire alloyed with yttrium, lanthanum, cerium, praseodymium, and gadolinium (0.5-1.0 wt.%). It was shown that chromium wire with a diameter of 0.4-0.5 mm possesses adequately high ductility ( $T_x$  down to  $-90^{\circ}\text{C}$ ) and strength up to 126 kg/mm<sup>2</sup>. It was found that alloying with lanthanum is the most advantageous. Wire with a diameter of 100 microns was produced from an alloy of chromium with 0.5% La. 5 figures, 2 tables, 30 bibliographic references.

1/1

- 57 -

AN 026669

AUTHORS--

KOVALEVA, M., PROFESSOR, AND KORYTOV, K., CANDIDATE  
OF ECONOMIC SCIENCES *UR 0533*

TITLE--

ERRONEOUS POSITIONS

NEWSPAPER--

SOTSIALISTICHESKAYA INDUSTRIYA, MARCH 5, 1970, P 2,  
COLS 5-8

ABSTRACT-- THE ARTICLE IS A REVIEW OF THE "FORMS OF INDUSTRIAL  
MANAGEMENT", A BOOK AUTHORED BY B. V. RAKITSKIY. ACCORDING TO THE  
REVIEW, RAKITSKIY DOUBTS THE VALIDITY OF THE CENTRALIZED PLANNING IN  
GENERAL, INASMUCH AS IT, IN HIS OPINION, IS INHERENT ONLY TO  
"UNBALANCED", BACKWARD ECONOMY. UNDER THE PRESENT DAY CONDITIONS,  
WRITES RAKITSKIY, "THE FUNCTION OF THE EXCHANGE CONTROL CEASES TO BE  
THE FUNCTION OF SPECIAL CENTRAL AGENCIES". HE LOOKS UPON THEM ONLY  
AS "ARBITERS". RAKITSKIY, CLAIMS THE REVIEW, ADVOCATES THE NEED FOR  
COMPETITION BASED ON FREE CHOICE OF BUSINESS PARTNERS AND UNRESTRICTED  
PRICES AT LEAST "WITHIN THE SPECIFIED RANGE".

IN CONCLUSION, THE AUTHORS OF THE REVIEW EXPRESS THEIR BEWILDERMENT  
AS TO WHY THE PUBLISHING HOUSE "NAUKA" HAS PUBLISHED THE BOOK.

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DEPARTMENT OF THE ARMY  
U.S. ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
330 DE WINTHUR STREET, N.E.  
CIVILICITY/FULLER VIRGINIA 22061  
TRANSLATION

Date: 16 March 1973

*DM*  
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*copy*

ENGLISH TITLE: Variable Length Pulse Super  
SOURCE: Foreign Patent 190393

AUTHOR: ~~Rakitsynsky, VS~~  
LANGUAGE: ~~RUSSIAN~~  
COUNTRY: USSR  
REQUESTOR: ADST  
TRANSLATOR: ACS: K132

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UNCLASSIFIED  
 TITLE--DOUBLE IRON FREE TOROIDAL BETA SPECTROMETER FOR THE INVESTIGATION  
 OF SHORT LIVED ACTIVITIES -U-  
 AUTHOR--(05)--RAKIVNENKO, YU.N., ROMANIY, I.A., KLYUCHAREV, A.P., SKAKUN,  
 YE.A., YATSENKO, G.I.  
 COUNTRY OF INFO--USSR

PROCESSING DATE--27NOV70

*R*

SOURCE--UKR. FIZ. ZH. (RUSS. ED.) 1970, 15(4), 578-82

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--BETA SPECTROMETER, PARTICLE ACCELERATION, CESIUM ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
 PROXY REEL/FRAME--3008/0588

STEP NO--UR/0185/70/015/004/0578/0582

CIRC ACCESSION NO--AP0137673

UNCLASSIFIED

012

CIRC ACCESSION NO--AP0137673  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT. A BETA SPECTROMETER IS DESCRIBED FOR USE IN STUDYING SHORT LIVED ACTIVITIES WHICH ARE FORMED FROM THE INTERACTION OF ACCELERATED PARTICLES WITH VARIOUS TARGETS. EACH LENS OF THE SPECTROMETER CONTAINS 100 COILS PREPD. FROM A PROFILED CU TUBE, THE SHAPE OF THEIR OPERATING SEGMENTS BEING DESIGNED SO THAT 2-MEV E CAN BE FOCUSED. THE APP. CAN MEASURE DOUBLE AND TRIPLE COINCIDENCES. THE TARGET IS CHANGED BY MEANS OF A VACUUM VALVE WITHOUT DESTROYING THE VACUUM IN THE APP. THE APP. WAS TESTED BY USING 10-MM PRIME137 CS SOURCES. FOR THESE SOURCES THE APRAMETERS OF THE APP. WERE DETD. TO BE AS FOLLOWS: TRANSMISSION OF 1 LENS 16PERCENT OF 4 PI, RESOLN. 1.0PERCENT.

FACILITY: FIZ.-TEKH. INST., KHARKOV, USSR.

UNCLASSIFIED

013

TITLE--EFFECT OF VARIOUS ELECTROCHEMICAL FACTORS ON PERCHLORIC ACID SYNTHESIS -U-  
UNCLASSIFIED PROCESSING DATE--30OCT70

AUTHOR--(03)-SHIMONIS, I.V., RAKOV, A.A., VESELOVSKIY, V.I.

R

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKIMIYA 1970, 6(2), 169-74

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTROCHEMISTRY, CHEMICAL SYNTHESIS, PERCHLORIC ACID

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1998/1147

STEP NO--UR/0364/70/006/002/0169/0174

CIRC ACCESSION NO--AP0121706

UNCLASSIFIED

2/2 013

CIRC ACCESSION NO--AP0121706  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. THE SYNTHESIS OF HClO SUB4 WAS STUDIED BY DETG. THE EFFECTS OF TEMP., ANODIC POTENTIAL, CONCNS. OF CL PRIME NEGATIVE AND ClO SUB4 PRIME NEGATIVE ON THE ELECTROCHEM. PROCESSES OCCURRING IN HClO SUB4. IN THE FORMATION OF HClO SUB4 WHICH BEGINS AT 2.4 V AND REACHES A MAX. VALUE AT 2.8-2.9 V LOWERING THE TEMP. TO MINUS 20 DEGREES SIGNIFICANTLY ACCELERATES THE PROCESS; CONCNS. CHANGES OF CL PRIME NEGATIVE FROM 0.5 TO 1.8 N AND OF ClO SUB4 PRIME NEGATIVE FROM 3 TO 8 N HAVE NO EFFECT EXCEPT THAT ON OXIDN. AT THE HIGHEST CONCNS. OF HCl AND HClO SUB4, THE CURRENT EFFICIENCY DECREASES. FACILITY:  
FIZ.-KHIM. INST. IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--PRINCIPLES OF ANODIC PROCESSES IN PERCHLORIC ACID AND IN A MIXTURE  
OF PERCHLORIC AND HYDROCHLORIC ACIDS ON A PLATINUM ELECTRODE -U-

AUTHOR--(03)-SHIMONIS, I.V.; RAKOV, A.A.; VESELOVSKIY, V.I.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKIMIYA 1970, 6(2), 163-8

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PERCHLORIC ACID, HYDROCHLORIC ACID, OXIDATION, CHEMICAL  
REACTION KINETICS, PLATINUM ELECTRODE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/1148

CIRC ACCESSION NO--AP0121707

STEP NO--UR/0364/70/006/002/0163/0168

UNCLASSIFIED

R

212 018  
CIRC ACCESSION NO--AP0121707  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

ABSTRACT. THE KINETIC PROCESSES OCCURRING IN THE OXIDN. OF CL IONS WERE STUDIED BY RECORDING POTENTIOSTATIC POLARIZATION CURVES IN SOLNS. OF 0.5-11.5 N HClO SUB4 AND IN 4 N HClO SUB4 PLUS 10 NEGATIVE PRIME3 MINUS11 N HCL AT 20-34DEGREES WITH PT ELECTRODES. A DISTINCT RELATION WAS FOUND BETWEEN THE POSITION AND BOUNDARIES OF THE POTENTIALS OF SEP. PARTS OF THE POLARIZATION CURVES, RECORDED BOTH IN THE PURE ACID AND THE ACID MIXT. IT IS PROPOSED THAT EACH PART OF THE CURVE CORRESPONDS TO A UNIQUE STATE OF THE ELECTRODE SURFACE. EXPTS. SHOWED THAT THE SEP. PARTS OF THE POLARIZATION CURVE CORRESPOND TO DEFINITE COMPNS. OF ANODE PRODUCTS AND CHANGE IN THE SELECTIVITY OF THE OXIDN. OF CL IONS. FACILITY: FIZ.-KHIM. INST.  
IM. KARPOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

RAKOV, A. I., KOVALENKO, V. A., REPIN, V. N.

UDC 681.2.083.8

"Automatic Monitoring Devices for Radio Relay Lines"

Tr. ucheb. in-tov svyazi. M-vo svyazi SSSR (Works of the Communications Training Institutes. USSR Communications Ministry), 1971, No 54, pp 32-38 (from RZH--Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 4, Apr 72, Abstract No 4A566).

Translation: A study was made of automatic monitoring devices for radio relay lines which increase the reliability and stability of the operation of these lines. There is 1 table and a 1-entry bibliography.

1/1

USSR

BOOK

UDC: 621.396.43:621.3.019.3

RAKOV, A. I., NADEZHNOST' RADIOLINEYNYKH SISTEM SVYAZI (Reliability of Radio Relay Communications Systems), Moscow, "Svyaz", 1971, 136 pp, illus, biblio, 7 000 copies printed

The book contains an analysis of the reliability of radio relay systems with selection of indices for evaluating the reliability of ground-based and satellite relay systems. Various plans are formulated for setting up reliability requirements, and the classification of failures is analyzed. Considerable attention is given to analysis of methods of improving the reliability of radio relay systems; light is thrown on problems of gathering data on operational reliability, and some results are presented on processing of data accumulated over a ten-year period. A procedure is developed for calculating the reliability of newly designed and updated radio relay systems, and ways are indicated for attaining a predetermined reliability level.

The book is written for engineering and technical workers in scientific research establishments and in design

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USSR

RAKOV, A. I., NADEZHNOST' RADIORELEynyKH SISTEM SVYAZI, Moscow, "Svyaz'", 1971

and planning organizations, and for building and maintenance agencies engaged in the development and servicing of radio relay systems, as well as for students in colleges and engineering schools.

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USSR

RAKOV, A. I., NADEZHNOST' RADIORELEynyKH SISTEM SVYAZI, Moscow, "Svyaz", 1971

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USSR

RAKOV, A. I., NADEZHNOST' RADIORELEYNKYKH SISTEM SVYAZI, Moscow, "Svyaz", 1971

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USSR

RAKOV, A. I., NADEZHNOST' RADIORELEYNKYH SISTEM SVYAZI,  
Moscow, "Svyaz'", 1971

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USSR

UDC: 621.396.5

PANKRATOV, Ye. D., RAKOV, A. I.

"Using a Digital Computer to Process Data on Failures of Radio Relay Lines"

Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR (Works of Academic Institutes of Communications, Ministry of Communications of the USSR), 1970, vyp. 51, pp 135-142 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5D394)

Translation: The paper deals with the problem of forming initial information for digital computer calculation of the reliability parameters of radio relay communications lines. Bibliography of five titles. Resumé.

USSR

RAKOV, A. I.

UDC: 621.396.946

"Reliability of the Circular System for Space Communication"

Moscow, Radiotekhnika, Vol 26, No. 2, 1971, pp 98-100

Abstract: The circular system for space communication is designed for the transmission of Central Television programs to the peripheral television centers. This brief communication estimates the system's reliability using optimum operation and reparability factors, the equations for which are given. The equation for the optimum operation factor is based on the probability of trouble-free operation for a given time interval; the equation for the reparability condition is that of the readiness factor, expressed in terms of the average period of recovery. A table to assist in the solution of such problems is presented, and a sample problem showing how the analysis proposed by this communication is used, is worked out.

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USSR

UDC 536.243

KHRUSTALEV, B.A. and ~~RAKOV, A.M.~~

"Investigation of Surface Roughness Effect on Spectral and Integral Radiation Properties"

Moscow, Teplo-Massopernos v Odn-i Dvukhfaznykh Sredakh, 1971, pp 126-135

Abstract: The effect of surface roughness on spectral and integral thermal radiation is investigated.

Five molybdenum tubes of different surface roughness were tested. The tubes were placed in a vacuum chamber and heated by electric current.

The degree of blackness was plotted versus temperature and versus wave length for various surface roughnesses. The degree of blackness increases with the roughness, it changes little with the wave length in the infrared region (wave lengths over 1 micron).

The pitch of the surface irregularities as well as the depth affect the radiation properties.

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USSR

UDC 547.71+542.952.1+661.718

RAKOV, A. P., and ALEKSEYEV, A. V., Chushovsk State University Imeni I. N. Ul'yanov

"Reactions of the Esters of  $\beta$ ,  $\gamma$ -Epoxypropylphosphonic Acid With Aliphatic Alcohols"

Leningrad, Zhurnal Obshchey Khimii, Vol 43(105), No 2, Feb 73, pp 276-278

Abstract: Esters of  $\beta$ ,  $\gamma$ -epoxypropylphosphonic acid react with alcohols in presence of basic catalysts to form  $\alpha$ ,  $\beta$ -unsaturated alcohols. A new group of unsaturated organophosphorus alcohols of the type  $\text{OHCH}_2\text{-CH=CHP}(\text{:O})(\text{OR})_2$  was produced. The structure was proved by IR and PMR spectroscopy.

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USSR

UDC 542.91.661.718.1

ARBUZOV, B. A., RAKOV, A. P., and VIZEL', A. O., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR, and Chuvash State University imeni I. N. Ul'yanov

"Phospholenols and Other Phospholene Derivatives"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 9, Sep 71, pp 1999-2002

Abstract: The article describes a method for the one-stage synthesis of 2-phospholen-4-ol derivatives by the reaction of 3-phospholene derivatives with peracetic acid in the presence of alkali metal salts. The hydroxy group of the phospholenes is highly reactive, which makes it possible to obtain other phospholene derivatives. Acylation with Acetic anhydride and oxidation with chromic acid gave the unsaturated heterocyclic ketone 2-phospholen-4-one, which was then converted to its 2,4-dinitrophenylhydrazones.

1/1

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USSR

UDC 547.41 + 542.952.1 + 661.718

RAKOV, A. P., Chuvash State University imeni I. N. Ul'yanov

"Isomerization of 2,3-Epoxy-cyclopentanylphosphonic Acid Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70,  
pp 2129-2130

Abstract: Derivatives of 2,3-epoxycyclopentanylphosphonic acid isomerize in alcoholic solution to unsaturated alcohols when heated in the presence of basic catalysts. Diethyl and dibutyl esters of 3-hydroxycyclopenten-1-ylphosphonic acid were obtained with following properties, respectively: b.p. 127-128/0.025 mm,  $d_4^{20}$  1.1512,  $n_D^{20}$  1.4740, and b.p. 153-154/0.022 mm,  $d_4^{20}$  1.0626,  $n_D^{20}$  1.4695. The author thanks B. A. ARBUZOV for his advice.

1/1

- 69 -

1/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--ISOMERIZATION OF 3,4,EPOXYPHOSPHOLANES -U-  
AUTHOR-(03)-ARBUZOV, B.A., RAKOV, A.P., VIZEL, A.D.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (1), 85-90  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ISOMERIZATION, ORGANIC PHOSPHORUS COMPOUND, HYDROXYL RADICAL,  
EPOXY COMPOUND, HYDRAZONE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1984/1589 STEP NO--UR/0062/70/000/001/0035/0090  
CIRC ACCESSION NO--AP0100206  
UNCLASSIFIED

2/2 014

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PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0100206

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. 3,4,EPOXYPHOSPHOLANES ARE ISOMERIZED IN BASIC MEDIA TO 2,PHOSPHOLEN,4,OLS. THE UNSYM. MEMBERS FORM THE ISOMER WITH PREDOMINANT TERTIARY HO GROUPING. TREATING 3,ETHOXY,3,OXO,6,3,OXAPHOSPHABICYCLO(3.1.0)HEXANE WITH ETONA-ETOH 12 HR, THEN REFLUXING 25 HR, GAVE ON ACIDIFICATION WITH HCL 74PERCENT 1,ETHOXY,1,OXO,2,PHOSPHOLEN,4,OL (I) (R EQUALS ETO, R PRIME1 EQUALS R PRIME2 EQUALS H), B SUB0.03 141-3DEGREES, N PRIME20 SUBD 1.4950, D PRIME20 1.2294. 1,METHYL,3,ETHOXY,3,OXO,6,3,OXAPHOSPHABICYCLO(3.1.0)HEXANE SIMILARLY GAVE 53.3PERCENT I, ETO, H, ME, B SUB0.045 116-17DEGREES, 1.4860, 1.1672, AND 4.4PERCENT I, ETO, ME, H, B SUB0.035 139-40DEGREES, 1.4960, 1.1799. 1,5,DIMETHYL,3,ETHOXY,3,OXO,6,3,OXAPHOSPHABICYCLO(3.1.0)HEXANE HEATED WITH ACOH-ACONA 15 HR GAVE 35PERCENT I, ETO, ME, ME, B SUB0.03 138-9DEGREES, 1.4908, 1.1501, WHILE 1,5,DIMETHYL,3,PHENYL,3,OXO,6,3,OXAPHOSPHABICYCLO (3.1.0)HEXANE HEATED WITH ETOH-ET SUB3 N GAVE 50PERCENT I, PH, ME, ME, M. 198.5-9.5DEGREES. I, ETO, ME, H, OXIDIZED WITH K SUB2 CR SUB2 O SUB7-H SUB2 SO SUB4 TO A CRUDE CARBONYL COMPD. WHOSE 2,4,DINITROPHENYLHYDRAZONE, M. 184-5DEGREES, WAS IDENTIFIED AS II.

UNCLASSIFIED

RAXOV, A.V.

Microelectronics

MICROELECTRONICS

JPRS 57313  
25 October 1972

Excerpts from Russian-language book edited by F. V. Lukin;  
Mikroelektronika, No 5, 1972, Sovetskoye Radio Publishing House,  
Moscow, UDC 621.392:621.396.6-181.5.

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[I - USSR - F]

cells, an important role is played by the choice of a constant current source.

The article analyzes the dependence of instability of the logic differential of the integrated circuits for the current switches on change in the destabilizing factors (supply voltage, temperature, and technological scatter in the component parameters) by using different modifications of the constant current source.

Recommendations are given for the optimal selection of the constant current source.

The article contains 4 figures, 1 table, and 5 bibliographic references.

UDC 621.383.421546.40.22/23

Distribution of Thermoelastic Deformations in the Surface Region of Thermally Oxidized Silicon. Vailiyev, K.A., Kagalov, P.I., Zhukova, A.G., Zhukov, N.G., and Baranov, V.P. *Elektronika*, Section Mikroelektronika, edited by I.V. Lukin, No 5, p 282. Sovetskoye Radio Publishing House, 1972.

The article theoretically analyzes the distribution of elastic deformations in the surface region of thermally oxidized silicon. The authors examine the case of a dense oxide film on a semiconductor and the case of termination of its denseness. The value obtained agrees with the theoretical computation. The authors discuss the results of experimental testing of the localization of deformations in the surface layer of silicon at the sites of termination of denseness of the oxide. They show the influence of thermoelastic deformation on the chemical activity and volt-Faraday characteristics of the NDP structures.

The article contains 3 figures and 11 bibliographic references.

UDC 621.383.421546.40.22/23

Investigation of the Longitudinal Operating Mode of CDS-CDS Film Photoresistors. Voznyukov, A.A., Krol'sevets, K.M., Korshakko, V.A., and Skryabin, V.P. *Elektronika*, Section Mikroelektronika, edited by I.V. Lukin, No 5, p 296. Sovetskoye Radio Publishing House, 1972.

The article describes a manufacturing method and the parameters of the CDS-CDS photoresistors, operating in a longitudinal mode. The authors mention their high specific sensitivity (0.5-1 A/V-A) and the weak dependence of the

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USSR

UDC 621.396.6-181.5

VALIYEV, K. A., BANKOVSKIY, Yu. V., RAKOV, A. V.

"Increasing the Output Probability of Usable Integrated Silicon Microcircuits"

Elektron. prom-st'. Nauchno-tekhn. sb. (The Electronics Industry. Scientific and Technical Collection), 1970, No 1, pp 52-60 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10V182)

Translation: The authors analyze methods of studying defects in oxide plates at various stages in the manufacture of microcircuits -- defects which arise immediately after oxidation-diffusion processes, and defects which arise as a result of penetration of Al and B or P through defects. The dimensions and densities of the defects are determined. A formula is derived for evaluating the probability of failure of the microcircuit. Three illustrations, two tables, bibliography of thirteen titles, N. S.

1/1

1/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--INTERACTION OF A SILICON SURFACE WITH CHEMICALLY ACTIVE ELECTROLYTES  
-U-  
AUTHOR--(02)-PETROVA, A.G., RAKOV, A.V.  
COUNTRY OF INFO--USSR  
SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(4), 697-01  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ELECTROLYTE, COPPER, MERCURY, SILVER, GOLD, SILICON, CHEMICAL  
REACTION RATE, ZINC, IRON, NITRIC ACID  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAKE--3004/2024 STEP NO--UR/0449/70/004/004/0697/0701  
CIRC ACCESSION NO--AP0132283  
UNCLASSIFIED



2/2 026

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132283

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTERACTION OF N-SI (1 OHM-CM) WAS ETCHING ACID SOLNS. CONTAMINATED WITH METAL IONS WAS INVESTIGATED. THE FACE OF THE SAMPLES CORRESPONDED TO THE (111) PLANE. AFTER TREATMENT IN THE RESP. ETCHANT, THE SAMPLES WERE THOROUGHLY RINSED IN DEIONIZED WATER. THE SURFACE CONTAMINATION WAS DETECTED BY EMISSION SPECTRAL ANAL. THE METAL IONS WERE STRIPPED OFF THE SI SURFACE BY DESORPTION WITH 2,4,PENTANEDIONE AND FIXED IN A 4PERCENT SOLN. OF POLY(METHYL METHACRYLATE) IN TOLUENE. AFTER, EVAPN., THE RESIDUAL FILM WAS EXFOLIATED. THE METAL CONCNS. IN THE ETCHANTS WERE 10 PRIME NEGATIVE3 M. THE TEST SOLNS. WERE: (1) 45PERCENT HF, (2), 63PERCENT HNO SUB3, AND (3) A MIXT. OF HF:HNO SUB3:HOAC EQUALS 1:8:1. THE SURFACE CONC. OF THE METALS AFTER RINSING DEPENDS ON THE NATURE OF THE METAL AND OF THE SOLN. WITH 1, THE SURFACE CONCNS. OF CU, HG, AG, AND AU ARE HIGHER THAN THOSE OF ZN AND FE. WITH 2 AND 3, THE SURFACE CONCNS. OF ALL METALS WERE GENERALLY LOWER. THE LOWEST CONCNS. ARE OBSD. IN 2. THE SURFACE CONC. OF CU DECREASES WITH INCREASING HNO SUB3 CONC. THE MECHANISM OF SI DISSOLN. AND OF METAL DEPOSITION ON THE SI SURFACE IS DISCUSSED. DEPENDING ON THE OXIDN. POTENTIAL OF THE METAL AND ON THE HNO SUB3 CONC., THE IMPURITTY IS EITHER DEPOSITED OR ADSORBED. IN THE 1ST CASE, THE EFFECTIVE D. OF THE FAST SURFACE STATES IS INCREASED, WHILE IN THE 2ND, THE D. OF THE SLOW STATES IS AUGMENTED.

UNCLASSIFIED

USSR

UDC 621.315.592

PETROVA, A.G. and RAKOV, A.V.

"Interaction of a Silicon Surface with Chemically Active Electrolytes"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 4, 1970, pp 697-701

Abstract: There is very little literature at the present time devoted to the interaction process between a semiconductor surface with acids and etching agents. There should be more, since the study of the physical mechanism involved in such interactions could demonstrate the mechanism of impurity deposition on the surface or of the electronic processes at the interface between semiconductor and electrolyte; it could also provide valuable information on the choice of optimal conditions for chemical processing of the semiconductor surface for modern semiconductor instrument manufacture. The purpose of this paper is to investigate the physical mechanism of the interaction between a silicon surface and electrolytes containing a small quantity of metallic impurity. The specimens used were n-type silicon plates with a specific resistance of 1 ohm cm, all given the same mechanical surface treatment, with the plane of the plate coinciding with the crystalline plane (111). The electrolytes

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USSR

PETROVA, A.G., et al., Fizika i Tekhnika Poluprovodnikov, Vol 4, No 4, 1970, pp 697-701

were 45% fluoric and 63% nitric acids, and etching agents using these acids. The metallic impurities introduced into the reagents were gold, silver, mercury, copper, iron, and zinc. The authors conclude that the equilibrium between the deposited atoms and the electrolyte ions is not established as a result of the high porosity because of the separation of gaseous reaction products and stripping of metal films. Hence, the metal deposition process is prolonged, with a time delay resulting from the reduction in the impurity concentration in the electrolyte.

2/2

1/3 009 UNCLASSIFIED PROCESSING DATE--05DEC70  
TITLE--PROBLEMS AND JUDGEMENTS: THERE ARE PLANS AND PLANS -U-  
AUTHOR--RAKOV, B. *R*  
COUNTRY OF INFO--USSR  
SOURCE--PRAVDA, MAY 17, P. 2.  
DATE PUBLISHED--17MAY70  
SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES  
TOPIC TAGS--INDUSTRIAL PRODUCTION, BONUS, INDUSTRIAL PLANNING  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1999/0879 STEP NO--UR/9012/70/000/000/0002/0002  
CIRC ACCESSION NO--AN0122923  
UNCLASSIFIED

2/3 009

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AN0122923

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MANY YAROSLAVL PROVINCE ENTERPRISES ARE ATTAINING HIGH PRODUCTION EFFECTIVENESS THROUGH INTENSIFIED PLANS. LAST YEAR, AT THE RYBINSK CABLE PLANT, BONUSES AMOUNTING TO 24.6PERCENT OF WORKERS' WAGES CAME FROM THE WAGE FUND AND THE MATERIAL INCENTIVES FUND; THE EQUIVALENT FIGURE FOR OTHER TYPES OF BONUSES WAS 3.2PERCENT. THE BONUSES OF THE CHIEF ENGINEER BROKE DOWN AS FOLLOWS: 17.3PERCENT FROM THE MATERIAL INCENTIVES FUND; OTHER TYPES OF BONUSES, PRINCIPALLY THOSE FOR PLAN FULFILLMENT, AMOUNTED TO 50PERCENT OF THE WAGE RATE. BONUSES FROM THE MATERIAL INCENTIVE FUND WERE 20.5PERCENT FOR THE ENGINEERS AND TECHNICIANS OF THE YAROSLAVL FUEL APPARATUS PLANT. OTHER TYPES OF BONUSES, INCLUDING THOSE FOR PLAN FULFILLMENT, CAME TO 0.8PERCENT. THE SIZE OF BONUSES FOR ADMINISTRATIVE AND MANAGERIAL PERSONNEL IN JOBS UNDER THE NEW CONDITIONS OF PLANNING AND ECONOMIC INCENTIVE SHOULD DEPEND ON THE GROWTH RATE OF SALES AND ENTERPRISE PROFITS, BUT THE MULTIPLICITY OF INDICES FOR WHICH PLANT EXECUTIVES ARE PAID BONUSES OFTEN REDUCES THE IMPACT OF THE REFORM AND RETARDS THE GROWTH OF PRODUCTION EFFECTIVENESS. I BELIEVE IT WOULD BE PROPER TO PAY BONUSES TO ENTERPRISE EXECUTIVES, OUTSTANDING SPECIALISTS AND DEPARTMENT HEADS EXCLUSIVELY FROM THE MATERIAL INCENTIVES FUND AND IN DIRECT RATIO TO ITS GROWTH RATE. THE SUPPLEMENTARY INCENTIVE PAYMENTS FOR RAPID ASSIMILATION OF NEW TECHNOLOGY, OUTPUT FOR EXPORT, CONSUMER GOODS PRODUCTION, TIMELY AND PRECISE MANUFACTURE OF SPARE PARTS AND SO ON SHOULD BE COMPUTED AS PART OF THE MATERIAL INCENTIVES FUND.

UNCLASSIFIED

3/3 009

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--ANO122923

ABSTRACT/EXTRACT--THE DIRECTOR OF THE HYDRAULIC APPARATUS PLANT WOULD UNDER THIS SYTEM SURELY ASK THE MINISTRY WHETHER THE ENTERPRISE'S ASSIGNMENTS MIGHT NOT BE INCREASED. AT PRESENT, HOWEVER, THE DIRECTOR CUTS OFF THE LIMB ON WHICH HE IS PERCHED WHEN HE TAKES ON AN INTENSIFIED PLAN. AND THUS MANY PLANTS CREATE RATHER HIGH MATERIAL INCENTIVES FUNDS, DESPITE RELATIVELY LOW GROWTH RATES IN SALES AND PROFITS AND WITH AN UNCHANGED ASSORTMENT OF PRODUCTS. AVERAGE WAGES SOMETIMES INCREASE FASTER THAN GROWTH OF LABOR PRODUCTIVITY. I BELIEVE THE PROBLEM CAN BE CORRECTED BY CREATING A MATERIAL INCENTIVES FUND THROUGH DIRECT DEDUCTIONS FROM AN ENTERPRISE'S NET PROFITS, WHICH WOULD REFLECT THE GROWTH RATE OF SALES VOLUME AND PROFITS. IT MAKES SENSE AT LEAST TO EXPERIMENT WITH THIS. FACILITY: YAROSLAVL PROVINCE PARTY COMMITTEE'S INDUSTRIAL TRANSPORTATION DEPARTMENT.

UNCLASSIFIED

1/2 011 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--SELECTIVE ION EXCHANGERS -U-  
AUTHOR--(02)-BAKOV, E.M., BOBKOV, O.I. **R**  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 265,450  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--09MAR70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL PATENT, ION EXCHANGE RESIN, AMINE, PHENOL, PYRIDINE,  
AMINO ACID  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3002/1405 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0128804  
UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AA0128804

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SELECTIVE ION EXCHANGERS ARE  
PREPD. BY TREATING ANION EXCHANGERS (OH FORM) CONTG. PRIMARY OR  
SECONDARY AMINO GROUPS WITH CYANURIC CHLORIDE AT 0-10DEGREES.  
SUBSEQUENTLY TREATMENT WITH REAGENTS CONTG. SELECTIVE GROUPS, E.G. AMINO  
ACIDS, HYDROSULFURIC ACID SALTS, MONO AND DIALKYLAMINES, AMINOPHENOLS,  
ALKALI SOLNS., PYRIDINE, AND ITS DERIVS., IS CARRIED OUT.

UNCLASSIFIED



USSR

RAKOV, G. N.

UDC: 621.391:519.27

"Comparative Estimate of the Efficiency of Time and Frequency Multiplexing"

V sb. Radioelektron. v nar. kh-ve SSSR. Ch. 2 (Radioelectronics in the National Economy of the USSR, Part 2--collection of works) Kuybyshev, 1970, pp 295-298 (from RZh-Radiotekhnika, March 71, No. 3, Abstract No. 3A51)

Translation: Data of the comparative estimate of various multiplexing systems is given. Two tables, bibliography of three.

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USSR

UDC: 616.831-073.97

ORLOV, Ye. F., BARANOVA, I. A., RAKOV, I. S. and RODINA, I. V.,  
Scientific Research Radiophysics Institute, Gor'kiy

"A Method of Investigating the Spatial Dependence of the Spectral  
Components of Electroencephalograms"

Moscow, Meditsinskaya tekhnika, No 1, 1973, pp 10-13

Abstract: Since the problem of parallel spectral analysis of electroencephalograms (EEG) for a large number of channels with measurement of phase differences in individual spectral components after narrow-band filtration is an interesting one, this paper proposes a device for solving the problem. Optical analog systems of this type have the advantage of operational speed in addition to multichannel application, and are thus especially useful for EEG analysis. In the final stage of this equipment, a schematic of which is shown, the results of the multichannel Fourier analysis is shown on the screen of a television kinescope with frequency measured along the x axis and the channel number along the y. The equipment is explained, and the mathematical analysis for a single channel given. A sample of eight-channel EEG spectra obtained with the device is shown.

1/1

USSR

UDC: 621.374.32

VASIL'YEV, V. V., KMET', A. B., PUKHOV, G. Ye., RAKOV, M. A., Physicomechanical Institute of the Academy of Sciences of the Ukrainian SSR

"A Decade Counter With Variable Scaling Factor"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 10, Apr 71, Author's Certificate No 298074, Division H, filed 23 Sep 69, published 11 Mar 71, pp 193-194

Translation: This Author's Certificate introduces a decade counter with variable scaling factor. The counter contains an input device, memory cell, single-digit counters, and also AND logic elements. As a distinguishing feature of the patent, the unit is designed for obtaining an arbitrary controllable scaling factor. The outputs of the memory cell are connected respectively to the master inputs of all single-digit counters and to the inputs of all AND logic elements for all digital places except the last. The inputs of the AND element for the last digital place are connected to the outputs of all single-digit counters, and the output of this AND element is connected to the reset terminals of the single-digit counters.

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USSR

UDC: 681.142-523.8

BELEN'KIY, Ya. Ye., YERMAKOV, A. N., RAKOV, M. A., KMET', A. B., RAKOV, V. I.,  
FISHCHENKO, A. G., TARASEVICH, V. A., Physicomechanical Institute of the  
Academy of Sciences of the Ukrainian SSR

"A Device for Discriminating and Computing Extrema"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratsey, Tovarnyye Znaki,  
No 29, 1970, Soviet Patent No 261913, Class 42, filed 30 Jul 69, p 135

Abstract: This Author's Certificate introduces a device for discriminating and computing extrema in predetermined discrete zones. The unit contains an extremum-isolating flip-flop, a cadence pulse oscillator, a pulse distributor, and a counter. As a distinguishing feature of the patent, the functional possibilities of the device are extended by adding an analog-digital converter whose inputs are connected to the outputs of the cadence pulse oscillator and the pulse distributor, while the output of this converter is connected to the extremum-isolating flip-flop. Also incorporated into the device are two identical channels, each of them consisting of a flip-flop for determining the type of extremum and a coincidence matrix with one input connected to the output of the extremum-isolating flip-flop, and a coincidence matrix with one input connected to the output of the flip-flop for determining the type of extremum and the other connected to one of the outputs of

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BELEN'KIY, Ya. Ye. et al., Soviet Patent No 281913

the analog-digital converter; the other inputs of the matrix are connected to the corresponding outputs of the pulse distributor. One of the outputs of the matrix is connected to the input of the flip-flop for determining the type of extremum, and the others are connected to the counters.

2/2

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USSR

 UDC 621.396.619.13:621.374.4(088.6)

BAKULIN, Yu. L., KMAZIK, V. T., RAKOV, M. A., Institute of Physics and Mechanics, Academy of Sciences of the UkrSSR

"A Frequency Divider"

USSR Author's Certificate No 256399, Filed 7 Jun 68, Published 27 Mar 70 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10D62 P)

Translation: This Author's Certificate introduces a frequency divider which contains a magnetotransistorized flip-flop and a single-core divider. To expand the functional possibilities of the device, the input circuits of the single-core divider and the magnetotransistorized flip-flop are connected in series through a shaping element.

1/1

USSR

R  
UDC: 621.374.3

PAKOV, M. A., ABDUKAYUMOV, A., Physicomechanical Institute, Academy of Sciences  
of the USSR

"A Multistable Pulse Duration Element"

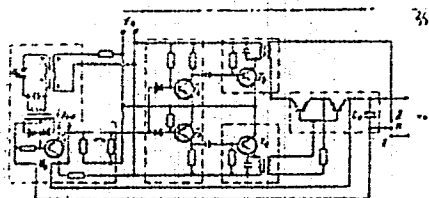
Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzyy, Tovarnyye Znaki, No 12,  
1970, Author's Certificate No 266839, filed 17 Jan 69, p 42

Abstract: This Author's Certificate introduces a multistable pulse duration element which contains a width modulator with differentiating network, a selective amplifier and a phase detector with low-frequency filter all connected in series. As a distinguishing feature of the patent, power supply is simplified by using a shaper distributor and an additional selective amplifier. The input of the shaper distributor is connected to the output of the differentiating network, and the outputs are connected to the inputs of the selective amplifiers. The outputs of the selective amplifiers are connected to a phase-sensitive detector whose output is connected through a low-frequency filter to the controlling input of the width modulator.

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USSR

RAKOV, M. A., et al, Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 12, 1970



2/2

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USSR

R  
UDC: 681.327.67

MOTOROV, N. G., OSIPOVA, M. M., RAKOV, M. A., TUZOV, V. M., Physicomechanical Institute, Academy of Sciences of the Ukrainian SSR

"A Multistable Pulse-Width Element for the Superhigh-Frequency Range"

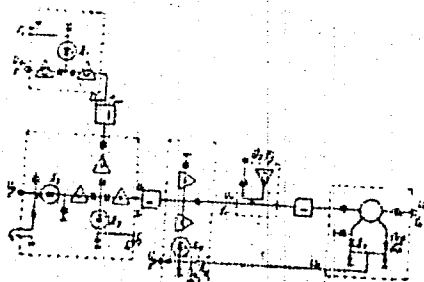
Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzysy, Tovarnyye Znaki, No 4, 1970, p 32, Patent No 260282, filed 30 Oct 68

Abstract: This Author's Certificate introduces a multistable pulse-width element for the superhigh-frequency range. The unit contains a self-oscillator and a phase detector. As a distinguishing feature of the patent, speed is increased and reliability is improved by connecting the phasing input of the self-oscillator to the reference voltage source through a frequency multiplier, and putting a resonance switch between the self-oscillator and detector. The output of the phase detector and the reference voltage source are connected through a summing circuit to the controlling input of the resonance switch.

1/2

USSR

MOTOROV, N. G., et al, Otkrytiya, Izobreneniya, Promyshlennyye Obraztsy,  
Tovarnyye Znaki, No 4, 1970, p 32, Patent No 260282, filed 30 Oct 68



2/2

RAKOV, N.A.

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

JPRS 58764  
17 April 1973

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[I - USSR - K]

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

Paper by V. I. Spitsyn, A. A. Khomychevich, V. D. Belokozh, L. M. Nizhnik, and N. A. Rakov, State Committee for the Use of Atomic Energy of the USSR, IAEA Publication SM-153/19, Vienna, Russian, pp. 1-207

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

- 1) holding them in special depositories for a prolonged period of time, necessary for reduction of the general activity of the fission products contained in the wastes;
  - 2) solidification of highly active wastes by one of the well-known methods tested in experimental plants;
  - 3) burial of highly active wastes in geological water-bearing strata similar to underground burial of wastes of intermediate activity as developed in the Soviet Union.
- Since in this case the concentration of fission products in the soils and the gas and heat liberation associated with this as a result of the radiation processes presents the greatest hazard, the basic attention in underground burial of highly active wastes is devoted to the preparation of the wastes for burial. The preparation lies either in separating

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

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

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

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

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

Nuclear fuel of reactors of the VVER type is sintered uranium dioxide enriched with uranium-235 up to 3.3%. The average life of the fuel is about three calendar years, and the depth of burn-up reaches 30,000 megawatt-hours per ton (27). The holding of used VVER TVEL before regeneration at a radiochemical plant may vary--from half a year to three years depending upon the necessity of the fastest return of uranium to the fuel cycle. However, we should consider that a longer holding will lead to a decrease in the general activity of the TVEL and, consequently, the technological scheme of the regeneration plant may be simplified.

USSR

RAKOV, V. I.

UDC: 621.373:621.391.822

"Comparing Gas Discharge Noise Oscillators for Spectral Density of Noise Power in Pulse and Continuous Operation"

Elektron. tekhnika. Nauchno-tekhn. sb. Kontrol'no-izmerit. apparatura (Electronic Engineering, Scientific-Technical Collection, Control and Measurement Equipment) 1970, No. 3(21), pp 56-66 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3A425)

Translation: The block diagram and the theory of operation of a device for checking gas discharge noise oscillators are considered. A method is described for measuring the spectral density of the noise power of an operating standard, from the continuous to the pulse mode and with a comparison between the gas oscillator and the standard. Formulas are given for the measurements. A "null" measurement method using an intermediate-frequency sample attenuator is described. Resume

1/1

USSR

UDC: 681.142-523.8

BELEN'KIY, Ya. Ye., YERMAKOV, A. N., RAKOV, M. A., KNEZ', A. B., RAKOV, V. I.,  
TISHCHENKO, A. G., TARASEVICH, V. A., Physicomechanical Institute of the  
Academy of Sciences of the Ukrainian SSR

"A Device for Discriminating and Computing Extrema"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztzy, Tovarnyye Znaki,  
No 29, 1970, Soviet Patent No 281913, Class 42, filed 30 Jul 69, p 135

Abstract: This Author's Certificate introduces a device for discriminating and computing extrema in predetermined discrete zones. The unit contains an extremum-isolating flip-flop, a cadence pulse oscillator, a pulse distributor, and a counter. As a distinguishing feature of the patent, the functional possibilities of the device are extended by adding an analog-digital converter whose inputs are connected to the outputs of the cadence pulse oscillator and the pulse distributor, while the output of this converter is connected to the extremum-isolating flip-flop. Also incorporated into the device are two identical channels, each of them consisting of a flip-flop for determining the type of extremum and a coincidence matrix with one input connected to the output of the extremum-isolating flip-flop, and a coincidence matrix with one input connected to the output of the flip-flop for determining the type of extremum and the other connected to one of the outputs of

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BELEN'KIY, Ya. Ye. et al., Soviet Patent No 281913

the analog-digital converter; the other inputs of the matrix are connected to the corresponding outputs of the pulse distributor. One of the outputs of the matrix is connected to the input of the flip-flop for determining the type of extremum, and the others are connected to the counters.

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USSR

UDC: 621.371.332.3:621.391.883.6

RAKOV, V. K.

"Quasioptimum Methods of Stabilizing the Probability of a False Alarm in a Detector With Quantization"

Tr. Mosk. energ. in-ta (Works of Moscow Power Engineering Institute), 1972, vyp. 110, pp 22-25 (from RZh-Radiotekhnika, No 8, Aug 72, Abstract No 8G10)

Translation: The paper presents an analysis of three classes of protection circuits -- auxiliary units connected in the post-detector processing circuit to stabilize the probability of a false alarm. Among these, class A is made up of circuits connected before the quantizer, and classes B and C -- after the quantizer; therefore the operation of these two classes is invariant with respect to type of interference. Practical implementation of protection circuits is considered. Four illustrations, bibliography of one title. N. S.

1/1

UCSR

UDC 541.122.2

MIRTSKHULAVA, A. A., RAKOV, V. V., LAYNER, B. D., MILVIDSKIY,  
M. G., SAKVARELIDZE, L. G., State Scientific Research and Design  
Institute of Rare Metals Industry

"Study of the Phase Equilibrium in Gallium Arsenide-Aluminum  
Arsenide System"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 45, No 9, 1971, pp 2374-  
2375

Abstract: The ternary phase diagram of the quasibinary gallium  
arsenide-aluminum arsenide system with 0-15 mol% aluminum arsenide  
was determined using gravimetric physicochemical analysis.  
Arsenic concentration in the melt, temperature of the melt, and  
arsenic vapor pressure were determined simultaneously by the above  
method. Vacuum degassing of the starting materials and of the  
ampoule and graphitization of the crucible prevented aluminum from  
interacting with the container and with oxygen. To determine the  
liquidus line polythermal cuts of the diagram were plotted for  
alloys with different ratios of nonvolatile components. The

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USSR

MIRTSKHULAVA, A. A., et al, Zhurnal Fizicheskoy Khimii, Vol 45,  
No 9, 1971, pp 2374-2375

maximum liquidus temperature within each cut corresponded to a Ga-Al-As melt with 50 at.% As. The projections of the liquidus line of the quasibinary system on T-x, P-x, and P-T planes are shown. The experimental coefficient of interdiffusion of the melt components, i.e., Ga, Al, and As, was found to decrease from  $1.5 \cdot 10^{-4}$  to  $1.1 \cdot 10^{-4}$  sq. cm./sec., when aluminum arsenide concentration in the melt was increased from 0 to 15 mol.%.

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1/2 028

UNCLASSIFIED

PROCESSING DATE--27NOV70

TITLE--CALCULATION OF THE NORMAL MODES AND FREQUENCIES OF THE TRANSVERSE OSCILLATIONS OF A PLATE OF COMPLEX SHAPE -U-

AUTHOR--(021)-RVACHEV, V.L., RAKOVA, L.Y.

R

COUNTRY OF INFO--USSR

SOURCE--PRIKLADNAIA MEKHANIKA, VOL. 6, APR. 1970, P. 80-85

DATE PUBLISHED-----70

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

TOPIC TAGS--OSCILLATION, METALLURGIC RESEARCH FACILITY, THIN PLATE, FLAT PLATE, VIBRATION FREQUENCY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1654

STEP NO--UR/0198/70/006/000/0080/0085

CIRC ACCESSION NO--4P0125276

UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0125276

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

ABSTRACT. APPLICATION OF THE RITZ METHOD TO THE DETERMINATION OF THE FREQUENCIES AND NORMAL MODES OF THE FREE TRANSVERSE OSCILLATIONS OF FREELY SUPPORTED PLATES OF POLYGONAL PLANFORM AND OF PLATES OF ARBITRARY PLANFORM RIGIDLY CLAMPED AT THE EDGES. THE SYSTEM OF COORDINATE FUNCTIONS THAT SATISFY THE BOUNDARY CONDITIONS IS OBTAINED WITH THE AID OF R-FUNCTIONS. THE RESULTS ARE APPLIED TO SEVERAL EXAMPLES.

FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, INSTITUT MEKHANIKI, KHARKOV, UKRAINIAN SSR.

UNCLASSIFIED

USSR

UDC 77

GOROKHOVSKIY, V. M., LEVIN, YA. A., SOTNIKOVA, I. P., RAKOVA, N. F.,  
KARUNINA, V. V., GALIMOVA, A. M.

"Certain Photographic and Physicochemical Properties of 2- and 5-n-alkyl  
Homologs of 4-oxo-6-methyl-1,2,4-triazole-(2,3a)-pyrimidine"

Uspekhi nauchn. fotogr. (Advances in Scientific Photography), 1970, Vol. 14,  
pp 24-29 (from RZh-Fizika, No 12(I), Dec 70, Abstract No 12D1340)

Translation: Photographic and physicochemical properties of 2- and 5-n-alkyl  
derivatives of sta-salt with substitutes before C<sub>7</sub>H<sub>15</sub> in the second position  
and before C<sub>9</sub>H<sub>19</sub> in the fifth position. All these substances effectively stopped  
aging of the emulsion; their stabilizing activity decreased with concentration  
and there was also observed a greater dilution for a longer alkyl radical. The  
action of these substances on the emulsion at the time of introduction varied:  
an increase and a lowering of sensitivity or fogging were encountered, but with  
an increase in the length of the substitute the predominant effect became desen-  
sitzation in combination with defogging, a property absent in sta-salt. A

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USSR

GOROKHOVSKIY, V. M., et al, Uspekhi nauchn. Fotogr., 1970, VOL. 14, pp 21-25

study of the adsorption of sta-salt homologs on the Hg electrode by the oscillographic polarography method showed that as distinct from sta-salt, which does not have oxidation-reduction peaks and capacity jumps in the region limited by the anode wave of Hg-oxidation and reduction of the background homologs of sta-salt give desorption peaks in this region, the height of which rises with an increase in the length of the substitute and correlates well with their desensitizing effect. This correlation indicates that the deactivation of the sensitivity centers is greater as substances are adsorbed more intensively. A determination of acid dissociation constants of sta-salt homologs and the solubility products of their Ag-salts showed that both quantities drop with an increase in the length of the substitute and the latter must also lead to progressive desensitization. 16 references. Authors abstract.

USSR

UIC 612.791.014.482

OSANOV, D. P., YERSHOV, E. B., KLYKOV, O. V., and ~~RAKOVA, V. A.~~

"Kinetics of Dose Distribution in Skin Contaminated by Radioactive Substances"  
Moscow, Meditsinskaya Radiologiya, No 5, 1971, pp 44-50

Abstract: Solutions of tritium oxide, Sr<sup>89</sup>, Pu<sup>239</sup> nitrates, and other radioactive substances were applied to the backs of 8-week-old pigs (whose skin is morphologically and physiologically almost identical to human skin) in order to study the kinetics of penetration of the absorbed doses. The distribution of activity was investigated by the method of layer-by-layer radiometry of horizontal sections 15 to 20  $\mu$ m thick. The substances remained on the skin from 1 hour to 2 days. Data were also obtained on the kinetics of elimination of the isotopes from the skin after a single 6-hour exposure. A correlation was observed between the absorbed doses in the basal layer that were formed by the thin surface contamination and the thick-layer source created in the skin by penetration of the isotopes through the horny layer.

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USSR

UDC: 519.21

RAKOVA, Ye. V.

"On Inverse Probability Functions"

Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR (Works of Academic Institutes of Communications. Ministry of Communications of the USSR), 1970, vyf. 52, pp 166-172 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V25)

Translation: A formula is derived for calculating the function which is the inverse of the function  $F(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-\frac{z^2}{2}} dz$ . The formula is based on Burr's approximation

$$F(x) = 1 - (1-x)^{-k}, \quad x > 0, \quad c > 0, \quad k > 0,$$

and a series is given for the function  $\phi(y)$  which is the inverse of  $F_1(x) = F(x) - \frac{1}{2}$ :

$$\phi(y) = \sqrt{2\pi} \left( y + \frac{2\pi}{3!} y^3 + \frac{7(2\pi)^2}{5!} y^5 + \frac{132(2\pi)^4}{7!} y^7 + \dots \right)$$

which is suitable for computation in the interval  $0 < y < 0.45$ . V. Ivanov.

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USSR

UDC: 8.74

MAKHINACH, G. V., RAKOVICH, A. G.

"Operations on Contours During Automatic Planning of Machine-tool Equipment"

Vychisl. Tekhn. v Mashinostr. Nauch.-tekhn. Sb. [Computer Equipment and Machine Building, Scientific and Technical Collection], 1971, pp 77-84 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V593, by the authors)

Translation: Methods of realization of operations on contours are studied as operations on sets.

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UNCLASSIFIED  
TITLE--EXCRETION OF CATECHOLAMINES IN PATIENTS WITH THYROTOXICOSIS AND  
EUTHYROID GOITER BEFORE AND FOLLOWING SURGICAL TREATMENT -U-  
AUTHOR--SKRIPACHENKO, D.F., RAKOVSKAYA, G.G. PROCESSING DATE--17JUL70

COUNTRY OF INFO--USSR

SOURCE--VRACHEENOE DELO, 1970, NR 2, PP 37-41

DATE PUBLISHED-----7C

27  
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32

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CATECHOLAMINE, GOITER, SURGERY, ADRENALINE, NORADRENALINE,  
ADRENAL GLAND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

INDEX REEL/FRAE--1582/0399

STEP NO--UR/0475/70/000/002/0037/0041

CONTROL ACCESSION NO--APOC51916

UNCLASSIFIED

Acc. Nr:

AP0051916

Ref. Code: UR0415

PRIMARY SOURCE: Vrachebnoye Delo, 1970, Nr 2 , pp37-41

EXCRETION OF CATECHOLAMINES IN PATIENTS WITH THYROTOXICOSIS AND EUTHYROID GOITER BEFORE AND FOLLOWING SURGICAL TREATMENT

D. F. Skriptichenko and G. G. Rakovskaya (Kiev)

The excretion of catecholamines (adrenaline and noradrenaline) was studied at admission, after preoperative preparation and in the postoperative period in 133 patients with thyrotoxic and euthyroid goiter.

Sympathico-adrenal function proved increased in thyrotoxic patients manifested in an elevation of catecholamine excretion paralleling the severity of thyrotoxicosis and regularly decreasing following antithyroid therapy and subtotal strumectomy.

Patients with euthyroid forms of goiter did not show any significant changes in excretion of catecholamines.

Examination of catecholamine excretion in patients with thyrotoxicosis is valuable in evaluating the severity of thyrotoxicosis and efficiency of treatment.

REEL/FRAME  
19820399

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USSR

UDC: 621.317:621.397.122(088.8)

PERSHAKOV, B. N., RAKOVSKIY, A. R., SOROKA, Ye. Z.

"A Method of Producing Brightness Pips on the CRT Screen of an Oscilloscope"

USSR Author's Certificate No 268517, filed 5 May 68, published 12 Aug 70  
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A381 P)

Translation: A method is proposed for producing brightness pips on the CRT screen of an oscilloscope when measuring frequency deviation of the color subcarrier at the output of the coding device in the SECAM color TV system by sending the pip signal to the brightness modulator of the CRT. As a distinguishing feature of the patent, measurement precision is improved by using the signal from the output of the phase detector in the coding device as the signal for producing pips. The voltage of a mixture of TV signal quenching pulses with a peak-to-peak amplitude equal to the brightness signal from black to white is sent to the input of the coding device. E. L.

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USSR

UDC: 621.397.132

SOROKA, Ye. Z., RAKOVSKIY, A. B.

"A Method of Reducing the Visibility of the Color Subcarrier in a Color Television System"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 36, Soviet Patent No 288025, class 21, filed 12 Feb 68, published 3 Dec 70, p 51

Translation: This Author's Certificate introduces a method of reducing the visibility of the color subcarrier in a color television system with frequency modulation of the color subcarrier, which is modulated alternately by lines by two color difference signals, while in the absence of modulation the subcarrier takes on two different frequencies, and at the beginning of each line it is brought into the same phase by forced phase reversal in the line-and-frame sequence. In the frame sequence, the phase is changed for the period of each successive frame. As a distinguishing feature of the patent, the phase of the subcarrier is reversed in the line sequence in accordance with a symmetric law over a period of every three successive lines.

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USSR

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UDC: 621.317:621.397.122

PERSHAKOV, B. N., RAKOVSKIY, A. R., SOROKA, Ye. Z.

"A Method of Producing Brightness Marks on the Cathode Ray Tube Screen of an Oscilloscope"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 14, 1970, Author's Certificate No 268517, p 44

Abstract: This author's certificate introduces a method of producing brightness marks on the screen of an oscilloscope CRT when measuring the frequency deviation of a color subcarrier at the output of the coding device in the SECAM television system by transmitting the brightness mark signal to the brightness modulator of the CRT. As a distinguishing feature of the patent, the precision of the frequency deviation measurements is improved by using the signal from the output of the coding device phase detector as the signal for producing the brightness marks. The voltage of a mixture of television signal quenching pulses with a peak-to-peak amplitude equal to the brightness signal from black to white is sent to the input of the coding device.

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UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--INVESTIGATION OF THE EXTRACTION OF SOME COPPER, II, CHELATES USING ISOTOPE COPPER 64 -U-  
AUTHOR--(03)--RAKOVSKIY, E.E., PETRUKHIN, D.M., SEVERIN, V.I.

COUNTRY OF INFO--USSR

SOURCE--J. RADIOANAL. CHEM. 1970, 4(2), 207-14  
DATE PUBLISHED--70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY  
TOPIC TAGS--COPPER ISOTOPE, COPPER COMPLEX, COPPER EXTRACTING, DISSOCIATION CONSTANT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--2000/2038

STEP NO--NE/0000/70/004/002/0207/0214

CIRC ACCESSION NO--AP0125626

UNCLASSIFIED



2/2 010

CIRC ACCESSION NO--AP0125626

UNCLASSIFIED

PROCESSING DATE--30OCT70

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

ABSTRACT. THE EXTN. OF CU(II) 8, HYDROXYQUINOLINATE, AND 2, THENOYLTRIFLUOROACETONATE WAS INVESTIGATED AND THE STABILITY CONSTS. AND DISTRIBUTION CONSTS. OF THE COMPLEXES WERE DETD. THE DEPENDENCE OF THE PH VALUES FOR 50PERCENT EXTN. AND OF THE DISTRIBUTION CONSTS. OF THE CU COMPLEXES ON THE DISSOCN. CONSTS. AND DISTRIBUTION CONSTS. OF THE CORRESPONDING AGENTS ARE DISCUSSED. FACILITY: CENT. MINING RES. INST. NONFERROUS METALS, MOSCOW, USSR.

UNCLASSIFIED

1/3 015

UNCLASSIFIED

PROCESSING DATE--27NOV70

TITLE--IRREGULARITY IN THE DISTRIBUTION OF GOLD IN ROCKS AND MINERALS,  
ILLUSTRATED BY RADIOACTIVATION ANALYSIS DATA -U-

AUTHOR--(05)--ROZHKOV, I.S., RAKOVSKIY, E.YE., BERENSHTEYN, L.YE.,  
SEREBRYANYI, B.L., SHILIN, N.L.

COUNTRY OF INFO--USSR

SOURCE--DOKL. AKAD. NAUK SSSR 1970, 191(4), 927-30

DATE PUBLISHED-----70

SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--GOLD, ROCK, MINERAL, GEOCHEMISTRY, RADIOACTIVITY MEASUREMENT,  
NEUTRON ACTIVATION ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3001/0569

STEP NO--UR/0020/70/191/004/0927/0930

CIRC ACCESSION NO--AT0126315

UNCLASSIFIED

2/3 015

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC, ACCESSION NO--AT0126315  
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. RADIOACTIVATION SAMPLING FOR AU IN ROCKS AND MINERALS BY USING SUBSTOICHIOMETRIC SEPN. IS VERY RELIABLE AND HAS A VERY GOOD REPRODUCIBILITY (SCATTERING OF PARALLEL DETNS. SMALLER THAN 20PERCENT). IT REQUIRES, HOWEVER, A SAMPLE WEIGHING LARGER THAN OR EQUAL TO 100 MG. THE EFFECT OF NATURAL SCATTERING OF AU ON THE REPRODUCIBILITY OF RESULTS OF RADIOACTIVATION ANAL. WAS INVESTIGATED. THE SCATTERING OF AU DISTRIBUTION IN ROCKS AND MINERALS DEPENDED ON NUMEROUS FACTORS; FORM OF AU OCCURRENCES IN THE MINERAL, STRUCTURAL AND TEXTURAL CHARACTERISTICS OF ROCKS, AND INTENSITY OF SECONDARY ALTERATIONS. THE ERROR OF AN ANAL. DETN. CONSISTS OF 2 COMPONENTS: ERROR RELATED TO THE REPRODUCIBILITY OF THE METHOD (SIGMA SUBR) AND ERROR RELATED TO HETEROGENEITY OF AN ANALYZED SAMPLE (SIGMA SUBH). THE SUMMARY ERROR (SIGMA SIGMA) IN DETG. THE AV. CONTENT OF AN ELEMENT IN AN ANALYZED SAMPLE IS,  $\text{SIGMA SIGMA PRIME}^2 = \text{SIGMA SUBR PRIME}^2 + \text{SIGMA SUBH PRIME}^2$ . THE RESULTS OF LARGER THAN 200 NEUTRON ACTIVATION DETNS. OF AU IN ROCKS AND MINERALS, PROCESSED STATISTICALLY, SHOWED THAT THE NATURAL HETEROGENEITY IN AU CONTENTS IN AMPHIBOLE GABBRO, BIOTITE AMPHIBOLE DIORITE, BIOTITE AMPHIBOLE GRANODIORITE, GRANITE VEIN IN GRANODIORITE, APLITE VEIN IN GRANODIORITE, AND APLITE VEIN IN GABBRO IS MUCH HIGHER THAN THE ERROR OF REPRODUCIBILITY OF THE METHOD (SIGMA SUBR SIMILAR TO 20PERCENT). NATURAL HETEROGENEITY WAS SO HIGH THAT THE AU CONTENTS IN INDIVIDUAL BATCHES OF THE SAME SAMPLE DIFFERED FROM EACH OTHER BY LARGER THAN 5 TIMES.

UNCLASSIFIED

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CIRC ACCESSION NO--AT0126315  
ABSTRACT/EXTRACT--THEREFORE,

UNCLASSIFIED

PROCESSING DATE--27NOV70

IF SIGMA SUBR IS SMALL, THERE ARE REASONS TO  
USE THE MOST ACCURATE METHODS OF DETN.; BUT IF SIGMA SUBH IS MUCH HIGHER  
THAN SIGMA SUBR, THEN THE USE OF ACCURATE AND USUALLY EXPENSIVE ANAL.  
METHODS IS SENSELESS IF DETN. IS MADE FROM SMALL SAMPLES

NONREPRESENTATIVE WITH RESPECT TO THE INITIAL OBJECT.  
TSENT. NAUCH. ISSLED. GDRNORAZYED. INST. TSVET. REDK. BLAGO ROD. METAL.,  
MOSCOW, USSR. FACILITY:

UNCLASSIFIED

USSR

UDC 537.525

RAKHOVSKIY, V. I.

"Physical Principles of Commutation of an Electrical Current in a Vacuum"

Fizicheskiye osnovy kommutatsiy elektricheskogo toka v vakuume (cf. English above), Moscow, "Nauka," 1970, 536 pp, ill. 1 r, 95 k (from RZh--Elektronika i yeye primeneniye, No 5, May 1971, Abstract No 5A4K)

Translation: The book is devoted to the physical processes in a vacuum arc at various stages of its development. In particular, such problems are considered in detail as the electric strength of the vacuum interval in static and dynamic regimes, phenomena at the contacts during commutation of the electric current, cathode and anode processes in a vacuum arc, and process of heat and mass transfer during commutation of an electrical current in a vacuum. 727 ref. L. A.

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USSR

UDC:669-138:621-762(063)

RAKOVSKIY, V. S.

"Status and Prospects for the Development of Powder Metallurgy of Nonferrous Metals"

Moscow, Tsvetnyye Metally, No 2, Feb 74, pp 85-88

Abstract: In late September 1973, the Eleventh All-Union Conference on Powder Metallurgy was held in Yerevan. This conference was quite representative, involving almost 400 delegates from 52 cities, representing 136 organizations in the USSR. Production enterprises were better represented than in past conferences. Five sections were in operation at the conferences: technology of production of powders, production of products from ferrous metal powders, production of products from nonferrous metal powders, production of refractory compounds and products and problems of forming and sintering. Some 100 reports were heard in all. Two collections of reports and one collection of abstracts were published before the conference opened. The significant successes achieved in the area of powder metallurgy research and produc-

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USSR

RAKOVSKIY, V. S., Moscow, *Tsvetnyye Metally*, No 2, Feb 74, pp 85-88

tion were noted at the conference. Subjects discussed included: a new technology for the production of SAP products, in which the initial powder, poured in a container, not in a vacuum, is degassed with argon; after degassing, the powder is immediately sent to pressure treatment. This increases productivity and decreases cost and reject rate; the autoclave method of preparation of copper powder directly from ores; rolling of nonferrous metal powders, for example powders of nickel; the creation of new types of hard alloys based on titanium carbide, in which cobalt is replaced by alloy steel or a heat-resistant nickel-based alloy; powder metallurgy of heat-resistant nickel-based alloys and powder metallurgy of titanium alloys; production of titanium powder by hydrogenation and subsequent dehydrogenation; methods of production and fine and ultrafine metal powders.

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USSR

UDC 621.762.4.001

RAKOVSKIY, V. S., BORZETSOVSKAYA, K. M., OLENINA, N. S., and BOLOTINA, T. A.,  
All-Union Institute of Light Alloys

"Hot Deformation of Titanium Cermet Blanks"

Kiev, Poroshkovaya Metallurgiya, No 1, Jan 73, pp 88-92

Abstract: The possibility of increasing the density of titanium cermet blanks using upsetting, forging, and extruding was studied. The different processes of using powder metallurgy in an attempt to achieve an absolute density were compared with the same processes using VT1-00 titanium alloy. Chemical contents of the alloy and powder used were as follows:

	C	Fe	Si	O <sub>2</sub>	N <sub>2</sub>	H	Others
PTEC-1 powder	0.01	0.06	0.01	0.07	0.02	0.002	0.10
VT1-00 alloy	0.05	0.20	0.08	0.10	0.04	0.003	0.10

It was established that molding of titanium powder at very high pressures (6-7 t/cm<sup>2</sup>), exceeding the yield strength of titanium, followed by vacuum sintering at 1100-1200°C does not yield a blank with 100% density. According to mechanical properties, these blanks, in view of a residual porosity of 1/2



USSR

RAKOVSKIY, V. S., et al., Poroshkovaya Metallurgiya, No 1, Jan 73, pp 88-92

4-6%, substantially surpass cast and deformed titanium. In the study of increasing density of sintered titanium blanks by upsetting, forging, and extrusion, it was shown that use of a technological scheme, including cold molding and sintering with subsequent hot deformation, makes it possible to achieve a 100% density. The mechanical properties of the sintered samples were evaluated after hot deformation, and it was shown that their strength, ductility, and impact strength were close to that guaranteed by the technical specifications for VT1-00 alloy. 7 figures, 1 table.

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UNCLASSIFIED

TITLE--PROSPECTS FOR THE DEVELOPMENT OF POWDER METALLURGY IN MACHINE BUILDING -U- PROCESSING DATE--27NOV70

AUTHOR--RAKOVSKIY, V.S.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, VESTNIK MASHINOSTROYENIYA, NO 3, 1970, PP 63-65

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--POWDER METALLURGY, ECONOMICS, MACHINE INDUSTRY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1982

CIRC ACCESSION NO--AP0130757

STEP NO--UR/0122/70/000/003/0063/0065

UNCLASSIFIED

L/C 024

CIRC ACCESSION NO--AP0130757  
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--27NOV70

ABSTRACT. THE HISTORY OF THE DEVELOPMENT OF  
POWDER METALLURGY IN THE USSR IS DISCUSSED. ITS TECHNICO ECONOMIC  
EFFECTIVENESS FOR MACHINE BUILDING IS CONSIDERED AND ITS BASIC  
DEVELOPMENTAL TRENDS ARE INDICATED.

UNCLASSIFIED

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UDC:621.762 313

RAKOVSKIY, V.S., Professor, Doctor of Technical Sciences

"Development Prospects of Powder Metallurgy in Machine Building"

Moscow, Vestnik Mashinostroyeniya, No 3, Mar 70, pp 63-65

Abstract: This article reviews the present state of powder metallurgy in the USSR and outlines the prospects of its future development. The main products of powder metallurgy in the USSR are: porous bearings, hard cermet alloys, filters, magnets, contacts, articles made of refractory metals, and in a smaller volume, parts of machines and instruments, and articles made of heat-resistant metals. The following metal powders are produced on an industrial scale: iron, copper, lead, nickel, tin, ferro-alloys, stainless steel, and many others. In the last few years, new forms of cermet articles have been developed. Prospects of their application to machine building appear to be very promising. The most important are articles made of titanium and chromium. By varying the quality of original titanium and methods of production, titanium parts with the following properties can be obtained by powder metallurgy: hardness HB 150--280 kg/mm<sup>2</sup>, 25--8%,

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RAKOVSKIY, V.S. et al., Vestnik Mashinostroyeniya, No 3, Mar 70,  
pp 63-65

and Young's modulus up to 11,000 kg/mm<sup>2</sup>. A wide variety of titanium and titanium alloy parts for the automobile, aviation, chemical machine building, power and heavy industries can be manufactured by powder metallurgy methods. New bearings made of iron alloyed with nickel, copper, titanium, manganese, chromium, and molybdenum are manufactured by powder metallurgy methods. These bearings can withstand higher pressures, velocities and temperatures than bearings manufactured by conventional methods. Manufacture of computer parts by powder metallurgy methods also can save a lot of material and time wasted for machining. On the basis of studies conducted by various Institutes, it has been established that very intricate parts can be manufactured within very close tolerance limits by powder metallurgy. However, to introduce this technology into mass production the following conditions must be provided. The initial powders, and particularly iron powder, should have the grain size of 10--15 $\mu$ . Presently produced powders have an average grain size of 150--200 $\mu$ . Moreover, the powders should have maximum plasticity, therefore they should be 99.5--99.7%-pure. Mass production of small but intricate parts should

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pp 63-65

be done in automatic presses. However, the domestic automatic presses have only two plungers which compact the powder in the mold. They lack the third plunger for knocking out the compacted article from the form. Therefore, new presses, with a third plunger, should be built. At the present time, one of the obstacles in the development of powder metallurgy, are high prices of metal powders which are not justified by the cost of their production, therefore they should be reduced. Realization of these measures will make it possible to expand the application of powder metallurgy in the domestic machine- and instrument-building industry, and will increase the efficiency of the entire industry.

USSR

UDC: 621.396:622

RAKOYED, A. F.

"A Step-Down Converter Based on a Nonlinear Resistance and a Nonlinear Capacitance"

Tr. uchebn. in-tov svyazi. M-vo svyazi SSSR (Works of Academic Institutes of Communications. Ministry of Communications of the USSR), 1970, vyp. 51, pp 39-47 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5D332)

Translation: The author discusses the use of a parametric diode operating in the self-biasing mode in a step-down converter. It is shown that the active component of the input conductance of such a converter may be equal to zero or negative in a certain frequency band. The conditions of optimum operation of the converter are determined. Resumé.

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PETROV, K. A., RAKSHA, M. A., KOROTKOVA, V. P., and SHMIDT, E.  
UDC 547.26'118.07  
"Synthesis of Alkenylphosphonic Acid Derivatives and Investigation of  
Their Properties. IV.  $\beta$ -Aldehydophosphonates"  
Leningrad, Zhurnal Obshchey Khimii, Vol 41 (103), No 2, Feb 71,  
pp 324-327

Abstract: Unsubstituted and  $\alpha$ -alkylated  $\beta$ -aldehydophospho-  
nates (I) may be obtained by hydrolysis of  $\beta$ -alkoxyvinyl- and  $\beta$ -alkoxy- $\alpha$ -  
alkylvinylphosphonic acid esters with concentrated hydrochloric acid.  
The products are colorless or slightly yellow liquids which can be  
vacuum-distilled with slight tarring; they give a qualitative reaction  
with fuchsin-sulfurous acid. (I) reacts energetically with sodium di-  
cyclohexylphosphite, forming sodiumdialkyldicyclohexyl- $\alpha$ -alkoxyethyl-  
enediphosphonate. To obtain (I), 3.6 g of concentrated HCl is added  
to 31 g of diethylester of ethoxyvinylphosphonic acid, heated for 30  
min at 70-80° and fractionated under vacuum.

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UDC 547.26'118

USSR  
PETROV, K. A., SULAYMANOV, A., DZHUNDUBAYEV, K. D., RAKSHA, M. A.,  
and KOROTKOVA, V. P., Institute of Organic Chemistry, Academy of  
Sciences Kirgiz SSR

"Synthesis and Study of Properties of Substituted Vinylthiophosphonic  
Acid Derivatives"

Frunze, Izvestiya Akademii Nauk Kirgiz SSR, No 3, 69, pp 73-77

Abstract: It was shown in an earlier study (Petrov, K. A. et al, ZhOKh. 36, 715, 1966) that ethers react with phosphorus pentachloride in an inert solvent medium or an excess of ether to form complex compounds which, when treated with sulfur dioxide, decompose and yield diacid chlorides of substituted alkenephosphonic acids; when treated with hydrogen sulfide, they yield diacid chlorides of substituted alkenethiophosphonic acids. In the present research it was shown that the reaction of diacid chlorides of  $\beta$ -alkoxy- $\alpha$ -alkylvinylthiophosphonic acids with alcohols and secondary amines yields neutral esters, ester acid chlorides, ester amides and tetraalkylamides. It was shown that O,O-dialkyl- $\beta$ -alkoxy- $\alpha$ -alkylvinylthio-

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PETROV, K. A., et al, Frunze, Izvestiya Akademii Nauk Kirgiz SSR,  
No 3, 69, pp 73-77

phosphonates isomerize to O,S-dialkyl- $\beta$ -alkoxy- $\alpha$ -alkylvinylphos-  
phonates on heating. A new method was developed for obtaining  
 $\beta$ -aldehydethiophosphonates by hydrolysis of the neutral esters of  
 $\beta$ -alkoxy- $\alpha$ -alkylvinylthiophosphonic acids.

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- 45 -

Simulations

UDC 51

USSR

PANKOV, P. I., RAKUZINA, O. Ya.

"Planning for Future Development of Land Improvement at the Atomic Power Plant of Minvodkhoz USSR"

V sb. Mat. metody v ekon. (Mathematical Methods in Economics -- Collection of Works), No. 9, Riga, "Zinatne", 1972, pp 5-22 (from RZh-Matematika, No 11, Nov 72, Abstract No 11V490)

Translation: Several multi-index models of linear programming are described.

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UDC: 51

USSR

PANKOV, P. I., RAKUZINA, O. Ya.

"Prospective Planning of the Development of Land Reclamation in the Automatic Control System of the USSR Water Resources Ministry"

Mat. Metody v Ekon. [Mathematical Methods in Economics--Collection of Works], No 9, Riga, Zinatne Press, 1972, pp 5-22 (Translated from Referativnyy Zhurnal Kibernetika, No 11, 1972, Abstract No 11V490)

Translation: Several multiple-index models of linear programming are discussed.

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RAKYTYANSKIY, D.F.

(4)

JPRS 58826  
23 APR 1973

EXTERNAL ELECTRIC FIELD RECORDED AROUND ANIMALS. MAN

Article by U. S. Volynsky, O. S. Danylyk, Yu. V. Tereshchuk, B. G. Rakytyanskiy; Institute of Physiology, Siberian Branch of the USSR Academy of Sciences, Novosibirsk; Kiev, Fiziolohichnyy Zhurnal Akademiyi Nauk Ukrayiny, Kiev, 1973, Vol. 19, No. 1, 1973, pp 99-106.

The attention of many researchers has been attracted recently by electromagnetic fields that originate in and around excited systems. Information regarding the presence of an electric field around an excited isolated nerve appeared first in 1949 [5]. The existence of a magnetic field around a nerve [6, 7] and of electric and magnetic fields around the heart became known later [8, 9]. Experimental results regarding the electric field around man and animals [1] showed that characteristics of the recorded electric field around the human heart at a distance of 1 m cannot be explained within the framework of our understanding of the heart as an electric field generator.

The aim of this work was to study the characteristics of the electric field which can be recorded around biological subjects and to explain its nature.

Methods

The method of recording the external electric field of biological subjects was developed on the assumption that the source of this field is the hypothetical electric dipole located in the volumetric conductor and which produces a difference in potentials that is equal to the QRS wave amplitude on an electrocardiogram.

In order to record the electric field of biological subjects, it is necessary to have very sensitive apparatus ( $10^{-3}$  to  $10^{-4}$  V). In our experiments we used the electrometric amplifier UI-2 with the input base of 1 input = 1011 ohm which was necessary to satisfy the field source impedance and the recording device. The maximal sensitivity of the

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23 APR 1973

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device between 0.5 Hz and 1 kHz was  $10^{-3}$  V. In several instances, standard band filters were used at the input of the indicating device.

A comparatively high external interference produced by the earth's electric field, other functioning equipment, and the loud work required very strict screening of the subject under study. The screening chamber was in the shape of a cone, with 3-meter sides. Designing a chamber that considerably exceeded in this case would be a study very important, because only in this case would it be possible to observe alternations in the recorded external electric field which originate due to the volumetric asymmetry of the subject with respect to the walls of the screening chamber. For the same reason, all subjects were placed approximately in the center of the chamber in a horizontal position.

Three remote electrometer units of three amplifiers were suspended with special stretchers (ropes) from the chamber ceiling at different distances from the heart of the subject investigated. This made it possible to record the electric field at three points simultaneously. In addition, it was made possible to record the ECG synchronously with the recording of the electric field. All measuring devices were placed outside the chamber, with the exception of the remote units of the amplifiers and the shields were grounded. Leads for the contact ECG were shielded and the shields were grounded.

Hezal discs 25 mm in diameter served as field sensors, and they were attached to input terminals (shunt) of the electrometer units. Each disc was surrounded by a protective ring which was connected through a resistance with the case of the remote unit. The diameter of this ring was equal to the line constant of the input of the electrometer with the electric field sensor. The disc also facing the subject was considered to be the working surface.

The humidity of the surrounding air was recorded simultaneously with the electric field.

The amplifying line was calibrated by placing the field sensor between two plane-parallel plates to which was applied the calibrating pulses, the shape of which resembled that of the field signal.

Frogs, cats, and people were the subjects of study. The electric field was recorded when the subject was grounded, and when there was no contact between the subject and the surrounding leads or the ground. In the second case the ECG was not taken. Figure 1 shows a schematic diagram of the recording unit.

(4)

UDC 612.014.42

USSR

VALYEYEV, U. S., OSYENNIY, O. S., TORNUYEV, YU. V., and RAKHYTYANS'KIY, D. F.,  
Institute of Physiology of the Siberian Branch of the Academy of Sciences USSR,  
Novosibirsk

"The Origin of the External Electric Field Which Is Recorded Around Animals  
and Man"

Kiev, Fiziologichnyy Zhurnal, Vol 19, No 1, 1973, pp 99-104

Abstract: Using very sensitive electric equipment, the electric field was recorded around man and animals at a distance of 1 m. The strength of the field increases linearly with the distance decrease between the recording equipment of the animal or human body. The configuration and amplitude of the external electric field differs over different parts of the body. When the air humidity was increased to 50-85%, no electric field was recorded even at a distance of 5 cm from the man's body. The best recordings were obtained at 20-25°C and air humidity of 17-35%. Rubbing of a man's body with a cloth or bare hand increases the electric field even in the presence of high air humidity (45%). In the case of furry animals, the recorded electric field changed synchronously with respiration cycles and heart beats. No electric field was recorded around frogs, even at a distance of 0.5 cm from the body. The electric field around  
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USSR

VAYEYEV, U. S., et al., Fiziologichnyy Zhurnal, Vol 19, No 1, 1973, pp 99-104  
animals and man depended on respiration and heart beats. The recorded electric field is the result of the mechanical activities of living creatures and is not related to any electrical processes that take place in the living organism.

2/2



UDC: 534.852.2

USSR

BALKO, A. V., KURSENKO, I. V., MANCHUK, K. I., GAVRISH, A. P., KOVENSKIY, B. G., "Kiev "Order of Lenin" Polytechnical Institute imeni the Fiftieth Anniversary of the Great October Socialist Revolution

"A Method of Making Ferrite Magnetic Heads"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztzy, Tovarnyye Znaki, No 30, Oct 71, Author's Certificate No 317100, Division G, filed 22 May 70, published 7 Oct 71, p 184

Translation: This Authors' Certificate introduces a method of making ferrite magnetic heads by adding a vitrifying material in the working gap between ferrite cores, and heating it to the vitrification point. As a distinguishing feature of the patent, the manufacturing process is simplified by impregnating a porous material such as ash-free filter paper with the vitrifying material, drying, and placing a sheet of the impregnated material between the ferrite cores.

1/1

1/2 017  
 TITLE—HEAT TREATMENT OF DIES AND MOULDS MADE OF CHROMIUM MANGANESE STEEL  
 7KHGSVM -U-  
 AUTHOR—(03)—YUZEFPOLSKY, Z.SH., RALKO, V.S., SAVINOVSKY, G.K.  
 COUNTRY OF INFO—USSR  
 SOURCE—METALLOVEDENIE I TERM. OBRABOT. METALLOV, 1970, (2), 70-71  
 DATE PUBLISHED—70

UNCLASSIFIED

PROCESSING DATE--30OCT70

SUBJECT AREAS—MATERIALS, MECH., IND., CIVIL AND MARINE ENGR  
 TOPIC TAGS—CHROMIUM MANGANESE STEEL, STEEL HEAT TREATMENT, STEEL  
 MANUFACTURE PROCESS, STEEL QUENCHING, MOLDING MATERIAL, DIE  
 STEEL/(U)7KHG2VM CHROMIUM MANGANESE STEEL

CONTROL MARKING—NO RESTRICTIONS

DOCUMENT CLASS—UNCLASSIFIED  
 PKOXY REEL/FRAE—2000/0138

STEP NO—UR/0129/70/000/002/0070/0071

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PROCESSING DATE—30OCT70

UNCLASSIFIED

2/2 017

CIRC ACCESSION NO—AP0123910

ABSTRACT/EXTRACT—(U) GP-0-

7KHG2VM STEEL FOR THE MANUFACTURE OF DIES AND MOULDS, PARTICULARLY

COMPLICATED PATTERNS USED IN THE PRODUCTION OF POLYMER PARTS, ARE

DESCRIBED AND DISCUSSED. IT ORDER TO ENSURE GOOD QUALITY MATERIAL IT IS

ESSENTIAL TO PAY SPECIAL ATTENTION TO THE CONDITIONS OF HEAT TREATMENT.

THUS, FOR EXAMPLE, AFTER ORDINARY QUENCHING AND TEMPERING AN ADDITIONAL

PERIOD OF HEAT TREATMENT AT 300 DEGREESC FOR 3 H IS REQUIRED IN ORDER TO

ALLEVIATE MARTENSITE ENGENDERED INTERNAL STERSSES; NO RAPID COOLING

SHOULD BE ALLOWED.

UNCLASSIFIED

1/2 018

UNCLASSIFIED  
TITLE--X RAY DIFFRACTION STUDY OF PLATINUM BARIUM AND PALLADIUM BARIUM  
ALLOYS IN THE REGION OF PT SUB5 BA AND PD SUB5 BA COMPOSITIONS -U-  
AUTHOR-(03)-ZHURAVLEV, N.N., YESAULOV, N.P., RALL, I.V.

PROCESSING DATE--23OCT70

COUNTRY OF INFO--USSR

SOURCE--KRISTALLOGRAFIYA 1970, 15(2), 374-6

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, CHEMISTRY, PHYSICS

TOPIC TAGS--X RAY DIFFRACTION, PLATINUM ALLOY, PALLADIUM ALLOY, BARIUM  
ALLOY, MICROSCOPY ALLOY, BARIUM COMPOUND, X RAY EMISSION

CONTROL MARKING--NO RESTRICTIONS

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STEP NO--UR/0070/70/015/002/0374/0376

CIRC ACCESSION NO--AP0119307

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