

2/2 013

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AA0128872

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POLYARYLATES ARE PREPD. BY
POLYCONDENSATION OF DICARBOXYLIC ACID CHLORIDES WITH BISPHENOLS. SUCH AS
GAMMA DILACTONES OF 2,5,BIS(PHENYL),4 PRIME,
HYDROXYPHENYL)HYDROXYMETHYL)TEREPHTHALIC ACID AND 2,4 BIS(PHENYL,4
PRIME, HYDROXYPHENYL)HYDROXYMETHYL)ISOPHTHALIC ACID. FACILITY:
INSTITUTE OF HETEROORGANIC COMPOUNDS, ACADEMY OF SCIENCES, USSR.

UNCLASSIFIED

1/2 007 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--ION EXCHANGE REFINING OF TANNIN -U-
AUTHOR-(04)-RIZAYEV, N.U., BERIDZE, P.Z., YAVICH, P.A., SARABUNOVICH, A.G.
COUNTRY OF INFO--USSR
SOURCE--SOOBSHCH. AKAD. NAUK. GRUZ. SSR 1970, 57(3), 597-600
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ION EXCHANGE RESIN, TANNIC ACID, CHEMICAL PURITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3007/0983 STEP NO--UR/0251/70/057/003/0597/0600
CIRC ACCESSION NO--AP0136413
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136413

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DIFFERENT CATION AND ANION
EXCHANGE RESINS WERE EMPLOYED FOR THE REFINING OF TANNIN FROM TWO
SOURCES. IN SOME REFININGS THE PURITY OF TANNIN WAS AS HIGH AS
94.5PERCENT. THE MERITS OF THESE RESINS ARE DISCUSSED FROM AN EXPTL.
VIEW. FACILITY: INST. FARMAKOKHIM. IM, KUTATELADZE, TBILISI,
USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--PRINCIPLES OF THE SORPTION OF TANNIN, PYROGALLOL SERIES, ON ION
EXCHANGERS -U-
AUTHOR-(04)-YAVICH, P.A., RIZAYEV, N.U., BERIDZE, P.Z., SARABUNOVICH, A.G.
COUNTRY OF INFO--USSR
SOURCE--SOOBSHCH. AKAD. NAUK GRUZ. SSR 1970, 57(1), 101-4
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ADSORPTION, TANNIC ACID, ION EXCHANGE RESIN/(U)KB4 ION
EXCHANGE RESIN, (U)KU2 ION EXCHANGE RESIN, (U)AN1 ION EXCHANGE RESIN,
(U)AN2F ION EXCHANGE RESIN, (U)AV16 ION EXCHANGE RESIN, (U)EDEL0P ION
EXCHANGE RESIN, (U)AN31 ION EXCHANGE RESIN
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3002/1372 STEP NO--UR/0251/70/057/001/0101/0104
CIRC ACCESSION NO--AP0128772
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0128772

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SORPTION DYNAMICS WAS STUDIED BY USING A COLUMN PACKED WITH 3 G DRY ION EXCHANGER, FILTRATION RATES OF 0.47-2.85 ML-MIN, AND TANNIN (I) SOLNS. OF EXTS. FROM TURKISH GALL NUTS, EACH CONTG. 7.5-8.5PERCENT I. THE SORPTION CAPACITY FOR I SOLNS. INCREASED IN THE FOLLOWING SERIES OF ION EXCHANGERS: KB-4, KU-2, KU-1, AN-1, AN-31, AN-2F, AV-16, EDE-10P, AV-17, WHEREAS FOR I EXTS. IN THE SERIES: KU-2, KU-1, KB-4, AN-1, AN-31, AN-2F, AV-17, EDE-10P, AV-16. THERE WAS A LITTLE DIFFERENCE BETWEEN THE SORPTION OF I FROM SOLNS. AND EXTS. THE SORPTION OF I WAS ACCOMPANIED BY THAT OF MINERAL IONS. HOWEVER, THEIR PRESENCE REDUCED THE SORPTION CAPACITY WITH RESPECT TO I. IT ALSO DROPPED MARKEDLY WITH INCREASING FILTRATION RATE, WHEREAS THE SORPTION WITH RESPECT TO MINERAL IONS DROPPED ONLY SLIGHTLY. WEAKLY BASIC ION EXCHANGERS FAILED TO SORB I OVER THE FLOW RATE RANGE 1.8-2.85 ML-MIN CM PRIME2, WHEREAS STRONGLY ACIDIC ONES SORBED LARGE AMTS. OF I EVEN AT HIGH RATES. I EXTS. CAN BE LIBERATED FROM MINERAL SALTS, ACIDIC COMPONENTS, AND NATURAL DYES BY FILTERING THEM THROUGH ION EXCHANGERS. IT IS ALSO POSSIBLE TO REMOVE I LIKE SUBSTANCES FROM PLANT EXTS. USING A SYSTEM COMPRISING A STRONGLY ACIDIC CATION EXCHANGER AND A STRONGLY BASIC ANION EXCHANGER. FACILITY: INST. FARMAKOKHIM. IM. KUTATELADZE, TBILISI, USSR.

UNCLASSIFIED

USSR

UDC: 512.25/.26+519.3:330.115

BERIKASHVILI, V. A.

"Concerning One Transport Problem"

Tr. Vychisl. tsentra AN GruzSSR (Works of the Computing Center of the Academy of Sciences of the Georgian SSR), 1970, 10, No 2, pp 5-9 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V600)

Translation: A certain modification of the three-index transport problem.

- 31 -

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USSR

UDC 632.95

BERIM, N. G., and BYKHOVETS, A. I.

"Particulars of Separate and Combined Action of Insecticides and Benzimidazole Derivatives on Lepidoptera"

Zap. Leningr. s.-kh. in-ta (Notes of Leningrad Agricultural Institute), 1972, 180, pp 33-36 (from RZh-Khimiya, No 18, Sep 72, Abstract No 18N429)

Translation: The effect which benzimidazole derivatives (preparation No 2) has on the toxic activity of insecticides (sevin, phthalophos, fozalon,) is determined on tent caterpillars, gypsy moth larvae and cabbage cutworms. The insecticides cause a sharp decrease in the content of lipids in the body of the caterpillars, and reduce their weight. Preparation No 2 reduces the toxic effect of the insecticides and improves the physiological condition of the caterpillars as compared with variants where the insecticides alone were used. T. A. Belyayeva.

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USSR

UDC 632.95

BERIM, N. G., GAVRILOVA, V. P., KOZLOVSKAYA, V. I., and RADISHCHEVA, D. F.

"On Combined Employment of Rogor and Benzimidazole or 5-Aminobenzimidazole Against Cabbage Pests"

Zap. Leningr. s.-kh. in-ta (Notes of Leningrad Agricultural Institute), 1972, 180, pp 20-27 (from RZh-Khimiya, No 14, 25 Jul 72, Abstract No 14N446 by T. A. Belyayeva)

Translation: Spraying cabbages with an 0.3% solution of Rogor during the mass pedogenesis period cuts down the numbers of spring cabbage fly by 87%, but adversely affects the plants' physiological condition: ascorbic acid content declines and photosynthetic activity lessens. Under the influence of benzimidazole (I) and 5-NH₂-I there is an increase in the resistance to Rogor both of the plant and of the insect pest. The optimum variant is simultaneous application of Rogor and I or 5-NH₂-I. A significant rise in the resistance of insects was found when plants were pretreated with benzimidazole solutions and subsequently sprayed with Rogor.

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Entomology

USSR

UDC 577.150.4.595.787

BERIM, N. G., and BYKHOVETS, A. I., Chair of Agricultural Entomology,
Leningrad Agricultural Institute, Pushkin

"The Effect of Organophosphorus Insecticides and Sevin on the Activity of
Digestive Enzymes in Lepidoptera"

Leningrad, Entomologicheskoye Obozreniye, Vol 50, No 2, 1971, pp 335-340

Abstract: Larvae of the last instar of *Malacosoma neustria*, *Porthetria dispar*, and *Mamestra brassicae* were poisoned by intrainstestinal introduction of sevin, ftalofos, fozalon, or mixtures of sevin with ftalofos or fozalon. The pH in the middle intestine of the larvae first decreased and then increased, showing phase changes. The activity of amylase, proteinases, lipases, and sucrose in larvae intestines decreased as a result of insecticide treatment. The degree to which the activity of the enzymes was reduced depended on the insect species and on the insecticide used.

USSR

UDC 541.183

BERING, B. P., and SERPINSKIY, V. V., Institute of Physical Chemistry,
Academy of Sciences USSR

"Thermodynamic Method for Determination of the Specific Surface of
Adsorbents"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 12, Dec 73,
pp 2672-2678

Abstract: A thermodynamic method for determining the capacity of a monomolecular layer of nonporous adsorbents, i.e. their surface, was developed, based on the analysis of vapor adsorption isotherms at two different temperatures and calculation of basic thermodynamic functions. Replacement of adsorption values by Gibbs free energy leads to linearization of all differential thermodynamic functions -- enthalpy, entropy, and free energy -- showing two areas: one of the monomolecular and the other of polymolecular adsorption. The integral thermodynamic functions -- surface tension, entropy and enthalpy of the surface layer -- behave analogously, becoming linear when the adsorption values are replaced by surface pressure. The point of the cross section of two linear segments of Gibbs free energy, corresponding to the mono- and polymolecular areas, makes it possible to determine a_M and the specific surface of a solid body, agreeing well with monolayer capacity determined by the BET equation.

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USSR

UDC 541.183

BERING, B. P., and SERPINSKIY, V. V., Institute of Physical Chemistry,
Academy of Sciences, USSR

"Adsorption Equilibrium and Thermodynamics of Vacancy Solutions"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 12, Dec 73,
pp 2679-2685

Abstract: A concept has been introduced of "adsorption vacancies" -- elements of adsorption volume filled with molecules being adsorbed. Adsorption on a solid body from a monocomponent gas phase is viewed as a process of the formation of a binary solution of adsorbate molecules and vacancies. Analysis of "vacancy solutions" by methods of the thermodynamics of solutions showed that for a series of systems the vacancy solution is regular, since its "excessive entropy of mixing" is zero throughout the entire interval of filling the adsorption volume. The regularity of the vacancy solution is equivalent to the temperature invariance of the curve of excess free energy of the adsorbate. The regularity of vacancy solutions characteristic for a large group of the adsorption system makes it possible to calculate differential heats and entropies by one adsorption isotherm and by the temperature function of specific adsorption.

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- 4 -

Adsorption Phenomena

USSR

UDC 541.183

BERING, B. P., RAKHMUKOV, B. Kh., and SERPINSKIY, V. V., Institute of Physical Chemistry, Academy of Sciences USSR

"Experimental Determination of Specific Adsorption and Its Temperature Dependence"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, Vol 12, Dec 73, pp 2798-2801

Abstract: A method was developed for the determination of specific adsorption and its temperature dependence based on dilatometric measurements of the adsorption system zeolite-liquid adsorptive. Specific adsorption and the temperature coefficient have been determined for the system n-pentane-NaX zeolite in the temperature range 30-150°. The temperature coefficient calculated by the method of Nikolayev-Dubinina agreed well with the experimentally determined value.

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Adsorption

USSR

UDC 541.183

BERING, B. P., SERPENSHIY, V. V., and SURENOVA, S. I., Institute of Physical Chemistry, Academy of Sciences USSR

"Calculation of the Isotherm of Adsorption from a Solution onto a Non-porous Substrate Using the Individual Isotherm of Adsorption of the Components From a Gas Phase"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 73, pp 3-6

Abstract: A solution is proposed for the title problem for the particular case of a binary solution and a nonporous or very large pore substrate. The solution is based on the Gibbs free energy equation together with the individual adsorption isotherms of the components from the gas phase and a diagram for the solution volume. Calculations were checked against experimental results of the adsorption of vapors in the system {benzene - Isooctane} at a temperature of 45° onto graphitized carbon black having a surface area of $85 \text{ m}^2/\text{g}$. Measurements were made not only of the monomolecular adsorption but also of the polymolecular adsorption and capillary condensation. Analogous results were obtained using the { CCl_4 - 2,2,4-trimethylpentane} and the { $\text{C}_2\text{H}_5\text{OH}$ - C_6H_6 } systems.

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USSR

UDC 541.183:536.7

BERING, B. P., and SERPINSKIY, V. V., Institute of Physical Chemistry Academy of Sciences USSR

"On Linear Correlations Between Thermodynamic Functions in Adsorption Equilibrium"

Moscow, Doklady Akademii Nauk SSSR, Vol 205, No 3, 1972, pp 611-614

Abstract: Experimental data have verified the theoretical assertion that if the isotherms of adsorption of a gas by a solid at temperatures T_1 and T_2 ($T_2 > T_1$) can be expressed by the equations $\ln p_1 = f_1(a)$ and $\ln p_2 = f_2(a)$ where p is the equilibrium pressure and a , the value of adsorption. From the ratio $k = \bar{p}_2(a) / \bar{p}_1(a)$, the constant " a " may be excluded from the above equations, leading to a linear function in $p_2 = k(T_1/T_2) \ln p_1 + C$ from which the following correlations can be obtained:

$$\Delta G_2 = k \Delta G_1 - \Delta G^* (k - 1); \quad (13)$$

$$\Delta S = [(1 - k) / (T_2 - T_1)] \Delta G_1 - [(1 - k) / (T_2 - T_1)] \Delta G^*; \quad (14)$$

$$1/2 \quad -\Delta H = q = [(kT_1 - T_2) / (T_2 - T_1)] \Delta G_1 - [(k - 1)T_1 / (T_2 - T_1)] \Delta G^*; \quad (15)$$

USSR

BERING, B. P., and SERPINSKIY, V. V., Doklady Akademii Nauk SSSR, Vol 205, No 3, 1972, pp 611-614

where $\Delta G_1 = RT_1 \ln p_1/p_{s1}$ and ΔG is the value of ΔG when $\Delta S=0$, i.e., at the point of intersection of isotherms $\Delta G_1=f_1(a)$ and $\Delta G_2=f_2(a)$. Substituting b from the equation $k=b_2/b_1=(T_2-b)/(T_1-b)$ for k gives

$$\Delta G_2 = [(T_2 - b) / (T_1 - b)] \Delta G_1 - [(T_2 - b) / (T_1 - b)] \Delta G^*; \quad (16)$$

$$\Delta S = -\Delta G_1 / (T_1 - b) + \Delta G^* / (T_1 - b); \quad (17)$$

$$-\Delta H = q = b \Delta G_1 / (T_1 - b) - \Delta G^* T_1 / (T_1 - b); \quad (18)$$

$$q = -b \Delta S - \Delta G^*. \quad (19)$$

Examination of published adsorption data indicated a good correlation between calculations and experimental results.

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- 2 -

USSR

UDC 541.183

BERING, B. P. and SERPINSKIY, V. V., Institute of Physical Chemistry, USSR Academy of Sciences

"Determination of the Activity Coefficients of Binary Adsorption Solutions"

Moscow, Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 72, pp 166-168

Abstract: The method of "the ideal adsorption solution" proposed by A. L. MYERS and J. M. PRAUSNITZ yields an adsorption coefficient which is close to unity in every case; but such a magnitude for the adsorption coefficients is not found in many systems, such as $\text{CH}_3\text{COCH}_3\text{-CNCl}_3$ -sil9ca gel, $\text{H}_2\text{S-C}_3\text{H}_8\text{-NaX}$ zeolite, etc. so that a more universal method must be devised.

The author proposes a method of calculating the activity coefficients of adsorbent solutions on the basis of given curves corresponding to constant values of the integral of the Gibbs equation; the method applies in particular to the adsorption of binary gaseous mixtures on microporous adsorbents.

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USSR

UDC 541.183

BERING, B. P. and SERPINSKIY, V. V., Institute of Physical Chemistry, USSR Academy of Sciences

"Calculation of the Adsorption Equilibrium of Binary Mixtures of Vapors for the Case of Affine Isotherms"

Moscow, Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 72, pp 169-171

Abstract: A method is proposed to calculate values of the integral of the Gibbs adsorption equation over the entire interval of variation in adsorption of the components.

Only the partial case in which the condition of affinity of adsorption isotherm of vapor mixtures with constant composition of the adsorption phase, and also the condition of additivity of the affinity coefficients of the adsorption solution, are met, is considered here.

Given fulfillment of those conditions, the method makes possible calculation of adsorption equilibrium of a binary mixture of vapors on a solid adsorbent on the basis of two individual adsorption isotherms; also, there is no necessity of applying the hypothesis of ideality of adsorption solutions.

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USSR

UDC 541.183

BERING, B. P., and SERPINSKIY, V. V., Institute of Physical Chemistry, USSR Academy of Sciences

"Justification of the 'Ideal Adsorption Solution' Method in the Case of Calculating the adsorption on Binary Mixtures of Vapors by Individual Isotherms"

Moscow, Izvestiya Akad, Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 72, pp 171-173

Abstract: The "ideal adsorption solution" method proposed by A. L. MYERS and J. M. PRAUSNITZ in 1965 offers the advantage of extreme simplicity in assessing the adsorption of the components of gaseous binary mixtures, it has not, however, been finally substantiated by any physical or thermodynamic data.

The authors offers a means of justification of the "ideal adsorption solution" method for the partial case of adsorbed systems for which the condition of the affinity of isotherms of the adsorbed mixtures of vapors (given a constant composition of the adsorption solution), and also the condition of additiveness of the efficient of affinity of such a solution, are met.

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- 2 -

USSR

UDC 541.183

BERING, B. P., SERPINSKIY, V. V., Institute of Physical Chemistry,
Moscow, Academy of Sciences USSR

"Calculation of the True Adsorption Isotherms for the Components
of Solutions From the Composite Adsorption Isotherm"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 6,
Jun 70, pp 1232-1235

Abstract: This paper concerns the method of determination of maximum real adsorption from solution based on the slope of the isotherm of excessive adsorption. A theoretical analysis is given for the relationship of excessive adsorption on the surface of a solid body (or on the surface of solution) and the molar fraction of the component 2 in this solution, which according to literature should represent the adsorption isotherm from solution. It is claimed that this function cannot be used for determination of the true adsorption isotherms for solution components. The only way to solve this problem is to determine independently the maximum adsorptions of pure components from individual adsorption isotherms
1/1 from gaseous phase.

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UDC 541.183

BERING, B. P., GORDEYEVA, V. A., DUBININ, M. M., YEFIMOVA, L. I., and
~~CHERPINSKIY~~, V. V., Institute of Physical Chemistry, Acad. Sc. USSR

"Development of Concepts on Micropore Volume Filling During Adsorption
of Gasses and Vapors by Microporous Adsorbents. 4 Communication.
Differential Heats and Adsorption Entropies"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1,
Jan 71, pp 22-28

Abstract: Equations were developed for differential molar heats and entropies of adsorption based on characteristic equations of the theory of micropore volume filling during adsorption of gasses and vapors on various types of microporous adsorbents. These equations may be used to calculate with sufficient approximation above values for various levels of adsorption or volume filling of the adsorption space from the data obtained from these characteristic equations requiring only minimal experimental information. The conditions necessary for satisfactory reliability have been discussed. Several examples have been reported showing satisfactory relationship between the calculated and experimental values for isosteric heat of adsorption.

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USSR

UDC 543.544

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ERISTAVI, D. I. (Deceased), BROUCHEK, F. I., ERISTAVI, V. D., ~~BERISHVILI, L. A.~~,
KAKABADZE, A. G., and KUTSIAVA, N. A., Georgian Polytechnical Institute Imeni
V. I. Lenin, Tbilisi

"Investigation of the Uranyl ion Sorption on the Anion Exchange Resins
Saturated With Anionic Ligands"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 46, No 5, May 72, pp 1165-1167

Abstract: Using the roentgenographic method, the sorption of uranyl ions from aqueous solutions with $\text{pH} = 2.5-3.0$ on fluoride, carbonate, and ethylenediaminetetraacetate forms of anion exchange resins has been shown to take place. On the basis of the results of IR spectroscopic studies the following stages were proposed for the formation of anionic complexes of uranyl in anion exchange phase: 1) formation of a neutral complex of uranyl with the anionic ligand; 2) association of this complex with anionic ligand in the ion exchange phase, and 3) formation of an ionic pair "anion complex-cation group R^+ from the anion exchange resin". Starting sorption curves were plotted for different hydrodynamic conditions and from them the values of dynamic sorption capacities for uranium of the anion exchange resin AN-2Fg, AV-16, and AV-17 have been determined, establishing effectiveness series of the sorbents studied.

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USSR

UDC 621.382.2

BERKELIYEV, A., BEREDA, L. I.

"p-InSb Magnetodiodes"

Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, Seriya Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk, No 5, 1971, pp 36-40

Abstract: A study was made of the magnetodiode effect of the direct and inverse branches of the volt-ampere characteristics of diodes based on p-InSb alloyed with germanium. The experimental procedure and results are presented. Graphs are presented for the direct branch of the magnetodiode for various values of the magnetic field, the volt magnetosensitivity of the diode for various currents through the diode, the return branch of the volt-ampere characteristic of the magnetodiode for various values of the magnetic field, and the direct branch of the volt-ampere characteristic of the magnetodiode with different base length in a magnetic field. With an increase in the magnetic field the direct current through the diode decreases, and the characteristic deviates toward the voltage axis, that is, the proportion of the voltage drop on the diode base increases. On the

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USSR

BERKELIYEV, A., et al, Izvestiya Akademii Nauk Turkmenskoy SSR, Seriya Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk, No. 5, 1971, pp 36-40

return branch of the volt-ampere characteristic in the absence of an external magnetic field, several breaks are observed before breakdown. On the direct branch of the volt-ampere characteristic of the diode, for certain values of the magnetic field a negative magnetodiode effect is observed. The mechanisms causing these effects are described.

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- 88 -

Aluminum and Its Alloys

USSR

UDC 669.71.053.4

ARONZON, V. L., ~~BERKH, V. I.~~, LEVIN, M. V., LOKSHIN, R. G.

"Automatic Control of Technological Processes of Alumina Production"

Avtomatiz. Proizv. Protsessov. Tsvet. Metallurgii [Automation of Production Processes in Nonferrous Metallurgy -- Collection of Works], Ordzhonikidze, "Ir" Press, 1971, pp 73-75, (Translated from Referativnyy Zhurnal, Metallurgiya, No 5, 1972, Abstract No 5 G212 by G. Svodtseva).

Translation: In developing algorithms for control of the hydrochemical cycle of Al_2O_3 production from bauxite in the area of the nominal mode, based on the shortage of Al_2O_3 , a control strategy was developed calling for two possible operating modes of the automated control system: the mode of independent control of individual sectors of the hydrochemical cycle and the mode of centralized control. In both modes, control is conducted by a two-stage system. In the independent control mode, a universal computer checks the condition of production by cyclical interrogation of the primary parameters. A special algorithm has been developed, allowing timely determination of the location and reasons for disruptions in the technological mode. Algorithms for optimization of the hydrochemical cycle of production of Al_2O_3 by the Bayer method have been developed, as well as algorithms for optimization of individual conversions in 1/2

USSR

UDC 669.71.053.4

ARONZON, V. L., BERKH, V. I., LEVIN, M. V., LOKSHIN, R. G., Avtomatiz. Proizv. Protssessov. Tsvet. Metallurgii, Ordzhonikidze, "Ir" Press, 1971, pp 73-75.

alumina plants, based on mathematical models of the technological processes being controlled.

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USSR

UDC 669.71.011.56

BERKH, V. I. LEVIN, M. V.

"Scientific and Technological Prerequisites of Developing Automated Systems in Alumina Production"

Tr. Vses. n.-i. i proyekt. in-ta alyumin., magn. i elektrod. prom-sti (Works of the All-Union Scientific Research and Planning and Design Institute of Aluminum, Magnesium and Electrode Industry), 1970, No 70, pp 183-188 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G122)

Translation: The sequence and content of the basic steps of creating automated control systems for the production processes of obtaining Al_2O_3 are discussed.

A list of scientific problems occurring in this case is introduced, and means of solving them based on the results of the scientific research work performed are indicated. The requirements on the technological process and equipment insuring the highest efficiency of the automated control systems for Al_2O_3 production are formulated.

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USSR

UDC: 615.89+681.142

GRINEVICH, M. A., ZARVA, L. A., and BERKMAN, I. I., Institute of Biologically Active Substances, and Department of Automation and Technical Cybernetics, Far-Eastern Branch of Academy of Sciences USSR, Vladivostok

"Computer Study of Compound Drugs and Their Components Used in Eastern Medicine Report 1 General Characteristics of the Principles and Structure of Medicinal Therapy in Eastern Medicine"

Leningrad, Rastitelnyye Resursy, Vol 6, No 1, 1970, pp 45-53

Abstract: The traditional medicinal therapy of eastern medicine is of particular interest because compound drugs including 15-20 ingredients were used. The prescriptions include several plants (up to 7) with the same action, apparently increasing the general effect. More than 200 prescriptions from Southeast Asia and from the Institute of Eastern Medicine of the Democratic Republic of Vietnam in Hanoi were analyzed by computer. It was established that: 1) most of the prescriptions have four to eleven ingredients; 2) the prescriptions are mostly designed for therapy of malignant neoplasm, hypertension, tuberculosis, anemia, nephritis, diabetes and atherosclerosis; 3) the most complicated compounds are for psychasthenia, sterility, atherosclerosis and hypertension; 4) the plants mostly used are ancient flowering plants (Mesanthophyta); and 5) the underground parts of plant species and the reproductive organs of younger species are used, contrary to the modern use of medicinal plants. It has been

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USSR

GRINEVICH, M. A., et al, Rastitelnyye Resursy, Vol 6, No 1, 1970, pp 45-53

stated that the plants used in Eastern Medicine are not rich in alkaloids, but mostly plants containing glucosides, coumarin, flavonoids, etc. Water extracts are administered per os and in relatively high doses (up to 10 g), due to the low alkaloid content. This is all contrary to the accepted use of medicinal plants. Plants with a tonic effect are most frequently used in eastern medicine, followed by plants with diuretic, antitoxic, sedative, effects, and then by plants with stimulating effect. Some medicines of animal origin are used also (bones of tiger, monkey, lizzard, etc.).

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- 112 -

USSR

BERKINBLIT, M. B., DUDZYAVICHYUS, I., KOVALEV, S. A., FOMIN, S. V., KHOLOPOV, A. V., and CHAYLAKHYAN, L. M., Institute of Problems of Information Transmission, Academy of Sciences USSR, Moscow

"Study of the Formation of a Local Response in a Nonuniform Membrane Corresponding to the Hodgkin-Huxley Model"

Moscow, Biofizika, Vol 15, No 5, Sep/Oct 70, pp 873-880

Abstract: The electric response of a model which consists of two membranes regions (one active and the other shunting) connected in parallel is considered. This model imitates biological objects containing membrane regions with a different threshold (e. g., neurons), as well as conditions of non-uniform membrane polarization. The transition is gradual in actual membranes, however. Shifts in the amplitude and duration of the reaction that develops, in the stimulation threshold, and in ionic currents as a result of shifts in the ratio of the excitable to nonexcitable area of the membrane are discussed. On the basis of the model, it is shown that the nonuniformity of the membrane considerably increases the range of strengths of the stimulating current at which a local response develops. The relations obtained

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USSR

BERKINBLIT, M. B., et al, Biofizika, Vol 15, No 5, Sep/Oct 70, pp 873-880

explain some characteristics of the electric reactions of smooth muscles and of myocardial tissue.

2/2

- 3 -

USSR

BERKINBLIT, M. B., VVEDENSKAYA, N. D., DUDZYAVICHUS, I., KOVALEV, S. A., FOMIN, S. V., KHOLOPOV, A. V., and CHAYLAKHYAN, L. M. Institute of Problems of Information Transmission, Academy of Sciences USSR, Moscow and Moscow State University imeni M. V. Lomonosov

"Study of Propagation of Excitation in Purkinje Fibers of the Heart Studied in a Mathematical Model"

Moscow, Biofizika, Vol 15, No 3, May/Jun 70, pp 521-527

Abstract: Propagation of the action potential in a uniform Purkinje fiber was modeled on a computer using Noble and McAlister models. The velocity of impulse propagation in the Noble model is shown to be five times lower, and in the McAlister model two times lower, than that measured experimentally. This discrepancy can be explained by the underestimated value of the rate of growth of the forward front of the action potential in the models used, since the calculations showed that the velocity of the impulse propagation to a first approximation linearly depends upon the growth of velocity of the forward front. The action potential in the region of fiber expansion was modeled on the Noble Model. It passes through larger expansions than the impulse in the Hodgkin-Huxley model, apparently because of the more extended time of the heart impulse. It is also shown that geometric nonuniformity can provide a

1/2

USSR

BERKINBLIT, M. B., et al., Biofizika, Vol 15, No 3, May/Jun 70, pp 521-527

temporary delay in impulse propagation, which comprises a considerable part of atrioventricular delay. It is suggested that the experimentally observed "hollow" and "hump" on the background of the plateau of cardiac action potentials are caused by the electrotonic "reflection" of the potential from geometric nonhomogeneities, since the potentials of such a shape are reproduced in model calculations.

2/2

1/2 020 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--COMPUTER MODELING OF THE BEHAVIOR OF NERVE FIBER MEMBRANE UNDER
RHYTHMIC STIMULATION -U-
AUTHOR-(05)-~~BERKINBLIT, M.B.~~, DUDZEVICUS, I., KOVALEV, S.A., FOMIN, S.V.,
KHOLOPOV, A.V. *B*
COUNTRY OF INFO--USSR
SOURCE--BIOFIZIKA 1970, 15(1), 147-55
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--NERVE TISSUE, CELL MEMBRANE, MATHEMATIC MODEL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1988/0017 STEP NO--UR/0217/70/015/001/0147/0155
CIRC ACCESSION NO--AP0105117
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0105117

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE BEHAVIOR OF EXCITABLE MEMBRANE UNDER RHYTHMIC STIMULATION WAS STUDIED USING THE MATH MODEL OF HODGKIN AND HUXLEY. SUMMATION OF SUBTHRESHOLD STIMULI WAS REPRODUCED ON THE MODEL. THIS PROCESS WAS MAINLY DETD. BY THE TIME CONST. OF THE RESTING MEMBRANE. THE PERIODIC FALL OF IMPULSES AND THE CHARACTER OF IONIC PROCESSES RESPONSIBLE FOR THIS PHENOMENON WERE STUDIED IN DETAIL. EXISTENCE OF MAX. FREQUENCIES WAS SHOWN; THESE WERE REPRODUCED BY THE MEMBRANE UNDER HIGH FREQUENCY STIMULATION, IN THE RANGE OF 140-170 RESPONSES-SEC. THE CHANGE OF FIBER IONIC GRADIENTS MAY BE THE CAUSE OF FATIGUE AND OF GRADUAL TRANSITION FROM LONG CYCLES TO THE SHORTER ONES IN THE PROCESS OF PROLONGED RHYTHMIC STIMULATION. FACILITY:
INST. PROBL. INFORM. TRANSM., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 539.4.015

BERKMAN, I. V., LEVIN, A. YE., and LOZINSKIY, M. G., Leningrad, Moscow

"On the Irregularity of Plastic Deformation of a Dispersion-Hardening Nickel-Base Alloy"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 72, pp 39-46

Abstract: The phenomenon of intermittent deformation under tension of a complexly alloyed, heat-resisting, and dispersion-hardening nickel-base alloy (16.1% Cr, 8.8% Mo, 4.0% W, 1.4% Ti, 1.4% Al, 0.4% Fe, the rest Ni) was investigated by methods of high-temperature metallography using a modernized IMASh-5S-65 unit. The lower and upper temperature limits -- 450°C and 780°C -- were determined for the occurrence of intermittent deformation. It was found that the deformation degree, beginning with which the irregular distortion of the alloy starts, increases with rising temperature and decreasing speed. The average value of the stress jump also changes with temperature and deformation rate, showing a clearly expressed maximum at 650°C. The average time between neighboring jump changes analogously. A hypothetical explanation of the mechanism of the intermittent deformation is suggested. It is based on the complex blocking of split dislocations by Suzuki clouds developing on packing defects and by dispersion particles of the hardening

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USSR

BERKMAN, I. V., et al., Fizika i Khimiya Obrabotki Materialov, No 3, May-Jun 72, pp 39-46

phase. The phenomenon of intermittent deformation is directly related to displacing intergranular processes. Four illustrations, six bibliographic references.

2/2

- 45 -

USSR.

UDC: (621.391.82:621.396.44):621.317.743(088.8)

BERKMAN, N. A., ZOLOTAREV, Ya. M., PONOMERENKO, V. A., RAKHLIN, Ya. A.,
*SKITOV, I. I., STEKLOVA, I. P.

"A Device for Analyzing Pulse Noises and Interruptions in a Communications Channel"

USSR Author's Certificate No 266858, filed 12 Dec 67, published 15 Jul 70
(from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2A294 P)

Translation: Conventional devices for measuring and analyzing pulse noises and interruptions in communications channels are designed for studying telephone channels in the 300-3400 Hz range and group channels in high-frequency telephony systems in the 60-108 kHz range. These devices are unsuited for studying channels in the 312-550 kHz range, and moreover they do not give the required resolution and are not distinguished by high reliability. It is proposed that a short-pulse clamping unit be connected between the selector and quantizing modules with a quantizing pulse oscillator output connected to the controlling input of the clamper through a delay element. A pulse time gradation module is connected between a binary counter and the coincidence circuits of the pulse duration analyzer. When the device is operating in the pulse noise analysis mode, it is connected to a free

1/2

- BERKMAN, N. A. et al., USSR Author's Certificate No 266858

channel; when operating in the interruption analysis mode, the device is connected to a channel through which a measurement frequency signal is transmitted. A. K.

2/2

- 49 -

USSR

UDC: 621.391.827

BERKMAN, N. A.

"An Analyzer for Instantaneous Values of the Envelope of Additive Interferences".

Sb. nauchn. tr. Kiyev. fil. TsNII svyazi (Collected Scientific Works of the Kiev Affiliate of the Central Scientific Research Institute of Communications), 1970, vyp. 6, pp 85-88 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5A26)

Translation: The article describes the operating principle of analyzers which can be used to find the probability density function of the envelope of additive interferences. Resumé.

1/1

- 73 -

USSR

UDC 669.712.1.05

AGRANOVSKIY, A. A., BERKH, V. I., KAVINA, V. A., LEVIN, M. V., LYAPUNOV, A. N.,
MONTVID, A. E., MUNITS, I. N., and CHERNIN, V. N.

"Spravochnik metallurga po tsvetnym metallam" (Metallurgist's Handbook of
Non-Ferrous Metals), Moscow, Izd-vo "Metallurgiya," 1970, 320 pp

Translation of Annotation: Data on the physico-chemical properties of the
most important aluminum compounds and aluminum solutions are presented,
phase diagrams of chemical systems determining the processes of alumina
production by alkali methods are given, and standards and technical con-
ditions are reviewed.

Various alumina production methods and reference data on the technology and
equipment of alumina production are described.

The handbook is intended for engineers and technicians engaged in the alum-
inum industry. Ninety-one figures, 116 tables, 176 references.

TABLE OF CONTENTS (Abridged)

1/3

USSR

AGRANOVSKIY, A. A., et al., "Spravochnik metallurga po tsvetnym metallam" (Metallurgist's Handbook of Non-Ferrous Metals), Moscow, Izd-vo "Metallurgiya," 1970, 320 pp

Foreword ...	9
Section One. PHYSICO-CHEMICAL DATA AND STANDARDS	
Chapter I. Minerals, Basic and Auxiliary Raw Materials and Final Products of Aluminum Oxide Production	11
Chapter II. Aluminum Compounds and Other Substances, Presenting Interest for Aluminum Oxide Production, Alkaline and Aluminate-Alkaline Solutions	24
Chapter III. Physico-Chemical Transformations in Aluminum Oxide Production Processes	91
Section Two. INDUSTRIAL PRODUCTION METHODS	
Chapter I. Short Classification of Types of Aluminum Raw Materials and Methods for Processing Them	134
Chapter II. Thermal Methods of Aluminum Oxide Production	143
Chapter III. Hydrochemical and Combined Methods of Aluminum Oxide Production	183

2/3

USSR

AGRANOVSKIY, A. A., et al., "Spravochnik metallurga po tsvetnym metallam" (Metallurgist's Handbook of Non-Ferrous Metals), Moscow, Izd-vo "Metallur-giya," 1970, 320 pp

Chapter IV.	Method of Producing Aluminum Oxide From Alunite	227
Chapter V.	Acid and Acid-Alkaline Aluminum Oxide Production Methods	232
Chapter VI.	Automatic Control and Regulation of Production Processes	283
References		314

USSR

UDC: 621.317.791

BERKMAN, R. Ya., BONDARUK, B. L., and RAKHLIN, L. I.

"Magnetotransistor D-C Voltage Amplifiers"

Moscow, Izmeritel'naya tekhnika, No 4, 1972, pp 56-57

Abstract: The characteristics and applications of the magnetic modulator, especially in d-c amplifiers, are discussed. To begin with, the authors complain that the potentialities of the device are greater than its current application warrants, and that the operation specifications and parameters of the modulator recommended in the literature on it are not always optimal. They discuss research conducted on the modulator by the Physico-Mechanical Institute of the USSR Academy of Sciences, in which relationships between its parameters and those of measuring circuits guaranteeing operation stability were found. A variation in structure of the device has been developed in which the effect of the distributed capacitance in the control winding has been eliminated, with the result that the coil can be manufactured with any number of turns and that the current sensitivity of the device is sharply increased. A detailed list of the technical characteristics of a microvolt-nanoammeter using the modulator is given plus a suggested block diagram of this d-c meter.

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- 120 -

USSR

UDC: 621.376

BERKMAN, R. Ya., BONDARUK, B. L.

"High Current Sensitivity Magnetic Modulator"

Otbor i peredacha inform. Resp. mezhved. sb. (Selection and Transmission of Information, Republic Interdepartmental Collection) 1970, No. 26, pp 78-83 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3D408)

Translation: A description is given of a new construction of magnetic modulator in which the effect of the control winding characteristic capacitance does not hinder improvement in sensitivity. Technical characteristics of the devices developed on the basis of the new type of modulator are given. Bibliography of three.
Resume

1/1

USSR

UDC 621.372.061

BERKMAN, R. YA., BONDARUK, B. L.

"Problem of Filtration of Even Harmonics in the Excitation Circuit of Magnetic Modulators"

Otbor i peredacha inform. Resp. mezhved. sb. (Information Sorting and Transmission. Republic Interdepartmental Collection), 1970, vyp. 26, pp 83-88 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A131)

Translation: The operation of the inductive elements of passive LC-filters is analyzed considering small nonlinearity of the remagnetization curve. It is demonstrated that even harmonics occurring in the excitation circuit of magnetic modulators as a result of nonlinearity of the filter elements are one of the main sources of errors limiting the lower sensitivity threshold of the device based on second harmonic magnetic modulators. Results are presented from an experimental check of the calculation relations. Recommendations are made with respect to reducing the content of even harmonics in a magnetic modulator excitation circuit.

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-USSR-

UDC 541.12:542.61:541.6:547.1'118

KABACHNIK, M. I., LASKORIN, B. N., BERTINA, L. E., MEDVED', T. YA., KOSSYKH, V. G., YUDIN, K. S., BERIKHAN, Z. A., and NEPRIYAKHIN, A. M., Institute of Hetero-Organic Compounds, USSR Academy of Sciences

"Dependence of the Extraction Ability of the Dioxides of Tetraarylmethylene Diphosphines Upon Their Structure"

Moscow, Izvestiya Akad. Nauk SSSR, Soriya Khimicheskaya, No 1, Jan 72, pp 65-70

Abstract: The connection between extraction ability and structure is currently being widely studied, but so far only in the case of monodentate neutral organophosphorus compounds; the corresponding bidentate compounds, with two phosphoryl groups in the molecule, have gone completely unstudied.

Using the extractant dilution method, the authors determined the composition of the extracting complexes of uranyl nitrate with dioxides of the tetraarylmethylene diphosphines containing various substitutes in the meta- and para-positions of the phenyl rings. Effective extraction constants of uranyl nitrate for a series of tetra-substituted dioxides of the methylene-diphosphines were computed. Effective extraction constants for complexes with three molecules of the extractant were found to correlate well with the Hammett constant, and with the σ^{-1} constant -- something not observed in the case of $1/2$

ACHNIK, M. I., et al., Izvestiya Akad. Nauk SSSR, Seriya Khimicheskaya,
1, Jan 72, pp 65-70

complexes with two molecules of the dioxide. Finally, the connection between the extraction ability of the diphosphines and their alkalinity was found to be a linear one. Various tables and graphs are included in the paper.

2/2

1/2 008 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--GYPSUM POLYMER CEMENT COMPOSITION FOR FINISHING PANELS AND WALLS
-U-
AUTHOR-(02)-BERKOVA, A.V., ILINYKH, L.V.
CCOUNTRY OF INFO--USSR
SOURCE--STRGIT. MATER. 1970, (2), 17
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--POLYVINYL ACETATE, BUTADIENE STYRENE RESIN, LATEX, GYPSUM
CEMENT/(U)SKS65GPB BUTADIENE STYRENE LATEX
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/1243 STEP NO--UR/0228/70/000/002/0017/0017
CIRC ACCESSION NO--AP0128659
UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128659

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A COMPOSITION CONSISTING OF
POLY(VINYL ACETATE) EMULSION OR STABILIZED POLY(BUTADIENE, STYRENE)
LATEXES, SKS, 65 GPB AND A GYPSUM POZZOLANA CEMENT BINDER IS USED FOR
FINISHING PANELS AND WALLS.

UNCLASSIFIED

USSR

UDC 621.316.1.012.5.001.24:681.3

BERKOVICH, M. A., IL'INICHNIN, V. V.

"Experience in Using Programs to Calculate the Periodic Components of Short Circuit Currents on the Ural-2 and Ural-4 Digital Computers"

V sb. Probl. tekhn. elektrodinamiki (Problems of Technical Electrodynamics -- collection of works), vyp. 25, Kiev, Naukova Dumka Press, pp 16-19 (from RZh-Elektrotehnika i Energetika, No 4, Apr 71, Abstract No 4 Ye258)

Translation: The characteristic of the algorithms and methods of calculating short circuit currents is presented. A comparative analysis of the calculations on physical models and digital computers is presented. The prospects for using a digital computer to calculate short circuit currents are characterized. [Integrated Dispatch Control of the Unified Electric Power System of the European Part of the USSR]

1/1

USSR

UDC 51

BERKOVICH, L. B., and PLOTINSKIY, YU. M.

"Heuristic Methods of Solving Certain Maritime Fleet Management Problems"

V sb. Aktual'n. vopr. tekhn. kibernetiki (Urgent Questions in Technical Cybernetics -- Collection of Works), Moscow, "Nauka," 1972, pp 153-157 (from RZh-Matematika, No 3, Mar 73, Abstract No 3V617 from authors' abstract)

Translation: Using the example of the problem of the monthly scheduling of the disposition of ships, the authors discuss certain fundamental difficulties encountered in solving problems in operational maritime transport planning. Arguments in favor of creating heuristic algorithms for such problems are presented, and the basic ideas and most important details of the heuristic scheduling algorithm are discussed.

1/1

1/2 023 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--APPLICATION OF STATISTICAL KINETIC THEORY TO THE DESORPTION OF
SIMPLE GASES -U-
AUTHOR-(03)-REGINSKIY, S.Z., BERKOVICH, M.A., SHUB, B.R.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(5), 1143-6
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, CHEMISTRY
TOPIC TAGS--DESORPTION, GAS STATE, KINETIC THEORY
CENTRCL MARKING--NC RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1998/0725 STEP NO--UR/0020/70/190/005/1143/1146
CIRC ACCESSION NO--AT0121384
UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AT0121384

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE STATISTICAL KINETIC THEORY WAS USED TO DET. THE RANGE OF COMPENSATION EFFECTS IN THE DESORPTION OF SIMPLE GASES. CALCNS. WERE MADE TAKING INTO ACCOUNT THE VOL. COORDINATION NO., AND THE RESULTS ARE TABULATED; THIS METHOD IS EITHER NOT APPLICABLE AT ALL FOR DESCRIBING THE SURFACE PROCESS OR REQUIRES GREATER REFINEMENT TO TAKE INTO ACCOUNT THE EFFECT OF THE SURFACE. THERE IS AN EFFECTIVE SURFACE COORDINATION NO., I.E. A NO. WHICH GIVES THE PROPER ORDER OF MAGNITUDE FOR THE COMPENSATION EFFECT.

UNCLASSIFIED

USSR

UDC: 51

BERKOVICH, M. M.

"A Method of Solving the Problem of Standardization With Upper Bounds on Variables"

Moscow, Mat. metody resheniya ekon. zadach--sbornik (Mathematical Methods of Solving Economics Problems--collection of works), No 3, "Nauka", 1972, pp 124-130 (from RZh-Kibernetika, No 5, May 73, abstract No 5V653 by Yu. Finkel'shteyn)

Translation: This article is a continuation of papers by the author (RZh-Mat, 1969, 1V395, 8V286). The formulation of the problem:

$$\sum_1^n c_k x_k \rightarrow \min, \quad \sum_1^n x_k > \sum_1^n b_k, \quad 0 < x_s < d_s, \quad s=1, \dots, n, \quad \sum_1^n \operatorname{sgn} x_k < m.$$

In contrast to problems previously considered by the author, the given problem may not have plans. Therefore the author assumes that the investigated problem is solvable; however, the proposed algorithm of solution is such that in the case where the problem is unsolvable, this is found out in the process of solution. It is assumed that $b_k > 0$.

1/3

USSR

BERKOVICH, M. M., Mat. metody resheniya ekon. zadach, No 3, "Nauka", 1972, pp 124-130

$c_k > c_{k+1} > 0, k=1, \dots, n; m < n$. Under these conditions in any plan of the problem $x_i > 0$, if X^0 is the optimum plan, then

$$\sum_{k=1}^n \text{sgn } x_k^0 = m \cdot n \sum_{k=1}^n x_k^0 = \sum_{k=1}^n b_k.$$

Theorem 1. Let X^0 be the optimum plan of the problem, then

$$\omega_l = \sum_{k=1}^n b_k - \sum_{i=1}^n x_k > 0, l=1, \dots, n, \quad \omega_l = 0.$$

If $x_l^0 \neq 0$ and $\omega_l > 0$, then $\omega_l + x_l^0 > d_l$.

Corollary 1. If $x_l^0 \neq 0$ and $\omega_l > 0$, then $x_l^0 = d_l$.

Corollary 2. If $x_l^0 \neq 0$ and $d_l = \infty$, then $\omega_l = 0$.

Corollary 3. If $\omega_l > 0$, then $\omega_l = \omega_l - z(l, l-1) + d_l > 0$,

where $z(l, l-1) = \sum_{k=1}^{l-1} b_k$.

Corollary 4. If $\omega_l = 0$, then $x_l^0 = z(l, l-1) + \omega_l < d_l$.

2/3

- 74 -

USSR

BERKOVICH, M. M., Mat. metody resheniya ekon. zadach, No 3, "Nauka", 1972, pp 124-130

Theorem 2. If b_i and d_i ($i=1, \dots, n$) are whole numbers, then the components of the optimum plan of the problem are also whole numbers.

Functional equations are then written out which, of course, are more complicated than for the problem without upper bounds. Estimates are made of the upper bounds for phase coordinates.

3/3

USSR

UDC: 681.327

BERKOVICH, S. Ya.; KAGANOVSKIY, A. Ya., Institute of Control Computers

"An Associative Memory"

USSR Author's Certificate No 332499, filed 14 Mar 69, published 13 Apr 72
(from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 1, Jan
73, abstract No 1B372 P)

Translation: Various designs of associative memories are known in which a multivalued response is distinguished by software and hardware methods. An associative memory is known in which the storage unit is divided into individual modules. Each module has its own chain of priority, and there is, in addition, an overall chain of priority which operates from a register in which the signals from detectors of the corresponding module are summed in each digital place.

A disadvantage of the priority chain is the low operating speed and the large number of elements. The use of this method of distinguishing a multivalued response is feasible only in associative memories with a large number of words in a module. Besides, in this case there is the difficulty of processing data words whose length exceeds the word length of the

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USSR

BERKOVICH, S. Ya., KAGANOVSKIY, A. Ya., USSR Author's Certificate No 332499

memory. The purpose of this invention is to increase the speed of the associative memory. This is achieved by adding a decoder in which the number of outputs is equal to the number of words in the associative recording medium, and by connecting each output to the corresponding inputs of each module.

2/2

- 28 -

BERKOVICH, S. YA.

automation

MACHINE ORGANIZATION OF A GROWING SEARCH TREE

So. 0025 5574.2

18 APR 72

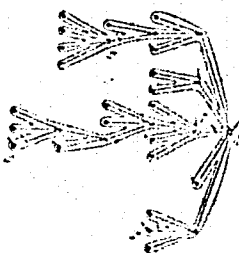
UDC 681.3.06

[Article by S. Ya. Berkovich, Institute of Problems of Control (Automation and Telemechanics), Moscow, Detskoy Akademii Nauk SSSR, Russian, Vol 202, No 2, 1972, signed to press 13 May 1971, pp 288-293]

The constructor of list structures in large information systems involves difficulties in effectively organizing the exchange between file and main memory. In this case the familiar methods [1, 2] for realizing a growing search tree are found to be insufficiently convenient in that they impose certain limitations on the structure of the system and require significant editing in completing it.

In the present article we suggest a method of organizing a growing search tree which will ensure simple logics of construction and of the growing system; here the editing required is only of a local nature; practically no limitations are imposed on the structure of the system and the inquiry is processed with only one memory access.

Figure 1. Separation of the set of apexes of a search tree.



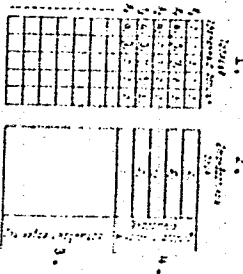
As usual, we introduce the ratio of ordering on a set of designations of the apexes of the examined search tree and using this ratio we establish the lexicographic ordering for all possible inquiries to the system represented in the form of paths from the root to the end apexes. In accordance with this we can give a rule for by-passing

all of the apexes of the tree that can be conveniently represented graphically (Figure 1); each branch is checked twice for accuracy: in the descending and in the ascending directions.

Let us interrupt the paths in certain branches; then the set of apexes will be divided into certain (i.e. the present arbitrary) classes: the boundary apexes in each class, the lowest in the lexicographic sense, are separated and denoted as K_1, K_2, \dots, K_n . Each class of apexes is formed in an individual unit, and the set of these units is placed into the file; the table of routes, leading to the boundary apexes, are placed into the main memory. Let us see how the structure of the unit must be organized and how we can organize the operation of the growing search tree (see Figure 2).

The system is constructed from standard units of identical information capacity. The apexes, which appear in a single unit, are connected into lists; this list possesses the characteristic that it must have, generally speaking, several inputs, the number of which however does not exceed the number of hierarchical levels of the tree. In an ordinary list the part of the input is played by the address indicator of the initial apex; the input in the list structure of the unit are all the apexes of the respective class which first appear in by-passing the tree at each hierarchical level (on Figure 1 these input apexes are denoted by the arrows). If we were to organize the examined tree in the form of a single list, then the input apexes of the given class would have to be addressed through the apexes of the preceding classes.

Figure 2. Elements of the system.
1. table of boundary apexes;
2. standard unit;
3. search structure;
4. initial address indicator.



Inquiries to the system are processed in the following manner. The value of K_1 , next lowest to the inquiry at hand, is sought in the table of boundary apexes. The given apex uniquely indicates the unit in which the desired information can be found, and the number of the hierarchical level at which the first non-coincidence

USSR

UDC: 681.325.63

BERKOVICH, S. Ya., LAPIR, G. M.

"A Decoder Based on Cryotrons"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No 9, Mar 71, Author's Certificate No 297130, Division H, filed 21 Jun 69, published 2 Mar 71, p 176

Translation: This Author's Certificate introduces a decoder based on cryotrons, each controlling channel containing controlling lines and a closed number-line loop. As a distinguishing feature of the patent, the decoder is designed for improved reliability, increased speed, extended logical possibilities and simplified manufacture. Each decoding channel is equipped with a shift register based on crytron circuits. The output of this shift register is connected to the number-line loop, and the inputs are connected to the controlling lines. Some of these inputs are connected in a coordinate sampling system.

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USSR

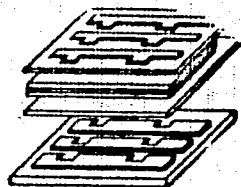
UDC: 621.3.013.7

ARSHINOV, V. I., BERKOVICH, S. Ya., KASATKIN, V. G., LAPIR, G. M., MAZITOV, R. K.

"A Cryotron Thin-Film Integrated Circuit"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyya Obraztsy, Tovarnyye Znaki, No 30, 1970, Soviet Patent No 282433, Class 21, filed 19 Jun 69, p 61

Abstract: This Author's Certificate introduces a cryotron thin-film integrated circuit which contains a shielding film of superconductive material, insulating layers, and layers with cryotrons and hook-up elements. As a distinguishing feature of the patent, the possibility of short circuits between elements through the shielding film is reduced and manufacturing technology is simplified by breaking up the shielding film into sections which are electrically insulated from each other and are located on different sides of the layers which contain the cryotrons and the hook-up elements.



1/1

USSR

UDC 621.669.018.25.620.178.16

KHRUSHCHOV, M. M., BABICHEV, M. A., BERKOVICH, YE. G., KOZYREV, S. P.,
KRAPOSHINA, L. B., PRUZHANSKIY, L. YU.

Izmosostovkost' i struktura tverdykh naplavok (Wear Resistance and Structure of
Hard Surfacing), Moscow, Mashinostroyeniye Press, 1971, 95 pp

Translation of Foreword: Application of hard wear-resistant surfacing to face the working surfaces of machine parts is one of the very efficient methods of increasing the service life of the parts. The problems of expedient selection of the surfacing materials as a function of the operating conditions of the parts, just as the problems of the technological methods of surfacing, have not been sufficiently clarified. Many surfacing alloys are known, and it is of practical interest to compare their properties under identical test conditions, in particular when testing for abrasive wear.

The book contains discussions of the results of laboratory testing of surfacing materials for abrasive wear, impact bending, strength, hardness, and microhardness of the structural components. The results of a study of the microstructure are also presented. These studies were performed by the authors of the book at the Wear Resistance Laboratory of the State Scientific Research Institute of Mechanical Engineering.

1/4

USSR

KHRUSHCHOV, M. M., et al., Iznosostoykost' i struktura tverdykh naplavok, Moscow, Mashinostroyeniye Press, 1971, 95 pp

The last chapter contains a discussion of the research data of a number of Soviet authors on the operational and laboratory comparative tests for abrasive wear of different surfacing materials applied to parts with different operating conditions.

The book is a reference manual for the properties of various surfacing materials during abrasive wear.

The abrasive wear tests on the Kh4-B machine were performed by M. A. Babichev, on the NK machine by Ye. S. Berkovich, for hydroabrasive wear by S. P. Kozyrev, and for impact toughness by L. Yu. Pruzhanskiy. A microstructural study and a microhardness test were performed by L. B. Kraposhina. The work was coordinated by M. M. Khrushchov.

Translation of Table of Contents

Foreword	3
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USSR

KHRUSHCHOV, M. M., et al., Iznosostoykost' i struktura tverdykh naplavok, Moscow, Mashinostroyeniye Press, 1971, 95 pp

Chapter I. Hard Surfacing Used to Increase the Wear Resistance of Machine Parts	5
Chapter II. Test Methods	9
1. Abrasive Wear on Fixed Abrasive Particles in the Kh4-B Machine	9
2. Abrasive Wear Against an Abrasive Interstitial Layer on the NK Machine	14
3. Hydroabrasive Wear	16
4. Determination of the Impact Toughness of Surfacing Materials	19
5. Metallographic Study.	22
6. Preparation of Specimens for Testing	23
Chapter III. Investigated Materials	25
Chapter IV. Results of Testing Surfacing for Abrasive Wear	33
1. Wear Resistance and Hardness	33
2. Wear Resistance and Microstructure	36

3/4

USSR

KHRUSHCHOV, M. M., et al., Iznosostoykost' i struktura tverdykh naplavok, Moscow, Mashinostroyeniye Press, 1971, 95 pp

Chapter V. Results of Testing of Surfacing for Hydroabrasive Wear . .	49
1. Wear Resistance and Hardness	49
2. Wear Resistance and Material Composition	53
Chapter VI. Laboratory and Operating Results of Determining the Wear Resistance of Surfacing Materials	58
1. Wear Against the Ground, Soil, Fixed Abrasive Particles and an Abrasive Interstitial Layer	58
2. Impact Abrasive Wear	65
3. Hydroabrasive Wear	69
Appendix. Microstructure of Surfacing	77
Bibliography	93

4/4

USSR

UDC: 519.2

BERKOVICH, Ye. M.

"Concerning the Existence of Optimum Solutions for a Class of Two-Phase Stochastic Extremum Problems"

Moscow, Priblizh. metody resheniya zadach optimal'n. upr. i nekorrek. obratn. zadach--sbornik (Approximate Methods of Solving Optimum Control Problems and Certain Incorrect Inverse Problems--collection of works), Moscow University, 1972, pp 17-41 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V88 by B. Rozovskiy)

Translation: Let there be given: the probabilistic space (Ω, \mathcal{L}, P) , arbitrary sets E_I and E_{II} , the nonempty subset $E_I - U$, and for every $u \in U$ for almost all $\omega \in \Omega$ let there be given the nonempty sets $V(u, \omega) \subseteq E_{II}$. The functional $K(u, v, \omega)$ is given on the direct product $E_I \times E_{II} \times \Omega$, such that for any $u \in U$

$$K^*(u, \omega) = \inf_{v \in V(u, \omega)} K(u, v, \omega)$$

1/2

USSR

BERKOVICH, Ye. M., Priblizh. metody resheniya zadach optimal'n. upr. i nekot. nekorrekt. obratn. zadach, Moscow University, 1972, pp 17-41

is a random quantity with finite mathematical expectation $f(u) = MK^*(u, \omega)$.

The author considers the problem of minimizing $I(u)$ on the set U , which is called a two-phase stochastic extremum problem. Making broad assumptions, the author proves the existence of an optimum $u^* \in U$, i. e. $I(u^*) = \inf_{u \in U} I(u)$. This result is then used to prove the existence of an

optimum control for certain types of ordinary differential equations with coefficients which depend on the case.

2/2

- 4 -

USSR

UDC: 519.2

BERKOVICH, Ye. M., BUDAK, B. M.

"Concerning a Class of Stochastic Extremum Problems"

Moscow, Priblizh. metody resheniya zadach optimal'n. upr. i nekorrek. obratn. zadach--sbornik (Approximate Methods of Solving Optimum Control Problems and Certain Incorrect Inverse Problems--collection of works), Moscow University, 1972, pp 3-16 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V87 by B. Rozovskiy)

Translation: The paper deals with the problem of minimizing the functional $f(u) = M_k(u)$ (M is the symbol for mathematical expectation), where $K(u) \equiv K(u, \omega)$ is a functional on the direct product of spaces $E \times \Omega$. With broad assumptions relative to the structure of space F and the functional $K(u, \omega)$ the authors prove the existence of an element $u^* \in E$ on which the minimum of $f(u)$ is reached. This general result is then used to prove the existence of an optimum control of solution of the equation

$$\begin{aligned} \dot{x}[t; u; \omega] &= f(x[t; u; \omega], u(t), t, \mu(\omega)), \\ x(T_0; u; \omega) &= x_0(\mu(\omega)), \quad t \in [T_0, T_1], \end{aligned}$$

1/2

USSR

BERKOVICH, Ye. M., BUDAK, B. M., Priblizh. metody resheniya zadach optimal'n. upr. i mekotor. nekorrekt. obratn. zadach, Moscow University, 1972, pp 3-16

$\mu(\omega)$ is a random vector.

In the given instance, the functional to be minimized has the following form:

$$J(u) = M \left\{ \int_{T_0}^{T_1} g(x(t; u; \omega), u(t), t, \mu(\omega); x(T_1; u; \omega)) dt + g_0(\mu(\omega), x(T_1, u, \omega)) \right\}.$$

2/2

- 3 -

USSR

UDC 518:519.3:62-50

BUDAK, B. M., BERKOVICH, Ye. M., Moscow

"On the Approximation of Extremal Problems. I"

Moscow, Zhurnal Vychislitel'noy Matematiki i Matematicheskoy Fiziki, No. 3, May/Jun 71, pp 580-596

Abstract: Problems of constructing a sequence of extremal problems that approximate the initial extremal problem, both in the sense of optimal values of the functional and in the sense of a set of elements producing this value, are discussed, and associated problems of the stability of extremal problems are considered in addition. Necessary and sufficient conditions are given for approximating the initial problem in terms of the functional, and then these results are applied to a study of the conversions of certain methods of solution of the extremal problems in the presence of constraints. The Ritz method and difference approximations for optimal control problems are discussed. The construction of elements close to a set on which the optimal value of the functional in the initial problem is achieved is discussed on the basis of the regularization notion of A. N. Tikhonov.

1/1

USSR

UDC: 8.74

BERKOVSKAYA, K. F.

"Electro-optical Matrix Scanned Converters -- One of the Possible Ways of Constructing an Element Base for Fourth Generation Computers"

Leningrad, Materialy 4-y Zimn. shkoly po fiz. poluprovodnikov, 1972 (Materials of the Fourth Winter School on Physics of Semiconductors, 1972), 1972, pp 33-73 (from RZh-Kibernetika, No 5, May 73, abstract No 5V754 by the author)

Translation: The paper deals with stages of development of an element base for computers. Frequency examples illustrate the possibilities of multichannel systems constructed on the basis of optical transparencies and on the basis of optron matrices. A technical variant is proposed for realizing a matrix optron which enables synthesizing "pictures" to be analyzed and converted on radiating matrices, and synthesizing photosensitivity "masks" on photoreception matrices which can be used to carry out the required functional conversion on

1/2

USSR

BERKOVSKAYA, K. F., Materialy 4-y Zimn. shkoly po fiz. polu-
provodnikov, 1972, pp 33-73

signals. Examples are presented of functional conversions
with the aid of an optron. Ways are indicated for construct-
ing multichannel systems based on alternating radiative and
photoreceptive structures.

2/2

- 93 -

USSR

UDC 612.317.7.087.92-932

BERKOVSKAYA, K. F., and PODLASKIN, B. G.

"Commutatable Functional Devices of the 'Scanistor' Type in Optico-Electronic Data Processing Systems"

V sb. Mikroelektronika (Microelectronics--collection of works), vyp. 5, Moscow, "Sov. radio," 1972, pp 48-65 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 9, Sep 72, Abstract No 9A114)

Translation: At the present time the most promising class of optico-electronic devices is apparently that of multichannel matrix optrons which use optical and electrical couplings not only within the elementary radiator-photoreceiver cells but also within the radiating and photoreceiving matrices. Interchanging the patterns synthesized on the radiation matrix in the form of radiating configurations and those on the photoreception matrix in the form of configurations of photosensitive elements enables processing of information simultaneously in many channels and, in principle, allows increasing the speed. The scanistor is proposed as a semiconductor structure which is convenient for synthesizing the above-mentioned patterns either on the radiating and photoreceiving matrices or on panels with distributed parameters. Readout of the final optical conversion in the form of shaped pulse train eliminates one 1/2

USSR

BERKOVSKAYA, K. F., and PODLASKIN, B. G., Mikroelektronika, vyp. 5, Moscow, "Sov. radio," 1972, pp 48-65

of the biggest disadvantages of analog computers -- their low precision. The accuracy of conversion by scanistor devices is determined by the number of optrons in the commutatable matrices. Examples are given for realization of the operations of addition, division, expansion in a series, raising to a power, and filtration on breadboard circuits of discrete scanistors. The theoretical possibilities of such devices are evaluated. Seven illustrations, bibliography of 29 titles. Resumé.

2/2

BERKOVSKAYA, K. F.

Microelectronics

MICROELECTRONICS

Excerpts from Russian-language book edited by K. V. Lukin;
Microelektronika, No 5, 1972; Sovetskoye Radio Publishing House,
Moscow, UDC 621.382:621.396.6-181.5.

JPRS 57333
25 October 1972

CONTENTS

PAGE

Annotation.....	1
Obituary of Fedor Viktorovich Lukin.....	2
Foreword.....	3
Abstracts.....	5

- a -

(I - USSR - F)

UDC 62-523.8.535.8:621.2

Communicable Functional Devices of "Scanner" Type in Syn-
thesis for the Optoelectronic Processing of Information. Sam-
oylovskiy, A.F. and Podlanskii, B.V. In the Collection Micro-
electronics, edited by V.V. Lukin, No 5, p. 48, Sovetskoye
Radio Publishing House, 1972.

At the present time the most promising class of optoelectronic devices apparently is the class of multichannel matrix optrons, in which optical and electrical contacts are used not only inside the unit cells "irradiator-photoreceiver" but also inside the irradiating and photoreceiver matrices. The replacement of "pictures", synthesized on the irradiating matrix in the form of irradiating configurations and on the photoreceiver matrix in the form of configurations and on the sensitive elements permits the processing of information simultaneously along numerous channels and to a theoretical increase in speed of response of the computers.

As the semiconductor structure, convenient for synthesis of the above "pictures" both on the irradiating and on the photoreceiver matrices or panels with distributed parameters, the article suggests a scanner.

Assuming the final optical converter in the form of a sequence of shaped electrical impulses permits elimination of one of the most substantial disadvantages in analog computers, i.e., their low accuracy. The accuracy of conversion on the scanners is determined by the number of unit optrons in the communicable matrices.

Examples are given for carrying out the operations of addition, division, expansion into a series, raising to a power, and filtration on models of discrete scannings.

The theoretical possibilities of such devices are evaluated.

The article contains 7 figures and 29 bibliographic references.

UDC 621.362.32

Influence of Radiation Emission on the Components of Non-Integrated Circuits. Yermazhinskiy, A.M., Garmar, A.S., and Baykov, V.D. In the Collection Microelectronics, edited by V.V. Lukin, No 5, p. 66, Sovetskoye Radio Publishing House, 1972.

Television

USSR

UDC 621.385.8:621.385.835.524

GUREVICH, S.B., BERKOVSKAYA, K.F.

"Prospects of Development of Nonvacuum Television Transmitting Device Using A Solid Body Of The Scanistor Type"

Izv. VMEI "Lenin" (Bulletin Of The VMEI [expansion unknown] Lenin), 1970, Book 5, pp 207-207 (from REN--Elektronika i yeye primeneniye, No 4, April 1971, Abstract No 4B362)

Translation: A scanistor with a divided base layer is proposed. It is possible to realize such a construction after developing the structure of a scanistor in one plane and after insulating the dividing [delitel'nyy] and photosensitive buses from one another. A series of discrete p-n junctions is constructed on one of the surfaces of a wafer of low-resistance n-Si, during which the p-regions are elongated bands. The central part of the unit is compensated by gold. Dark pulses are supplied to the scanistor from discrete components. Discrete photosensitive devices with any spectral characteristic are connected into the commutation circuit. 1 ill. 5 ref. V.Ch.

1/1

1/2 024 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--SPECTRAL CHARACTERISTICS OF FOUR LAYER SILICON STRUCTURES -U-
AUTHOR-(03)-BERKOVSKAYA, K.F., KIRILLOVA, N.V., KONAKOVA, R.V.
COUNTRY OF INFO--USSR **B**
SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(2), 396-8
DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.
TOPIC TAGS--SPECTRAL ENERGY DISTRIBUTION, SILICON, THYRISTOR, PN JUNCTION

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/0432 STEP NO--UR/0449/70/004/002/0396/0398
CIRC ACCESSION NO--AP0116098
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0116098

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PHOTOTHYRISTORS WERE STUDIED (MADE FROM N-SI, WITH RESISTIVITY 80 OHM-CM; AN N-P-N-P SWITCH WAS REALIZED BY A CONSECUTIVE DIFFUSION OF AL AND P, NAMELY THE INFLUENCE OF THE JUNCTION POSITIONS AND OF THE LIFETIME OF ELECTRONS IN P- AND N-BASES ON THE SPECTRAL SENSITIVITY. THE SPECTRAL CHARACTERISTIC OF SUCH A THYRISTOR DEPEND ON ALL PARAMETERS OF THE 4 LAYER STRUCTURE; ALSO, THE CHARACTERISTIC CAN BE INFLUENCED BY THE LIFETIME OF MINORITY CARRIERS IN THE BASES. THE MAX. OF THE SPECTRAL SENSITIVITY (LAMBDA SUBMAX.) CAN BE SHIFTED MAINLY BY THE POSITION OF THE 2ND JUNCTION: LAMBDA SUBMAX. EQUALS 9450 AND 9800 ANGSTROM FOR 10 AND 90 MU, RESP. FACILITY: FIZ.-TEKH. INST. IM. IOFFE, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC 621.316.99:621.315.1.3.024(088.8)

TURETSKIY, V. YE., BERKOVSKIY, A. M., SHAPOSHNIKOV, I. N., MELIK-SARKISOV, B. S.

"High Voltage Remote Operating Ground"

USSR Author's Certificate No 270062, Filed 12 Jul 65, Published 13 Aug 70 (from RZh-Elektrotehnika i Energetika, No 3, Mar 71, Abstract No 3Yel54P)

Translation: A scheme is proposed for a remote operating ground executed by wires split into two equal insulated branches. A measurement and relay protect circuit is provided to insure continuous control of the state of the ground branches. An auxiliary power transformer with the secondary winding midpoint joined to the ground circuit of the substation is used in the ground unit. The ground wires are connected to the secondary winding leads of the transformer. The primary winding of the transformer is connected to the 380 volt AC network. Control of the state of repair of the ground circuit is realized with respect to the presence and magnitude of the current in the branches of the ground lines and the primary winding of the transformer. Signal relays and a balanced protection circuit are used. The unit is applied in the operating circuit of two-pole and single-pole PPT [semiconductor triode?] lines. There is 1 illustration.

1/1

USSR

UDC 536.252

BERKOVSKIY, B. M., and POLEVIKOV, V. K., Institute of Heat and Mass Exchange, Academy of Sciences, Belorussian SSR, Minsk

"Influence of the Prandtl Number Upon Structure and Heat Exchange During Natural Convection"

Minsk, Inzhenerno-Fizicheskiy Zhurnal, Vol 24, No 5, May 1973, pp 842-849

Abstract: An investigation is made of the spectrum of thermoconvective structures within a wide range of Prandtl parameters. Consideration is given to the two-dimensional steady convective motion of a viscous incompressible fluid within a square region bounded by hard, impermeable walls. An empirical formula is obtained, which makes it possible to find, for arbitrary Prandtl numbers, regions of values of the Rayleigh criterion in which heat exchange and the temperature fields can be described only by the Rayleigh number. The conclusion is arrived at, that for any fixed Prandtl number Pr_1 there exists such a critical Rayleigh number $Ra_*(Pr_1)$ that within the range of $Pr > Pr_1$, subject to the condition of $Ra < Ra_*$, heat exchange and the temperature distribution can be described by the Rayleigh parameter alone. Consequently for small values of Pr , heat exchange and the temperature distribution are functions of Ra only within a very narrow region of small values of the Rayleigh parameter. Within 1/2

USSR

PERKOVSKIY, B. M. and POLEVIKOV, V. K., Inzhenerno-Fizicheskiy Zhurnal, Vol 24,
No 5, May 1973, pp 842-849

the range of high Prandtl numbers, these processes are determined only by the
Ra number within a considerably wider range. 4 figures. 16 references.

2/2

- 34 -

1/2 025 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--NUMERICAL INVESTIGATION OF FREE CONVECTION IN THE CASE OF HEATING
FROM ABOVE -U-
AUTHOR-(02)-BERKOVSKIY, B.M., NOGOTOV, YE.F.

COUNTRY OF INFO--USSR

SOURCE--AKADEMIYA NAUK SSSR, IZVESTIYA, MEKHANIKA ZHIDKOSTI I GAZA,
MAR.-APR. 1970, P. 147-154
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--THERMAL CONVECTION, HEAT SOURCE, FLOW STRUCTURE, NUMERIC
SOLUTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1205

STEP NO--UR/0421/70/000/000/0147/0154

CIRC ACCESSION NO--AP0124859

UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0124859

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DISCUSSION OF THE TWO DIMENSIONAL PROBLEM OF FREE CONVECTION IN A SQUARE (OR RECTANGULAR) REGION BOUNDED BY SOLID IMPERMEABLE WALLS. CONVECTION IS GENERATED BY NONUNIFORM HEATING FROM ABOVE (IN WHICH CASE THE BASE OF THE REGION, NORMAL TO THE GRAVITATIONAL FIELD, AND BOTH LATERAL SURFACES MUST BE KEPT AT A CONSTANT TEMPERATURE THAT DOES NOT EXCEED THE TEMPERATURE OF THE UPPER BOUNDARY AT ANY POINT). THE LAWS GOVERNING THE CONVECTIVE MOTION AND HEAT TRANSFER DETERMINED ALSO FOR SIMULTANEOUS HEATING FROM ONE SIDE AND FROM ABOVE AND FOR SIMULTANEOUS HEATING FROM ONE SIDE, FROM BELOW, AND FROM ABOVE.

UNCLASSIFIED

1/2 022 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--LIFE OF A QUARTZITE CRUCIBLE FOR A 12 METRIC TON INDUCTION FURNACE
-U-
AUTHOR--(C5)--KAYBICHEVA, M.N., PLATONOV, B.P., PLATONOV, YU.B., BERKOVSKIY,
I.M., ROPATOVSKIY, M.I.
COUNTRY OF INFO--USSR
SOURCE--LITEINCE PROIZVOD. 1970, (4), 33-6
DATE PUBLISHED-----70

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

TOPIC TAGS--INDUCTION FURNACE, QUARTZ, THERMAL STABILITY, MAGNESIUM OXIDE,
CALCIUM OXIDE, IRON OXIDE, ALUMINUM OXIDE, SILICON DIOXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--3004/1932

STEP NO--UR/0128/70/000/004/0033/0036

CIRC ACCESSION NO--AP0132194

UNCLASSIFIED

2/2 G22

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132194

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TWO QUARTZITES FOR MAKING INDUCTION FURNACE CRUCIBLES WERE COMPARED AS TO THEIR ENDURANCE, FRIABILITY, AND HEAT RESISTANCE: DOMESTIC AND SWEDISH, WHOSE COMPS. WERE SIO SUB2 98.10, 97.34, AL SUB2 0 SUB3 0.59, 0.95, FE SUB2 0 SUB3 0.31, 0.26, CAO 0.79, 0.26, MGO MINUS, 0.03, AND M SUB2 0 (METAL OXIDES) MINUS, 0.24, LOSS ON IGNITION 0.10, 0.46 WT. PERCENT, RESP. THE CRUCIBLES MADE FROM THE DOMESTIC QUARTZITE WERE MORE FRIABLE AFTER HEATING FOR 2 HR AT 1450DEGREES THAN THE SWEDISH CRUCIBLES, (PROBABLY BECAUSE THE DOMESTIC QUARTZITE HAD MORE SIO SUB2), AND THE D. WAS 2.530 AND 2.360 G-CM PRIME3, RESP. THE ADDN. OF 1.0-2.0PERCENT OF B SUB2 0 SUB3 DECREASED THE D. TO 2.459, AND 2.330 G-CM PRIME3, RESP. THE CRUCIBLES WITHSTOOD 321 AND 309 MELTINGS, RESP.

UNCLASSIFIED

1/2 013 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--PREPARATION OF SHELL MOLDS BY USING ETHYL SILICATE 40 FOR
INVESTMENT CASTING -U-
AUTHOR--(05)-OZEROV, V.A., SAKODYNSKIY, K.I., SHPRITS, B.B., MOSEVA, L.I.,
BERKOVSKIY, V.M.
COUNTRY OF INFO--USSR
SOURCE--LITEINOE PROIZOD. 1970, 2, 14-15
DATE PUBLISHED-----70

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

TOPIC TAGS--SHELL MOLD, INVESTMENT CASTING, ORGANIC SILICATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1996/1735

STEP NO--UR/0128/70/002/000/0014/0015

CIRC ACCESSION NO--AP0118713

UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0118713

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE APPLICATION OF ET SILICATE-40 TO SHELL MOLDS MADE IT NECESSARY TO FOLLOW THE PROCESSES OCCURRING DURING THE PREPN. OF THE BONDING SOLN. PROPERTIES OF THE SOLN. ARE DEPENDENT ON THE CONTENT OF FREE H SUB2 O. CHROMATOLOG. OF HYDROLYZED ET SILICATE SOLN. IS USED TO DET. THE PROCESSES OCCURRING DURING HYDROLYSIS. ON THIS BASIS, IT IS POSSIBLE TO CHOOSE: AN OPTIMUM RECIPE, A MANNER OF HYDROLYSIS, A MEANS OF PREPN. OF SHELL MOLDS FOR EACH PROCESS VARIANT, AND A MEANS OF CONTROLLING THE COMPN. OF HYDROLYZED SOLNS. THE ADDN. OF ET SILICATE-40 DECREASED THE COST OF THE BONDING AGENT AND INCREASED THE PRODUCTIVITY OF SHELL MOLD PREPN.

UNCLASSIFIED

USSR

UDC: 621.762.2+539.67

BERKOVICH, I. I., VINOGRADOV, G. A. and KATASHINSKIY, V. P., Kalinin Polytechnic Institute; Institute of Problems of Material Science Academy of Sciences Ukrainian SSR

"Study of the Friction and Shearing Strength of Iron and Aluminum Powders"

Kiev, Poroshkovaya metallurgiya, No 11, Nov 71, pp 84-88

Abstract: Described are tests on the physical and mechanical properties of PZhLM-2 iron and AP-1 aluminum powders conducted on a RT-1 ring-shaped tribometer at pressures ranging from 0 to 500 kg/cm². Both the testing equipment and procedure are detailed. The kinetic curves of both internal and external frictions and shearing strength of the iron and aluminum powders are shown as a function of normal pressures. It was found that the value of the cohesion coefficient responsible for the structural strength of the material, increases with an increase in normal pressure while the internal friction coefficient remains almost constant. The friction and shear strength measurement results of both iron and aluminum powders at various pressures are presented in a table. (4 illustrations, 1 table, 4 bibliographic references).

1/1

USSR

UDC 621.38.836.112.15c24

BERKOVSKAYA, K.F., KIRILLOVA, N.V., KONAKOVA, R.V., KRASYUK, B.A., MESKIN, S.S.,
RAVICH, V.N., SOBOLEV, V.I., SHUMAN, V.B.

"Optoelectronic Pair, Light-Emitting Diode--Photthyristor: New Element Of
Electronic Apparatus"

V sb. Mikroelektronika (Microelectronics--Collection Of Works), Moscow, Izd-vo
"Sovetskoye Radio," No 4, 1971, pp 216-228

Abstract: The possibilities are analyzed of a new type of optoelectronic pair, GaAs light-emitting diode--Si photthyristor. The characteristics and parameters are furnished of light-emitting diodes and photthyristors of various types. The possibilities of their optimum combination are considered. Specific regimes of operation are recommended and the parameters of the optoelectronic pair are presented for three regimes of operation. 6 fig. 3 tab. 8 ref.

1/1

USSR

UDC 621.771.8

POLUKHIN, P. I., ZHADAN, V. T., BERKOVSKIY, V. S., FEDOSOV, B. M., and
BRYUKHOV, B. N.

"An Investigation of Forming in Flange Passes during Rolling of Stainless Steel"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya"
Publishing House, No 64, 1970, pp 79-87

Translation: The results of an experimental study of the forming process during the rolling of square billets of Kh18Ni9Ti steel in open-flange passes are considered. Selection of the geometric parameters of the pass and billet is substantiated. Results are presented of an analysis of forming parameters as a function of the dimensions of the peak and the amount of roughing. Eight illustrations, one table, and five bibliographic entries.

1/1

USSR

UDC 621.771.8

POLYKHIN, P. I., BERKOVSKIY, V. S., ZHADAN, V. T., FEDOSOV, B. M., STEISENKO, N. V., OSADCHIY, N. A., AVRUNIN, P. M., and KOVTANYUK, Yu. P.

"Developing New Technology for Rolling the PSh-20 Section from Kh18Ni9Ti Steel on the 550 Mill"

Moscow, Plasticheskaya Deformatsiya Metallov i Splavov, "Metallurgiya" Publishing House, No. 64, 1970, pp 106-113

Translation: A brief description is given of the technology for rolling the shaped sections being studied. An analysis is made of the existing rolled pass design and deformation parameters by templates, and data are given from an investigation of the power parameters of rolling. On the basis of an analysis of the data received and the technical-economic indicators, a new technology for the process of rolling the sections under study is developed. Eleven illustrations and one table.

1/1

USSR

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"Rolls for Rolling Hard-to-Work Steels"

Moscow, Metallurg, No 1, Jan 71, pp 31-34

Abstract: Rolling-mill rolls from both low-alloy and plain carbon cast iron steels with lamellar graphite, which have been used in the past did not provide proper-quality rolling stock or make possible rhythmic operation of the mills. In recent years extensive use has been made of alloyed quality steels having a higher hardness value and a low rolling temperature range. As a result, the industry faces higher requirements with respect to the wear resistance of passes and over-all service strength. This study involves rolls from cast iron injected with magnesium and cerium with a lower content of chromium, silicon, and phosphorus. Spheroidal graphite and a compact-grained structure stemming from reduced contents of chromium and silicon as well as from injection with magnesium have given the rolls good wear resistance, low

USSR

TROFIMOVSKIY, V. A., et al, Metallurg, No 1, Jan 71, pp 31-34

uniform frictional wear, and surface finish. Low phosphorus (up to 0.28%) and chromium (up to 0.3%) contents provide the required strength since the number of brittle components (carbides) is reduced. The new rolls have been introduced on all break-down and prefinishing stands of the Dnepros-petsstal' Plant. Tables in the original article cite test results of mechanical properties of rolls from magnesium cast iron and cast iron with lamellar graphite as well as comparative data on the resistance of both experimental and ordinary rolls.

2/2

- 90 -

72 020 UNCLASSIFIED PROCESSING DATE--020170
TITLE--HEATING OF CASTINGS IN A THERMAL FURNACE WITH A CAR TYPE BOTTOM -U-

THOR-(05)-PARASYUK, P.F., SHERSTYUK, A.A., KORNIICHUK, A.I., TUMANSKIY,
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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FOR BETTER CONTROL OF HEATING IN A FURNACE WITH A CAR TYPE BOTTOM, THE THERMOCOUPLE SHOULD NOT BE PLACED IN THE ARCH OF THE FURNACE BECAUSE OF THE LARGE HEAT GRADIENT BETWEEN THE CASTING AND THE ARCH. IN THE STUDY OF HEATING A CASTING OF 110G13L FOR 17 HR, BECAUSE OF THIS LARGE HEAT DIFFERENCE, THE CASTING WAS NOT HEATED TO THE NECESSARY TEMP. AS A RESULT, INSTEAD OF PURE AUSTENITE, UNDISSOLVED CARBIDES REMAINED IN THE CASTING. THE AMT. OF SCALE FORMED ON 110G13L CASTINGS DEPENDS ON THEIR POSITION IN THE FURNACE; THE LESSER AMT. IN THE CENTER OF THE FURNACE, THE MOST AT THE END OWING TO LEAKS OF THE JOINT OF THE CAR TYPE BOTTOM AND THE LINING WALL. IN THE STUDY OF THE EFFECT OF COMPN. OF THE HEATING PRODUCTS FROM THE GAS ON SCALE FORMATION IN 110G13L DURING TEMPERING, ANAL. OF THE PRODUCTS SHOWED THAT WITH INCREASE IN EXCESS AIR, THE DEPTH OF THE SCALE AND DECARBURIZED LAYER ON THE SURFACE OF THE CASTINGS INCREASED. ARTHUR J. PEAT.

UNCLASSIFIED

BERKUTOV, A. N.

Phil Med Journal
#6, 1972

- 77 -

Resuscitation is closely associated with the development of the blood circulation and transfusion-injection therapy. The direct blood transfusion method and non-70 procurement and blood transfusion goals are able to supply the medical installations with all the blood and blood preparations that they need. The transfusion of blood, its components and other blood products is exceptionally important in the effort to save the life of a victim suffering from shock, bleeding, and other threatening states. Immediate transfusion is no less significant than transfusion of blood. Exchange transfusion is one of the steps taken to remove poisons of poisoning by carbon monoxide or other substances. The volume of exchanged blood is quickly corrected by transfusing blood and antitoxin solutions through catheters inserted into the veins under the control of central venous pressure.

Local anesthesia (A. V. Vishnevsky's method) was very common, used by 1 percent of the cases. It was greatly improved by using more potent and longer-acting preparations or by combining it with novocainamide, procaine, prolonged procaine, anesthesia and neuroleptanalgesia were recently introduced into practice.

Various forms of anesthesia are used in the medical installations of the district in the course of resuscitation. The method of choice for surgical operations is combined nitrous oxide-oxygen endotracheal anesthesia with artificial respiration (used in 5.7 percent of all the cases). Tracheal intubation, median sternotomy, thoracotomy, tracheotomy, laryngotomy, tracheostomy, and other methods of artificial respiration (ventilators) were used in 1.7 percent of the cases, intravenously in 1.5 percent, and intravenously in 1.3 percent.

No operation on and used resuscitation for 72 percent of cases in which death after suturing closed and open injuries to the chest or thoracic cavity, severe trauma, or fracture of the sternum. The 3 cases were referred to the nearest hospital for resuscitation.

V. A. Nishchenko et al.,
The results of resuscitation of victims of the Chernobyl disaster.

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UDC 681.332.63.088.6.001.24

BERLAN', A. T.

"Some Problems of Analyzing Analog Computer Errors"

Vopr. tochnosti i effektivn. vychisl. algoritmov. Tr. Simpoziuma. T. 5
(Problems of Accuracy and Efficient Computation Algorithms. Works of the
Symposium. Vol 5), Kiev, 1969, pp 55-66 (from RZh-Avtomatika, Telemekh-
anika i Vychislitel'naya Tekhnika, No 3, Mar 70, Abstract No 3B21)

Translation: By comparison with digital computers, the range of application of analog computers is limited as a result of a series of peculiarities: nonautomatic program input (selection of the problem), specialized execution, and theoretically limited accuracy. The creation of hybrid machines is opening up means of automating programming, universality, and so on, but the problem of limited accuracy remains. Some of the problems of analyzing the accuracy of analog computers are characterized, and several known and possible means of solving these problems, such as the frequency method, the method of error coefficients, the method of evaluating the errors by models of differential equations with constant coefficients based on application of integral characteristics of the solutions, and so on are indicated. The bibliography has 19 entries.

1/1

