

USSR

UDC 621.3.085.36

CHISTYAKOV, B. V., Engineer

"High-Speed High-Accuracy Digital-to-Analog Converter"

Moscow, Pribory i Sistemy Upravleniya, No 2, 1972, p 43

Abstract: A brief description is presented of the operating principle of a high-speed high-accuracy digital-to-analog converter based on current division [B. V. Chistyakov, et al., USSR Author's Certificate No 238905, Byulleten' izobreteniy, No 10, 1969]. The basic element of the circuit is a differential amplifier with an emitter coupling, the transistors of which are matched with respect to characteristics and their bases are under an identical potential so that the collector currents are identical. The converter was tested in the temperature range from  $-40$  to  $+50^{\circ}$  C. To increase the conversion accuracy, the bases of the transistors in each differential amplifier are connected through the base current switches to bias voltage sources with low input impedance the potential of which must be in the middle between the collector and emitter potentials. A diode circuit is used for this purpose. The tests demonstrated a significant increase in operating accuracy of the described converter in the tested temperature range by comparison with the presently widely known converters.

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USSR

UDC 681.335

KULIKOV, S.V.. CHISTYAKOV, B.V.

"Device for Determination of Extreme Values"

USSR Author's Certificate No. 271615, Filed 30/05/69, Published 3/09/70 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No. 4, 1971, Abstract No. 4B129P).

Translation: The device suggested is designed to be used in those cases in which it is necessary to determine with great accuracy the moment when an observed (measured) voltage passes through an extreme value, while the rate of change may be very low. Known devices for determination of an extreme, based on a voltage repeater with a memory condenser connected in parallel to the output through a switching circuit, have an insufficient sensitivity threshold and do not allow the moment when the voltage passes through the extreme i.e., the moment of change of sign of the derivative of the voltage to be determined accurately. The device suggested differs in that the emitter-base junction of the transistor of the output amplifier is connected in series with the memory condenser and the switching circuit; the output of the amplifier is connected through two oppositely connected diodes to the input of the derivative sign flip-flop. This allows the sensitivity threshold of the extreme

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USSR

UDC 681.335

KULIKOV, S.V., CHISTYAKOV, B.V., USSR Author's Certificate No. 271615, Filed 30/05/69,  
Published 3/09/70.

sensor to be reduced and increases the accuracy of determination of the moment when  
the sign of the derivative of the input voltage changes. 1 fig.

2/2

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USSR

C UDC 621.373.531.1(088.8)

KULIKOV, S. V., RYAPOLOV, V. A., KRYUKOV, L. V., CHISTYAKOV, B. V.

"Multivibrator with a Synchronization Circuit"

USSR Author's Certificate No 251614, Filed 27 Jun 68, Published 3 Feb 70  
(from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9G255P)

Translation: This author's certificate introduces a multivibrator with a synchronization circuit containing basic and auxiliary transistors, switching and starting transistors, a stabilatron and the synchronization circuit resistors. In order to decrease the delay of the synchronized pulses, the base of one of the basic transistors is connected to the collector of the switching transistor of the synchronization circuit. The base of the latter is connected via a resistor to the collector of the starting transistor and via a semiconductor diode to the collector of the second transistor of the multivibrator the base of which is connected via the stabilatron and the resistor to a common point of the semiconductor diode and the collector of the starting transistor of the synchronization circuit.

1/1

Acc. Nr:

AP0049911

Abstracting Service:

CHEMICAL ABST. 5/70

Ref. Code:

UR 0181

105171w Electrical properties of an organic phthalocyanine semiconductor in the ferroelectric state. Vidadi, Yu. A.; Rozenshtein, L. D.; Chistvakov, E. A. (Inst. Poluprov., Leningrad, USSR). *Fiz. Tverd. Tela* 1970, 12(2), 634-5 (Russ). Temp. dependences are given of the films. The cond. of phthalocyanine is characterized by an exponential dependence on temp. with an energy of activation of  $\sim 2.0$  eV. After the phase-transition current across the specimen decreases in time as a result of its polarization as in other ferroelec. materials. Cond. in the ferroelec. state in the region of the transition is higher than in the initial state and has a max. Polarization of the specimen is such because of the fact that the phase transition is accompanied by formation of dipoles. This leads to the appearance of new intermol. interactions leading to increased cond. Current-voltage dependence close to the temp. of the phase transition in the ferroelec. state is different from similar dependence in the semiconducting state and exhibits sublinearity even at low field intensities. A. Libackyj

1/1

REEL/FRAME  
19801847

7 14

UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--WHITENING OF A PORTLAND CEMENT CLINKER -U-

AUTHOR--(05)--KRAVCHENKO, I.V., CHEREPOVSKIY, S.S., ALESHINA, O.K.,  
DNITRIYEVA, V.A., CHISTYAKOV, G.I.

COUNTRY OF INFO--USSR

SOURCE--USSR. 267,432

REFERENCE--OTKRYTIYA, IZOBRET., PRJM. OBRAZHTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--01APR70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CEMENT, PATENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3002/1434

STEP NO--UR/0482/70/G00/000/0000/0000

CIRC ACCESSION NO--AA0128833

UNCLASSIFIED

2/2 006

UNCLASSIFIED

PROCESSING DATE--20NOV70

IRC ACCESSION NO--AA0129833

BSTRACT/EXTRACT--(U) GP-C- ABSTRACT. A PORTLAND CEMENT CLINKER WAS  
WHITENED BY BEING COOLED FROM 1200 TO 450 DEGREES IN A REDUCING GAS  
MEDIUM CONTG. 3-10 VOL. PERCENT CO PLUS H. FACILITY: STATE  
SCIENTIFIC RESEARCH INSTITUTE OF THE CEMENT INDUSTRY.

UNCLASSIFIED





2/2 010

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AA0128809

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BLACK PORTLAND CEMENT WAS PREPD. BY INTRODUCING A PIGMENT ADDITIVE, SUCH AS CARBON BLACK, INTO THE CLINKER WHICH WAS REMOVED FROM THE FURNACE AT GREATER THAN OR EQUAL TO 1200DEGREES AND WAS COOLED IN A REFRIGERATING APP. IN A NATURAL GAS MEDIUM TO 600DEGREES. FACILITY: STATE SCIENTIFIC RESEARCH INSTITUTE OF THE CEMENT INDUSTRY.

UNCLASSIFIED

1/2 006 UNCLASSIFIED C PROCESSING DATE--13NOV70  
TITLE--PREPARATION OF BLACK CEMENT -U-  
AUTHOR--(05)-KRAVCHENKO, I.V., CHEREPOVSKIY, S.S., ALESHINA, O.K.,  
CHISTYAKOV, G.I., DMITRIYEVA, V.A.  
COUNTRY OF INFO--USSR  
SOURCE--U.S.S.R. 267,430  
REFERENCE--OTKRYTIYA, IZOBRE., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--01APR70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--CEMENT, -PATENT, PIGMENT, MANGANESE COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3002/1404 STEP NO--UR/0482/70/000/000/0000/0000  
CIRC ACCESSION NO--AA0128803  
UNCLASSIFIED

2/2 006

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0128803

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BLACK CEMENT BASED ON ORDINARY PORTLAND CEMENT WAS OBTAINED BY INTRODUCING A PIGMENT ADDITIVE INTO THE CLINKER. TO OBTAIN A DEEPER TONE, THE CLINKER WITH A MN ORE ADDITIVE WAS COOLED IN AN O ENRICHED GAS MEDIUM FROM ITS SINTERING TEMP. TO 900DEGREES. FACILITY: STATE SCIENTIFIC RESEARCH INSTITUTE OF THE CEMENT INDUSTRY.

UNCLASSIFIED

USSR

UDC 519.21

CHISTYAKOV, G. P.

"The Stability of the Theorem of Yu. V. Linnik in the Metrics of P. Levi"

Teoriya Funktsiy, Funkts. Analiz i Ikh Prilozh. Resp. Nauchn. Sb. [Theory of Functions, Functional Analysis and Their Applications, Republic Scientific Collection], No 11, 1970, pp 93-97, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V13 by V. Prelov).

Translation: A continuation of an earlier work by the author (see Teoriya Funktsiy, Funkts. Analiz i Ikh Prilozh., No 9, Khar'kov, 1969). Suppose  $X_1$  and  $X_2$  are independent random quantities,  $X = X_1 + X_2$ ,  $F_1(x)$ ,  $F_2(x)$  and  $F(x)$  are the distribution functions of the random quantities  $X_1$ ,  $X_2$  and  $X$  respectively. We represent by  $\Lambda(x, \nu_1, \nu_2, \nu_3)$  the composition of the Gauss and Poisson laws, the characteristic function of which is  $\exp\{\nu_3(e^{it} - 1) - \nu_2 t^2 + i\nu_1 t\}$ . The following statement is proven. If  $L(F(x), \Lambda(x, 0, \frac{1}{2}, 1)) < \varepsilon < e^{-\varepsilon}$ , where  $L$  is the distance in Levi metrics, then

$$\inf_{\Lambda \in \mathcal{K}_\Lambda} L(F_j, \Lambda) < A \left( \ln \ln \ln \frac{1}{\varepsilon} \right)^{-\frac{1}{2}}.$$

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USSR

UDC 519.21

CHISTYAKOV, G. P., Teoriya Funktsiy, Funkts. Analiz i Ikh Prilozh. Resp. Nauchn. Sb., No 11, 1970, pp 93-97.

where  $K_A$  is the class of composition of Gauss and Poisson laws, while  $A$  is an absolute, positive constant.

2/2

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USSR

UDC 621.221 (024) (47+57)

CHISTYAKOV, G. YE., NOGOVITSYN, D. D., YAKUSHEV, M. V.

Gidroenergeticheskiye resursy basseyna reki Yany. (Hydroelectric Power Resources of the Yana River Basin), Moscow, Nauka, Press, 1970, 214 pp (from RZh-Elektrotehnika i Energetika, No 2, Feb 71, Abstract No 2 D2 K)

Translation: This book contains a brief physical-geographic description of the Yana River Basin, information on hydrography and the regime of the principal rivers and the potential hydroelectric power reserves of the basin rivers more than 10 km long. In addition, other power resources and the economy of the region are investigated, and some arguments are presented regarding the prospects of development of power consumption and installation of power equipment. There are 13 illustrations, 51 tables and an 83-entry bibliography.

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CHISTYAKOV, I. G.

*Polymers*

THE RHEOLOGY OF POLYMERS  
(Symposium in Moscow)

Edited by Doctor of Physical and Mathematical Sciences A. V. Tobolsky, Institute of Chemical Physics, Academy of Sciences of the USSR, Moscow, U.S.S.R., August 1972, pp 119-121

Rheological investigations are being developed at the present time in the USSR. The goal of these investigations is to establish the connection between the molecular structure of a substance and its macroscopic properties and, secondly, as a consequence, to determine the kinetic and dynamic parameters of the connections between the corresponding boundary problems and their application to analysis of concrete technological processes. At the regular (Seventh) symposium on the rheology of polymers, organized by the Institute of Petrochemical Synthesis (Academy of Sciences of the USSR) and held on 10-14 April in Moscow, the main attention was given to the first direction of investigation. The Group of Scientists from East Germany, Poland, Czechoslovakia, and Bulgaria, about 100 reports were heard. Discussed at the symposium was a broad complex of problems connected with the physical chemistry and mechanics of polymeric materials. Special attention was given to the construction of mechanical models of the molecular nature of relaxation effects in macromolecular chains, and the construction of models for the description of the conditions of deformation with detailed comparison of the molecular parameters of reliably characterized samples and their viscoelastic properties. Discussed with special interest was the problem of the liquid crystalline state and the influence of the physical structure of the system on its rheological properties.

The symposium was opened with the addresses of Professor K. A. Andrianov and A. Yu. Ishlinsky, who emphasized the

comprehensive importance of rheological investigations in polymer systems as a whole and concrete applications of high molecular compounds and compositions based on them for structural purposes. Then was heard the survey report of Yu. V. Vinogradov who sketched contemporary concepts of the connection of the molecular structure and rheological properties of polymers. Systematic investigations of the viscoelastic properties and fluidity of melt-disperse polymers with different flexibility of the chain, conducted in recent years, have made it possible to quantitatively estimate the role of the length of the molecular chain in modifications of mechanical properties (characteristic of polymeric systems). In particular, the limiting conditions of deformation, when the polymer still preserves fluidity and can be processed in stable conditions, have been established. Another aspect of that problem is connected with the determination of general regularities of the transition from the fluid into the highly elastic state as a function of the intensity of deformation and with finding a correlation of between the behavior of the polymer in different states and of its structure.

The reports of Yu. A. Golitskiy, G. N. Vishniakov, Yu. V. Amerlyakov and others were devoted to general problems of polymer physics in connection with study of the processes of viscoelastic and dielectric relaxation in different physical states and evaluation of the correspondence of those processes with the conformational properties of polymeric chains. Also belonging to the same physical direction in rheology was the report of S. Ya. Frenkel on the problem of phase transformations arising as a result of deformation and their influence on the conditions and regime of flow of polymeric systems.

In a number of reports the structure of fluid polymers and the influence of the structure of the system on its rheological properties were discussed. Thus, A. A. Tager discussed in detail the correspondence of the structure and viscosity of solutions of polymers. The report of S. P. Fakhov and co-authors presented the results of study of the rheological properties of anisotropic solutions of rigid-chain polymers which can form a liquid crystalline phase. Possible models of liquid crystals were examined by L. G. Shalyshev and a hydrodynamic theory of their behavior was proposed by P. I. Agra and A. N. Bulynin. Structural problems connected with the liquid crystalline order were presented in survey form by I. G. Chistyakov, and the application of these concepts to the ~~investigation of the~~ intra- and submolecular liquid crystalline order was examined in the report of V. N. Tsvetkov and co-authors.

Also related to problems of polymer physics was the report of G. A. Goryunov (Poland), who told about new results obtained by him in the theory of polymeric lattices. V. B.



1/2 049 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--POSSIBLE USE OF LIQUID CRYSTALS FOR PHOTOGRAPHING SINGLE PULSES OF  
THERMAL RADIATION -U-  
AUTHOR--(05)-GINZBURG, V.M., SMIRNOV, V.I., SONIN, A.S., STEPANOV, B.M.,  
CHISTYAKOV, I.G.  
COUNTRY OF INFO--USSR  
SOURCE--PRIB. TEKH. EKSP. 1970, (2), 206-7<sup>12</sup>  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--NEODYMIUM LASER, LIQUID CRYSTAL, THERMAL RADIATION,  
PHOTOGRAPHY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3007/0870 STEP NO--UR/0120/70/000/002/0206/0207  
CIRC ACCESSION NO--AP0136304  
UNCLASSIFIED

2/2 049

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0136304

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A 2-DIMENSIONAL IMAGE WAS OBTAINED OF A THERMAL FIELD GENERATED BY A SINGLE PULSE RADIATION ND LASER (PULSE ENERGY SIMILAR TO 0.5 J, PULSE DURATION 2 TIMES 10 PRIME NEGATIVE 8 SEC) USING A LIQ. CRYSTAL MIXT. OF 70PERCENT CHOLESTEROL PELARGONATE AND 30PERCENT CHOLESTEROL OLEATE. THE SELECTIVITY OF THE SCATTER OF THE MIXT. RANGES FROM 59.8 TO 62.2DEGREES. FACILITY: VNII OPT.-FIZ. IZMER., USSR.

UNCLASSIFIED

Acc. Nr: **AP0040311**

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Ref. Code: UR 0481

PRIMARY SOURCE: Eksperimental'naya Khirurgiya i Anesteziologiya,  
1970, Nr 1, pp 10-12

THE COLOUR THERMOGRAPHY BY CHOLESTERIC LIQUID CRYSTALS  
IN SURGERY

Yu. M. Gerasov, I. G. Chistyukov

Cholesteric liquid crystals were used as thermography for a study of the intensity and expansion of inflammatory processes in soft tissues, vessels, lymph nodes, thoracic and thyroid glands. The thermograms of malignant and benign tumours were studied. The properties of liquid crystals to change their colour at different temperatures make possible to use them for diagnostic purposes. In this study two pictures of thrombophlebitis and right-side mastitis with peculiar distribution of temperatures in the investigated areas are given (blue colour). The method is to be further investigated by improving the composition of liquid crystals and accumulation of clinical experience.

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REEL/FRAME  
19741742

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USSR

UDC 617-073.65

GERUSOV, YU. M., And CHISTYAKOV, I. G., Chair of Surgery, Therapeutic Faculty, and Chair of Physics, Ivanovo Medical Institute

"Color Thermography with Liquid Cholesterol Crystals in Surgery"

Moscow, Eksperimental'naya Khirurgiya i Anesteziologiya, No 1, 1970, pp 10-12

Abstract: The ability of liquid cholesterol crystals to change color at minimum temperature differences enabled the authors to determine the boundaries and intensity of inflammation, to detect lymph nodes affected with cancer, to determine the degree and extent of joint involvement and their sensitivity to conservative treatment, to discover the exact site and level of involvement of the spine in tuberculosis, the direction of wandering abscesses, and to ascertain boundaries of pathological masses in the mammary and thyroid glands. They also used the method to observe rapid temperature changes caused by dilatation or constriction of the blood vessels in response to pharmacological, local, thermal, or centrally-acting agents. Excerpts from two case histories demonstrate the value of the procedure.

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1/2 013 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--DERIVATIVES OF P SUBSTITUTED BENZALDEHYDES WITH LIQUID CRYSTAL  
PROPERTIES -U-  
AUTHOR-(02)-SMIRNOV, B.P., CHISTYAKOV, K.G. C

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., KHIM. KHIM. TEKHNOL. 1970, 13(2),  
217-20  
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--BENZALDEHYDE, LIQUID CRYSTAL, AMINE, AZO COMPOUND,  
NAPHTHALENE, BENZENE DERIVATIVE, CONJUGATE BOND SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3008/0847

STEP NO--UR/0153/70/013/002/0217/0220

CIRC ACCESSION NO--AT0137875

UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0137875

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LIQ. CRYSTAL BEHAVOIR IS NOTED FOR THE FOLLOWING COMPOS. (THE GIVEN TEMP. IS THE TRANSITION TEMP. TO THE THREAD LIKE PHASE): CONDENSATION PRODUCT OF P,AMC SUB6 H SUB4 CHO (AM EQUALS AMYL) AND P AMINO,AZOBENZENE, 86DEGREES, 4,PHENYLAZO,1,NAPHTHYLAMINE, 88DEGREES, CONDENSATION PRODUCT OF P AMC SUB6 H SUB4 CHO AND P H SUB2 NC SUB6 H SUB4 CH:CHCO SUB2 ET, 99DEGREES; (; PRC SUB6 H SUB4 CH:N) SUB2, 61DEGREES; (P AMC SUB6 H SUB4 CH:N) SUB2, 68DEGREES; P,(P,ISO,PRC SUB6 H SUB4 CH"N) SUB2 C SUB6 H SUB4, 185DEGREES; P,(P,ISO,BUC SUB6 H SUB4 CH:N) SUB2 C SUB6 H SUB4, 188DEGREES; P,(P,ISO,C SUB5 H SUB11 C SUB6 H SUB4 CH:N) SUB2 C SUB6 H SUB4, 166DEGREES; (P,ETC SUB6 H SUB4CH: N) SUB2 C SUB6 H SUB4, 152DEGREES; P,(P,PRC SUB6 H SUB4 CH:N) SUB2 C SUB6 H SUB4, 125DEGREES; P,(P,AMC SUB6 H SUBE CH:N) SUB2 C SUB6 H SUB4, 122DEGREES, AND P,AMC SUB6 H SUB4 CH:N) SUB2 C SUB6 H SUB4, 128DEGREES. TWELVE RELATED COMPOS. EXAMD. DID NOT EXHIBIT LIQ. CRYSTAL BEHAVIOR. LIQ. CRYSTAL BEHAVIOR IS APPARENTLY DETD. BY THE LENGTH OF THE CONJUGATED CHAIN AND TO A GREATER DEGREE BY THE LENGTH AND NATURE OF SUBSTITUENTS. METHODS OF PREPN., YIELDS, AND PROPERTIES ARE GIVEN FOR MOST OF THE COMPOS. FACILITY: IVANOV. MED. INST., IVANOVO, USSR.

UNCLASSIFIED

AA0051848- CHISTYAKOV N.N. UR 0482 11

Soviet Inventions Illustrated, Section II Electrical, Derwent, 1/70

239597 INDUCTIVE LEVEL METER where a float can move freely along the inductive coils indicating its position corresponding to the measured level. The float has been improved, it has two flanges which make it possible to obtain a parallel reading from two independent coils.

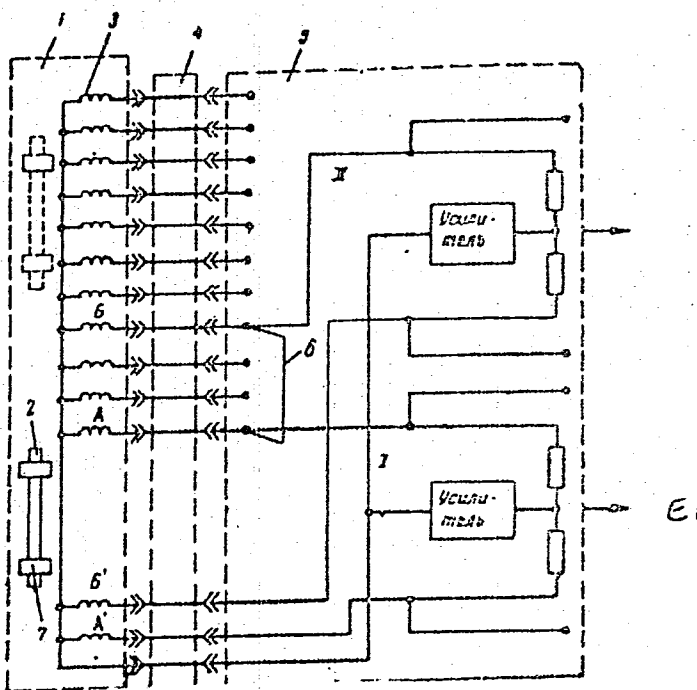
12.12.66 as 1119046/26-10. A.S. ABRAMOV et al.  
(28.7.69) Bul 11/18.3.69. Class 42e. Int.Cl.G 01f.

AUTHORS: Abramov, A. S.; Zotov, S. V.; Maslov, G. S.; Vargin, B. A.;  
Shorin, N. I.; Kornyushin, P. M.; Mirskoy, B. I.; Chistyakov, N. N.;  
Mosyakov, V. A.; Kozlovskiy, G. V.; Chichigin, I. B.; Batov, V. A.;  
Golovachev, V. T.; Lyakhterov, M. N.; Kobelev, Yu. M.

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19820276

AA0051848



19820277

*n/n*



Acc. Nr: **AP0047636** Abstracting Service:  
CHEMICAL ABST. 5/70

Ref. Code:  
**UR0057**

C

/ 105088z Postdischarge (exoelectron emission from layers of a vacuum oil). Lukashiev, A. A.; Chistvakov, P. N. (Mosk. Inzh.-Fiz. Inst., Moscow, USSR). ZH. Tekhn. Fiz. 1970, 40 (1), 236-40 (Russ). The problem was investigated whether electron exoemission from a metal body may be an indication of the presence of vacuum oil on the surface of this body. A special device enabled one to admit controlled doses of oil which would cover the electrode (this electrode was held nearly at 77°K). The time behavior of the emission current pulse was measured, and the dependences of the emission current on the duration of oil evapn. (and thus on film thickness) and on the temp. of the oil vapor source were plotted. Currents  $<10^{-13}$  A could be measured. A film of contaminating oil can be detected on a metallic surface; the emission increases with oil thickness initially and then a decrease follows. V. Burjan

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REEL/FRAME  
**19791208**

18/11

CHISTYAKOV S. L.

USSR

UDC 669.14.018.8:658.562

MAS'YANOV, A. G., GUREVICH, YU. G., MARKBLOV, A. I., SIBONOV,  
N. V., GERASIMOV, YU. V., KHASIK, G. A., CHISTYAKOV, S. L.,  
POLYAKOV, YU. V., LEBEDEVA, V. N., Chelyabinsk Polytechnical  
Institute and Zlatoust Metallurgical Plant

"Quality of Stainless, Low-Carbon Steel"

Moscow, Metallurg., No 5, May 70, pp 17-19

Abstract: A stainless, low-carbon steel developed at the Zlatoust Metallurgical Plant is described. The carbon content of this steel is less than 0.030%, and the steel is made in open arc furnaces using metal electrodes or by scavenging the liquid steel with argon. Comparisons were made between this steel and a similar metal made in vacuum induction furnaces. A table gives the impurities in the various types of steel produced by the two methods -- the use of metal electrodes and argon scavenging. An analysis of the results of a quantitative estimate of impurities showed that owing to the high degree of deformation, the contamination along the transverse axis of the steel sheet is less than that along the longitudinal axis. The mechanical  
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USSR

KAS·YANOV, A. G., et al., Metallurg, No 5, May 70, pp 17-19

characteristics of the steel satisfied all technical requirements.  
A comparison of the mechanical characteristics of this steel  
made by the three processes discussed -- metallic electrodes,  
argon scavenging, and vacuum induction -- is also presented.

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CHISTYAKOV, V. A.

UDC 612.388-064.014.46:613.849.1.013.25:612.766.2  
EFFECT OF RADIOPROTECTANTS ON THE FUNCTIONAL STATE OF HISTO-HEMATIC BARRIERS  
IN RESTRICTED ANIMALS

Article by V. V. Sibiryev, V. S. Shashkov, P. V. Serdyukova, V. A. Chistyakov  
and N. A. Syrdamitov; Moscow, Kozhicheskaya Biologiya i Meditsina, vestnik,  
Vol 6, No 1, pp 7-10, 1972, submitted for publication 15 March 1971

Abstract: The effect of mecamine and cystamine on the permeability of histo-hemetic barriers in intact and restricted animals was studied. During the experiments rats were kept under hypokieletic conditions for 10 days. Intraperitoneal injections of radioprotectants increased substantially the I31-albumin permeability of tissue barriers in most organs and tissues. In response to an injection of radioprotectants during the 10-day hypokieletic experiment the label transfer through the hemato-encephalic barrier and tissue barriers of the femur and back muscles, thymus and adrenals increased to a lesser extent.

Hypokinesia causes a change in the biological tolerance of the body to exposure to a number of unfavorable environmental factors. For example, the results of investigations made by B. A. Lomusov, V. A. Shkurkoda (1962, 1963), V. M. Seraya and I. A. Alukunova revealed a considerable decrease in the body tolerance to irradiation in animals which were totally or partially immobilized. In addition, there are indications that under the influence of weightlessness and restriction of motor activity there is a change in the intensity and direction of the effect of drugs (V. V. Parin, et al.; V. Ye. Belay and P. V. Vasil'yev). The system of histo-hemetic barriers in one of the mechanisms ensuring the operation of the regulatory-protective function directed to the retention of homeostasis.

This paper is devoted to a study of the effect of radioprotectants on the permeability of tissue barriers in animals with restricted motor activity.

Method

The work was done using 125 sexually mature males of nonlinear white rats weighing 170±30 g. Two series of experiments were carried out. In the

SPRS 55687  
12 Apr 1978

USSR

UDC: 621.373.001.24:621.372.413

VINOGRADOV, G. I., KREYNOVICH, Ya. R., RADETSKIY, M. N., SLUTSKIY, P. G.,  
SHERAYZIN, A. K., CHISTYAKOV, V. A.

"A Device for Tuning Resonant Circuits"

USSR Author's Certificate No 280579, filed 5 Jan 67, published 17 Nov 70  
(from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D384 P)

Translation: A device is proposed for tuning resonant circuits such as cavity circuits. The device contains a two-armed lever connected by a rod to the tuning element of the circuit to be adjusted, and resting on the cams of a discrete controlling mechanism. To improve the operating precision of the device, the two-armed lever is made in the form of a yoke equipped with regulating screws and connected to a set of levers whose spring-loaded shanks rest on the cams of the control mechanism. Two illustrations. V. P.

1/1

**Steels**

USSR

UDC:669.187.2:621.746

CHISTYAKOV, V. F., AVERIN, V. V., PRONOV, A. P., DANTLIN, V. I.,  
LISOV, I. V., YERMAKOV, B. A., KISELEV, A. A., DUMCHEV, YA. P. and  
KHRISTICH, V. D., "Krasnyy Oktyabr'" Plant

"Casting of ShKh15 Steel under Exothermic Slag-Forming Briquets"

Moscow, Metallurg, No 1, Jan 74, pp 19-22

Abstract: Exothermic, slag-forming briquets were tested by casting of steel melted in a 16-ton electric arc furnace with evacuation of the metal, not deoxidized with silicon and aluminum, in the ladle. For comparison, steel was cast in 2.7 t ingots by the siphon method without briquets and with application of a light crust to the surface of the liquid metal when the mold was 1/3 full. The riser was heated with type L28M lungerite and an exothermic mixture based on 75% FeSi. The experimental briquets produced steel of a quality corresponding to the requirements of the state standard (GOST801-60). The ShKh15 steel produced with the exothermic experimental briquets was higher in quality than metal produced in coated molds.

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Acc. Nr.: AP0050244 CHISTYAKOV Ref. Code: VUS0000

PRIMARY SOURCE: FBIS, Daily Report, Soviet Union, 30 March 1970, Vol III, No 61, p d 1

USSR

**BENNETT'S COMET OBSERVED FROM SOVIET FAR EAST**

Moscow TASS International Service in Russian 0637 GMT 27 Mar 70 L


[Text] Vladivostok-John Bennett's Comet, discovered in December 1969, was today observed in the south of the Soviet Far East.

Astronomer Vladimir Chistyakov told a TASS correspondent that Bennett's Comet was visible from 5 to 6 o'clock in the morning local time. Its head had a bright white light and was comparable in brilliance with stars of the first magnitude. The bright tail extended in a westerly direction and was easily discernable against the dark sky.

Far Eastern astronomers took several photographs of Bennett's Comet, using a chromosphere telescope with photo apparatus.

Reel/Frame  
19810170

12 30.

1/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--TWO NEW EFFECTS OBSERVED IN THE MAGNETIC FIELDS OF SUNSPOTS -U-  
AUTHOR--CHISTYAKOV, V.F.   
COUNTRY OF INFO--USSR  
SOURCE--ASTRONOMICHESKII ZHURNAL, VOL. 47, NO. 3, 1970, P. 533-540  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--ASTRONOMY, ASTROPHYSICS  
TOPIC TAGS--SUNSPOT, SOLAR MAGNETIC FIELD, SPECTROGRAPH, SOLAR TELESCOPE,  
HORIZONTAL TELESCOPE, ZEEMAN EFFECT/(U)ATSU5 HORIZONTAL SOLAR TELESCOPE  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY FICHE NO----FD70/605012/B11 STEP NO--UR/0033/70/047/003/0533/0540  
CIRC ACCESSION NO--AP0140255  
UNCLASSIFIED



2/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70  
CIRC ACCESSION NO--AP0140255  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ANALYSIS OF A TOTAL OF 306  
SPECTROGRAMS OF 59 SUNSPOTS OBTAINED AT USSURIYSK IN 1968 AND 1969 ON AN  
ATSU-5 HORIZONTAL SOLAR TELESCOPE WITH A NEGATIVE BARLOW LENS. THE  
OCCURRENCE OF A WAVELENGTH SHIFT IN THE ZEEMAN TRIPLET CIRCULAR  
COMPONENTS AND THE INEQUALITY OF MAGNETIC SPLITTING IN SPECTRA WITH  
DIFFERENT TYPES OF CIRCULAR POLARIZATION ARE ESTABLISHED IN THE SUNSPOT  
SPECTROGRAMS. IN SUNSPOT NUCLEI, BOTH EFFECTS DEPEND ON THE MAGNETIC  
FIELD SIGN AND ON THE DIRECTION OF CIRCULAR SPECTRUM POLARIZATION. THEY  
ARE FINER THAN THE ZEEMAN EFFECTS IN THAT THEY PRODUCE WAVELENGTH SHIFTS  
AVERAGING UP TO 20PERCENT OF THE MAGNETIC SPLITTING VALUES. IT IS NOTED  
THAT THESE EFFECTS ARE NOT MEASURED BY ORDINARY SOLAR MAGNETIC FIELD  
OBSERVATIONS WHICH THEREFORE GIVE USUALLY TOO LOW MAGNETIC FIELD VALUES.  
FACILITY: AKADEMIIA NAUK SSSR, VOL. 47, NO. 3, 1970, P.  
533-540.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--MAGNETIC AND STRUCTURAL CHARACTERISTICS OF COLD ROLLED TRANSFORMER  
STEEL WITH RIBBED STRUCTURE AND LOW SPECIFIC LOSSES -U-  
AUTHOR--(04)--DRUZHININ, V.V., PRASOVA, T.I., CHISTYAKOV, V.K., KURENNYKH,  
L.K.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(2), 226-32  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, PHYSICS  
TOPIC TAGS--TRANSFORMER STEEL, COLD ROLLING, METAL TEXTURE, GRAIN SIZE,  
CRYSTAL STRUCTURE, MAGNETIC PROPERTY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1995/0201 STEP NO--UR/0048/70/034/002/0226/0232  
CIRC ACCESSION NO--AP0115905  
UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--09OCT70  
CIRC ACCESSION NO--AP0115905  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TO PRODUCE A COLD ROLLED  
TRANSFORMER STEEL WITH A RIBBED TEXTURE AND SP. LOSSES  $\rho_{15-50}$  EQUALS  
0.9-1.0 W-KG THE FOLLOWING CONDITIONS MUST BE FULFILLED. THE PRESENCE  
OF STRONGLY PRONOUNCED CRYSTALLOGRAPHIC TEXTURE; THE DEGREE OF  
PERFECTION OF THE MAGNETIC TEXTURE SHOULD BE SUCH THAT  $\gamma$  EQUALS  
(1-3) TIMES  $10^6$  PRIME NEGATIVE 6; THE AV. GRAIN SIZE SHOULD BE MAINTAINED  
AT 1-4 MM; THE SUM TOTAL OF C, S, N, AND AL IMPURITIES IN THE STEEL  
SHOULD BE SMALLER THAN 0.01PERCENT. FACILITY: VERKH-ISETSKII  
MET. ZAVOD, USSR.

UNCLASSIFIED

USSR

UDC: 536.2.082

DUGANOV, G. V., CHISTYAKOV, V. L., STREZHEKUROV, E. Ye.

"New TPM-1 Heat-Physical Instrument"

Priborostroyeniye. Resp. Mezhved. Nauch.-Tekhn. Sb. [Instrument Building. Republic Interdepartmental Scientific and Technical Collection], 1972, No 13, pp 17-21 (Translated from Referativnyy Zhurnal Metrologiya i Izmeritel'naya Tekhnika, No 3, 1973, Abstract No 3.32.847), by V. S. K.

Translation: A report is presented on the TPM device, developed at the Sevastopol' Instrument Building Institute, designed for determination of a combination of heat-physical characteristics of materials, including metals, by an express method under production conditions. The sensor of the device is made of Teflon with a low coefficient of linear expansion and a low heat conductivity coefficient. The indicator of the measurement circuit is a type ViV 250  $\mu$ a microammeter. The device is supplied by a "Krona" battery with a total voltage of 9 v; the heater of the thermal sensor is supplied by an individual battery of 5.6 v. The TPM-1 device, properly calibrated, can detect the presence of certain inclusions or cavities in metals during rolling of titanium and alloy plates, and also during assembly or installation of metal structures. 1 figure, 2 biblio. refs.  
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171  
CHISTYAKOV, V. M.

INFORMATION  
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SO: FOREIGN PRESS DIGEST

31 AUGUST 1971

66. USSR

UDC 002.001

CHISTYAKOV, V. M.

"Problems of Informatics (A Discussion)"

Novosibirsk, Probl. Informatiki. Zacheh. Seminar -- Sbornik (Problems of Informatics. A Correspondence Seminar -- Collection of Works), Vypusk 1, "Nauka," 1970, pp 13-23 (from R-Zh -- Informatika, No 4, Apr 71, Abstract No 71.4.12 (71R--438))

Translation: Individual problems of informatics are examined in the form of a discussion, and it is noted that at least three views of informatics exist at the present time. They reflect respectively the points of view of specialists in the fields of automation, telemechanics, measurement technology, and computer technology; informatics; and scientology and forecasting. It is confirmed that informatics as a science is in an empirical stage of development and it is necessary to raise it to a higher theoretical level. Informatics is defined as the science whose subject is the relationship between a scientific information system and the information processes in it. In accordance with this understanding, three groups of urgent problems (problem nodes) are singled out: 1) research on the emissions of information in a communications system and the associated problems of rationalization of the processes of production of new structures, including creative processes; 2) increasing the

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31 Aug 71

88

PPD:CYBERNETICS

USSR

CHISTYAKOV, V. M., Probl. Informatiki. Zaochn. Seminar -- Sbornik, Vypusk 1, "Nauka," 1970, pp 13-23

capacity of information and consolidation of knowledge; and 3) a study of the principles of information propagation and a search for ways of improving transmission channels and the processes of perception. The structure of informatics at the content level is given in the form of a problem tree, resulting in a separation of the problem nodes. It is concluded that the problem tree may prove useful in a survey of the research trends and boundaries of informatics, which can be regarded as a composite science of an applied nature.

1/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--THE PARTICIPATION OF THE LUNGS IN FIBRINOLYTIC PROCESSES OF THE  
ORGANISM -U-  
AUTHOR--(05)-SOLOVYEV, G.M., GUSEYNOV, CH.S., GEBEL, G.YA., CHISTYAKOV,  
V.N. FLEROV, YE.V. |  
COUNTRY OF INFO--USSR C

SOURCE--BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY, 1970, VOL 69,  
NR 5, PP 22-25  
DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--LUNG, BLOOD VESSEL, LACTIC ACID, INTRAVENOUS PERFUSION,  
ACIDOSIS, FIBRINOLYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0369

STEP NO--UR/0219/70/069/005/0022/0025

CIRC ACCESSION NO--AP0121057

UNCLASSIFIED

2/2 022

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--A0121057

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN EXPERIMENTS ON DOGS THE AUTHORS STUDIED THE REACTION OF PULMONARY VESSELS TO THE ADMINISTRATION OF A 30PERCENT SOLUTION OF LACTIC ACID WHICH CAUSES SPASM OF PULMONARY VESSELS AND A STATE OF METABOLIC ACIDOSIS. IT IS SHOWN THAT IN THE BLOOD OUTFLOWING FROM THE LUNGS THE CONTENT OF FIBRINOLYSIS PROACTIVATORS AND FIBRINOLYTIC ACTIVITY ARE GHIGHER IN COMPARISON WITH THOSE IN THE BLOOD INFLOWING TO THE LUNG. FACILITY: SCIENTIFIC RESEARCH INSTITUTE OF CLINICAL AND EXPERIMENTAL SURGERY, MOSCOW.

UNCLASSIFIED



USSR

CHISTYAKOV, V. P.

"Transient Phenomena in Branching Processes with Several Types of Particles"

Teoriya Veroyatnostey i Ee Primeneniya [Theory of Probabilities and its Application], 1972, Vol 17, No 4, pp 669-678 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V114, by A. Zubkov).

Translation: The author extends results which he produced in studying transient phenomena in branching processes with  $m$  types of particles for the case of discrete time to the case of continuous time (see RZhMat, 1961, 9V62), and corrects certain errors in the earlier article.

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1/2 012 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--TAUTOMERISM OF 5,5,DISUBSTITUTED BARBITURIC ACIDS -U-  
AUTHOR--(03)-GAVRILIN, G.F., CHISTYAKOV, V.YE., KONONENKO, G.A.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(3), 669-72  
DATE PUBLISHED--70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--TAUTOMERISM, BARBITURATE, ORGANIC ACID, KETONE, PHARMACEUTICS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/0932 STEP NO--UR/0079/70/040/003/0669/0672  
CIRC ACCESSION NO--AP0124592  
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124592

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IR SPECTRA OF BARBITURIC ACIDS AND THEIR K SALTS SHOW THAT 5,5-DISUBSTITUTED ACIDS (PHONOBARBITAL AND ITS HYDRATE, CARBITAL, AMYTAL) POSSESS, IN THE SOLID STATE, THE TRIKETO OR DIKETOLACTIM STRUCTURES. HYDROLYSIS OF BENZONAL 1 HR WITH AQ. NAOH GAVE THE PRODUCT IDENTIFIED AS  $\text{PH SUB2 CHCONBZCONH SUB2 M. 210DEGREES, I. E. ENOLIZATION OCCURS AT THE 4(6), CARBONYL GROUP OF BARBITURIC ACID. FACILITY: VGVOKUZNETSK. NAUCH.-ISSLED. KHIM.-FARM. INST., NOVOKUZNETSK, USSR.}$

UNCLASSIFIED

CHISTYAKOV, Yu.D.

SPRS 59208  
6-73

3

IX. 4b. STUDY OF THE MECHANISM OF GROWTH AND ALLOYING OF AUTOEPITAXIAL LAYERS ON CONDENSATION FROM MOLECULAR BEAMS IN A VACUUM

Article by L. A. Seydman, L. N. Hemelrovskiy, Yu. D. Chistyakov, Novosibirsk, 111 Stetskiy St. Zhurnal Fizicheskoi Khimii, 1972, p. 1197

A report is given on the results of studying the growth of autoepitaxial layers of Germanium with condensation from molecular beams in a vacuum of  $1 \cdot 10^{-6}$  mm Hg obtained by means of a vapor-oil pump. Studies were made of the initial growth stages of the Ge autoepitaxial layers at condensation temperatures of 620-920°C and with a growth rate of 100 Å/sec. It is demonstrated that growth begins with nucleation, growth and coalescence of three-dimensional growth centers. The higher temperatures correspond to larger dimensions of the nuclei and lower density of them. The stage of initial growth defines the surface morphology of the epitaxial layer in the following growth stages.

It is demonstrated that the degree of perfection of the crystal lattice of the epitaxial layer and its surface morphology essentially depend on the surface structure of the substrate. The substrate surface was hemisided with argon ions in a vacuum of  $2 \cdot 10^{-5}$  mm Hg directly before growing. This treatment cleans the surface of the oxide layer and other contaminants. Here, the number of defects in the crystal lattice of the autoepitaxial layer of germanium is reduced by two or three orders.

Studies were made of the condensation, diffusion and reevaporation of impurity atoms with growth of the germanium autoepitaxial layers. It was demonstrated that it is possible to find conditions which insure reproducible deposition of the epitaxial layers with a high alloying level.

A study was made of the possibility of the occurrence of the mechanism by the vapor → autoepitaxial layer and vapor → liquid → autoepitaxial layer scheme.

CHISTYAKOV, Yu.D.

SPRS 598 03  
6-73

13-4a. STUDY OF GERMANIUM EPITAXY FROM A MOLECULAR BEAM IN A VACUUM THROUGH THE LIQUID PHASE

Article by A. I. Pakarev, Yu. P. Mishaenko, A. N. Korshakov, Yu. D. Chistyakov, Moscow; Novomibirsk, III Smpozium na Progression, Nonts i Sintez Poluprovodnikov i Kristallov i Plenok, Kazan, 12-17 June 1972, p 118j

A study was made of germanium epitaxy from a molecular beam in a vacuum [10<sup>-4</sup> to 10<sup>-5</sup> mm Hg] through a layer of previously formed liquid phase (tin, indium, gallium) on the surface of various substrates (germanium, silicon or gallium arsenide). The best results were obtained for the case of germanium condensation through the alloy layer (tin-lead) on the surface of germanium crystalline germanium substrate. This is explained by the best wetting conditions. The deposition of the metal creating the liquid phase was carried out at a substrate temperature of 70-100 degrees, subsequent pickling of the metal at a temperature of 300-500 degrees, and deposition of germanium through the liquid phase layer, at 300-400 degrees. The x-ray diffraction method of Kossel was used to estimate the variation of the crystal lattice parameter of the autoepitaxial layer of germanium on saturation of it with tin (0.87 atomic percent). The possibility of creating microdiodes using the given process is demonstrated. The volt-ampere characteristics of the microdiodes 0.2mm in diameter (the n-type layer, the p-type substrate) are close to the characteristics of the all-purpose DiD and DiZn germanium point-contact diodes. The results obtained indicate the prospectiveness of the given method of epitaxy for the creation of homojunctions and heterojunctions based on semiconductors.

CHISTYAKOV, YU. D

SPRS 59208

6-73

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IV-5. INTENSIFICATION OF THE GROWTH PROCESSES OF EPITAXIAL LAYERS BY PHOTO EXITATION AND THE APPLICATION OF ELECTROMAGNETIC FIELDS

(Article by Yu. D. Chistyakov, A. D. Gerasimov, Yu. P. Reymova, A. N. Palislenko, V. A. Kirpukhin, V. I. Sharapov, Moscow: Novosibirsk, III Stepanovskogo Proletarskogo Universiteta, Poluprovodnikov Khimicheskii Katedra, Russian, 12-17 June, 1972, p 46)

The effect on the system from photoradiation and electromagnetic fields per se, in contrast to the thermal effect, stimulation of defined chemical reactions both in the volume and at the phase interface. Each chemical reaction depending on the electric transition taking place in it requires irradiation by light of a strictly defined wave length. The photoradiation offers the possibility of simple realization of a selective crystal growth with respect to area.

In the papers by Frazier and Kusarava it was demonstrated that irradiation by ultraviolet light lowers the autoepitaxial temperature of the silicon in the presence of hydrogen reduction of SiCl<sub>4</sub> and SiCl<sub>2</sub> respectively, and with a constant temperature it increases the growth rate.

In the experiments of the authors by application of an electric field with an intensity of 3 kv/cm in the chloride process of silicon autoepitaxy, it was possible to increase the growth rate of the epitaxial layers and also to reduce the process temperature. In addition, the variation in intensity of the electromagnetic field permits variation of the alloying level without varying the composition of the vapor-gas mixture.

The indicated effects also open up new possibilities for intensifying the technological processes.

CHISTYAKOV, Yu. D.

50: JPRS 59279  
14 June 73

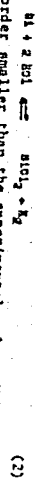
MECHANISM OF SILICON AUTOEPITAXY DURING TRANSPORT IN SMALL INTERVALS

Article by Yu. D. Chistyakov, A. S. Korotkiy, Novosibirsk, Prolsennoy Kozhii  
Struktura i Kinetika Avtoepitaksial'nogo Sloynov Poluprovodnikov - Study Sirovolina,  
Russian, Part 2, 1969, pp 42-51]

The thermodynamic and kinetic studies of the reactions which are considered  
[1-3] defining in the silicon transport process using chlorine-containing  
transport agents adopted by us [4] to explain the existing experimental data did  
not give satisfactory results. The growth rates of the autoepitaxial layer  
of silicon obtained by the calculation procedure for transport by the reaction:



significantly exceed the experimental values at the same time as the calculation  
based on the assumption that the transport is realized using the reaction



gives values almost an order smaller than the experimental values (Figure 16).

The lack of correspondence of the theoretical and experimental results  
is difficult to explain beginning with the generally accepted criteria of the  
Sandwich process. Obviously, the existing concepts of the mechanism of auto-  
epitaxy do not take into account any cardinal peculiarities of the process.

The authors of reference [3] arrived at analogous conclusions in their research.  
Without indicating the lack of correspondence of the experimental and theoretical  
results, they could not explain a number of anomalous phenomena when obtaining  
autoepitaxial layers of silicon by the sandwich method. In spite of the numerous  
studies [5], the phenomena connected with autoepitaxy of the autoepitaxial  
layer of silicon by the substrate entering into the substrate composition  
remain unexplained. There is no explanation from the point of view of existing  
concepts of the mechanism of autoepitaxy, and the anomalies differences in the  
transport coefficients of the elements of Group III which are similar with  
respect to properties (for boron  $K = 0.6-0.8$ ; for aluminum  $K = 0.01-0.02$ ) or  
Group V elements (for phosphorus and arsenic  $K = 0.3-0.4$ ; for antimony  $K = 0.01-$   
 $0.005$ ).

Therefore, the conclusion regarding the necessity for reexamining the  
existing point of view of the autoepitaxy mechanism turns out to be valid.

CHISTYAKOV, Yu. D.

SO: SPAS 59279  
14 June 73

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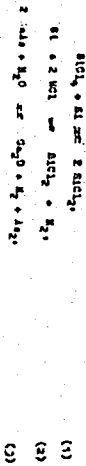
UTILIZATION OF THE SANDWICH METHOD TO OBTAIN EPITAXIAL LAYERS OF SEMICONDUCTING MATERIALS

911 - *Sovetskaya Fizika*

Article by A. S. Yonokov, Yu. D. Chistyakov, Yu. N. Tikhonov, Novosibirsk, Professor Rosita [SEKHUNIN, NIKOLAI, TIKHONOV, YU. N., YONOKOV, A. S., Trudy Sibirskogo Nauchno-Issledovatskogo Instituta Poluprovodnikov ... Russian, Part 2, 1969, pp 33-41]

In this paper a study was made of obtaining autoepitaxial layers of Si. Gases and also heteroepitaxial layers of GaAs-Ge using the sandwich method [1].

As the transport agent for transporting the silicon we used SiCl<sub>4</sub> vapor and for the GaAs transport, the H<sub>2</sub>O + H<sub>2</sub> system. The reactions regulating the transport process in this case are:



The thermodynamic and kinetic analysis of the reactions (1) and (2) which are considered [2-4] defining in the silicon transport process performed by us in reference [5] demonstrated the significant lack of correspondence of the calculated and experimental values. In order to explain this and a number of other anomalous phenomena noted during the autoepitaxy, we proposed a mechanism [6] taking into account the nature of the physical-chemical interaction of the substrate with the environment and assuming the presence of a liquid phase of the defined composition on the surface of the plates.

Experimental Apparatus and Procedure

In order to obtain the epitaxial layers of gallium arsenide, a device was used with infrared heating. The heating by infrared lamps lowers the amount of admixture entering the reaction zone from the elements of the apparatus since these elements are at a lower temperature than the sandwich packet. In addition, the low inertia of the infrared heaters permits us to achieve the given process temperature in two or three minutes after switching the lamps



CHISTYAKOV, Yu. D.

SO: JPRS 54879  
14 June 73

MECHANISM OF AUTOEPI TAXY OF SILICON FOR GROWTH FROM THE VAPOR-GAS MIXTURE  
(SiCl<sub>4</sub> + H<sub>2</sub> + 3 Cl<sub>2</sub>) IN THE OPEN PROCESS

Article by Yu. D. Chistyakov, A. Yu. Malinin, V. M. Birukov; Novosibirsk,  
Proteyny Konts. i Strukturno-Fizikallicheskii Sloyev Poluprovodnikov -  
Tretiy Simpozium, Krasnoy, Part 2, 1969, pp 22-27

Introduction

The existing concepts of the growth of autoepitaxial layers of silicon can not give an answer to a number of the problems of practical importance advanced by epitaxial technology. Inasmuch as the method of obtaining autoepitaxial layers of silicon by reducing it with hydrogen from halides in the open process has been most developed, and it is widely used in epitaxial technology, without a doubt any efforts more precisely to define the mechanism of the epitaxy process are expedient.

The mechanism of autoepitaxy of silicon discussed earlier [1, 2] in general outline was based on the assumption of the existence of a continuous thin layer of liquid phase coating the surface of the substrate and participating in the process of growth of the autoepitaxial layer of silicon.

The indicated layer is formed in accordance with the phase equilibrium diagram of the Si-O-3% system (3% is the allowing additive) in a random admixture. This layer differs with respect to composition and mechanism of formation from the layers of the liquid phase which were discussed in the papers by Wagner, et al. [3, 4], Filby and Nielsen [5], and so on.

The VLS (vapor-liquid-solid state) mechanism proposed by these authors provides for the presence of a specially applied layer of one of the metals giving the light-alloy eutectic point with the substrate. When the silicon reaches the surface of the artificially formed liquid phase, growth of the autoepitaxial layer of the silicon on the liquid phase-substrate interface takes place.

The purpose of this paper is to confirm the reality of the existence of the liquid oxygen-containing phase occurring spontaneously during the process

USSR

UDC 621.217.7.087.92-932

FRANK, G. A., and CHISTAKOV, Yu. D.

"On the Possibility of Making Precision Thin-Film Voltage Dividers for Digital Measuring Instruments"

Sb. nauch. tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn.  
(Collected Scientific Works on Problems of Microelectronics. Moscow Institute of Electronic Technology), 1972, vyp. 8, pp 165-173 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 9, Sep 72, Abstract No 9A112)

Translation: The authors consider requirements for the most typical resistor ratio circuits used in digital measuring instruments and investigate the possibility of making voltage dividers by thin-film techniques. Technological particulars which improve the electrophysical properties of voltage dividers are presented. Two illustrations, bibliography of one title. Resumé.

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CH ISTYAKOV, Yu. D.

57K 5 58208

6-73

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XII-5. MECHANISMS OF THE PROCESS OF LOCAL PICKLING OF SILICON SUBSTRATES MASKED WITH SILICON OXIDE.

Article by A. A. Shebetkin, K. G. H. Shvarts, Yu. D. Chistyakov, Moscow; Novosibirsk, III Sibirskoye Po Prikladnoyemu Spetsial'noyemu Polimirovedeniye Kristalloy (Izvestiya Akad. Nauk SSSR, 1972, p. 106)

A study was made of the process of local pickling of silicon substrates masked with silicon oxide in a mixture of hydrogen chloride and hydrogen. It was found that the shape of the depressions as a result of the etching depends on the temperature and concentration of the hydrogen chloride and is determined by two simultaneously occurring processes: between the silicon substrate free of the oxide mask and the H<sub>2</sub>-HCl mixture and between the substrate and the silicon oxide film in the presence of hydrogen.

The mechanism of local etching of the silicon substrates masked by an oxide film is proposed, and the possible forms of the depressions are explained on the basis of this.

The quantitative relation of the normal and tangential etching rates of the depressions is found.

1/2 024 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--ROLE OF AN OXIDE FILM IN THE FORMATION OF VACANCY FIGURES ON AN  
ALUMINUM SURFACE -U-  
AUTHOR--(02)-YEPANCHINTSEV, O.G., CHISTYAKOV, YU.D.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, METAL. 1970, (1) 150-1  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, PHYSICS  
TOPIC TAGS--ALUMINUM SURFACE, SURFACE FILM, METAL SURFACE PROPERTY,  
THERMAL EFFECT, OXIDE, CRYSTAL VACANCY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1988/0551 STEP NO--UR/0370/70/000/001/0150/0151  
CIRC ACCESSION NO--AP0105536  
UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0105536

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE INTERACTION OF THE DEGREE OF SUPERCOOLING  $\Delta T$  NEEDED FOR INITIATION OF NUCLEI OF VACANCY FIGURES ON THE SURFACE OF AL, AND THE TEMPERING TEMP.,  $\tau_{subH}$  SHOWED THAT WITH A RISE IN  $\tau_{subH}$  THE MAGNITUDE  $\Delta T$  FALLS IN ACCORD WITH THE DERIVED EXPRESSION  $\Delta T = \alpha \tau_{subH}^{1/3} - \beta \tau_{subH}^2$ , WHERE  $\alpha$  AND  $\beta$  ARE COEFFS. AFTER ACHIEVING A CERTAIN VALUE  $\tau_{subH}$  THERE IS A CHANGE IN THE SLOPE OF CURVE  $\Delta T = f(\tau_{subH})$ , WHICH IS RELATED TO THE CHANGE IN THE TEMP. REGION OF THE FORMATION OF THE OXIDE FILM ON THE AL SURFACE. THE IMPORTANT ROLE OF THE OXIDE FILM ON THE AL SURFACE IN THE DEVELOPMENT AND FURTHER GROWTH OF THE VACANCY FIGURES WAS CONFIRMED.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--MEASURING THE THERMAL CONDUCTIVITY OF THIN LAYERS OF SOLIDS -U-  
AUTHOR--(02)-SERGEYEV, O.A., CHISTYAKOV, YU.A.  
COUNTRY OF INFO--USSR  
SOURCE--TR. METROL. IN-TOV SSSR, WORKS OF METROLOGICAL INSTITUTES OF THE  
REFERENCE--RZH-FIZIKA, NO 1, JAN 70, ABSTRACT NO 1A160  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--THERMAL CONDUCTIVITY, HEAT MEASUREMENT, LAMINATED STRUCTURE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1992/0979 STEP NO--UR/0000/70/000/111/0040/0C53  
CIRC ACCESSION NO--AR0112139  
UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AR0112139

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN ANALYSIS IS GIVEN OF ORIGINAL WORK DEALING WITH THE MEASUREMENT OF THERMAL CONDUCTIVITY OF THIN LAYERS OF SOLIDS. IT IS SHOWN THAT METHODS OF MEASURING THERMAL CONDUCTIVITY USED SUCCESSFULLY ON MASSIVE SPECIMENS ARE NOT PRACTICALLY SUITABLE FOR THIN LAYERS. IT IS CONCLUDED THAT THE USE OF CONVENTIONAL METHODS IS RESTRICTED TO THE REGION OF LOW VALUES OF THERMAL CONDUCTIVITY (BASICALLY NO MORE THAN 1 S.M. DEG) AND COMPARATIVELY THICK LAYERS OF THE SPECIMENS STUDIED (200 MICRONS AND UP).

UNCLASSIFIED

USSR

UDC 53:07/.08

SERGEYEV, O. A., CHISTYAKOV, Yu. A.

"Measuring the Thermal Conductivity of Thin Layers of Solids"

Tr. metrol. in-tov SSSR (Works of Metrological Institutes of the USSR), vyp. 111 (171), pp 40-53 (from RZh-Fizika, No 1, Jan 70, Abstract No 1A160)

Translation: An analysis is given of original work dealing with the measurement of thermal conductivity of thin layers of solids. It is shown that methods of measuring thermal conductivity used successfully on massive specimens are not practically suitable for thin layers. It is concluded that the use of conventional methods is restricted to the region of low values of thermal conductivity (basically no more than 1 W/m.deg) and comparatively thick layers of the specimens studied (200 microns and up). Bibliography of 22 titles. Authors' abstract.

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USSR

UDC 621.315.592:546.28

CHISTYAKOV, YU.D., PALIYENKO, A.N., GULIDOV, D.N., SECHENOV, D.A.

"Some Features Of The Growth Of Autoepitaxial Layers Of Silicon During Application Of Exterior Electrical Field"

Sb. nauch.tr. po probl. mikroelektron. Mosk.in-t elektron.tekhn. (Collection Of Scientific Works On Problems Of Microelectronics. Moscow Institute Of Electronics Technology), 1972, Issue 8, pp 161-164 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 1972, Abstract No 9B77)

Translation: Consideration is given to the effect of an electrical field on the rate of flow of a chemical reaction at the surface of an increasing autoepitaxial layer (AEL) and on the controlled introduction of impurities into the AEL. Experimental data are presented on the growth rate of an AEL from a vapor-gas mixture ( $\text{SiCl}_4 + \text{H}_2$ ) during application of an exterior electrical field with an intensity of  $1 \div 5 \text{ kV/cm}$ . 6 ref. Summary.

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USSR

UDC 621.315.592:546.88

SLOTIN, V.V., BUTURLIN, A.I., DUVANOV, G.V., CHISTYAKOV, YU.D.

"Thermodynamic Analysis Of Hydrolysis Reaction Of Silicon Tetrachloride Vapors"

Sb.nauch.tr. po probl.mikroelektron. Mosk. in-ta elektron.tekhn. (Collection Of Scientific Works On Problems Of Microelectronics). Moscow Institute Of Electronics Technology, 1972, Issue 8, pp 193-199 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 1972, Abstract No 9B81)

Translation: A thermodynamic analysis is made of the hydrolysis reaction of  $\text{SiCl}_4$ . The temperature is determined for preparation of silica gel type products ( $\sim 60^\circ \text{C}$ ). The role is considered of the hydrolysis reaction of  $\text{SiCl}_4$  vapors in a chloride process for preparation of autoepitaxial layers of Si. 4 ref.

Summary.

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USSR

UDC 621.315.592:546.28

CHISTYAKOV, YU.D., RAYNOVA, YU.P., MALININ, A.YU.

"Mechanism Of Formation Of Oxide Films Of Silicon From Vapor-Gas Mixture  
[SiCl<sub>4</sub> + H<sub>2</sub> → CO<sub>2</sub>]"

Sb.nauch.tr. po probl. mikroelektron. Mosk. in-t elektron. tekhn. (Collection Of Scientific Works On Problems Of Microelectronics. Moscow Institute Of Electronics Technology), 1972, Issue 8, pp 174-183 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 1972, Abstract No 9B84)

Translation: The principal kinetic characteristics are considered of the process of reaction of SiCl<sub>4</sub> with H<sub>2</sub> and CO<sub>2</sub>, and conclusions are drawn concerning the reaction mechanism of the latter. The micromechanism of the formation of the oxide phase of the vapor-gas mixture [SiCl<sub>4</sub> + H<sub>2</sub> + CO<sub>2</sub>] is considered in accordance with the phase diagrams in the system Si-O. 7 ref. Summary.

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USSR

UDC 621.315.592:546.28

SLOTIN, V.V., BUTURLIN, A.I., DUVANOV, G.V., CHISTYAKOV, YU.D.

"On The Possibility Of Control Of The Composition Of A Vapor-Gas Mixture In The Chloride Process Of Preparing Autoepitaxial Layers Of Silicon By The Method Of Piezoquartz Microweighing With A Sorbing Layer"

Sb. nauch.tr. po probl.mikroelektron. Mosk. in-t elektron.tekhn. (Collection Of Scientific Works On Problems Of Microelectronics. Moscow Institute Of Electronics Technology), 1972, Issue 8, pp 184-192 (from RZh:Elektronika i yeye primeneniye, No 9, Sept 72, Abstract No 9B78)

Translation: The paper considers a statement of the problem of automatization of the control of the composition of a vapor-gas mixture in the chloride process of preparing autoepitaxial layers of Si. Requirements are formulated for methods of control which make it possible to automatize the measurement process. An analysis is made of the possibilities of a method of piezoquartz microweighing with a sorbing layer and the prospects for its use for continuous control of the composition of vapor-gas mixtures are shown. 16 ref. Summary.

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USSR

VORONOV, A. A. CHISTYAKOV, Yu. V.

"Approximate Methods of Determining Busy Period"

Teoriya i Prakt. Mekhanizir. Obrab. Ekon. Inform. [Theory and Practice of Mechanized Processing of Economic Information -- Collection of Works], Moscow, 1971, pp 65-74 (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V71 from the Resume).

Translation: A one-line queueing system with waiting and unlimited line length is studied with a recurrent input flow and arbitrary distribution of servicing time. Approximate methods for production of the distribution functions and mathematical expectation of the busy period are developed.

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- 2 -

USSR

UDC: 681.3.06:51

VORONOV, A. A., CHISTYAKOV, Yu. V.

"One Mathematical Model of Computer Solution of Problems of Varying Priority"

V sb. Teoriya i praktika mashin. obrab. ekon. inform. (Theory and Practice in the Computer Processing of Economic Information--collection of works), Moscow, 1971, pp 50-64 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V740)

Translation: In the face of the random nature of the presentation of demands for solution of individual problems and random time of their solution, it is necessary to be able to evaluate the reliability of the solution of problems within the deadlines established even in the planning stage of atomic power plants. This paper deals with the problem of making this kind of evaluation.

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USSR

UDC 547.963.3

CHISTYAKOVA, A. V.

"The Structure of Viral Desoxyribonucleic Acids"

Abstract: This survey presents data on the dimensions of DNA molecules isolated from virus particles; the characteristics of the structure of single-strand DNA obtained from phages and of double-helix DNA, which is typical of animal viruses and the majority of phages, are also presented. In addition, various ring-shaped forms of viral DNA are considered.

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1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--CHANGES IN THE ULTRASTRUCTURE OF EPIDERMIS IN PSORIASIS -U-  
AUTHOR--(03)-TSVETKOVA, G.M., GETLING, Z.M., CHISTYAKOVA, I.A.  
COUNTRY OF INFO--USSR  
SOURCE--VESTNIK DERMATOLOGII I VENEROLOGII, 1970, NR 5, PP 13-17  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--SKIN DISEASE, BIOPSY, DIAGNOSTIC MEDICINE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1998/0689 STEP NO--UR/0206/70/000/005/0013/0017  
CIRC ACCESSION NO--AP0121350  
UNCLASSIFIED



2/2 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121350

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PAPER PRESENTS THE RESULTS OF INVESTIGATION OF THE ULTRASTRUCTURE OF EPIDERMIS IN DIFFERENT PERIODS AND FORMS OF PSORIASIS (STATIONARY AND PROGRESSING PERIODS, AS WELL AS IN PSORIATIC ERYTHRODERMIA). BIOPSIES OF THE SKIN IN THE AREA OF PSORIATIC ELEMENTS FROM 10 PATIENTS AT THE AGE OF 21 TO 50 YEARS WERE STUDIED. THE STUDIES INDICATED THAT DEVELOPMENT OF PSORIATIC ELEMENTS WAS BASED ON INCREASED FUNCTIONAL ACTIVITY OF EPIDERMIS CELLS ACCOMPANIED BY DISTURBANCES IN OXIDATIVE PROCESSES AND PHENOMENA OF KERATINIZATION. HYPOXIC STATES ARE CONFIRMED BY THE PRESENCE OF DYSTROPHIC AND DESTRUCTIVE CHANGES IN EPIDERMIS CELLS AND SIGNS OF EDEMA.

FACILITY: OTDELY PATOMORFOLOGII I DERMATOLOGII  
 TSENTRAL'NOGO N-I KCZHNO-VENEROLOGICHESKOGO INSTITUTA MINISTERSTVA  
 ZDRAVOOKHRANEN. SSSR, MOSCOW.

UNCLASSIFIED

Pharmacology and Toxicology

USSR

UDC 615.285.7.099

BUCHKO, V. M., RABUKHINA, V. A., and ~~CHISTYAKOVA, I. V.~~, Chair of Internal Diseases, First Leningrad Medical Institute imeni I. P. Pavlov, Hospital Number Two, Zhdanovskiy Rayon

"Clinical Manifestations of Occupational Intoxications With Some Organophosphorus Compounds"

Moscow, Sovetskaya Meditsina, No 10, Oct 70, pp 143-145.

Abstract: Clinical manifestations and methods of treatment are described for 106 cases of intoxication with chlorophos (Dipterex) or thiophos, organophosphorus compounds widely used in agriculture for the control of insects and rodents. The patients arrived at the hospital within 1 to 15 hours after intake of 30 to 500 g of the poisons. On the basis of clinical symptoms, intoxications with these compounds are divided into mild, moderately severe, and severe categories. Severity of intoxication varies according to the time lag between intake of the poison and medical treatment. No definite relationship between dose and severity was established. Symptoms of moderate intoxication include bradycardia, moisis, muscular fibrillation, and, in some cases, asthma induced by bronchospasms. In mild cases, these symptoms are less  
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USSR

BUCHKO, V. M., et al, Sovetskaya Meditsina, No 10, Oct 70, pp 143-145

strongly expressed. Severe cases are usually accompanied by disturbances of the central nervous system, coma, disturbed respiration, low arterial pressure, and pulmonary edema, in addition to the above symptoms. Treatment usually consists of administration of atropine, ephedrine, cardiac preparations, glucose with vitamins, artificial respiration, and camphor and oxygen when necessary. Prompt gastric lavage is an important factor in prevention of the development of severe forms of this intoxication.

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- 65 -

Acc. Nr: **AP0044183**

Ref. Code: UR 0016

PRIMARY SOURCE: Zhurnal Mikrobiologii, Epidemiologii, i  
Immunobiologii, 1970, Nr 2, pp 91-95

CHANGES OF THE PROPERTIES OF DIPHTHERIA  
BACTERIOPHAGE AND OF ITS CAPACITY TO CONVERSION  
IN THE DIRECTION OF TOXIGENICITY  
WITH THE CHANGE OF THE HOST-STRAIN

I. V. Chistyakova

Diphtheria moderate bacteriophage 253k, isolated from local lysogenic toxigenic culture, capable of provoking lysogenic conversion of sensitive nontoxigenic culture into toxigenic, lost its converting activity and capacity to lyse its initial strain of reproduction after adaptation to nonsensitive strain C. diphtheriae No. 444 (Freeman). The loss of converting properties was irreversible and repeated adaptation of such changed bacteriophage to the initial host failed to lead to reversion of its initial signs. After the adaptation to the strain No 444, bacteriophage 253k acquired the properties which affiliated it with the known Roumanian bacteriophage Pc29, for which the mentioned culture was the usual strain of reproduction. The changes described led to a supposition that they occurred on account of mutations of the converting bacteriophage.

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REEL/FRAME  
19770668

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USSR

UDC 551.573

BUKATY, V. I., KOPYTIN, Yu. D., POGODAYEV, V. A., KHMELEVTSOV, S. S.,  
CHISTYAKOVA, L. K., Institute of Atmospheric Optics of the Siberian  
Department of the Academy of Sciences USSR, Siberian Physicotechnical  
Institute imeni V. D. Kuznetsov at Tomsk State University

"The Light-Reactive Motion of Aerosol Particles Acted on by Optical  
Radiation"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, No. 3, 1972, pp 41-44

Abstract: A study of the motion of water droplets of an aerosol under the action of optical radiation is described. It is noted that in the radiation heating of a water droplet, the dimensions of which are considerably greater than the wavelength of the radiation, the radiation process has a highly asymmetric character due to anisotropy of the light field in the droplet. The asymmetry of the evaporation process leads to the appearance of a resulting force from the outflow of evaporated material and causes "light-reactive" motion of the droplet in the optical field. An expression is obtained for the light-reactive force, taking into account the refracting properties of the spherical surface. Experimental studies were conducted

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USSR

BUKATY, V. I., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, No. 3, 1972, pp 41-44

with drops fastened at the end of a vertically placed grid. The breaking away of drops was slight and was considered in finding the rate of light-reactive motion from the equation for force oscillations of a physical pendulum. The coefficient of elasticity of the grid was determined experimentally on the basis of the oscillation period measured. The initial and final dimensions of the droplet were recorded with a SKS-1M motion picture camera. A type GOR-0.2 ruby laser was used as an activating source for the light pulse energy of 0.15 joule. Calculations of velocities caused directly by light pressure and the action of radiometric forces on the part of the gas medium showed that their effect on the dynamics of the water particles was slight for the values of the parameters used in the experiment. The experimental and theoretical results agreed satisfactorily.

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USSR

UDC 621.373.826:53

POGODAYEV, V. A., KHELEVTSOV, S. S., and CHISTYAKOVA, L. K.

"Vaporization of Small Drops in an Optical Radiation Field"

Moscow, V sb. X Vses. konf. po rasprostr. radiovoln. Tczisy dokl.  
(Tenth All-Union Conference on the Propagation of Radio Waves;  
Report Theses--collection of works) "Nauka," 1972, pp 139-143 (from  
RZh--Radiotekhnika, No 10, 1972, Abstract No 10D586)

Translation: The dynamics of the vaporization of water drops with radii of about 20 microns in an aerosol atmosphere is investigated. Two modes are considered: surface vaporization, and explosion. In the explosion mode, the law for the scattering of the small drops obtained through the explosion of the initial particle of aqueous aerosol was studied. A. K.

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USSR

UDC 549.643.574.3

CHISTYAKOVA, M. B., and KAZAKOVA, M. Ye.

"A Find of Carpholite in the USSR"

Moscow, Doklady Akademii Nauk SSSR, Vol 195, No 6, 21 December 1970, pp  
1423-1426

Abstract: Carpholite, a very rare mineral, has been found during a study of the Kent pegmatite deposit in Central Kazakhstan. The carpholite was found on the deposit in shallow cavities of weakly greisenized granite, in greisen bodies, and in the pegmatite. At the Kent deposit the carpholite is formed under more diverse genetic conditions than at other deposits. Up to this time, it had never been observed to occur in pegmatite. 2 figures, 3 tables, 13 bibliographic entries.

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USSR

UDC 616.33+616.342]-002.44-085.849.112-073.97

CHISTYAKOVA, N. S., SKURIKHINA, L. A., MAMAYEVA, Z. K., and ARAPOVA, A. D.,  
Central Clinical Hospital, 4th Main Administration, Ministry of Health USSR,  
Moscow

"Dynamics of the Electrogastrogram During Comprehensive Therapy of Peptic  
Ulcer Including the Use of Microwaves"

Moscow, Voprosy Kurortologii, Fizioterapii i Lechebnoy Fizicheskoy Kul'tury,  
No 4, 1972, pp 341-344

Abstract: Electrogastrographic examination of 30 peptic ulcer patients showed increased electrical activity in most cases of duodenal ulcer in the acute and recurrent form, stages 1 and 2 in a state of exacerbation. Electrical activity was decreased in some patients suffering from stage 2 recurrent and chronic forms. Microwave therapy including medication normalized or improved gastric electrical activity. It also contributed to the relief of pain, disappearance or subsidence of dyspeptic phenomena, and cicatrization of the ulcer. No changes were noted in the stomach biopotential of patients treated with medication alone.

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- 60 -

Miscellaneous

USSR

UDC 669.018.25

IVENSEN, V. A., CHISTYAKOVA, V. A., and EYDUK, O. N., All-Union Scientific Research and Design Institute of Hard Alloy and Refractory Metals

"Investigation of the Change of Properties in Hard Alloy WC-Co During Deformation and Recovery of These Properties During Annealing. Communication I. Effect of Hard Alloy Deformation During Uniaxial Compression on Certain Physical and Mechanical Properties"

Kiev, Poroshkovaya Metallurgiya, No 9, Sep 73, pp 39-45

Abstract: Hard WC-Co alloys were studied to determine the change in properties resulting from preliminary deformation. The main areas studied were relationships of relative resistivity and coercive force to degree of deformation, bend strength to degree of deformation, stress at the start of yield and grain size of tungsten carbide to degree and direction of preliminary deformation, and change in relative width of diffraction lines of carbide and cobalt phase to degree of deformation, all for varying cobalt content. On the whole the investigations showed an essentially varying change of properties during deformation of the alloys with differing cobalt content and carbide grain size. These differences were caused by nonuniform development of strengthening and weakening processes, and the affinity to be slightly weakened during deformation is one of the important properties of the alloy and on the basis of

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USSR

IVENSEN, V. A., et al., Poroshkovaya Metallurgiya, No 9, Sep 73, pp 39-45

which it was suggested that the good performance of coarse-grain alloys under impact loads is determined not only by their increased formability but also by diminished weakening from deformation. 8 figures, 5 bibliographic references.

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- 23 -

USSR

UDC 669.721.472

3

STRELETS, Kh. L., DEVYATKIN, V. N., TATAKIN, A. N., CHESNOKOV, A. S., CHISTYAKOVA, V. S., MEDVETSKAYA, G. A., BONDARENKO, N. V.

"Development of Designs of Diaphragmless Magnesium Electrolyzers"

Tr. Vses. N-i. i Proyechn. In-ta. Alyumin., Magn. i Elektrodn. Prom-sti [Works of All-Union Scientific Research and Planning Institute of the Aluminum, Magnesium and Electrode Industry], 1970, No. 72, pp. 41-47. (Translated from Referativnyy Zhurnal Metallurgiya, No. 5, 1971, Abstract No. 5 G195 by the authors).

Translation: Results are presented from testing of pilot-scale diaphragmless electrolyzers (DE) with upper and lower input of anodes. The DE allow the specific consumption of electric power to be decreased by about 1500 kw-hr/t Mg, increasing the specific removal of Mg by 30-35% and decreasing the losses of Cl in the exhaust gases. The results of testing indicated that DE with lower position of the anodes should be introduced at two plants. 2 figs; 2 tables, 6 biblio refs.

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Acc. Nr: AP0038036

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 1, pp 133-134

THERMAL SELF-FOCUSSING IN A LIGHT BEAM WITH  
LOW INTENSITY NEAR THE AXIS

Askar'van, G. A.; Chisty, I. L.

Thermal self-focussing in a strong light beam with a low intensity near the axis is investigated. A blue light beam from a 0.3 W continuous argon laser was employed. Self-focussing was particularly pronounced in methylene iodide, alcohol solution of iodine and other liquids. It is shown that self-focussing of the inner part of the beam occurs under stationary conditions with different regimes of convection (vertical and horizontal rays were investigated). Movement of the liquid destroys self-focussing. Black-white and color photographs and moving films of the process have been made.

REEL/FRA  
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USSR

UDC: 621.372.01-503.25

TODUA, A. V., ZUYEV, L. N., YEREMEYEV, G. A., ~~CHITAIISHVILI, I. A.~~

"Frequency Parameters of the Input Circuits of Electronic Devices"

V sb. Radioelektronika optich. diapazona (Radio Electronics in the Optical Band--collection of works), Moscow, 1970(1971), pp 188-193 (from RZh-Radic-tekhnika, No 3, Mar 72, Abstract No 3A118)

Translation: The paper deals with the frequency and wave properties of a series tank circuit with auxiliary active load in parallel with the tank capacitance. An expression is found for the modulus of the transmission factor of the circuit, and an extremum analysis of this expression is given which shows the cutoff frequencies of the tank passband and the maximum transmission factor. An examination of transient processes in periodic and aperiodic modes of conduction is made on the basis of a differential equation for the voltage across an equivalent capacitor. It is shown that the given circuit can have two types of transient characteristics: classical, where the resistance of the loop is less than the double wave impedance, and non-trivial, where the zone of periodicity is in the middle of the range of external loads relative to the capacitor. In this connection, between the

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USSR

TODUA, A. V. et al., Radiotekhnika optich. diapazona, Moscow, 1970(1971),  
pp 188-193

upper and lower limits of the oscillatory region is a load at which the  
oscillatory process has an extremum. Two illustrations, bibliography of  
two titles. Ye. R.

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USSR

BABUNASHVILI, M. K.; CHITASHVILI, R. Ya. (Tbilisi)

"Optimization of Control in the Movement of a System Toward a Certain Goal"

Moscow, Avtomatika i Telemekhanika; May, 1972; pp 123-7

ABSTRACT: The authors consider a controlled system the goal of which is the attainment of a certain level. A given penalty is assigned for each failure in attaining the goal, and the price of obtaining each complex resource designed to correct a given state as well as the expense connected with determining a given current state of the system are taken into account. The problem of finding the optimal method of control, selection of resources, and time of shut-down minimizing the average losses in the system is analytically stated and solved. The probability characteristics of attaining the goal of the system are studied.

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USSR

UDC 51:350.115

LOMINADZE, N. M., KHUTSISHVILI, R. L., CHITAVA, Z. D.

"Experimental Study of the Solution of the Problem of Selecting Shipping Ports for Marine Transport"

Tr. XV Nauchno-Tekhn. Konf. Prof.-Prep. Sostava I Nauchn. Rabot Po. Probl. I Otrasl. Labor. Gruz. Politekhn. In-t Vyp. 17, [Works of the 15th Scientific-Technical Conference of Teachers and Scientific Workers of the Problem and Branch Laboratory of Georgian Polytechnical Institute, No. 17], Tbilisi, 1970, pp 69-76, (Translated from Referativnyy Zhurnal Kibernetika, No 5, 1971, Abstract No. 5V591).

No Abstract.

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1/2 011 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--EPIGENETIC ALTERATION OF LOOSE DEPOSITS OVERLYING SOUTHERN URAL  
PYRITE DEPOSITS AND THEIR EXPLORATION SIGNIFICANCE -U-  
AUTHOR--CHITAYEVA, N.A.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. GEOL. 1970, (3), 90-102.  
DATE PUBLISHED-----70  
SUBJECT AREAS--EARTH SCIENCES AND OCEANOGRAPHY  
TOPIC TAGS--LEAD ORE, MINERAL DEPOSIT, GEOGRAPHIC LOCATION, COPPER OXIDE,  
IRON OXIDE, GEOLOGY, GEOCHEMISTRY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3003/1437 STEP NO--UR/0011/70/000/003/0091/0102  
CIRC ACCESSION NO--AP0130372

UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130372

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MESOZOIC CENOZOIC LOOSE DEPOSITS, OVERLYING PALEOZOIC VOLCANIC SEDIMENTARY STRATA IN THE SOUTHERN URALS, WERE SUBJECTED TO MULTIPLE SECONDARY ALTERATIONS OCCURRING DURING VARIOUS TIMES AND RELATED TO THE CHANGES IN THE PALEOCLIMATE. THE DEGREE OF ALTERATION WAS NONUNIFORM. THE MOST INTENSE SECONDARY ALTERATIONS ARE TYPICAL OF LOOSE FORMATIONS FILLING KARST DEPRESSIONS AND OVERLYING PYRITE DEPOSITS IN ZONES OF ORE CONTROLLING FRACTURES. THE ZONES OF LIMONITIZED ROCKS, OUTLINING THE DIRECTION OF WATER FLOW TO THE ANCIENT DISCHARGE AREA, WERE OBSD. OCCASIONALLY. THE NEW FORMATIONS, TYPICAL ONLY OF THE STRATA OVERLYING THE PYRITE DEPOSIT (RHYTHMICALLY BONDED AGGREGATES OF HALLOYSITE AND LIMONITE, JAROSITE, DESTINEZITE, ETC.), WERE OBSD. IN THE KARST DEPRESSIONS OR NEAR THEM TOGETHER WITH REGIONALLY OCCURRING SECONDARY ALTERATIONS. THEY HAD A ZONING STRUCTURE EXPRESSED BOTH IN RELATIVE AMTS. OF NEWLY FORMED MINERALS AND IN COMPN. OF MINERAL ASSOCNS. THE SPATIAL RELATION OF SECONDARY ALTERATIONS WITH THE PYRITE DEPOSIT AND IN SOME CASES THE COMPN. (SO SUB3, CUO, FE SUB2 O SUB3, ETC.), NEARLY SIMILAR TO THAT OF PYRITE ORES, SUGGESTS USING THE SECONDARY ALTERATIONS AS EXPLORATION INDEXES. THEY CAN BE USED IN COMBINATION WITH STRUCTURAL GEOL. AND GEOCHEM. INDEXES. FACILITY: INST. MINERAL., GEOKHIM. KRISTALLOKHIM. REOK. ELEM., MOSCOW, USSR.

Thin Films

USSR

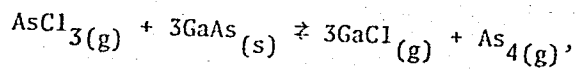
UDC: 541.124/.128

RTSKHILADZE, V. G., MOISTSRAPISHVILI, A. V., CHITORELIDZE, G. M.,  
MAMULASHVILI, M. P., ABASHIDZE, T. D.

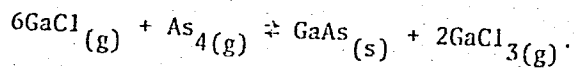
"Study of the Possibility of Producing Epitaxial Gallium Arsenide by  
the Method of Chemical Transport Reactions in a Stream of Argon"

Soobshcheniya Akademii Nauk Gruzinskoy SSR, Vol 67, No 3, 1972, pp 637-640.

Abstract: This article presents a study of chemical-transport deposition  
of gallium arsenide films, with the usual hydrogen transport medium  
replaced by the inert gas argon. The reaction at the source zone is



and in the deposition zone



The reaction tube was heated by a resistance furnace with two independent  
heaters. Temperature was maintained with an accuracy of 0.5°C in each  
zone. The study showed that the main factor influencing etching of the

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RTSKHILADZE, V. G., et al., Soobshcheniya Akademii Nauk Gruzinskoy SSR  
Vol 67, No 3, 1972, pp 637-630

substrates and decreasing growth rate at high stream velocities was the increase in the quantity of  $AsCl_3$  present at the source zone. The growth rate as a function of argon stream velocity shows a maximum at about  $70 \text{ cm}^3/\text{min}$ , the subsequent decrease resulting from the fact that, due to the high difference in temperature drop between the two zones, a portion of the gallium arsenide formed is deposited on the walls of the reaction vessel before reaching the substrate zone. The quality of the epitaxial layer produced increases with increasing deposition temperature up to  $710\text{-}730^\circ\text{C}$ . The films produced were monocrystalline, oriented in the same direction as the substrate.

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USSR

UDC 547.743.1.07:542.958.3

ARSHIDZE, KH. I., and CHIVADZE, G. G., Institute of Physical and Organic Chemistry imeni P. G. Melikishvili, Georgian SSR Academy of Sciences, Tbilisi

"Synthesis of Pyrrolidine and Other Heterocyclic Compounds from Butandiole-1,4 and Ethandiole-1,2"

Riga, Khimiya Geterotsiklicheskikh Soyedineniy, No 7, 1973, pp 937-941

Abstract: Studies were conducted on the effectiveness of seven different catalysts used in amination of butanediole-1,4 and ethanediole-1,2, which were derivatives of aluminosilicate. Highest yields of pyrrolidine were obtained from both compounds when 95% bleaching clay and 5% ferric oxide was used as the catalyst. With this catalyst amination of butanediole-1,4 at 350-360° was characterized by an energy of activation of 15.2 kcal/mole; utilization of natural aluminosilicate under the same conditions gave an energy of activation of 18.4 kcal/mole.

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1/2 .011 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--CATALYTIC PROPERTIES OF NATURAL AND ACTIVATED ALUMINUM SILICATES IN  
THE DEHYDRATION OF 1,4,BUTANEDIOL -U-  
AUTHOR-(03)-ARESHIDZE, KH.I., TAVARTKILADZE, YE.K., CHIVADZE, G.O.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(3), 601-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ALUMINUM SILICATE, DEHYDRATION, BUTANE, ALCOHOL, FURAN,  
CATALYST ACTIVITY, BUTADIENE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1997/0799 STEP NO--UR/0080/70/043/003/0601/0605  
CIRC ACCESSION NO--AP0119706  
UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119706

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. GUMBRIN AND ASKANGLIN CLAYS  
CATALYZE THE DEHYDRATION OF 1,4,BUTANEDIOL (I) TO TETRAHYDROFURAN (II)  
AT 200-400DEGREES; CATALYST ACTIVITY IS INCREASED BY WASHING WITH HCL.  
II IS OBTAINED IN 98PERCENT YIELD OVER HCL WASHED GUMBRIN AT 280DEGREES  
AT VOL. RATE 0.3 HR. PRIME NEGATIVE1. GASEOUS PRODUCTS ARE FORMED  
LARGER THAN 300DEGREES; AT 350DEGREES 20 WT. PERCENT I IS CONVERTED TO  
GAS CONTG. 20.8 WT. PERCENT BUTADIENE. FACILITY: INST. FIZ.  
ORG. KHIM. IM. MELIKISHVILI, TBILISI, USSR.

UNCLASSIFIED



USSR

MURINA, T. A., CHERENKOVA, L. V., and CHIVELEVA, I. M., Ukhtomskiy Institute of Physiology and Leningrad University

"Relationship Between the Time of Visual Discrimination in Cats and the Signal-Noise Ratio"

Moscow, Biofizika, No 4, 1973, pp 766-777

Abstract: Cats were trained to discriminate between a star and a circle flashed on a screen against a background of noise in the form of various geometric figures. At a signal noise ratio of 6.5 the cats could not discriminate between the images when they were exposed for 250 msec. However, further lowering of the noise level to a signal-noise ratio of 13 did not reduce the critical time. The curve plotted from the experimental data proved to be exponential. Analysis of the curve reveals that a healthy cat requires at least 300 msec to discriminate between practically noise-free images, or about the same amount of time required by man.

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USSR

UDC 621.355.2.035.3

GHIVOTINSKIY, P. B., and BESSONOVA, T. M.

"Separators for Zinc Batteries"

Sb. rabot no khim. istochnikam toka. Vses. n.-n akkumulyator. in-t (Collection of Works on the Chemical Source of Current. All-Union Scientific Study Institute for Storage Batteries), Vyp 7, 1972, pp 81-91 (from Referativnyy Zhurnal -- Khimiya, No 8(II), 1973, Abstract No 8L229 by V. S. Levinson)

Translation: The types of separators for lead batteries produced industrially in the USSR are presented. Topics discussed include methods for their production, properties of their separators, their advantages and disadvantages. The prospects are considered for the microporous separators of the 'porovinil' and 'vinipor' types.

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USSR

UDC: 51

GABOVICH, Ye., CHIZH, A., YALAS, A.

"On the Traveling Salesman Problem in Restricted Areas"

Tr. Vychisl. tsentra. Tartus. un-t (Works of the Computing Center. Tartu University), 1971, vyp. 22, pp 3-24 (from RZh-Kibernetika, No 5, May 72, Abstract No 5V412)

Translation: It is known that the classical problem of the traveling salesman (TS) is a problem in selecting the shortest circuit  $t$  passing through  $n$  cities (for which the distance matrix  $\|c_{ij}\|$  is given). The following generalization of the problem is considered. Let  $t = (t_1, t_2, \dots, t_n)$  be some circuit. Let us call the number

$$u(t) = \max \{c_{t_1 t_2}, c_{t_2 t_3}, \dots, c_{t_{n-1} t_n}, c_{t_n t_1}\}.$$

the width of the circuit  $t$ . The problem of finding the circuit of optimum width is called by the authors the problem of the traveling salesman in restricted areas (TSRA) with matrix  $\|c_{ij}\|$ . The TSRA is the same kind of natural generalization of the conventional traveling salesman problem as the problem of assignments to restricted areas (see for instance RZh-Mat

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USSR

GABOVICH, Ye. et al., Tr. Vychisl. tsentra Tartus. un-t, 1971, vyp. 22, pp 3-24

1966, 11V249K) is for the conventional assignment problem. The TSRA was first formulated and solved in one special case in a paper by Gilmore and Gomori (RZh-Mat, 1964, 11V262). In a doctoral dissertation, D. Shapiro (RZh-Mat, 1968, 1V422D) proposed an exact method (of the "branches and boundaries" type) suitable for solving both the TS and the TSRA. The maximum number of cities is  $n = 70$  for TSRA problems solved by this method.

The TSRA arises, for instance, in considering the following problem of planning the route for a cycle race. It is known that the route must pass through  $n$  preselected cities. It is established for any two cities by which road the cyclists are to travel from the first city to the second (if the route is to be marked out in this order), and by which road they are to travel from the second city to the first (obviously these two paths may be of different lengths). It is required to route the race in such a way that the longest stage will be as short as possible.

A certain method is proposed in § 1 for solving the TSRA. The method is not completely formalized and is intended for solving the TSRA manually (rather than by computer). The authors note that complete formalization of

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GABOVICH, Ye. et al., Tr. Vychisl. tsentra. Tartus. un-t, 1971, vyp. 22, pp 3-24

the proposed method (probably feasible in principle) is apparently very cumbersome and is scarcely advisable. In § 2 the method is applied to various TSRA problems defined by distance matrices directly known from the literature on the traveling salesman problem. In § 3 a solution is given for six TSRA problems whose matrices are different random-number matrices. The number of cities for the largest matrix is  $n=100$ . A certain degree of success is attained in this paper due to 1) utilization of certain advantages of a human operator over a computer (informal thinking); 2) the specific nature of the method which enables almost arbitrary plotting of a path repeatedly beyond a certain point in time. In the final analysis, the authors' experiment shows that the TSRA is accessible to manual solution in the case of fairly large problems. The time of solution for  $n \leq 57$  varies from a half hour to several hours if the time for preparation of initial data is not taken into account. A problem for  $n=100$  was solved manually in less than 10 hours. Yu. Finkel'shteyn.

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USSR

UDC 669.131.6:539.217.1

CHIZHENKO, Yu. D., and KHRAPOV, A. Ya., Siberian Metallurgical Institute

"Determination of Quantity of Graphite and Porosity of Cast Iron by the Photometric Method"

Novokuznetsk, Izv. VUZ, Chern. Metallurgiya, No 10, 1970, pp 117-120

Abstract: The most common method of determining the porosity of metals is the method of hydrostatic weighing, consisting of successive determination of the weight of the specimen and a standard piece in air and in a liquid. For gray cast iron, it is almost impossible to find a standard in relation to which the porosity of an alloy can be determined. The authors suggest a method which does not have this defect, consisting of determination of the total porosity of gray cast iron, with subsequent differentiation into graphite and gas-shrinkage porosity. A diagram of the photometric device used to perform this differentiation is presented.

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USSR

UDC 612.822

ALEKSANDROVSKAYA, M. M., and CHIZHENKOVA, R. A., Laboratory of Morphology of the Central Nervous System, Institute of Higher Nervous Activity and Neurophysiology, Academy of Sciences USSR, Moscow

"Glial Reactions of the Motor Cortex to Sonic Stimuli"

Leningrad, Fiziologicheskii Zhurnal, No 2, Feb 72, pp 145-149

Abstract: Sound stimulation of healthy unrestrained rabbits by a tone of 200 Hz with an intensity of 0.012 dyne/cm<sup>2</sup> for 15 minutes and 1 hour had the statistically reliable effect of increasing the total number of neuroglial and perineuroglial cells in the motor cortex of the cerebral hemispheres. Sound stimulation with an intensity of 1.0 dyne/cm<sup>2</sup> brought about less pronounced changes, which consisted of decreasing the total number of glial elements and perineuronal satellites, and were noted after only 3 minutes. A correlation of the morphological and electrophysiological brain-reaction indexes was noted with respect to duration and directionality.

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USSR

UDC 612.822.3+612.821.2

CHIZHENKOVA, R. A., Institute of Biophysics, Academy of Sciences USSR

"Electrophysiological Research on Memory at the Neuronal Level"

Moscow, Uspekhi Sovremennoy Biologii, No 3, pp 374-390

Abstract: Since neurons are constituents of the central nervous system, the formation of functional organizations associated with remembering can be expected to find reflection in the individual nerve cells. Electrophysiological research at the neuronal level as related to learning has produced information: (a) trace processes after stimulation, (b) change in neuronal activity during the orienting reflex and dynamics of neuronal responses to repetition of the same stimuli, and (c) electrical activity of neurons during the formation of temporal connections whereby one stimulus becomes the signal for another. Following a review of the literature, Soviet and foreign (about 150 references), in accordance with the above three categories, the author sets forth some of the most widely held hypotheses concerning the entry and storage of information in neurons. There is a consensus that learning entails change in the synaptic structures. The nature of the relationship existing between the electrophysiological phenomena of retention in the neuron and the biophysical and biochemical processes that take place therein is still obscure.

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USSR

CHIZHENKO, YU. D., and KHRAPOV, A. YA., Siberian Metallurgical Institute

"Effect of Microdefects and Graphite Porosity on the Strength, Elastic, and Damping Properties of Iron"

Novokuznetsk, IVUZ-Chernaya Metallurgiya, No 6, 1971, pp 135-137

Abstract: A study was made of the change in the strength, elastic, and damping properties in relation to the magnitude of total volume of microdefects in iron. Iron with a degree of eutecticity from 0.83 to 1.16 was melted in an OKB-868 induction furnace and modified in the ladle with metallic magnesium, ferrosilicocalcium with magnesium, and 75% ferrosilicon. It was shown that the strength and damping properties of iron depend on the structure of the metallic matrix and on the total volume and shape of defects (graphite inclusions, gas-shrinkage micropores, and nonmetallic inclusions). The elastic properties of the same iron depend only on the total volume of matrix defects. Two figures, 3 bibliographic references.

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Acc. Nr:

AP0055995

Abstracting Service:  
CHEMICAL ABST. 4-70

Ref. Code:

GA 0368

C

116317z Integrated intensities of carbonyl bands in the ir spectra of some aromatic aldehydes. Zavadskaya, M. I.; Chizhevskaya, I. I. (USSR). Zh. Prikl. Spektrosk. 1970, 12(1), 159-60 (Russ). The frequencies were measured and the abs. integrated intensities were calcd. of the  $\nu(\text{C:O})$  absorption bands in the spectra of  $\text{CHCl}_3$  solns. (0.075-0.3 mole/l.) of PhCHO as well as of its *p*-dimethylamino, *p-N,N*-bis( $\beta$ -chloroethyl)amino, *p-N,N*-bis( $\beta$ -fluoroethyl)amino, *o*-methyl-*p-N,N*-bis( $\beta$ -chloroethyl)amino, *p*-nitro, and *m*-nitro derivs. The integrated intensity value can be used as a criterion of the degree of polarization the C:O bond. Vaclav Sara -

pc

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REEL/FRA  
19841324

1/2 016 UNCLASSIFIED PROCESSING DATE--04DEC70  
TITLE--MEASUREMENT OF THE ELECTRICAL CONDUCTIVITY AND THERMOEMFS. OF MELTS  
OF HIGHLY VOLATILE SUBSTANCES -U-  
AUTHOR--(03)--ABRIKOSOV, N.KH., CHIZHEVSKAYA, S.N., KURBATOV, V.P.  
COUNTRY OF INFO--USSR  
SOURCE--ZAVOD. LAB. 1970, 36(4), 449-50  
DATE PUBLISHED-----70  
SUBJECT AREAS--METHODS AND EQUIPMENT, MATERIALS  
TOPIC TAGS--ELECTRIC CONDUCTIVITY MEASUREMENT, THERMAL EMF, MOLYBDENUM  
GLASS, ELECTRODE DESIGN, VAPOR PRESSURE, HIGH TEMPERATURE INSTRUMENT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3008/1182 STEP NO--UR/0032/70/036/004/0449/0450  
CIRC ACCESSION NO--AP0138197  
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0138197

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. METHODS AND APP. WERE DEVELOPED FOR MEASUREMENT OF THE ELEC. CONDS. AND THERMOEMFS. OF HIGHLY VOLATILE MELTS. THE NEW VESSELS ARE MADE OF MO GLASS WITH SEALED MO ELECTRODES FOR MEASUREMENTS AT LOW TEMPS., AND OF FUSED QUARTZ WITH SEALED W ELECTRODES FOR HIGH TEMPS. FACILITY: INST. MET. IM. BAIKOVA, MOSCOW, USSR.

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