

1/2 018 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--ELECTROTRANSFER IN HIGHLY CONCENTRATED AMMONIUM CHLORIDE, AMMONIUM
NITRATE, AND AMMONIUM SULFATE SOLUTIONS -U-
AUTHOR--TROSHIN, V.P., ZVYAGINA, E.V.
COUNTRY OF INFO--USSR 2
SOURCE--ELEKTROKIMIYA 1970, 6(1), 127-30
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--HYDRATION, IONIZATION, AMMONIUM CHLORIDE, AMMONIUM NITRATE,
AMMONIUM SULFATE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0317 STEP NO--UR/0364/70/006/001/0127/0130
CIRC ACCESSION NO--AP0103972
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0103972

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IONIC MOBILITY, IONIC TRANSFER NO., AND THE KINETIC HYDRATION NO. OF IONS WERE STUDIED IN NH SUB4 CL SOLNS CONTG. 2-5.6 G-EQUIV1., NH SUB4 NO SUB3 SOLNS. CONTG. 2-10 G-EQUIV1., AND (NH SUB4) SUB2 SO SUB4 SOLNS. CONTG. 2-8 G-EQUIV1. THE TRANSFER NO. OF NH SUB4 PLUS IN NH SUB4 CL AND NH SUB4 NO SUB3 CHANGED VERY LITTLE WITH CHANGES IN THE CONC. OF THE SOLN., 0.47-0.485 AND 0.507-0.513, RESP. THE TRANSFER OF SOLVENT WAS ALSO VERY SMALL. THE DATA OBTAINED FOR (NH SUB4) SUB2 SO SUB4 ARE MORE COMPLICATED BECAUSE OF THE ASYMMETRY OF THE CHARGES ON THE COMPONENT IONS. ALTHOUGH THE CATION CONTAINED H, THE ANOMALOUS MOBILITY USUALLY ASSOCD. WITH IT DID NOT APPEAR, STILL THE MOBILITY OF NH SUB4 PRIME POSITIVE IS OF THE SAME ORDER OF MAGNITUDE AS THAT OF K PRIME POSITIVE WHICH IS A FAIRLY MOBILE ION.

UNCLASSIFIED

ZUYAGINTSEV, A.V.

RAS / 10.06.1971 / 5.11.1971 101
ABO 72
XI. PLASMA DYNAMICS

(4)

Patrenko, V. I., R. V. Mitin, Yu. R. Kravtsov,
and A. V. Zuyagintsev. High-current pulsed arc
in hydrogen at pressures to 400 atmospheres.
DI: Fizika plazmy i problemy upravlyayemogo
termoyadernogo sinteza. Kiyev, Izd-vo Naukova
dumka, no. 1, 1971, 205-212.

Experiments in initiating a high pressure pulsed discharge
in hydrogen to generate and investigate properties of a dense hydrogen
plasma are discussed. The experimental device comprised a high-
pressure discharge chamber, a thermo-compressor and condenser
batteries. The discharge chamber was a thick-walled cylindrical
metal vessel, designed for a maximum operating pressure of 1000 atm.
The chamber had three diagnostic windows for conducting optical, photo-
graphic and other observations; chamber gas volume was about 1 liter.
The thermocompressor maintained the required system pressure, and a
liquid nitrogen coolant ensured a chamber hydrogen pressure of 500 atm.
The pulsed discharge was initiated using a 0.7 mm copper wire between
electrodes fitted with tungsten terminals as shown in Fig. 1. The condenser



Fig. 1. Discharge configuration
1 - tungsten inserts; 2 - textolite cap;
3, 5 - electrodes; 4 - plasma

USSR

UDC 533.9

MUTIN, R. V., PRYADKIN, K. K. ZVYAGINTSEV, A. V., Khar'kov Physicotechnical Institute of the Academy of Sciences UkrSSR

"On the Effect of a Magnetic Field on an Electrodeless Discharge Plasma"

Moscow, Teplofizika Vysokikh Temperatur, No 6, Nov/Dec 70, pp 1142-1148

Abstract: The results of an experimental study of the effect of rotation of an electrodeless high-frequency discharge plasma at high pressure in an external constant magnetic field are presented. In previous experiments by the authors the effect of a magnetic field on a stationary electrodeless high-frequency discharge in inert gases at a pressure of 0.5-2 at was investigated; the shape of the discharge observed at such pressures and sufficiently high levels of the high-frequency power under the action of the magnetic field transforms into a toroidal shape, and this toroidal plasmoid has its own magnetic properties: it rotates in a homogeneous field and pulls in when in a nonhomogeneous magnetic field. It was shown that rotation of the plasma is observed when the plasma is created by closed circular currents flowing in the plane perpendicular to the magnetic field (H-discharges) and is not observed in E-discharges (a high-frequency discharge without closed currents).

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USSR

MJTN, R. V., et al., Teplofizika Vysokikh Temperatur, No 6, Nov/Dec 70,
pp 1142-1148

It is hypothesized that the effects observed are caused by partial rectification of the closed high-frequency currents, but the experiments described here show that it cannot explain all phenomena observed, although this one cause may play a decisive role. The nature of the dependence of the frequency of rotation of the discharge on the nature of the gas (Ne, Ar, Kr, Xe), the magnetic field strength, and the pressure (in the range 0.5-2 at) are described in detail. The reason for the rotation is explained on the basis of the theory of electrophoresis in a gas discharge plasma. It is shown that the application of this theory to this phenomenon is valid, since it is possible to explain the reason for the rise of an uncompensated force, the direction of rotation of the gas, and the nature of the dependence of the rate of rotation on pressure, magnetic field, and type of gas.

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USSR

UDC 576.095.1.1631.46

ZVYAGINTSEV, D. G.

Vzaimodeystviye Mikroorganizmov s Tverdymi Poverkhnostyami (Interaction of Micro organisms with Solid Surfaces), Moscow, Izdatel'stvo Moskovskogo Universiteta, 1973, 176 pp

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USSR

ZVYAGINTSEV, D. G., Interaction of Micro-Organisms With Solid Surfaces,
Moscow, 1973

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ZVYAGINTSEV, D. G., Interaction of Micro-Organisms With Solid Surfaces, Moscow, 1973

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USSR

ZVYAGINTSEV, D. G., Interaction of Micro-Organisms With Solid Surfaces, Moscow, 1973

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USSR

UDC 541.183:576.8:666.1

PERTSOVSKAYA, A. E., and ZVIAGINTSEV, D. G., Chair of Soil Biology, Moscow State University imeni M. V. Lomonosov, Moscow

"Adsorption of Bacteria on Glass, Modified Glass Surfaces, and Polymer Films"

Moscow, Nauchnyye Doklady Vysshey Shkoly, Biologicheskiye Nauki, No 3, 1971, pp 100-105

Abstract: The adsorption of microorganisms from an aqueous medium on the surface of glass (functional group OH^-), glass modified by deposition of silicones with the functional groups Me or NH_2^+ on the surface, and polymer films with the functional groups NH_2^+ (polyamide), $-\text{CH}_2-\text{CH}_2-$ (polyethylene), or COO^- on the surface was studied. All microorganisms could be subdivided into three groups: those that were adsorbed strongly on all surfaces independently of the nature of the functional group and the hydrophobic or hydrophilic nature of the adsorbent (I); those whose adsorbability varied with the nature of the adsorbents' functional groups, although they were adsorbed to a greater or lesser extent on most surfaces (II); those that were adsorbed weakly on all surfaces (III). Group I consisted of all cocci (Sarcina, 1/2

USSR

PERTSOVSKAYA, A. E., and ZVYAGINTSEV, D. G., Nauchnyye Doklady Vyshey Shkoly, Biologicheskiye Nauki, No 3, 1971, pp 100-105

Micrococcus), all strains of Bacterium prodigiosum, and the majority of mycobacteria. The surface of these microorganisms presumably has a structure similar to that of a mosaic, with facets that have an affinity for different adsorbent surfaces. The majority of non-spore-forming bacteria belonged to group II. Group III consisted of all species of the genus Bacillus. Although their adsorption on all surfaces was weak, bacilli were adsorbed more strongly on hydrophobic than hydrophilic surfaces. The adsorbability varied with the strain for the same species and the age of bacterial cultures of the same strain. It was generally the same for live cells as those killed by auto-calving.

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1/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--SELECTIVE ADSORPTION OF SOIL MICROORGANISMS BY ION EXCHANGE RESINS
-U-
AUTHOR--ZVYAGINTSEV, D.G.
COUNTRY OF INFO--USSR
SOURCE--BIOL. NAUKI 1970, 1, 81-6
DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, EARTH SCIENCES AND
OCEANOGRAPHY
TOPIC TAGS--ADSORPTION, SOIL MICROBIOLOGY, ION EXCHANGE RESIN, SOIL TYPE

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1999/1960 STEP NO--UR/0325/70/000/001/0081/0086
CIRC ACCESSION NO--AP0123741

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0123741

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SHAKING OF SOIL SUSPENSIONS WITH ION EXCHANGE RESINS AND OTHER ADSORBENS (CA SUB3 (PO SUB4) SUB2, PARAFFIN WAX) RESULTED IN SELECTIVE ADSORPTION OF CERTAIN SOIL MICROORGANISMS. THUS, AFTER SHAKING THE SOIL SUSPENSION WITH DOWEX 1 CONTG. BOUND CU, THE SPORULATING BACTERIA ACCOUNTED FOR 93PERCENT OF THE TOTAL COLONIES DEVELOPED AFTER CULTIVATION AS COMPARED WITH ONLY 18PERCENT IN CONTROLS. AFTER SHAKING THE SOIL SUSPENSIONS WITH RESINS SATD. WITH FE AND AL, THE MYCOBACTERIA ACCOUNTED FOR 61-63PERCENT OF THE TOTAL COLONIES AS COMPARED WITH 27PERCENT IN CONTROLS. EXPTS. WITH DIFFERENT SOIL TYPES (TERRA ROSSA, HUMIC GLEY SOIL, CHERNOZEM, AND GRAY SOIL) SHOWED THAT THE ADSORPTION OF MICROORGANISMS DEPENDED ONLY ON TYPE OF MICROORGANISM. FACILITY: MOSK. GOS. UNIV. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

142 010 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--FUNGI ACCOMPANYING BACTERIA OXIDIZING MANGANESE -U-
AUTHOR--MIRCHINK, T.G., ZAPROMETQVA, K.M., ZVYAGINTSEV, D.G.
COUNTRY OF INFO--USSR
SOURCE--MIKROBIOLOGIYA, 1970, VOL 39, NR 2, PP 379-383
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--FUNGUS, BACTERIV, BIOLOGIC OXIDATION, MANGANESE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1985/0371 STEP NO--UR/0220/70/039/002/0379/0383
CIRC ACCESSION NO--AP0100857

UNCLASSIFIED

2/2 010

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0100857

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. WHILE USING SOIL AGAR, 21 FUNGAL STRAINS, GROWING WITH MICROORGANISMS OF THE METALLOGENIUM GENUS, WERE ISOLATED FROM TURF PODZOL SOIL OF THE MOSCOW AND NOVGOROD REGIONS AS WELL AS OF THE ESTONIAN SSR. THESE FUNGI WERE REPRESENTED BY THE FOLLOWING SPECIES: CONIOTHIRIUM FUECKELLI, SAC. MYCOGONE NIGRA (MORGAN) JENSEN, FUSARIUM KUHNII (FUCK) SAC., ALTERNARIA GEOPHILA DASZ., CEPHALOSPORIUM SP. AS WELL AS BY THE FORMS OF STERILE MYCELIUM. HENCE, NOT ONE FUNGAL SPECIES BUT SEVERAL CAN BE SATELLITES OF METALLOGENIUM. THESE ARE WELL KNOWN FORMS BUT WITH SOME PECULIARITIES DUE TO COEXISTANCE WITH METALLOGENIUM.

UNCLASSIFIED

USSR

UDC 576.809.33.2:576.809.54

ZVYAGINTSEV, D. G., Chair of Soil Biology, Soil Biology Faculty,
Moscow State University imeni M. V. Lomonosov

Moscow, Mikrobiologiya, Vol 39, No 1, Jan/Feb 70, pp 161-165

Abstract: A comparative study was made of microbial growth in Perfiliev glass capillaries of different diameters. The microorganisms investigated were *Pseudomonas fluorescens*, *Pseudomonas pyocyanea*, *Escherichia coli*, *Bacterium Prodigiosum*, *Micrococcus sulfureus*, *Staphylococcus aureus*, *Thermobacterium cereale*, *Williopsis saturnus* and *Saccharomyces vini*. Studies conducted with a *Staphylococcus aureus* culture indicated that the cell multiplication rate depends to a great degree on capillary diameter. In a 24-hour period, cells increased tenfold in a 400x150 micron capillary, twofold in a 10x5 micron capillary and hardly at all in a 5x3 micron capillary. Similar results were obtained with other microbes studied. Another important feature of microbial growth in thin capillaries was the significant contraction of the length of bacillary cells or decrease in the average size of yeast cells. In thin capillaries, the cell growth process was inhibited more intensively than the fission process. To obtain more detailed data on the specific

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USSR

ZVYAGINTSEV, D. S., et al., Moscow, Mikrobiologiya, Vol 39, No 1, Jan/Feb 70, pp 161-165

character of microbial growth in capillaries, a study was made of the ability of cultures to reduce potassium tellurite. The most detailed experiments were conducted with a *Thermobacterium cereale* culture. They indicated that formazan and tellurium grains appear much faster and in greater numbers in thin capillaries than in thicker ones. Experiments on the multiplication rate of cells located in thin films of culture medium applied to cover glasses by the hanging drop method showed that in films with thicknesses of 1-2 microns, a sharp decrease in the multiplication rate occurs. This effect is also common to large size cells located in the thin liquid film at the edge of the hanging drop. In the latter case, the cells located in the center of the drop multiply much faster, often 10-20 times faster.

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USSR

UDC 582.282.23.094.85.088.7

GUZEV, V. S., GOLUBEV, V. I., and ZHYVACINTSEV, D. G., Chair of Soil Biology,
Faculty of Soil Biology, Moscow State University imeni M. V. Lomonosov, Moscow

"The Detection of Microcapsules in Microorganisms and the Control of Their
Complete Decapsulation by Microelectrophoresis"

Moscow, Mikrobiologiya, Vol 41, No 1, Jan/Feb 72, pp 115-120

Abstract: Strain No 943 of yeast *Cryptococcus albidus* var. *diffluens* was used in the study. An acapsular strain was obtained by multiple transfers and growths of the original strain on wort agar. Complete decapsulation was performed by autoclaving of the culture in an acetic acid solution at pH 4. Electrophoretic mobility was estimated using microelectrophoresis in a closed chamber. The effect of pH was studied using modified McIlvein's citrate-phosphate buffer of an ionic strength 0.02. The maximal electrophoretic mobility (2.7 micron/second/volt/centimeter) was obtained at pH 7.8. The mobility decreased at lower pH values. Both capsular and acapsular strains had identical mobility, which indicated the identity of their surfaces. The presence of a microcapsule (less than 0.4 micron) on the so-called acapsular strain was confirmed by electron microscopy. On the other hand, a strain completely decapsulated had a different electrophoretic mobility (+0.25
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USSR

GUZEV, V. S., et al., Mikrobiologiya, Vol 41, No 1, Jan/Feb 72, pp 115-120

micron/second/volt/centimeter) than the parent strain (-0.2 micron/second/volt/centimeter) at pH 1.7. The differences in electrophoretic mobility decreased with increased pH. Microelectrophoresis is a simple and convenient method for the detection of microcapsules undetectable by optical microscopy or by chemical methods. A control capsular strain is necessary for the test.

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USSR

UDC 576.8.098

GUZEV, V. S., and ZYAGINTSEV, D. G., Chair of Soil Biology, Moscow State University

"Microelectrophoresis of the Cells of Microorganisms"

Moscow, Vestnik Moskovskogo Universiteta, Seriya 6, Biologiya, Pochvovedeniye, No 6, Nov/Dec 71, pp 90-96

Abstract: Despite the importance of electrophoresis to the study of the electrokinetic properties of cells, until now Soviet literature has not contained a description of a method of microelectrophoresis of cells in a closed chamber. The authors of the present article designed a device to accomplish this purpose, and thorough testing has shown it to be sufficiently accurate and reliable for a wide range of practical applications. It consists basically of a Perfil'yev capillary chamber with plane-parallel walls and two vessels containing electrodes and having outlets which lead back to the chamber. A system of stopcocks makes it possible to fill the vessels with a saturated solution of $CuSO_4$ and to drive the air out of the chamber and fill it with a suspension of cells. The authors list 10 steps for using their device to obtain electrophoretic data and then present and explain formulas for using this data to compute the cells' electrophoretic mobility, electrokinetic potential, and surface density of the charge. Finally, as an example, the values computed for the electrokinetic properties

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USSR

GUZEV, V. S., and ZVYAGINTSEV, D. G., Vestnik Moskovskogo Universiteta,
Seriya 6, Biologiya, Pochvovedeniye, No 6, Nov/Dec 71, pp 90-96

of *Bacillus subtilis* and *Bacillus cereus* under varying media conditions are
given.

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UDC 576.8.095.383

ZVYAGINTSEV, D. G., PERTSOVSKAYA, A. F., YAKHNIN, YE. D., and AVERBAKH, E. I., Chair of Soil Biology, Biology and Soil Faculty, Moscow State University imeni M. V. Lomonosov, Moscow, and Institute of Physical Chemistry, Academy of Sciences USSR

"Determination of the Degree of Adhesion of Cells of Microorganisms to Solid Surfaces"

Moscow, Mikrobiologiya, Vol 40, No 6, Nov/Dec 71, pp 1024-1028

Abstract: The force with which cells of 11 strains of microorganisms of 9 species adhered to the surface of a glass plate upon adsorption was determined on a centrifuge equipped with a special rotor. The number N_0 of cells adsorbed on the glass surface from suspensions of equal concentration before the force detaching them was applied decreased in the order Staphylococcus aureus 120 > Bacterium fimbriatum > Bacillus mesentericus 112 > Ser. marcescens 71 > Ser. marcescens 103 > Bac. mesentericus 53 > Pseudomonas fluorescens > Ps. pyocyanea Bac. cereus 116 > Bac. subtilis 27 > Saccharomyces cerevisiae. The value of $\gamma_F = N \cdot 100 / N_0$, where N is the number of cells that remained on the surface after rotation at 16,000 rpm (7,800 rpm for Sacch. cerevisiae), decreased in the order Ser. marcescens 71 > Staph. aureus 120 > Ser. marcescens 103 > Sacch. cerevisiae

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ZVIYAGINTSEV, D. G., et al., Mikrobiologiya, Vol 40, No 6, Nov/Dec 71, pp 1024-1028

bac. cereus 116 > Ps. pyocyanea > Bac. mesentericus 53 > Bact. fimbriatum > Ps. fluorescens > Bac. mesentericus 112 > Bac. subtilis 27. The force F_{50} at which 50% of the cells adhering to the glass became detached was within the range of 4×10^{-7} - 4×10^{-4} dyne/cell for the microorganisms studied. γ_F decreased with increasing age of the cultures. It was typical for some strains (principally those of species of the genus Bacillus) that the number of cells which adhered to the surface was small, while F_{50} was large (0.6×10^{-5} dyne/cell). For Ser. marcescens 71 and Staph. aureus 120, both the number of cells that adhered and the force of adhesion were large. Non-sporiferous bacteria (e.g., those of the genus Pseudomonas) adhered to the solid surface in large numbers, while F_{50} for them was small (0.4×10^{-6} - 0.6×10^{-6} dyne/Cell). Consideration of the values of P_a equal to the ratio of F_{50} to the volume of a cell indicated that the force of adhesion on the basis of P_a was highest for Ser. marcescens 71 and Staph. aureus 120, while it was much lower for the other strains. An electron-microscopic examination showed that the great strength of adhesion of Ser. marcescens 71 and Staph. aureus 120 was due to the presence of thin cell-wall protuberances that facilitated contact. 2/2

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Acc. Nr:

AP0101521

Abstracting Service:
CHEMICAL ABST. 6-70

Ref. Code:

UR 0064

113422u Kinetics of the conversion of methane by steam under pressure. Atroshchenko, V. I.; Zvyagintsev, G. L. (USSR). *Khim. Prom. (Moscow)* 1970, 46(1), 56-8 (Russ). The catalytic conversion of sulfide-free natural gas in contact with the GIAP-3 catalyst was investigated at 873-1073°K, 41 atm., flow rates of 3000-50,000 vol./hr. and steam-gas ratios of 0.5-4.0:1. The time needed to reach an equil. deg. of conversion of the CH₄ was 0.20-0.25 sec. The rate const., *k*, of the reaction in the presence of an excess of steam, e.g., at 2:1 H₂O-CH₄ ratio was practically independent of the pressure between 2 and 41 atm and its value at 1073°K was 31.6 atm/-sec; the energy of activation of the reaction was 90,300 J/mole. The relation between *k* and temp., *T*, can be expressed by the equation $\log k = 5.90 - (4720/T)$. At H₂O:CH₄ ratios $< \sim 1.2:1$ *k* decreased sharply with decreasing H₂O-CH₄ ratio. At low H₂O-CH₄ ratios, the conversion mechanism involved mainly free-radical decompn. of CH₄, while at high H₂O-CH₄ ratios, thermal decompn. of CH₄ was predominant. A. Aladjem J. rme

REEL/FRAME
19851431

1/2 035 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--COMPOUND OF RHODIUM WITH ALPHA AMINOBUTYRIC ACID -U-
AUTHOR--(03)-PROKOFYEVA, I.V., BUKANOVA, A.YE., ZVYAGINSEV, O.YE.
COUNTRY OF INFO--USSR
SOURCE--ZH. NEORG. KHIM. 1970, 15(4), 1037-9
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--RHODIUM COMPOUND, AMINE, BUTYRIC ACID, CRYSTAL, ELECTRIC
CONDUCTIVITY, IR SPECTRUM, HEAT EFFECT
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3C02/1207 STEP NO--UR/0078/70/015/004/1037/1039
CIRC ACCESSION NO--AP0123625

2/2 035

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128625

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ORANGE NEEDLE LIKE CRYSTALS OF (RH(LH)L SUB2 CL).H SUB2 O (I) SEPD. AFTER A MIXT. OF AQ. SOLN. OF NA SUB3 RHCL SUB6 AND ALPHA AMINOBUTYRIC ACID (LH) WAS BOILED AND THEN THE VCL. OF THE SOLN. REDUCED. I HAS NGAMMA 1.595, NALPHA 1.531, AND NBETA 1.552, LOSES H SUB2 O AT 105-100DEGREES, STARTS TO DECOMP. SIMILAR TO 280DEGREES, AND HAS A MOLAR ELEC. COND. OF 202:4 OHM PRIME NEGATIVE 1 CM PRIME2 (AT PH 2.3 AND 5 TIMES 10 PRIME NEGATIVE3 MU CONC.). THE COND. INCREASES WITH INCREASING DILN. AND TEMP. OF SOLNS. THE IR SPECTRUM OF I IS GIVEN.

USSR

UDC 548.5



BAGDASAROV, KH. S., DOBROVINSKAYA, YE. R., PITSHCHIK, V. V., CHERNIK, M. M., KOVALEV, YU. YU., GERSHUN, A. S., ZVYAGINTSEVA, I. F., All-Union Scientific Research Institute of Single Crystals

"Low-Dislocation Single Crystals of Corundum"

Moscow, Kristallografiya, Vol 18, No 2, Mar-Apr 73, pp 390-395.

Abstract: The relationship of growth conditions and quality of structure of corundum single crystals is studied. The influence of spatial orientation, temperature gradient and stability of thermal conditions on formation of dislocations in crystals of corundum grown by directed crystallization is studied. Proper selection of orientations minimized the influence of structural defects in an etched crystal and practically eliminated heredity of dislocations arising in the growth process. Investigation and consideration of three-dimensional orientation and crystallization conditions on structural quality allowed the production of low-dislocation single crystals of lucosapphire.

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Acc. Nr **AP0107153** - Abstracting Service:
CHEMICAL ABST. 9-70

Ref. Code
UR0303

123010x Protective capacity of fluoroplast coatings in corrosive liquid media. Shigorina, I. I.; Zvyagintseva, N. V.; Egorov, B. N. (USSR). *Lakokrasoch. Mater. Ikh Primen.* 1970, (1), 47-9 (Russ). The phys. properties of the F-contg. plastic, Mark F-3M, are reported. Steel plates coated with F-3M remained intact up to 3 years at 20° in 12M HNO₃, M HCl, M H₂SO₄, M HOAc, M oxalic acid (I) M HF, 10M NaOH, 13.5M NH₄OH, and CCl₄. Other F-contg. plastics, Mark F-3 and F-42L, were attacked by HNO₃, HOAc, NH₄OH, or I. F-3M retained its protective ability at higher temps.; e.g., it decompd. in 12M HNO₃ at 90° only after 3000 hr. CPJR

REEL/FRAME
19890548

CK

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USSR

UDC 541.62.547.1*118

RAYEVSKIY, O. A., KHALITOV, F. G., and ZYABLIKOVA, T. A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Isomeric Equilibrium of Dimethylmethylphosphonate and Diethylchlorophosphate"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 2, Feb 72, pp 348-352

Abstract: IR spectra of liquid dimethylmethylphosphonate and diethylchlorophosphate studied in temperature range 150-300°K showed the existence of definite reversible spectral changes. Characteristic changes were observed in the range 400-700 cm^{-1} corresponding to the valence vibrations of P-C and P-Cl bonds, indicating existence of an equilibrium of two isomeric forms. Internal energies (ΔH) were found to be 0.75 Kcal/M for diethylchlorophosphate and 0.40 Kcal/M for the dimethylmethylphosphonate. The relationship of absolute integral intensities of the absorption bands of $\nu_{\text{P-Cl}}$ and $\nu_{\text{P-C}}$ made it possible to determine the composition of the isomeric forms for given molecular dipole moments to be 60:40 of the more polar:less polar isomer in case of diethylchlorophosphate, and 65:35 of the less polar:more polar isomer in case of dimethylmethylphosphonate. The isomers were identified by means of the IR spectra and dipole moments. A dynamic equilibrium of the isomeric forms was pointed out by means of PMR spectroscopy.

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USSR

UDC 542.953:661.718.1

IVANOV, B. YE., KUDRYAVTSEVA, L. A., ZYABLIKOVA, T. A., BYKOVA, T. G., and GOL'DFARB, E. I., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov of the Academy of Sciences USSR

"Condensation of Diethylphosphorous Acid with Formaldehyde and Triethyl Phosphite"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 7, 1971, pp 1497-1502

Abstract: Condensation was carried out in the ternary system triethyl phosphite (TEP)-formaldehyde-diethylphosphorous acid (DEP). The formation of the product, diethyl ester of ethylphosphonic acid (I), results from the partial isomerization of triethyl phosphite in the presence of diethylphosphorous acid. Other products formed included: diethyl ester of alpha-hydroxymethylphosphonic acid, diethylphosponomethyl diethyl phosphite, bis-(diethylphosphone) methyl ester, 2,5-dioxo-2,5-dihydroxy-1,4,2,5-dioxadiphospholenane, and a product with the gross formula $C_8H_{20}O_6P_2$. The latter is probably a mixture of esters of hypophosphoric and isohypophosphoric acids. The structure of each product was proven by chemical and physical methods. These included nuclear magnetic

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IVANOV, B. Ye, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 7, 1971, pp 1497-1502

resonance spectra, melting-point tests, and infrared spectra. Different quantitative ratios of the ternary system components were combined to provide data for the corresponding multi-product yield percentages for each ternary component ratio used.

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USSR

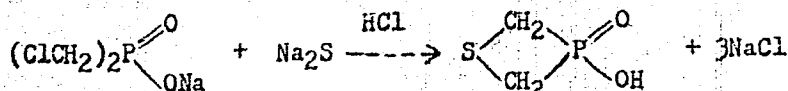
UDC 542.91+661.718.1.

GILYAZOV, M. M., ZYABLIKOVA, T. A., MUKHAMETZYANOVA, E. Kh., SHERMERGORN, I. M.,
Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of
Sciences, USSR

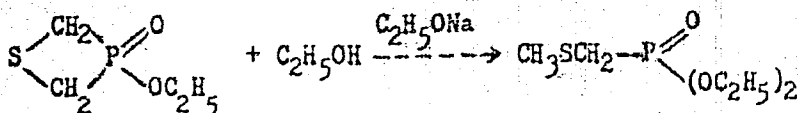
"Derivatives of 1,3-Thiaphosphetanes"

Moscow, Izvestiya Akademiyi Nauk SSSR, Seriya: Khimicheskaya, No 5, May 70,
pp 1177-1180

Abstract: The reaction of the sodium salt of bis(chlormethyl)phosphinic acid
with sodium sulfide in aqueous solution in presence of HCl gave a good yield
of 3-oxo-3-hydroxy-1,3-thiaphosphetane:



The produce was easily esterified. Ring cleavage was observed:



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USSR

UDC: 542.91+661.718.1

IVANOV, B. Ye., KUDRYAVTSEVA, L. A., and ZYABLIKOVA, T. A., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Formation of Oxaphospholane Derivatives in the Phosphonmethylation of Compounds with a Mobile Hydrogen Atom"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 70, pp 96-100

Abstract: Five-membered cyclic esters with oxaphospholane (I) structure, along with mixtures of dialkyl(Me,Et) 2,2-dicarbethoxyethylphosphonates(II), were synthesized by heating at 145-180° mixtures of di-Et malonate, tri-Me(Et) phosphite, and paraformaldehyde in excess. The yield of I was higher with trimethyl than with triethyl phosphite(33 versus 24%). But pure II was separated by redistillation from the products of the reaction with triethyl phosphite only. The products with oxaphospholane structure, where R=CN, R'=Me, or R=Ac, R'=Et, were obtained (without any appreciable amounts of II), by similar reactions of two other compounds with a mobile H atom--Et cyanoacetate and Et acetylacetate, tri-Me or tri-Et phosphite, respectively, and paraformaldehyde. The I structure was confirmed by elemental analysis data,

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IVANOV, B. Ye., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 1, Jan 70, pp 96-100

IR, ESR, and NMR spectra of the products. Also, 2-methoxy-2-oxo-4,4-dicarbethoxy-1,2-oxaphospholane was hydrolyzed by heating with diluted HCl to 2-carboxy-2,3-propylenylphosphonic acid.

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.. ii

I/2 013 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--FORMATION OF OXAPHOSPHOLANE DERIVATIVES IN THE PHOSPHONOMETHYLATION
OF COMPOUNDS WITH A MOBILE HYDROGEN ATOM -U-
AUTHOR--IVANOV, B.YE., KUDRYAVTSEVA, L.A., ZYABLIKOVA, T.A.
COUNTRY OF INFO--USSR
SOURCE--AKAD. NAUK SSSR, SER. KHIM. 1970, (1), 96-100
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--NMR SPECTRUM, ORGANIC PHOSPHORUS COMPOUND, FORMALDEHYDE,
MALONIC ESTER, ETHER, HETEROCYCLIC BASE COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1984/1612 STEP NO--UR/0062/70/000/001/0096/0100
CIRC ACCESSION NO--AP0100222
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0100222

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HEATING 24 G DI-ET MALONATE, 9 G PARAFORMALDEHYDE, AND 18.6 G P(OMESUB3 TO 110DEGREES (EXOTHERM), AND HEATING 3-4 HR AT 150DEGREES GAVE A FRACTION, B SUB0.001 120-30DEGREES, CONTG. MIXED DI-ME 2,2,DICARBENTHOXY ETHYLPHOSPHONATE (I) AND 2,METHOXY,2,OXO,4,4,DICARBETHOXY,1,2, OXAPHOSPHOLANE (II), SEPD. BY REDISTN.; I B SUB0.03 125-60DEGREES, N PRIME20 SUBD 1.4390, D PRIME20 MINUS; II B SUB0.004 136-80DEGREES, 1.4535, 1.2492. SIMILAR REACTION WITH P(DET)SUB3 GAVE (ETD)SUB2 P(O)CH SUB2 CH(CO SUB2 ET)SUB2 AND III (R EQUALS CO SUB2 ET, R PRIME1 EQUALS ET), B SUB0.001 120-10DEGREES, 1.4490, 1.2035, IN NEARLY EQUAL AMTS. SIMILAR REACTION OF NCCH SUB2 CO SUB2 ET AND P(OMESUB3 WITH PARAFORMALDEHYDE GAVE III (R EQUALS CH, R PRIME1 EQUALS ME), B SUB0.03 140-1DEGREES, 1.4630, 1.2738, WHILE ACCH SUB2 CO SUB2 ET AND P(DET)SUB3 WITH PARAFORMALDEHYDE GAVE III (R EQUALS AC, R PRIME1 EQUALS ET), B SUB0.015 125DEGREES, 1.4630, 1.2271; II HEATED WITH DIL. HCL GAVE HO SUB2 CC(:CH SUB2)CH SUB2 P(O) (OH) SUB2, M. 148-51DEGREES. NMR SPECTRAL CURVES (2) WERE SHOWN. A REACTION SCHEME WAS PROPOSED.

UNCLASSIFIED

USSR

UDC 542.91:547.1'118

PUDOVIK, A. N., DMITRIYEVA, G. V., ANOSHINA, N. P., ZYABLIKOVA, T. A., and KHAYRULLIN, V. K., Institute of Organic and Physical Chemistry imeni A. Ye. Arbuzov, Academy of Sciences USSR

"Reaction of Chlorophosphines with β -Chloroacrylic Acid"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 5, May 72, pp 1159-1164

Abstract: The article describes the reaction of methyl-, ethyl-, and phenyl-dichlorophosphine with β -chloroacrylic acids, as well as results of thermographic studies of some reactions of this type. The reaction of methyl-, ethyl- and phenyldichlorophosphine with cis- β -chloroacrylic acid gives alkyl- or aryl-(β -chloroformylvinyl)phosphinic acid chlorides, while the reaction with trans- β -chloroacrylic acid gives trans- β -chloroacrylic acid chloride.

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USSR

UDC 617-001.28-07:616.153.756-092:616.36-07

DOROFYEV, V. M., ZYABLITSKIY, V. M., SOBOLEVA, E. L., and NESTAYKO, G. V.,
Institute of Medical Radiology, Academy of Medical Sciences USSR, Obninsk

"Role of the Liver in the Mechanism of Lowering the Blood Serotonin Level in
Acute Radiation Sickness"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 1, 1973,
pp 33-34

Abstract: In rabbits irradiated once at 600 r (Co^{60} gamma rays, dose rate 120 r/min), the serotonin concentration in the portal vein was the same as in the control, showing that the entry of serotonin from the argentaffine cells into the blood was not blocked at the height of acute radiation sickness. However, the serotonin concentration in the vena cava inferior was almost half that in the portal vein. This suggests that at the height of acute radiation sickness a substantial part of the serotonin coming from the intestine was destroyed in the liver before reaching the blood by monoamine oxidase whose activity in the liver increased sharply in the irradiated animals.

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UDC 616-001.28-036.11-07:616.155.25-007

USSR

DOROFYEV, V. M., ZYARLITSKIY, V. M., and NESTAYKO, G. V., Laboratory of Experimental Hematology, Division of Radiation Pathophysiology and Group of Electron Microscopy, Scientific Research Institute of Medical Radiology, Academy of Medical Sciences USSR, Obninsk.

"Changes in Thrombocyte Aggregation Brought About by ADP and Serotonin in Acute Radiation Sickness"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, Vol 72, No 11, Nov 71, pp 32-34

Abstract: Changes in the aggregation of thrombocytes under the effects of ADP and serotonin were studied in experiments on rabbits subjected to irradiation with gamma-rays in a dose of 600 R. The aggregation of thrombocytes under the effect of ADP was significantly lowered on the 1st, 7th, and 15th day after irradiation and the thrombocyte aggregates became less stable vs. those for control animals. The aggregation of thrombocytes under the action of serotonin was lowered only at the peak of radiation sickness (on the 7th day after irradiation). The reduced capacity of thrombocytes to be aggregated under the effect of serotonin was presumably associated with a reduction in the amount of 5-OT-receptors or a change in the state of these membrane structures.

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USSR

UDC 576.8.077.35

RUDAKOV, I. A., RUDAKOVA, S. F., and ZYABLITSKIY, V. M., Laboratory of Experimental Hematology, Division of Radiation Pathophysiology, Institute of Medical Radiology, Academy of Medical Sciences USSR, Obninsk

"Stimulation of the Restoration of Hematopoiesis in Whole-Body Irradiated Animals by Dispersal of Hematopoietic Cells in the Early Postirradiation Period"

Moscow, Byulleten' Eksperimental'noy Biologii i Meditsiny, No 10, Oct 70, pp 98-101

Abstract: Rats and mice were exposed to whole-body gamma irradiation. After 1-2 hours, a needle was inserted through the distal end of the femoral bone into the medullary canal and then moved about vigorously to destroy the bone marrow. Some 50% of the myelokaryocytes were washed into the bloodstream as a result. As a result of this procedure restoration of the bone marrow, platelets, and leukocytes was more rapid in experimental animals than in irradiated but untreated controls. The beneficial effect of postirradiation dispersal of marrow cells is probably due to the artificial washing out of the surviving hematopoietic elements (the stem cells in particular) into the peripheral blood, where they form new foci of hematopoiesis.

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USSR

UDC: 51.621.391

ZHIGULIN, L. F., ZYABLOV, V. V.

"Exponential Function of Error Probability in a System With Feedback When Cascade Code is Used"

Probl. peredachi inform., 1973, 9, No 1, pp 3-10 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V458 from the authors' résumé)

Translation: The basic purpose of this article is to obtain an upper estimate of the probability of error in a system with feedback when cascade code is used with a definite decoding algorithm.

The result of the work shows that when cascade code is used in a system with feedback where the forward channel is a binary symmetric channel without memory with probability of error per symbol $0 < \epsilon \leq 0.5$, and the feedback channel is a channel without interference and without delay, the error probability with an increase in the mean length of a cascade code combination n decreases according to an exponential function, and is estimated from above by the expression

$$P_{er} \leq \exp\{-nE_{10}(R)\}, \quad (1)$$

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USSR

ZHIGULIN, L. F., ZYABLOV, V. V., Probl. peredachi inform., 1973, 2, No 1, pp 3-10

where $E_{10}(R)$ is the lower estimate of the exponential function of error probability which is a function of the average transmitting rate R , $E_{10}(R)$ being positive for all positive R less than C .

Estimate (1) is obtained for a system which has ideal synchronization with respect to binary symbols.

The basic advantage of the given method of transmission with the use of cascade code combined with ideal feedback is the relatively low complexity of decoding, limited maximum delay of a message during transmission, and an exponential decrease in error probability with unbounded increase in the length of the cascade code for all average transmitting rates less than the throughput. No other known system with feedback has all three of the properties mentioned above simultaneously.

The given system has the mentioned advantages when extremely long codes are used. The question remains open as to the advantages of the system for channels with memory when very long codes are used in it.

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USSR

UDC: 51.621.391

ZYABLOV, V. V.

"Optimizing Cascade Decoding Algorithms"

Probl. peredachi inform., 1973, 9, No 1, pp 26-32 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V459 by the author)

Translation: A study is made of the correcting properties of cascade and iterated codes realized when different algorithms are used for cascade decoding. The estimate of correcting properties (multiplicity of reliably corrected errors) is found by examining the game situation between channel and decoder. In this connection, the channel expenditures are estimated by the multiplicity of the error combination, and the decoder expenditures are estimated by the number of decoding attempts. A minimax strategy is found for a fixed number of decoding attempts.

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USSR

UDC 577.4

ZYABLOV, V. V., AFANAS'YEV, V. B., IVANOVA, L. A., SHUTIKOV, I. V.

"Results of Simulation of Three-Dimensional Codes with Error Localization"

V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami (Transmission of Digital Messages over Channels with Group Errors -- collection of works), Moscow, Nauka Press, 1972, pp 47-52 (from EZh-Kibernetika, No 7, Jul 72, Abstract No 7V456)

Translation: Results are presented from simulating procedures on a digital computer for decoding three-dimensional iterated codes used to transmit the digital data in standard telephone channels. Error recordings for four different channels were used as the channel model. The results obtained permit us to estimate the limiting possibilities for the investigated codes and the effect of the structure, length and redundancy on the erasure probability and the probabilities of erroneous decoding of the messages. An experimental check demonstrated that the modulated versions of the three-dimensional codes are insignificantly inferior with respect to the probability of erasure to cascade codes of the same length and redundancy.

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USSR

UDC 577.4

ZYABLOV, V. V.

"Algorithm for Decoding Nonbinary BCH Codes and Circuits Implementing it"

V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami
(Transmission of Digital Messages over Channels with Group Errors -- collection of works), Moscow, Nauka Press, 1972, pp 23-34 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V454)

Translation: A study was made of an algorithm for decoding the Reed-Solomon codes in the presence of errors and omissions. The proposed decoding algorithm is a further modification of the BCH code decoding algorithms. An explicit formula is obtained for finding the values of the erased symbols, and the indexes of the location of the erroneous symbols are found from the linear matrix equation. Equipment has been developed to correct erasures the volume of which increases linearly with an increase in the number of check symbols, and the speed does not depend either on the length of the code or on the number of check symbols. In order to find the location of the erroneous symbols, equipment has been proposed the volume of which increases proportionally to the square of the number of check symbols and the speed does not depend on the code length or on the number of check symbols.

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USSR

UDC 577.4

ZYABLOV, V. V.

"New Interpretation of Codes for Localization of Errors, their Correcting Properties and Decoding Algorithms"

V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami (Transmission of Digital Messages over Channels with Group Errors -- collection of works), Moscow, Nauka Press, 1972, pp 8-16 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V452)

Translation: A new interpretation is presented for codes for localizing errors, the correcting properties of which represent the mean between correction and detection of the errors. The scheme is presented for encoding codes for error localization analogous to the scheme for encoding a cascade code. An analysis of the correcting properties and the coding and decoding algorithms is presented. A study has been made of the generalization of the proposed encoding scheme for error localization codes. For this generalized encoding scheme, an analysis of the correcting properties of the coding and decoding algorithms is performed.

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USSR

UDC 577.4

ZYABLOV, V. V.

"Correction of Erasures in Binary Linear Codes"

V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami
(Transmission of Digital Messages over Channels with Group Errors -- collection of works), Moscow, Nauka Press, 1972, pp 34-48 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V455)

Translation: A study was made of the correction of erasures and the detection of errors occurring simultaneously with erasures in binary linear codes. For correcting erasures there is a type of check matrix for which the values of the erased symbols are the first symbols of the syndrome, and the last symbols of the syndrome indicate the presence of errors simultaneously with the erasures. In order to find this type of check matrix, an algorithm is used which was obtained on the basis of the Gauss algorithm for solving a system of linear equations. The technical realization of the automatic equipment for such transformations of the check matrix with any combination of erasures is proposed, and it is demonstrated that the volume of such equipment is proportional to the product of the check matrix dimensions.

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USSR

UDC 577.4

BLOKH, E. L., ZYABLOV, V. V.

"Cascade Iterated Codes and Application of Them to Correct Error Packets"

V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami
(Transmission of Digital Messages over Channels with Group Errors -- collection of works), Moscow, Nauka Press, 1972, pp 5-8 (from RZh-Kibernetika, No 7, Jul 72, Abstract No 7V451)

Translation: A scheme is proposed for encoding cascade iterated codes. It is demonstrated that the known coding schemes for iterated codes and also cascade codes are special cases of the scheme for coding cascade iterated codes. The application of this generalized scheme has permitted the construction of codes which are effective for correcting a single error packet. A procedure is proposed for selecting the parameters of the cascade iterated code correcting the single error packet of given length and having the minimum number of check symbols for the given code length and structure. Here, in many cases the codes obtained can have a smaller number of check symbols than the Fire codes or the Reed-Solomon codes which correct the same packet of errors.

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USSR

UDC: 577.4

ZYABLOV, V. V.

"Correcting Erasures in Binary Linear Codes"

Moscow, V sb. Peredacha diskret. soobshch. po kanalam s gruppiru-
yushchimisya oshibkami (Transmission of Discrete Information Along
Channels With Grouped Errors--collection of works) "Nauka," 1972,
pp 34-48 (from RZh--Matematika, No 7, 1972, Abstract No 7V455)

Translation: An examination is made of the correction of erasures and the detection of errors occurring simultaneously with the erasures in binary linear codes. For erasure correction, a form of verifying matrix is found in which the values of the erased symbols are the first symbols of the syndrome, while the succeeding syndrome symbols indicate the presence of errors occurring simultaneously with the erasures. To find this type of verifying matrix an algorithm obtained from the Gauss algorithm for solving systems of linear equations is used. The author proposes the use of automatic equipment for providing similar transformations of the verifying matrix in any combination of erasures, and it is shown that the volume of such equipment is proportional to the matrix dimensions. Author's abstract

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USSR

UDC: 577.4

~~ZYARLOV V. V.~~ AFANAS'YEV, V. B., IVANOVA, L. A., SHUTIKOV, I. V.

"Results of Modeling Three-Dimensional Codes With Error Localization"

Moscow, V sb. Peredacha diskret. soobshch. po kanalam s gruppiruyushchimisya oshibkami (Transmission of Discrete Information Along Channels With Grouped Errors--collection of works) "Nauka," 1972, pp 47-52 (from RZh--Matematika, No 7, 1972, Abstract No 7V456)

Translation: The results are given of the use of electronic digital computers for modeling decoding procedures for three-dimensional iterative codes used for the transmission of digital information in standard telephone channels. Records of errors for four different channels are used in channel modeling. The results obtained permit evaluations of the limiting possibilities for the codes and of the effect of the structure, length, and redundancy on the probability of erasure and wrong decoding of the information. Experimental verification has shown that the modeled variants of the three-dimensional codes are only slightly inferior to cascade codes of the same length and redundancy with regard to the probability of erasure. Authors' abstract

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Semiconductors and Transistors

USSR

UDC 621.376.234

VYSTAVKIN, A.N., ZYABREV, B.G.

"Concerning The Choice Of Material And Geometry Of A n-InSb Detector Based On The Electron Photothermomagnetic Effect"

Radiotekhnika i elektronika, Vol XVII, No 6, June 1972, pp 1273-1279

Abstract: The problem is studied of a choice of material and geometry of a detector based on the electron photothermomagnetic effect. Formulas are found for the optimum thickness and material of the detector. It is shown that use of a resonance system does not lead to a gain in sensitivity. The effect is considered of the magnitude of the power of the incident radiation on the conversion ratio of the detector. Experimental results are compared with theory. The authors thank T.M. Lifshits and Sh.M. Kogan for interest in the work and discussion, I.V. Zyabrev for formulation of the program and conducting calculations on an electronic computer, and R.B. Safin for assistance in conducting the experiment. 3 fig. 8 ref. Received by editors, 27 April 1971.

1/1

Transformation and Structure

USSR

UDC 620.186:669.71'3

ZYABREVA, L. N., NIKIFOROV, G. D. and KOLACHEV, B. A., Moscow Aviation Technological Institute

"Structural Changes and Phase Transformations in Welded Joints of Aluminum Alloy With 4% Copper"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 2, 1972, pp 75-76

Abstract: Described is a study on structural changes and phase transformations occurring in Al-4% Cu alloy under the thermal cycle of welding. During welding each volume of metal is heated up to certain limit temperatures reflected in five characteristic structural sections which had been heated to different temperatures ranging from 150°C (zone decay stage) to 640°C (liquidus stage). The detailed changes in each section indicate the possibility of changing the width of the structural sections by varying the thermal welding cycle. A 30% addition of sintered aluminum powder promotes diffusion processes in the metal and precludes grain disintegration which will, in turn, eliminate the major cause of deterioration of the mechanical properties in the heat-affected zone. (1 illustration).

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USSR

UDC 621.378.8

ZYATITSKIY, V. A., KAZANTSEV, YU. N.

"Problems of Exciting Wave Guides of the Dielectric Channel Class"

Gor'kiy, Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, Vol XIV, No 10, 1971, pp 1570-1573

Abstract: The effectiveness of exciting dielectric channel wave guides by three different types of exciters -- a metal wave guide, an iris line and a lens line -- is analyzed. The excitation effectiveness, η , is defined as the ratio of the power of the operating wave of the dielectric channel wave guide to the power of the incident wave. It is found to be no less than 0.98 for the basic wave of the dielectric channel wave guide in the case of iris and lens lines. From comparison of the calculated data, preference must be given to the lens line operating under optimal excitation conditions of the dielectric channel wave guide. The purity of the excitation is of the same order in both lines, but the lens line has less rigid tolerances on the ratio of the transverse dimensions of the wave guide-exciter and the dielectric channel wave guide in the vicinity of the extremum of η . The results obtained can be carried over to excitation of dielectric channel wave guides by lasers with flat and spherical reflectors, which corresponds to excitation by means of iris and lens lines.

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USSR

UDC: 621.3723:555

ZYATITSKIY, V. A.

"Beam Guides With Adjusted Nonuniformities (Regular Beamguides of the 2nd and 3rd Order)"

V sb. Aerothermooptika i luchebody (Aerothermal Optics and Beam Guides--collection of works) Minsk, 1970, pp 24-41 (from RZh-Radiotekhnika, No. 3, March 71, Abstract No. 3B209)

Translation: A generalization is made of classical regular quasi-optical beam guides which satisfy two conditions: constancy of radiation losses with consequent field reradiation, and redundancy of field distribution from corrector to corrector. Three illustrations, bibliography of 10. V. S.

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USSR

UDC: 621.372.8:535

ZYATITSKIY, V. A.

"Optimization of Average Stochastic Uncontrolled Beam Guides"

V sb. Aerotermostika i luchebody (Aerothermal Optics and Beam Guides) Minsk, 1970, pp 42-47 (from RZh-Radiotekhnika, No. 3, March 71, Abstract no. 3B206)

Translation: On the basis of an analysis of the effect of beam guide nonuniformities on the energy balance of radiation transmitting field, problems of optimizing beam guide construction are solved. It is shown that the beam guide can be made in the form of a widening funnel to give it best protection from losses due to transverse lens (mirror) shifts. Three illustrations, bibliography of four. V. S.

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USSR

UDC 621.372.8:535

ZYATITSKIY, V. A.

"Theory of Stochastic-Irregular Beam Wave Guides"

Aerothermooptika i luchebody -- V sb. (Aerothermooptics and Beam Wave Guides -- collection of works), Minsk, 1970, pp 194-214 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4B206)

Translation: The effect of inhomogeneities of two types (inhomogeneities of the corrector and the transverse shift of the corrector) on wave propagation in beam wave guides is investigated. An algorithm is constructed for calculating the mean energy transmission coefficient. There are 5 illustrations and a 10-entry bibliography.

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USSR

UDC 535.33

SEVCHENKO, A. N., OL'DEKOP, YU. A., ZYAT'KOV, I. P., BYLINA,
G. S., SAGAYDAK, D. I., SHINGEL', I. A.

"Investigation of the IR Spectra of Poly-n-Formylstyrene, Styrene Copolymers, n-Formylstyrene, and Some of Their Derivatives"

Minsk, Zhurnal Prikladnoy Spektroskopii (Journal of Applied Spectroscopy), Vol 13, No 4, Oct 1970, p 633-638

Abstract: The authors study the ir spectra of several styrene (S) and n-formylstyrene (FS) copolymers containing various aldehyde groups as well as several aldehyde group derivatives: namely, poly-n-formylstyrene (PFS); copolymers I-V containing 23.8, 31.9, 36.0, 40.2, and 456 mole % FS, respectively; Schiff copolymers I and V; phenylhydrazone copolymer IV; azine copolymer I, III, IV, and V; oxime copolymers IV and V; and acetal - methyl alcohol copolymer III. The polymer samples were ground together with a quantity of KBr and then pressed into tablets. The spectra were taken with a UR-10 spectrophotometer. The spectral regions studied were 3100 to 2700 cm^{-1} and 2000 to 700 cm^{-1} .

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USSR

SEVCHENKO, A. N. et al, Zhurnal Prikladnoy Spektroskopii, Vol 13,
No 4, Oct 1970, p 633-638

The ir spectra of S, FS, and PFS are analyzed, compared, and interpreted in detail. The ir absorption spectra are plotted and presented in the form of curves. Numerous bands are identified and related to specific bond vibrations and atomic groups.

The authors thank L. K. Burykina for assistance in preparing the samples. Orig. art. has 4 figs. and 7 refs.

2/2

1/3 027 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--DETERMINATION OF THE GAS SATURATION OF BLAST FURNACE SLAGS -U-
AUTHOR--ZYATKOVA, L.R., CHERNYAVSKIY, I.YA.
COUNTRY OF INFO--USSR
SOURCE--ZAVOD. LAB. 1970, 36(1) 49-51
DATE PUBLISHED-----70
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, MATERIALS
TOPIC TAGS--BLAST FURNACE, SYNTHETIC SLAG, METAL CONTAINING GAS, CARBON
DIOXIDE, GAS FLOW
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1993/0272 STEP NO--UR/0032/70/036/001/0049/0051
CIRC ACCESSION NO--AP0113204
ZZZZZZZZZZ UNCLASSIFIED

2/3 027

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0113204

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BLAST FURNACE SLAGS DO NOT APPRECIABLY ENTRAP OR DISSOLVE CO SUB2. SINCE CO SUB2 IS SOL. IN KOH AND THE GASES USUALLY CONTAINED IN SLAGS ARE NOT, THE GAS CONTENT OF SLAGS COULD BE DETD. BY UTILIZING CO SUB2 AS A CARRIER GAS AND BY COLLECTIN THE SLAG GASES IN A GAS BURET OVER A SOLN. OF KOH. APPROX. 3 G POWD. SLAG WAS PLACED IN A CORUNDUM COMBUSTION BOAT. THE BOAT WAS PLACED IN THE CORUNDUM TUBE OF A TUBE FURNACE, THE INLET END OF WHICH WAS ATTACHED TO A KIPP GENERATOR (SET UP TO PRODUCE CO SUB2) THROUGH A FLOW-METER. THE OUTLET END WAS ATTACHED TO A GAS DELIVERY TUBE WHICH LED TO THE GAS BURET FILLED WITH A 40PERCENT KOH SOLN. CO SUB2 WAS ALLOWED TO FLOW AT 30 L:-HR FOR 1 HR, WHILE THE SLAG WAS HEATED FROM 800 TO 1400DEGREES, WITH THE EXIT GASES BEING VENTED TO THE ATM. AFTER PURGING, THE CO SUB2 GAS FLOW WAS DECREASED TO 12L.-HR AND THE EXITING GASES WERE PASSED INTO THE GAS COLLECTING SYSTEM. A TIMER WAS STARTED WITH THE 1ST APPEARANCE OF GAS IN THE BURET AND THE KOH LEVEL WAS MONITORED EVERY 5 MIN. THE TEST WAS CONTINUED UNTIL THE GAS LEVEL WAS CONST. FROM 1 READING TO THE NEXT. A BLANK TEST WAS RUN TO DET. THE VOL. OF KOH INSOL. GAS EVOLVED FROM THE SYSTEM CONTG. NO SLAG UNDER EXACTLY THE SAME CONDITIONS OF TIME, TEMP., AND CARRIER GAS FLOW. THE GAS CONTENT OF THE SLAG WAS EASILY CALCD. FURTHER EXPTS. ON A SYNTHETIC SLAG, COMPRISING CAO 31, SIO SUB2 28.38, AL SUR2 O SUR3 24.66, AND MGO 6.46PERCENT, WAS CARRIED OUT BY THE USE OF FLOW METERS AT THE INLET AND OUTLET ENDS OF THE SYSTEM, TO ASCERTAIN COMPLETENESS OF REMOVAL OF ENTRAPPED SLAG GASES.

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PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0113204

ABSTRACT/EXTRACT--CALCN. SHOWED THAT GAS RECOVERY WAS GREATER THAN 97PERCENT UNDER THE CONDITIONS USED. DEVIATIONS OF GAS CONTENT FROM DUPLICATE DETMS. WERE SMALLER THAN OR EQUAL TO 10PERCENT. SLAGS FROM DIFFERENT PLANTS CONTAIN ESSENTIALLY EQUAL VOLS. OF GAS (900-1200 CM PRIME3-100 G SLAG).

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1/2 035

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--PROTONS POLARIZATION ARISING DURING THE INTERACTION OF 650-840 MEV PHOTONS WITH LITHIUM-7 AND CARBON-12 -U-

AUTHOR--(05)-TONAPETYAN, S.G., KONOVALOV, O.G., DEREBCHINSKIY, A.I., ZYBALOV, A.A., KHVOROSTYAN, V.M.

COUNTRY OF INFO--USSR

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SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 1970, 11(3), 165-8

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--PROTON POLARIZATION, PHOTONUCLEAR REACTION, ELASTIC SCATTERING, GRAPHITE, LITHIUM ISOTOPE, CARBON ISOTOPE, GAMMA SPECTRUM, PHOTO EMF

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0242

STEP NO--UR/0386/70/011/003/0165/0168

CIRC ACCESSION NO--AP0105318

UNCLASSIFIED

2/2 035

UNCLASSIFIED

PROCESSING DATE--16JCT70

CIRC ACCESSION NO--AP0105318

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POLARIZATION, P, OF P WHICH ARE ELASTICALLY SCATTERED ON NUCLEI OF GRAPHITE ELECTRODES WAS CALCD. AT ENERGIES OF PHOTOCURRENTS OF 700-900 MEV, P POL RIZATION FOR NUCLEI OF PRIME7 LI AND PRIME12 C IS CLOSE TO ZERO. IN THE MESON II KINEMATIC REGION P CHANGES SHARPLY FROM MINUS 0.76 TO 0.48 AS THE PHOTON ENERGY INCREASED. FOR PHOTONS WITH ENERGIES 650, 715, AND 840 MEV, IN THE REACTION GAMMA PLUS N YIELDS N PRIME NEGATIVE PLUS P, P EQUALS MINUS 0.74, MINUS 0.16, AND 1.66, RESP. FACILITY: FIZ.-TEKH. INST., KHARKOV, USSR.

UNCLASSIFIED

USSR

UDC 535.37:621.375.8

BOL'SHOV, M. A., GUZEYEV, I. D., ZYBIN, A. V., KOLOSHNIKOV, V. G., MAYOROV, I. A., NEDLER, V. V., MANDEL'SHTAM, S. L., TIMOFEYEV, Ye. F., and FILIMINOV, L. N.

"Determining Small Na Concentrations by the Fluorescence Resonance Method Using Tunable, Pulsed Dye Lasers"

Minsk, Zhurnal Prikladnoy Spektroskopii, November 1973, pp 821-824

Abstract: The subject of this article involves the method of fluorescence resonance in the use of tunable radiation dye lasers for detecting small concentrations of elements. Experiments designed to demonstrate the possibilities of this method in the saturation mode of resonance transition with Na as the element to be detected are described. For the excitation of the Na vapor a rhodamine laser of the 6Zh type, pumped by the second harmonic radiation of a neodymium laser, was employed. The duration of the pulses was $2 \cdot 10^{-8}$ sec, their power was 10^5 W, the width of the fluorescence line was 1 Å, and the tunable range 5600-6200 Å, with an interval of 20-30 sec between scintillations. The ZMR-3 was used as receiver. A block diagram of the equipment is given, together with a curve for the amplitude of the 1/2

USSR

BOL'SHOV, M. A., et al., Zhurnal Prikladnoy Spektroskopii, November 1973,
pp 821-824

fluorescence signal varying with time. The authors find that using a laser with high scintillation repetition rates and increasing the light power increase the sensitivity of the element detection.

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ZYBIN, I. F.

SO: JPRS 54394
22 OCT 71

ETHNOLOGICAL APPROACHES TO DETERMINATION OF POLYCLINIC AND HOSPITAL CARE DEMAND OF THE RESIDENTS OF MOSCOW

UFG 352.11+632.221:55.012.23(47-25)

Article by I.D. Babitskiy, I.A. Vorobkova, Yu.A. Podvarko, V.D. Dubrovina, N.Ye. Kuznetsov, A.V. Kozlov, All-Union Scientific Research Institute of Social, Public Health and Public Health Organization Imeni N.A. Semashko, Moscow, Main Soviet of Workers' Deputies, Moscow, Scientific Committee of the Moscow City No 9, 1971, submitted 6 March 1971, pp 33-61

Determination of the demand in Moscow with reference to polyclinic and hospital care is a burning issue.

The presence in Moscow of a branched out network of scientific research institutes, clinical hospitals, specialized departments and centers serviced by many highly qualified specialists is the reason why many out of town and rural residents come to the therapeutic and prophylactic institutions of Moscow for polyclinic and hospital medical care. In 1969 alone, 15,885 patients from other cities and rural regions visited the USSR Ministry of Health for a referral to Moscow specialists; 615 of them were hospitalized; 31,373 patients came to the reception rooms of the RSFSR Ministry of Health, and 1,842 of these were hospitalized. According to the available data, there was no appreciable difference between the number of patients from other cities and rural regions who turned to the USSR and RSFSR ministries of health for a number of prior years. According to random statistical studies, up to 10 percent of the individuals admitted from rural regions and other cities to the hospitals of the Main Public Health Administration of the Mosgorispolkom [Executive Committee of the Moscow City Soviet of Workers' Deputies], and a mean of about 30 percent of such individuals are hospitalized in the hospitals of scientific research institutes.

In view of this circumstance, at the request of the Main Public Health Administration of Mosgorispolkom, the USSR Ministry of Health commissioned the All-Union Scientific Research Institute of Social, Public Health and Public Health Organization to investigate jointly with this administration the demand of the inhabitants of Moscow in medical care and to develop differentiated norms for specialized forms of such care with due consideration

ZYBIN, I. F.

SO:JPRS 55204
16 FEB 72

UDC: 362.11-057.638(47-21)

NONRESIDENT HOSPITALIZATION RATE IN THE HOSPITALS OF A LARGE CITY

(Article by I. F. Zybin, All-Union Scientific Research Institute of Social Hygiene and Public Health Organization Imani S. A. Samashko, USSR Ministry of Health, Moscow; Moscow, Sovetskoye Zdravookhraneniye, Russian, No 1, 1972, submitted 10 August 1971, pp 11-16)

One of the typical distinctions of large cities, such as Moscow, is the existence of a ramified network of clinical hospitals and hospitals with narrowly specialized departments, as well as scientific research institutes where the latest therapeutic methods are used and highly qualified specialists are employed. This attracts patients with complicated and chronic diseases. Patients come to the therapeutic and prophylactic institutions of Moscow from other populated centers, in particular from rural areas, and thus occupy hospital beds intended for the residents of Moscow.

The statistical sampling method (10% sample) was used for a full calendar year to analyze the composition of rural and nonresident patients who received hospital care in all of the therapeutic and prophylactic institutions in Moscow. It was established that more than 127,500 rural and nonresident patients went through the therapeutic and prophylactic institutions of the city in a calendar year. Most of them (over 60%) were treated in institutions of the Main Administration for Public Health under the Moscow Municipal Executive Committee. There were more women (53-47) among such patients than men; 74 percent were employed and 26 percent were unemployed. About 47 percent of all nonresident patients were treated in therapeutic and surgical departments. The highest number of rural and nonresident patients in different departments of therapeutic and prophylactic institutions of Moscow, as compared to all patients in these departments, was noted in oncological, ophthalmological, stomatological, neurological, and musculoskeletal departments (Table 1).

The hospitalization levels for nonresident patients according to special factors (per 1,000 residents of Moscow of the same sex and age) are shown in Table 2.

The hospitalization indices are higher in all specialties, and with respect to some (ophthalmology, phthisiatry, and psychiatry) they were much higher than for women. Most often men and women were referred to therapeutic

ZYBIN, I. F.

SO: JPRS 54354
28 OCT 71

UDC: 616-082.4(47-25):313.12
DISTINCTIVE FEATURES IN THE STRUCTURE OF NONRESIDENT PATIENTS TREATED IN THE HOSPITALS OF MOSCOW

Article by I. F. Zybin (Moscow) ¹¹⁴
Hygiene and Public Health Organization Imeni N.A. Semashko, USSR Ministry of Health, Moscow; Sovetskaya Zdravoohraneniye, Russian, No 9, 1971, submitted 13 April 1971, pp 40-44

The network of hospital institutions in Moscow is growing constantly. The number of beds is also increasing with each year. Availability of hospital beds at the disposal of the Main Public Health Administration of Moscow, according to reported data, reached 10.9 beds per 1,000 population in 1970. If we consider the network of branch services this index is even higher.

In spite of the fact that there has been considerable improvement in availability of hospital beds for the residents of Moscow in the last few years, the rapidly growing demand is not yet met in full. This is due, to a large extent, to the enormous influx of patients from other cities and rural areas to the therapeutic and prophylactic institutions of the capital. According to the data from statistical samplings, up to ten percent of those hospitalized in the system of the Main Public Health Administration of Moscow consist of about 30 percent of those admitted to the hospitals of scientific institutes consists of nonresidents.

Our objective was to make a sample study for a complete calendar year of the composition of rural and out-of-town patients in hospitals of therapeutic and prophylactic institutions of Moscow, regardless of their jurisdiction. A statistical card was developed for each nonresident discharged from a Moscow hospital was kept up for a period of 12 calendar months of followup in all public health institutions regardless of their jurisdiction located in Moscow. Such a card was made up for every tenth nonresident discharged from the particular hospital department.

In a year we gathered 12,752 cards, 60.6 percent of which were referable to institutions of the Main Public Health Administration of Moscow. 19.4 percent to scientific research institute clinics, 16.7 percent to institutions of the Ministry of Transportation, and 3.6 percent to other public health

Public Health

2YBIN, I.F.

JRS 58475
21 Jul 73

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POLYCLINIC AND HOSPITAL CARE REQUIREMENTS OF THE POPULATION OF MOSCOW

UDC: 362.114362.121
(470.311):65.012.2

Articles by I.D. Bogatyrev, Yu.A. Fedarika, V.D. Dubrovina, I.F. Zhibin, G.N. Jukhneva, All-Union Scientific Research Institute of Social Hygiene and Public Health Organization Imani N.A. Semashko, Moscow; Meditsina i Zdravookhraneniye, Russian, No 1, 1973, submitted 8 August 1972, pp 23-29.

The requirements of the population of Moscow with regard to polyclinic and hospital care were determined by the All-Union Scientific Research Institute of Social Hygiene and Public Health Organization Imani N.A. Semashko in collaboration with the Main Administration for Public Health of the Moscow Municipal Executive Committee in 1969-1971. In accordance with a decision made by the board of the USSR Ministry of Health on 15 May 1967, using a method of investigation approved by the Institute's scientific council.

Data pertaining to the methodological approaches to determining the medical care requirements of the inhabitants of Moscow and some preliminary data of this investigation have been published previously.

Our objective was to supply recommendations as to the demand referable to the population of Moscow and a specific type of care, on the basis of our previous studies to determine the requirements of urban population in polyclinic and hospital medical care, by means of standardizing the norms of supplying such care, as related to the age and sex structure; we also wanted to determine the scope of polyclinic and hospital care received by nonresident patients in the public health institutions of Moscow.

We determined the medical care requirements of permanent residents of Moscow using the standardization method. The indices of Methodological Approaches to Determination of Polyclinic and Hospital Care Demand of the Residents of Moscow, Sovetskoye Zdravookhraneniye, No 9, 1971.

5

Acc. Nr: AP0044383

Ref. Code: UR 0463

PRIMARY SOURCE: Molekulyarnaya Biologiya, 1970, Vol 4, Nr 1,
pp 3-8

KINETIC CHARACTERISTICS OF CHEMILUMINESCENCE APPEARING
IN REACTION OF DNA WITH *N*-ACETYLETHYLENEIMINE
Zybina, D. L.; Volokitina, K. S.; Kruglyakova, K. Ye.;

Emanuel, N. M.,

Institute of Chemical Physics, Academy of Sciences, USSR, Moscow

Chemiluminescence was revealed in the course of reaction of DNA with *N*-acetyl-ethyleneimine. Kinetic curve for the chemiluminescence indicated that intermediate products did appear in the system. The dependence was found of the intensity and the rate constant of chemiluminescence upon the concentrations of reagents and temperature. The chemiluminescence was shown to be due to oxidation processes. The decrease in the chemiluminescence intensities under the action of free-radical reaction inhibitors made it possible to suggest the radical nature of the chemiluminescence occurring in the course of the reaction between DNA and *N*-acetyleneimine.

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UDC 621.791.72:669.14.013.8

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ZYBKO, I. YU., Engineer, and LYUBAVSKIY, K. V., Doctor of Technical Sciences

"Electron-Beam Welding of EP291sh (2Kh11MB) and EI680 (1Kh16N13M2B) Steels"

Moscow, Svarochnoye Proizvodstvo, No 5, May 70, pp 14-15

Abstract: Results are presented of the electron-beam welding of EP291sh and EI680 steels up to 60-65 mm thick. The basic technological parameters of the welding process are given and an evaluation is made of the structure and properties of weld seams under different regimes of heat treatment. In electron-beam welding with deep fusion of the steel, the strength properties of the weld joints of both steels at room temperature are on a level with the strength properties of the base metal, while at elevated temperatures the weld joint are 5-15% weaker than the base metal. Preliminary heating somewhat increases the impact toughness of the seam metal of EP29sh steel. Defects in the form of shallow cavities form in the root of the weld during welding of both steels.

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UDC 621.791.72.011:669.15-194

ZYBKO, I. YU., Central Scientific Research Institute of Technology and
Machine Building

"Evaluation of the Weldability of Cr-Ni Steels by an Electron Beam in a Vacuum"
(Presented at the Third Conference on Electron-Beam Welding in Kiev on
14 Sep 71)

Kiev, Avtomaticheskaya Svarka, No 3, Mar 73, pp 5-7

Abstract: The tendency of hot crack formation in weld seams to a depth of 12-15 mm when electron-beam welding in a vacuum was investigated for Ni-Cr steels 1Kh16Ni3M2B, Kh18Ni10T, Kh18Ni12T, Kh20Ni45V6T, Kh16Ni9M2, and Kh20Ni45M4V3B. A comparison of steels welded by an argon arc with a nonconsumable electrode and electronbeam welding for the formation of hot cracks showed that all the steels except Kh16Ni9M2 have hot cracks when argon-arc welded while steels 1Kh16Ni3M2B, Kh18Ni10T and Kh16Ni9M2 did not have cracks when welded in a vacuum by an electron beam. 4 figures, 3 tables.

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USSR

UDC 621.791.72

ZYBKO, I. YU., TSEL'NIKER, YE. YA., and KRIVKO, M. A., Central Scientific Research Institute of Technology and Machine Building

"Electron Beam Welding of Heavy Steam Turbine Assemblies"

Kiev, Avtomaticheskaya Svarka, No 10, Oct 72, pp 59-62

Abstract: TsNIITMash/Tsentral'nyy Nauchno-Issledovatel'skiy Institut Tekhnologii i Mashinostroyeniya; Central Scientific Research Institute of Technology and Machine Building/ has investigated the welding processes in the welding of steam turbine guide wheel and diaphragm vane blocks made from 2Kh11MBsh (EP291), 1Kh13, 1Kh16N13M2B (EI680), 15Kh1MF, and 12Kh1MF steels. Weldability of the steels was studied on electron-beam-welded samples 60 mm thick using a TsELS-1M unit. In joints of EP291 and 1Kh16N13M2B steels micro- and macro-cracks were absent. In EP291 the seams had individual pores 0.2-0.3 mm in diameter. It is possible that these pores formed as the result of incomplete degassification of the seam metal during welding. The short-time strength of weld joints at room temperature after heat treating (740°C anneal for two hours for EP291 and austenitization at 1100°C for one hour for EI680 steel was the same as the base metal, and at 300 and 600°C it amounted to 85-90% of the base metal's short-time strength. The impact strength of the seam metal for 1/2

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ZYBKO, I. YU., et al., *Avtomaticheskaya Svarka*, No 10, Oct 72, pp 59-62

EP291 (not preheated before welding) was 6 kg-m/cm^2 and with preheating to 400°C -- 10 kg-m/cm^2 . The impact strength of the seam metal for EI680 steel after welding was 12 kg-m/cm^2 , and after austenizing -- $15-18 \text{ kg-m/cm}^2$. The fatigue strength of EP291 welds at 20°C with symmetrical loading at 10^6 cycles was $32-32.5 \text{ kg/mm}^2$, and joints of EI680 steel -- 25 kg/mm^2 . At 565°C the fatigue strengths were 25 and 17 kg/mm^2 , respectively. The above results made it possible to develop the technology of welding vane blocks and to weld the unit of regular vanes for a K300-240 turbine, manufactured at the Leningrad Metals Plant imeni XXII Congress CPSU. The welding was done with the TsELS-2 unit developed jointly by TsNIITMash and the Institute of Electric Welding, the productivity of which is 30 vane blocks and 4 diaphragms per shift. Electron beam butt welds were made of dissimilar steels (12Kh1MF-1Kh13 and 15Kh1MF-15Kh11MF) 30 mm thick. Shear tests at 20, 300, and 600°C showed that these welded pairs failed in the base metal. The tensile strengths of these pairs at 20°C was $52-56 \text{ kg/mm}^2$ for 15Kh1MF-15Kh11MF and $40-45 \text{ kg/mm}^2$ for 12Kh1MF-15Kh11MF. At 600°C the tensile strengths of these pairs were 38-40 and $30-32 \text{ kg/mm}^2$, respectively. 6 figures, 2 tables.

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SOLYAKOV, S. P., BELKIN, G. I., TATAKIN, A. N., NACHAYEV, V. M., ZOBININ, S. I.,
ZYEV, N. M., IVANOV, A. B., VUKOLOV, V. V., SVALOV, G. N., DEVYATKIN, V. N.,
ALEKSANDROV, V. A., GRIBOV, V. I.

"Method of Processing Slimes from Electrolytic Production of Magnesium"

Author's Certificate No 278126, filed 11/02/69, published 18/11/70. (Translated from Referativnyy Zhurnal Metallurgiya, No 2, 1972, Abstract No 2G185).

Translation: In order to use the slime for production of Mg, it is fed from the electrolyzers to chlorinators together with the depleted $MgCl_2$ electrolyte in the form of a pulp containing 1-10% MgO and 5-25% $MgCl_2$. The chlorinators also receive the Cl-Mg raw material and Cl_2 , after which the electrolyte, enriched with $MgCl_2$, is fed to the electrolyzers.

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Organophosphorous Compounds

USSR

UDC 546.183

PETROVA, I. M., ZYK, N. V., NIFANT'YEV, E. YE.

"Hydrolysis and Acidolysis of Methriol Phosphite"

Vestnik Moskovskogo Universiteta, Khimiya, No 4, 1971, pp 433-435

Abstract: Earlier works have noted the great hydrolytic instability of methriol /1,1,1-tris(hydroxymethyl)ethane/ phosphite and concluded that it is hydrolyzed by even traces of moisture to the monocyclic acid phosphite. The authors established that the hydrolysis does not occur so simply. Studying the interaction of methriol phosphite with acids when heated to 80° for several hours, the authors determined that the reactivity of methriol phosphite is lower than that of non-cyclic normal phosphite. 2-Methyl-2-benzoyloxymethyl-1,3-propylene phosphite was produced by reesterifying methriol monobenzoate with dimethyl phosphite. Certain properties of this substance were studied, including reactions producing polyphosphites.

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USSR

UDC 595.752+632.3

ZYKIN, A. G.

Tli -- Perenoschiki Virusov Kartofelya (Aphids -- Vectors of Potato Viruses), Leningrad, "Kolos," 1970, 72 pp

Translation: Annotation: Potato viral diseases are the main scourge of potato growing. Under field conditions most potato viruses are spread by insects -- aphids. In the main potato producing regions the struggle for the control of aphids is, therefore, a component part of the task of growing seed potatoes.

Information concerning the biology and ecology of aphids -- the vectors of the viruses, methods of insect control, determination of species, and methods of controlling potato virus vectors are provided in the pamphlet.

The pamphlet is intended for potato growing specialists (seed cultivators and selection specialists and plant protection specialists.

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ZYKIN, A. G., Tli --- Perenoschiki Virusov Kartofelya (Aphids --- Vectors of Potato Viruses), Leningrad, "Kolos," 1970, 72 pp

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USSR

UDC 621.9.01.669.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., ZHARKOV, I. G., ZYKIN, A. S., KRAVCHENKO, B. A., LENILIN, V. I., MEDVEDEV, L. P., MITRYAYEV, K. F., URYVSKIY, F. P.

"Cutting of Heat-Resistant, High-Strength Titanium Alloys"

Obrabotka Rezaniyem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov [English Version Above], Moscow, Mashinostroyeniye Press, 1972, 198 pages.

Translation of Foreword: The Twenty-Fourth CPSU Congress defined the main trends in further development of the socialist economy and indicated the necessity of comprehensive acceleration of scientific and technical progress.

One primary trend in the development of the economy is increasing the effectiveness of production. This means that under today's conditions, ever greater significance is being given to increasing the output of products, improving their quality and technical and economic indicators.

Over the past years, the tool industry has solved important problems related to the creation of new tool designs, the development of the production and improvement of tools, as well as mass production of tools of ever stronger high-speed steels. Broad utilization of automated machine tools, continuous and automatic production lines in large-series and mass production requires an increase in the output of cutting tools of long life and

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UDC 621.9.01.669.018.25

USSR

REZNIKOV, N. I., BURMISTROV, Ye. V., et. al., Obrabotka Rezaniiem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniye Press, 1972, 198 pages.

high accuracy, capable of operating under severe cutting conditions for long periods of time without replacement. Tool life can be increased if the tool industry is provided with high quality steels and alloys. Soviet scientists have created alloys with high strength characteristics and high heat resistance. The workability of alloys and steels can be improved by the use of various methods based on ultrasonics, electric contact and induction heating, application of small electric currents to the cutting zone, etc. These methods allow the life of a cutting tool to be increased by 2 to 5 times, increasing the cutting speed and productivity of processing. Part quality can be improved by using tools of natural and synthetic diamonds, as well as elbor.

The present work familiarizes the reader with research conducted into the physics of the cutting process, materials for cutting tools, optimal cutting modes and methods of improving the quality and workability of parts.

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UDC 621.9.01.669.018.25

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UDC 621.9.01.669.018.25

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REZNIKOV, N. I., BURMISTROV, Ye. V., et. al., Obrabotka Rezaniiem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniye Press, 1972, 198 pages.

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UDC 621.9.01.660.018.25

REZNIKOV, N. I., BURMISTROV, Ye. V., et al., Obrabotka Rezaniiem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniya Press, 1972, 198 pages.

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UDC 621.9.01.660.018.25

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REZNIKOV, N. I., BURMISTROV, Ye. V., et al., Obrabotka Rezaniiem Zharoprochnykh Vysokoprochnykh i Titanovykh Splavov, Moscow, Mashinostroyeniya Press, 1972, 198 pages.

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USSR

UDC 616.932-092.9

ZYKIN, L. F., LOBANOV, V. N., SAGEYEVA, O. F., and PETROVA, L. S., All Union Scientific Research Antiplague Institute "Mikrob"

"Study of the Action of Cholero-gen and Isolated Cell Components of *V. cholerae*"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunologii, No 9, Sep 70, pp 36-43

Abstract: A comparative study of the action of cholero-gen and the isolated cell structures of *Cholera vibrio* (cell walls, flagellae, and cytoplasm) is presented. A fatal cholera syndrome developed in neonatal rabbits following endoenteric infection. Histological investigations revealed various lesions in the intestine, including necrotic changes in the villi, mucosa and submucosa of the small intestine, and granular dystrophy of the kidney and liver cells. No cholero-genic action was produced by the cell walls, flagellae, and cytoplasm. Endotoxin localized in cell walls and cholero-gen differed in respect to their effect on neonatal rabbits.

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1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--THE ROLE OF CELLULAR STRUCTURES OF CHOLERA AND NON CHOLERA VIBRIOS
IN DEVELOPMENT OF NON SPECIFIC RESISTANCE -U-
AUTHOR--(02)--ZYKIN, L.F., PETROVA, L.S.
COUNTRY OF INFO--USSR
SOURCE--ANTIBIOTIKI, 1970, VOL 15, NR 6, PP 537-540
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--CHOLERA, VIBRIO COMA, CYTOPLASM, CELL MEMBRANE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAHE--2000/1865 STEP NO--UR/0297/70/015/006/0537/0540
CIRC ACCESSION NO--AP0125476
UNCLASSIFIED

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CIRC ACCESSION NO--AP0125476
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--30OCT70

MEMBRANES AND INTACT CELLS OF CHOLERA, EL TOR AND NAG VIBRIOS WERE STUDIED WITH RESPECT TO THEIR ABILITY TO INDUCE THE STATE OF NON SPECIFIC RESISTANCE IN ALBINO MICE TO CHOLERA INFECTION. THE PREPARATIONS OF CYTOPLASMIC MEMBRANES AND CELL WALLS OF VIBRIOS NAG WERE MOST ACTIVE.
FACILITY: NATIONAL ANTIPLAGUE INSTITUTE MICROBE, SARATOV.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--13NOV70
 TITLE--EXPERIENCE WITH HEXONUM ELECTROPHORESIS IN HEALTH RESORT TREATMENT
 OF PATIENTS WITH HYPERTENSIVE DISEASE -U-
 AUTHOR--(05)-NEOSTUPOV, S.P., ALEKSANDROVA, K.M., MERKULOVA, YE.YU.,
 VAKHNOVSKAYA, O.I., ZYKIN, N.N.
 COUNTRY OF INFO--USSR

SOURCE--VRACHEBNOYE DELO, 1970, NR 4, PP 73,75

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
 TOPIC TAGS--ELECTROPHORESIS, HYPERTENSION, BLOOD PRESSURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--3002/1686

STEP NO--UR/0475/70/000/004/0073/0075

CIRC ACCESSION NO--AP0129056
 UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0129056

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COMPLEX HEALTH RESORT TREATMENT INCLUDING HEXONIUM ELECTROPHORESIS RESULTED IN MOST CASES IN REDUCTION OF THE ARTERIAL PRESSURE. AN IMPROVEMENT OF THE PATIENTS CONDITION WAS OBSERVED IN 93.8PERCENT. THE EXPEDIENCY IS CONCLUDED OF INCLUSION OF HEXONIUM ELECTROPHORESIS IN THE COMPLEX OF HEALTH RESORT TREATMENT OF PATIENTS WITH HYPERTENSIVE DISEASE (STAGES I AND II). FACILITY: YALTINSKOGO TERRITORIAL'NOGO SOVETA PO UPRAVLENIYU KURORTAMI PROFSOZUZOV.

UNCLASSIFIED

USSR

UDC:539.4

ZYKIN, P. G. and LUKIN, B. YU., Ufa Aviation Institute

"Endurance of Thin Strips of Heat-Resistant Alloys"

Kiev, Problemy Prochnosti, No 2, Feb 74, pp 117-118

Abstract: This work presents the results of an experimental study of fatigue strength during bending of thin strips 0.2 mm thick of the heat-resistant alloys KH18N10T, VZH98, EI602 and EI654 under normal temperature conditions. One end of each of three specimens tested simultaneously was pulled with a constant force, while the other was bent around a cylindrical surface of a certain radius, corresponding to one cycle of loading. The surfaces used had radiuses of 5, 10, 15, 20, 30 and 40 mm. The data produced by this test method can be used to estimate the fatigue strength of products of these materials.

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UDC 621.317.361

USSR

IRTEGOV, YU. N., ISKANDAROV, F., PETRAKOVA, V. N., PURCHENOV, V. P.,
SHAMIN, G. F., and ZYKOV, A. A.

"A Device for Determining and Recording the Spectral Characteristics of Complex Signals"

USSR Author's Certificate No 363930 kl G 01 r 23/18, filed 20 Jan 71, published 7 Mar 73 (from RZh Avtomatika Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 73, abstract No 11 A437P)

Translation: A device is proposed for determining and recording the spectral characteristics of complex signals, containing an input apparatus, a group of band-pass filters, a filter interrogation unit, a recording unit with electrodes, and a paper tape transport unit.

To improve the accuracy, the output of the filter interrogation unit is connected through an analog-code converter and recirculator in series, one of the inputs of which is connected to the control unit; the amplitude graduation decoder is connected to the inputs of an arbitrary symbol synthesizer.

In this approach, the control inputs of the synthesizer are connected to the outputs of a vertical symbol scanning unit. The second input of this unit is

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IRTEGOV, YU. N., et al., USSR Author's Certificate No 363930 K1 G 01 r 23/18

supplied with a signal from a cycle pulse generator. The control inputs of the synthesizer are also connected to the outputs of a horizontal symbol scanning unit, the input of which is connected through an electrode counter (whose input is supplied with a signal from the cycle pulse generator) to the inputs of the control unit. The control inputs of the synthesizer are also connected in parallel through the inputs of an "AND" gate to the decoder of the addresses of electrodes connected to the recording unit. One illustration.

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Devices

UDC 621.372.834

USSR

KNYAZEV, B. R., ZYKOV, A. I.

"Coupling Device for Cryogenic Microwave Resonators"

Moscow, Pribory i Tekhnika Eksperimenta, No 5, 1972, pp 242-243

Abstract: A description is presented of a coupling device for a transmitting line with a microwave resonator cooled to low-temperatures which permits it to be installed at any point of difficult access on the surface of the resonator and adjustment of the coupling. The coupling element is shifted in the resonator cavity by changing the gas pressure in the device. The device can also be used for introducing the investigated specimens and frequency control elements into the resonator cavity.

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USSR

UDC 621.372.855(088.8)

KRAMSKOY, G. D., ZYKOV, A. I.

"Microwave Load"

USSR Author's Certificate No 253193, Filed 17 Jan 68, Published 1 Sep 70,
(from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4B188P)

Translation: The proposed load is executed from a septate wave guide with ring diaphragms made of carbon steel.

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UDC 621.372.8

USSR

KRAMSKOY, G. D., ZYKOV, A. L., GRISHAYEV, I. A., and KOLOT, Z. M.

"Dispersion Properties of a Circular Diaphragm Waveguide With Radial Cuts of the Diaphragms ($\pi/2$ Type Oscillations)"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol. 51, No. 3, Mar. 71, pp 567-571

Abstract: The effect of the length of radial cross-shaped and right-angle (two cuts at an angle of 90°) cuts in a diaphragm with a slit width of 0.4 mm on the dispersion characteristics of E_{01} , EH_{11} , EH_{12} , EH_{21} , and E_{02} waves was investigated. The purpose of the study was to select versions and types of radial cuts which would shorten as much as possible the number of repetitions of segments with the same geometry in different sections of a multi-section accelerator; i.e., to spread the frequencies of hybrid waves which can be excited by the beam in these sections. Measurements show that the reason for the effective rise in the critical current of the accelerating sections when radial cuts of the diaphragms are applied is the considerable lowering of the Q of the system for high defocusing EH waves as compared with a waveguide without cuts. The data on Q and the frequencies of the synchronous interaction of the beam with higher types of oscillations are 1/2

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KRAMSKOY, G. D., et al, Zhurnal Tekhnicheskoy Fiziki, Vol 51, No 3, Mar
71, pp 567-571

used to determine approximately the critical current of a waveguide with a
given geometry.

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USSR

UDC 537.311.33:621.315.592

ZYKOV, A. M. and SAMORUKOV, B. YE., Leningrad Polytechnic Institute imeni
M. I. Kalinin

"Electrical and Optical Properties of Gallium Phosphide Films"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, No 6, 1971, pp 54-58

Abstract: Two basic directions are being explored today in the field of film technology. Scientists are concerned first with growing epitaxial semiconductor films on monocrystalline substrates and with the production of polycrystalline films on substrate insulators with good optical and electrical properties. This article is concerned with investigating the properties of polycrystalline gallium phosphide films produced by evaporation in vacuum. The authors also use a three-temperature method and find that the properties of the films depend substantially on the method of production and the temperature of the substrate. The authors describe the production of the film samples, the method and results of the experiments, illustrating their findings in the form of a table and graphs. They find that the best electrical and optical properties are possessed by gallium phosphide films prepared by evaporation and having an ideal structure. This differs from the data of

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USSR

ZYKOV, A. M. and SAMORUKOV, B. YE., *Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika*, No 6, 1971, pp 54-58

Vlasenko, et al., who found that the three-temperature method produced the best samples. This is obviously due to the technological characteristics of producing the film samples. The article contains 4 figures, 1 table, and 10 bibliographic entries.

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Metrology, Surveying, Graphics, Mapping

USSR

UDC 621.317.44.087.92.001.24

ZYKOV, B. N.

"Calculation of the Magnetic Field in a System with a Cylindrical Magnet, Magnetized Through the Diameter, and a Cylindrical Magnetic Circuit Placed Eccentric to the Magnet"

Tr. Kazan. Aviats. In-ta. [Works of Kazan' Aviation Institute], 1971, No 138, pp 27-33, (Translated from Referativnyy Zhurnal, Metrologiya i Izmeritel'naya Tekhnika, No 7, 1972, Abstract No 7.32.122, from the Resume).

Translation: At the present time, magnetoelectric convertors combining a cylindrical magnet and magnetic circuit have become widely used in automation and telemetry equipment. The field in a system consisting of a cylindrical magnet, diametrically magnetized, and a cylindrical magnetic circuit placed eccentrically to the magnet is calculated with certain assumptions. In the solution, the doubly connected area included between the magnet and magnetic circuit is represented on the area of a circular ring by means of a piecewise linear function, and the boundary problem is solved on the ring relative to the scalar magnetic potentials. The solution is converted back to the initial area by means of a conformal mapping function. 3 Figures; 6 biblio. Refs.

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1/2 016 UNCLASSIFIED PROCESSING DATE--20NGV70
TITLE--SIMPLIFIED METHOD FOR DETERMINING THE SENSITIVITY OF THE
FRACTIONATING COLUMN ZONE TO REGULATION -U-
AUTHOR-(03)-MIKHNO, S.I., KOPTEV, G.P., ZYKOV, D.D.
COUNTRY OF INFO--USSR
SOURCE--KOKS KHIM. 1970, (5), 42-5
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY, MECH., IND., CIVIL AND MARINE ENGR
TOPIC TAGS--AUTOMATIC CONTROL, AUTOMATIC CHEMICAL PROCESS CONTROL,
FRACTIONATION, BENZENE, CARBON DISULFIDE, TOLUENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3005/0101 STEP NO--UR/0068/70/000/005/0042/0045
CIRC ACCESSION NO--AP0132394
UNCLASSIFIED