

USSR

UDC 621.771.064

NIKITIN, G. S., ZHUCHIN, V. N., KAPUSTIN, V. A., YEVSTROPOL, G. M., and
TSVETKOV, A. I., Moscow Higher Technical School imeni Bauman, and the
"Elektrostal'" Plant

"Rolling Deformation-Resistant Steels and Alloys in a Planetary Mill"

Moscow, Stal', No 2, Feb 71, pp 142-144

Abstract: This paper describes planetary mills which are now being combined with ingot-producing mills for continuous and integrated casting and rolling processes. The input to the planetary mill, used for the rolling part of the combined operation, can be fed in a continuous ingot from the crystallizer at the rate of 2.0-3.5 meters per minute. Among other advantages, the planetary mill can be fully automated, requiring no complex control system for regulating the production rate, and can be used for rolling deformation-resistant steels in a narrow temperature interval. Several of these mills are in operation in foreign countries but are used only for rolling. In the VNIIMETMASH (All-Union Scientific Research and Planning Design Institute of Metallurgical Machine Building)
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NIKITIN, G. S., et al, Stal', No 2, Feb 71, pp 142-144

a basically new planetary mill has been developed in which the metal is compressed from four sides. Known as the Tselikov-Nosal' system, the machine can result in substantial economies.

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UDC 621.315.592

TSARENKOV, B. V., AKPEROV, YA. G., VERESHCHAK, N. I., YEMSTROPOV, V. V.,
IMENKOV, A. N., YAKOVLEV, YU. P. Physicotechnical Institute imeni A. F. Ioffe
of the USSR Academy of Sciences, Leningrad

"Diode Sources of Red Light made of Variband $Ga_{1-x}Al_xAs:Si$ p-n- structures"
Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 6, No 5, 1972, pp 921-925

Abstract: The results of the development and study of the properties of semi-conductor sources of red light based on variband $Ga_{1-x}Al_xAs$ p-n-structures alloyed with Si are discussed. These p-n-structures were created by epitaxial growth of a solid solution of $Ga_{1-x}Al_xAs:Si$ from a liquid Ga-Al-As-Si solution on an n-Ga-As substrate with cooling; the composition of the $Ga_{1-x}Al_xAs$ epitaxial layer was smoothly varied in the direction of growth so that the width of the forbidden zone decreased from the boundary with the substrate with a gradient of $(2-3) \cdot 10^{-3}$ eV/micron. The thickness of the p-region in the light diodes was 20-31 microns, and the n-region was 60-70 microns. Radiation was generated perpendicular to the plane of the p-n-junction or through the p-layer or through the n-layer of the p-n-structure.

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TSARENKOV, B. V., et al., Fizika i Tekhnika Poluprovodnikov, Vol 6, No 5, 1972, pp 921-925

The electric and electroluminescent characteristics of the $Ga_{1-x}Al_xAs$ p-n-structures with an area of 0.5 mm^2 at room temperature are as follows: 1) the forward current increases exponentially with an increase in voltage ($I \sim \exp(qV/\beta kT)$ where $\beta = 1.4-1.6$) to voltages of 1.5-1.6 volts, and then it increases linearly (current cutoff voltage 2.0-2.1 volts); 2) the radiation spectrum consists in only one band with a peak energy of 1.72-1.76 electron volts which does not shift with current variation; 3) with an increase in current the radiation power first increases superlinearly (to 2 amps/cm²) and then linearly (to 100 amps/cm²); 4) the external quantum yield of the radiation is 0.5-0.6 percent for 20 milliamps and 0.6-0.8 percent for 200 milliamps; 5) the characteristic times of the transient electroluminescent processes decrease with an increase in current; they are 200 nanoseconds for small currents and 100 nanoseconds for large currents.

These light sources do not become degraded for at least 1,000 hours of operation with a forward current of 20 milliamps and an ambient temperature of +70°C.

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1/3 024 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--STATISTICAL THEORY OF EXCITON RECOMBINATION OF ELECTRONS AND HOLES
IN SEMICONDUCTORS -U-
AUTHOR-(02)-YEVSTROPOV, V.V., TSARENKOV, B.V.
COUNTRY OF INFO--USSR
SOURCE--LENINGRAD, FIZIKA I TEKHNIKA POLUPROVODNIKOV, VOL. 4, NO 5, 1970,
PP 923-932
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--EXCITON, ELECTRON RECOMBINATION, HOLE MOBILITY, SEMICONDUCTOR
CRYSTAL, PARTICLE ANNIHILATION, PN JUNCTION, GALLIUM COMPOUND,
PHOSPHIDE, ZINC COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/1441

STEP NO--UR/0449/70/004/005/0923/0932

CIRC ACCESSION NO--AP0136773

UNCLASSIFIED

2/3 024

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136773

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MODERN STATISTICAL THEORY OF ELECTRON AND HOLE RECOMBINATION IN SEMICONDUCTORS ASSUMES THAT DURING A COLLISION, FOR EXAMPLE, OF A FREE HOLE WITH AN ELECTRON (FREE OR BOUND) THEIR ANNIHILATION TAKES PLACE INSTANTLY, THAT IS, WITHOUT THE FORMATION OF AN INTERMEDIATE ELECTRON HOLE COMPLEX (EXCITON). THE AUTHORS DEPARTED FROM THIS CONCEPT AND ASSUMED THAT ANNIHILATION DOES NOT OCCUR INSTANTLY, BUT WITH A DELAY WHICH INDICATES FORMATION OF AN EXCITON. THE STATISTICAL THEORY OF EXCITON RECOMBINATION IS CONSTRUCTED IN THE EXAMPLE OF TWO MODELS: (A) WHEN AN EXCITON IS FORMED AT A RECOMBINATION CENTER IS FORMED, (B) WHEN A FREE EXCITON IS FORMED. AS A RESULT, FORMULAS ARE OBTAINED FOR THE RECOMBINATION GENERATION RATE. FOR MODEL (A) THE FORMULA PREDICTS SATURATION OF THE RECOMBINATION RATE AT HIGH INJECTION LEVELS. IF THE LIFE OF THE EXCITON IS ASSUMED TO BE ZERO, THE FORMULA FOR THE RECOMBINATION GENERATION RATE COINCIDES WITH THE GENERALLY KNOWN SHOCKLEY READ FORMULA. FOR MODEL (B) IT IS DEMONSTRATED THAT THE RECOMBINATION RATE IS NOT SATURATED FOR ANY INJECTION LEVELS. THE AUTHORS CONCLUDE THAT THEIR THEORY MUST BE CONSIDERED WHEN STUDYING LUMINESCENT, PHOTOELECTRIC, AND ELECTRIC PHENOMENA BOTH IN HOMOGENEOUS SEMICONDUCTOR CRYSTALS AND IN P-N-STRUCTURES. IN PARTICULAR, MODEL (A) IS APPLICABLE WHEN DESCRIBING THE INTENSITY OF RED LUMINESCENCE IN GAP ARISING FROM ANNIHILATION OF THE EXCITON LOCATED ON THE DONOR ACCEPTOR COMPLEX OF A DONOR NATURE (ZN SUBGAP SUBP).

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PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136773

ABSTRACT/EXTRACT--AS A RESULT OF ANNIHILATION OF AN EXCITON, EITHER A PHOTON (RADIATIVE ANNIHILATION) IS GENERATED OR ANNIHILATION ENERGY IS TRANSFERRED TO VIBRATIONS OF THE CRYSTAL LATTICE (NONRADIATIVE ANNIHILATION). CONSEQUENTLY, THE RECOMBINATION GENERATION RATE OF ELECTRONS AND HOLES IS MADE UP OF TWO COMPONENTS: RADIATIVE AND NONRADIATIVE. IF ABSORPTION OF RADIATED PHOTONS IS NEGLECTED, THE RADIATIVE RECOMBINATION GENERATION RATE IS SIMULTANEOUSLY THE LUMINESCENT INTENSITY. THE TWO CASES OF EXCITON RECOMBINATION OF ELECTRONS AND HOLES IN SEMICONDUCTORS INVESTIGATED BY THE AUTHORS DO NOT EXHAUST ALL POSSIBLE CASES: FIRST, OTHER RECOMBINATION MODELS CAN BE REALIZED, AND, SECONDLY, SEVERAL RECOMBINATION CHANNELS CAN OPERATE SIMULTANEOUSLY AND HAVE A MUTUAL EFFECT.

PHYSICO TECHNICAL INSTITUTE IMENI A. F. IOFFE, LENINGRAD, ACADEMY OF SCIENCES USSR.

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UDC 621.315.592

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YEVSTROPOV, V. V., TSARENKOV, B. V., Leningrad Physico Technical
Institute imeni A. F. Ioffe, Leningrad, Academy of Sciences USSR

"Statistical Theory of Exciton Recombination of Electrons and
Holes in Semiconductors"

Leningrad, Fizika i Tekhnika Poluprovodnikov, Vol 4, No 5, 1970,
pp 923-932

Abstract: Modern statistical theory of electron and hole re-
combination in semiconductors assumes that during a collision,
for example, of a free hole with an electron (free or bound) their
annihilation takes place quickly, that is, without the formation
of an intermediate electron-hole complex (exciton). The authors
departed from this concept and assumed that annihilation does
not occur directly, but with a delay which indicates formation
of an exciton. The statistical theory of exciton recombination
is constructed in the example of two models: (a) when an exciton
located on a recombination center is formed, (b) when a free
exciton is formed. As a result, formulas are obtained for the
recombination-generation rate. For model (a) the formula predicts
saturation of the recombination rate or high injection levels.

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YEVSTROPOV, V. V., et al., Fizika i Tekhnika Poluprovodnikov,
Vol 4, No 5, 1970, pp 923-932

If the life of the exciton is assumed to be zero, the formula for the recombination-generation rate coincides with the generally known Shockley-Read formula. For model (b) it is demonstrated that the recombination rate is not saturated for any injection levels.

The authors conclude that their theory must be considered when studying luminescent, photoelectric, and electric phenomena both in homogeneous semiconductor crystals and in p-n-structures. In particular, model (a) is applicable when describing the intensity of red luminescence in GaP arising from annihilation of the exciton located on the donor-acceptor complex of a donor nature ($Zn_{Ga}O_P$).

As a result of annihilation of an exciton, either a photon (radiative annihilation) is generated or annihilation energy is transferred to vibrations of the crystal lattice (nonradiative
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YEVSTROPOV, V. V., et al., Fizika i Tekhnika Poluprovodnikov,
Vol 4, No 5, 1970, pp 923-932

annihilation). Consequently, the recombination-generation rate of electrons and holes is made up of two components: radiative and nonradiative. If absorption of radiated photons is neglected, the radiative recombination-generation rate is simultaneously the luminescent intensity.

The two cases of exciton recombination of electrons and holes in semiconductors investigated by the authors do not exhaust all possible cases: First, other recombination models can be realized, and, secondly, several recombination channels can operate simultaneously and have a mutual effect.

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USSR

UDC 543.42:666.1/2

YEVSTROP'YEV, K. S., KRUPKIN, YU. S., GALIMOV, D. T., TARLAKOV,
YU. P., SHEVYAKOV, A. M.

"On the Structural Features of $R_2O - B_2O_2 - GeO_2$ System Glasses
from IR and EPR Spectroscopic Data"

Minsk, Zhurnal Prikladnoy Spektroskopii (Journal of Applied
Spectroscopy), Vol 13, No 4, Oct 70, pp 655-661

Abstract: A UR-10 spectrograph was used to take ir spectra in
the range of 1600 to 400 cm^{-1} . The glass samples, made of
chemically pure materials, were heated to 800°C and pressed into
potassium bromide. A Co^{60} gamma source of 104r/hr was used to
irradiate the samples for the EPR tests. The dose was 2×10^6
roentgens at room temperature. The spectra were recorded with
an RE 1301 radiospectrometer at 300°K.

Ir spectra of sodium glass samples with varying content (10, 20,
and 30 mole %) of alkali oxide and of lithium and potassium boro-
germanate glasses were taken. As the Na_2O content is increased,

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YEVSTROP'YEV, K. S., Zhurnal Prikladnoy Spektroskopii, Vol 13,
No 4, Oct 70, pp 655-661

the spectral curves become simpler and the principal absorption band of Ge - O - Ge at 900 cm^{-1} progressively shifts in the long wave direction. This behavior holds also for Li_2O , Na_2O , and K_2O .

Introduction of boric anhydride into the sample greatly alters the nature of the spectra of alkali germanate glasses. The principal absorption band shifts toward the higher frequencies. The band at 1100 cm^{-1} attributed to BO_4 tetrahedra, increases in intensity. The deformation vibration band at 600 to 400 cm^{-1} decreases gradually and in borate glasses degenerates. The effect of the boric anhydride is the same for sodium, lithium, and potassium glasses.

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YEVSTROP'YEV, K. S., Zhurnal Prikladnoy Spektroskopii, Vol 13, No 4, Oct 70, pp 655-661

The shifting of the absorption bands and changes in intensity with variation in the composition and content of the glasses is related to changes in lattice structures in the samples.

Epr spectra excited by gamma radiation were taken for the same samples, and similar analyses and interpretations are made as for the ir spectra. Variation in the signals and their intensities as a function of the quantity of B_2O_3 correlates well with the results of the ir spectra.

It is concluded that there is a range of compositions of alkali borogermanate glasses in which part of the germanium exists in sixfold coordination (in the form of GeO_6 octahedra). The range expands as the concentration of the alkali oxide increases. For 10, 20, and 30 mole % of Na_2O , the limiting concentration of B_2O_3 is 10, 25, and 30 to 40 mole %. In potassium and lithium glasses the maximum is 30 to 40 mole % of B_2O_3 .

Orig. article has 4 figures, 1 table, and 10 references.

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1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--LIGHT TRANSMISSION OF FLUOROPHOSPHATE GLASSES AS A FUNCTION OF
SYNTHESIS CONDITIONS -U-
AUTHOR-(04)-GOLUBTSOV, L.A., KHALILEV, V.D., YEVSTROPYEV, K.S.,
DOLADUGINA, V.S.
COUNTRY OF INFO--USSR
SOURCE--IZV. SSSR. MOSCOW, NEORGANICHESKIYE MATERIALY, VOL 6, NO 5, MAY
70, PP 924-927
DATE PUBLISHED----MAY70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--LIGHT TRANSMISSION, CHEMICAL STABILITY, GLASS CRYSTALLIZATION,
PHOSPHATE GLASS, FLUORIDE, GLASS COMPOSITION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1044 STEP NO--UR/0363/70/006/005/0924/0927
CIRC ACCESSION NO--AP0134746

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UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0134746

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

ABSTRACT. THE AUTHORS STUDIED THE EFFECT OF

THE DIGESTION CONDITIONS ON THE TRANSPARENCY AND HOMOGENEITY OF FLUOROPHOSPHATE GLASSES OF THE FOLLOWING COMPOSITION (WT PERCENT):

AL(PO SUB3) SUB3, 30; BAF SUB2, 60; CAF SUB2, 10. THIS GLASS SHOWS VERY HIGH CHEMICAL STABILITY AND COMPARATIVELY LOW CRYSTALLIZATION ABILITY. IT WAS DETERMINED THAT THE PRESENCE OF OXYGEN AND WATER VAPORS IN THE GASEOUS MEDIUM ABOVE THE ALLOY DURING DIGESTION OF FLUOROPHOSPHATE GLASSES LEADS TO CONSIDERABLY POORER TRANSPARENCY IN THE ULTRAVIOLET AND INFRARED SPECTRAL REGIONS, AND TO POORER HOMOGENEITY. HOMOGENEOUS GLASSES WITH HIGH TRANSPARENCY MAY ONLY BE 1-1 OBTAINED IN AN INERT ATMOSPHERE.

FACILITY: LENINGRAD TECHNOLOGICAL INSTITUTE IMENI

LENSOVET.

UNCLASSIFIED

USSR

UDC 669.26.048

YEVSYUKHIN, A. I., ABANIN, D. D., KORNEYEV, V. A., MASLOV, V. P.

"Obtaining Alloys Based on Chromium by the Iodide Method"

V sb. Metallurgiya i metalloved. chist. met. (Metallurgy and Physical Metallurgy of Pure Metals — collection of works), vyp. 9, Moscow, Atomizdat Press, 1971, pp 12-19 (from RZh--Metallurgiya, No 4, Apr 72, Abstract No 4G338)

Translation: In order to obtain iodide alloys of Cr with Y, V, and Ti, the charge was pressed and melted in an argon atmosphere in an arc furnace. Shavings which entered into the iodide process were prepared from the ingot obtained. Calculations were performed determining the possibility of deposition of Cr alloys with V, Ti, and Y. Thermal dissociation was carried out by the Van Arkel scheme. In all the experiments the filament temperature was 1,000-1,100°, and the flask temperature was 750-800°. The precipitates obtained in the iodide process were remelted in an arc furnace and investigated. The Cr-V and Cr-Ti alloys in the analyzed concentration range are single-phase, but separations of a second phase are obvious in the microstructure of the Cr-Y alloy. On introduction of Y into the raw material, the effect of additional purification of the Cr is observed in the process of iodide refining. The iodide alloys of Cr with V and Ti were obtained, and the transfer coefficient was found as a function of the raw material composition.

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USSR

UDC 669.27/28-174

YEVSTYUKHIN, A. I., LEONT'YEV, G. A., NECHAYEV, V. V., and GAVRILOV, I. I.

"Development of a Continuous Process for Production of Monocrystalline Wire From Tungsten and Molybdenum"

Monokristally Tugoplavkikh i Redkikh Metallov [Single Crystals of Refractory and Rare Metals -- Collection of Works], Nauka Press, 1971, pp 42-47

Translation: A method is described for production of monocrystalline molybdenum and tungsten wires up to 0.2 mm in diameter by performing collective recrystallization using a specially designed apparatus. As the initial material, ordinary technical wires of Type VA-3 were used. The wires produced served as substrates for growing of larger single crystals of molybdenum and tungsten by thermal dissociation of chlorides. X-ray structural and metallophysical studies of the monocrystallized wire and the precipitates produced were performed. 6 Figures; 5 Bibliographic References.

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USSR

UDC 620.193.23:669.296

YEVSTYUKHEN, A. I., KOROBKOV, I. I., and OSIPOV, V. V.

"Zirconium Intermetallides and Their Effect on the Corrosion Properties of Zirconium Alloys"

Moscow, Akademiya Nauk SSSR, Atomnaya Energiya, Vol 28, No 3, Mar 70, pp 201-206

Abstract: An investigation was made of the properties of intermetallide impurities and their effect on the corrosion properties of zirconium alloys in water and vapor. The microhardness at various temperatures, the structure of the intermetallides, and the composition of oxide films were studied. The materials used and the experimental technique are described in detail. It was established that: 1) the corrosion of pure intermetallides ($ZrFe_2$, $ZrMo_2$, Zr_2Ni , Zr_4Sn , Zr_2Cu) in the 400-800°C temperature range occurs more rapidly than of pure zirconium, both in oxygen and water vapor; 2) $ZrMo_2$ has the lowest oxidizing rate and Zr_2Ni the highest; Zr_4Sn has a low oxidizing rate at 300-400°C, but this rate increases sharply with increasing temperature; 3) a connection exists between the kinetics of oxidation, the structure, and composition of oxide films, occurring on the intermetallide surface; 4) Zr_2Ni , Zr_4Sn , and Zr_2Cu are softened by heating in the 350-450°C temperature range, while $ZrMo_2$ and $ZrFe_2$ retain their hardness up to 700°C. Orig. art. has: 4 figures, 3 tables, and 5 references.

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nuclear science and technology

USSR.

UDC 669.015.4

YEMEL'YANOV, V. S., and YEVSTYUKHIN, A. I., Eds.

Metallurgiya i Metallovedeniye Chistykh Metallov; sbornik nauchnykh rabot MIFI, No 9 (Metallurgy and Metal Science of Pure Metals; Collection of Scientific Works of MIFI)[Moscow Engineering Physics Institute], Moscow, Atomizdat, 1971, 176 pp

Translation of Annotation: This collection contains original works on the investigation of the structure and physico-mechanical properties of various refractory, rare, and radioactive metals; molybdenum, tungsten, zirconium, vanadium, uranium, and their alloys and compounds. Problems of refining metals are discussed and a theoretical explanation is given of the process of refining by means of transport reactions. Experimental investigation results of these processes are presented. Particular attention is given to the study of properties of pure metals, their alloys, and compounds. Results are presented of studies of the fine structure of pure metals in polycrystalline and monocrystalline states by means of different methods, the distribution of admixtures in them, and corrosion, sublimation, diffusion characteristics, internal friction, and other properties of refractory metals, alloys, and compounds. The strength and plasticity properties of metals and alloys in connection with their processing and application are discussed. Nineteen tables, 133

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YEMEL'YANOV, V. S. and YEVSTYUKHIN, A. I., Atomizdat, 1971, 176 pp
illustrations, and 326 biblio. refs.

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UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--ZIRCONIUM INTERMETALLIDES AND THEIR EFFECT ON THE CORROSION
PROPERTIES OF ZIRCONIUM ALLOYS -U-

AUTHOR--(03)--YEVSTYUKHIN, A.I., KOROBKOV, I.I., OSIPOV, V.V.

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, AKADEMIYA NAUK SSSR, ATOMNAYA ENERGIYA, VOL 28, NO 3, MAR
70, PP 201-206

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--CORROSION RATE, ZIRCONIUM ALLOY, WATER, OXYGEN, CHEMICAL
REACTION KINETICS, METAL HEAT TREATMENT, COPPER COMPOUND, TIN COMPOUND,
NICKEL COMPOUND, IRON COMPOUND, MOLYBDENUM COMPOUND, OXIDE FILM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1952

STEP NO--UR/0089/70/028/003/0201/0206

CIRC ACCESSION NO--AP0130736

UNCLASSIFIED

2/2 038

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0130736

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN INVESTIGATION WAS MADE OF THE PROPERTIES OF INTERMETALLIDE IMPURITIES AND THEIR EFFECT ON THE CORROSION PROPERTIES OF ZIRCONIUM ALLOYS IN WATER AND VAPOR. THE MICROHARDNESS AT VARIOUS TEMPERATURES, THE STRUCTURE OF THE INTERMETALLIDES, AND THE COMPOSITION OF OXIDE FILMS WERE STUDIED. THE MATERIALS USED AND THE EXPERIMENTAL TECHNIQUE ARE DESCRIBED IN DETAIL. IT WAS ESTABLISHED THAT: 1) THE CORROSION OF PURE INTERMETALLIDES (ZRFE SUB2, ZRMO SUB2, ZR SUB2 NI, ZR SUB4 SN, ZR SUB2 CU) IN THE 400-800DEGREESC TEMPERATURE RANGE OCCURS MORE RAPIDLY THAN OF PURE ZIRCONIUM, BOTH IN OXYGEN AND WATER VAPOR; 2) ZRMO SUB2 HAS THE LOWEST OXIDIZING RATE AND ZR SUB2 NI THE HIGHEST; ZR SUB4 SN HAS A LOW OXIDIZING RATE AT 300-400DEGREESC, BUT THIS RATE INCREASES SHARPLY WITH INCREASING TEMPERATURE; 3) A CONNECTION EXISTS BETWEEN THE KINETICS OF OXIDATION, THE STRUCTURE, AND COMPOSITION OF OXIDE FILMS, OCCURRING ON THE INTERMETALLIDE SURFACE; 4) ZR SUB2 NI, ZR SUB4 SN, AND ZR SUB2 CU ARE SOFTENED BY HEATING IN THE 350-450DEGREESC TEMPERATURE RANGE, WHILE ZRMO SUB2 AND ZRFE SUB2 RETAIN THEIR HARDNESS UP TO 700DEGREESC.

UNCLASSIFIED

USSR

UDC 669.296'784.018.28:539.531:669-977

SAVITSKIY, YE. M., KUL'BAKH, A. A., and YEVSTYUKHIN, N. A.

"Study of Hot Hardness of Cast Zirconium Carbides"

V sb. Tugoplavk. karbidy (The Refractory Carbides -- Collection of Works), Kiev, "Nauk. Dumka," 1970, pp 211-214 (from RZh-Metallurgiya, No 3, Mar 71, Abstract No 3I780 by authors)

Translation: The article presents data on hot-hardness measurements of cast specimens of Zr carbide with a porosity approximating zero and density close to theoretical. Hardness measurements by the static method were carried out in the 900-1650° range. Softening of Zr carbide (cast and hot-pressed) is observed with an increase in temperature. Three illustrations. Bibliography with three titles.

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ELECTRICAL ENGINEERING
Cryogenics and Superconductivity

USSR

UDC: 537.312.62

GRUZIN, P. L., BYCHKOV, Yu. F., YEVSTYUKHINA, I. A., KRUGLOV, V. S.,
NIKOLAYEV, I. N.

"The Mössbauer Effect in Nb₃Sn as a Function of Heat Treatment"

Moscow, Sverkhprovodyashchiye splavy i soyedin.--sbornik (Superconductive Alloys and Compounds--collection of works), "Nauka", 1972, pp 42-47 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 12D549 [résumé])

Translation: The superconductive compound Nb₃Sn displays the so-called "degradation effect" -- an appreciable reduction in T_c when the annealing or sintering temperature is raised to 2000°C. An investigation was made of the influence of heat treatment in a vacuum on the parameters of nuclear gamma resonance. With a rise in annealing temperature a considerable reduction was observed in the width of the NGR line and isomer shift, together with a reduction in absorption probability. The narrowing of the NGR line is due to an increase in the degree of ordering of the structure of the compound Nb₃Sn. It is shown that the degree of ordering can be determined from the absorption probability for different states if the degree of ordering and absorption probabilities are known for two other states. With an

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GRUZIN, P. L. et al., Sverkhprovodyashchiye splavy i sovedin., "Nauka", 1972, pp 42-47

increase in heat-treat temperature, a change was observed in the density of the $5S$ -electrons on the Sn nucleus. It is shown that the MGR method is very sensitive to the other tin-containing phases in Nb_3Sn . Three illustrations, one table, bibliography of seven titles.

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USSR

UDC 539.67

YEVSYUKOV, V. A., ZOLOTUKHIN, I. V., LEHEDINSKIY, V. S., PESIN, M. S.,
POSTNIKOV, V. S., and SHARSHAKOV, I. M.

"Internal Friction in Phase Transformation in TiNi Intermetallic Compound"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction
in Metallic Materials), Moscow, Izd-vo "Nauka," 1970, pp 163-165

Abstract: The nature of the phase transformation in an equiatomic TiNi compound is studied by methods of internal friction, electrical resistance, and dilatometric analysis. The presence of some peaks on the internal friction temperature dependence curve is reported and their features are discussed. The energies of the activation processes are determined. It is assumed that the internal friction peak at 16°C is governed by the diffusion-free phase transformation. Data on internal friction, electrical resistance, and linear characteristics coincide well and confirm the assumed nature of the processes. 3 figures, 6 references.

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1/2 029 UNCLASSIFIED PROCESSING DATE---20NOV70
TITLE--PHASE TRANSFORMATIONS IN THE INTERMETALLIC COMPOUND TINI -U-
AUTHOR--(05)--PLSTNIKOV, V.S., LEBEDINSKIY, V.S., YEVSYUKOV, V.A.,
SHARSHAKOV, I.M., PESIN, M.S.
COUNTRY OF INFO--USSR
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, FEB. 1970, P. 364-369
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, CHEMISTRY
TOPIC TAGS--ALLOY PHASE TRANSFORMATION, BIBLIOGRAPHY, METAL INTERNAL
FRICTION, TITANIUM ALLOY, NICKEL, INTERMETALLIC COMPOUND, DILATOMETRIC
ANALYSIS, RESISTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/0895 STEP NO--UK/0126/70/029/000/0364/0369
CIRC ACCESSION NO--AP0116405
UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0116405

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF PHASE TRANSFORMATIONS IN THE ALLOY TiNi WITH EQUIATOMIC COMPOSITION, USING METHODS OF INTERNAL FRICTION, ELECTRICAL RESISTIVITY, AND DILATOMETRY. IT IS SUGGESTED THAT THE TRANSFORMATION AT TEMPERATURES RANGING FROM 50 TO PLUS 80 C IS OF A DIFFUSIONLESS TYPE AND IS CHARACTERIZED BY SMALL TEMPERATURE HYSTERESIS. A PHASE TRANSFORMATION OF AN ORDER DISORDER TYPE WAS DETECTED AT A TEMPERATURE OF 625 C. FACILITY: VORONEZHSKII POLITEKHNICHESKII INSTITUT, VORONEZH, USSR.

UNCLASSIFIED

USSR

UDC 678.06:631.6.672

YEVSYUKOV, YE. I., and KNEL'TS, K. F.

"The State of Art and the Possibilities of Developments in the Production of Plastic Materials and Objects Manufactured From Them for the Use in Agricultural Production, Development, and Water Economy"

Moscow, Plasticheskiye Massy, No 11, 1973, pp 7-10

Abstract: A review covers achievements in the development of plastic films, plastiglasses and plastic tubing, reflecting upon the fact that production is only about 77% that of the possible consumption market. Predictions are made for the 74-75 period, the demand again outpacing the productivity. The stress is made of the need to coordinate the productivity with the consumers demand.

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USSR

UDC 681.325.3:612.377.622.13

GEYSHIS, M. I., YEVTEYEV, F. Ye., IZRAILEV, Yu. S., KUSHLIN, V. I., and PLOTKIN, M. A.

"On Achieving a High-Precision, High-Speed Matrix System"

Izv. Leningr. Elektrotekhn. In-ta (News of Leningrad Electrical Engineering Institute), No 92, 1971, pp 47-50 (from Referativnyy Zhurnal -- Avtomatika, Telemekhanika, i Vychislitel'naya Tekhnika, No 8, 1971, Abstract No 8B376, by B. K.)

Translation: A decoding matrix system for use in digital-analog converters which function in communication systems with pulse-code modulation is described. The decoding matrix consists of a nine-bit ohmic divider of the R-2R type and sources of current, which are controlled by symmetric diode keys. The sources of current are formed by switching on the sources in series with a source of standard voltage of resistors with a resistance of 20 kilohms. An expression for evaluating the admissible root-mean-square deviation of the resistances of the matrix is derived. The basic technical data is presented for the matrix system, which is made in the form of a functionally completed assembly based on thin-film technology. It is pointed out that the time needed for establishment of a transient process in the

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USSR

GEYSHIS, M. I., et al., Izv. Leningr. Elektrotekhn. In-ta (News of Leningrad Electrical Engineering Institute), No 92, 1971, pp 47-50 (from Referativnyy Zhurnal — Avtomatika, Telemekhanika, i Vychislitel'naya Tekhnika, No 8, 1971, Abstract No 8B376, by B. K.)

system does not exceed $5 \cdot 10^{-9}$ seconds, given a root-mean-square voltage error of $(0.088-0.16) \delta$, where δ is the quantization size. 1 illustration.

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USSR

UDC: 62-187.4.65-01.122

YEVTEYEV, E. Ye. and PANUSHKIN, B. P., Leningrad Elect. Eng. Inst.
imeni Lenin

"Statistical Modeling of the Output Rate for Good Hybrid Resistive
Film Integrated Circuits"

Leningrad, Izvestiya VUZ -- Priborostroveniye, No. 9, 1970, pp
108-111

Abstract: The subject of this paper is the determination, through statistical modeling, of the rate of assembly-line manufacture of good integrated circuits of this type. The initial data for such a modeling procedure are supplied by the distribution and correlation expressions of the parametric relationships in passive and active integrated circuits. In investigating the distribution of film-element parameters, one should not use the ergodic hypothesis that the statistical characteristics in one set of resistors on the same substrate will be the same as the corresponding charac-

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equivalence circuit to the shift-end bus, connecting the readout bit lines in opposition through diodes to the nondestructive readout line of the register of associative memory elements, and connecting the write-enable and readout lines of this register through the shapers and rectifiers to the one-output and zero-output terminals of the flip-flop for the first digital place of the number shift register. The controlling inputs of the rectifiers are connected to the shift-end bus. The output number lines of the second section of the device are connected through the gating shapers to the gating inputs of the playback amplifiers in the first section of the device, the inputs of these amplifiers being connected to the output lines of the register of associative memory elements. These output lines are matched to the output number lines of the first section of the device, and the address decoder outputs in the second section of the device are connected to the gating shapers through the corresponding rectifiers, whose second inputs are connected to the associative interrogation-enable line.

USSR

UDC: 621.317.757

YEVTEYEV, Yu. T., YURUKHIN, B. N., Voronezh Polytechnical Institute

"A Device for Automatic Determination of Integral Evaluations of Graphs"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 10, Apr 72, Author's Certificate No 332464, Division G, filed 2 Mar 70, published 14 Mar 72, pp 196-197

Translation: This Author's Certificate introduces: 1. A device for automatic determination of integral evaluations of graphs. The device contains a calibrated pulse frequency generator, a pulse counter, a unit for step-by-step transport of the recording medium, and a program block. The input of the pulse counter is connected to the output of a diode circuit. One of the inputs of the diode circuit is connected to the output of a unit for input of the graph ordinates. As a distinguishing feature of the patent, the device is simplified and its functional possibilities are extended by adding a block of digit decoders, a digit-by-digit division counter, and a time delay circuit. The first group of inputs of the block of digit decoders is connected to the outputs of the program block. The second group of inputs is connected to the outputs of the digit-by-digit

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USSR

YEVTEYEV, Yu. T., YURUKHIN, B. N., USSR Author's Certificate No 332464

division counter whose input is connected to the output of the calibrated pulse frequency generator. The controlling output of the block of digit decoders is connected to the input of the unit for step-by-step transport of the recording medium. The digit-by-digit frequency output is connected to the second input of the diode circuit, and the set terminal is connected to the output of the time delay circuit, which is connected to one of the outputs of the unit for input of the graph ordinates. 2. A modification of this device distinguished by the fact that the digit decoder contains a flip-flop with separate inputs, an inverter, and a coincidence circuit. One input of the flip-flop is connected to the first input of the digit decoder, and the second input is connected to the output of the coincidence circuit. One of the inputs of the coincidence circuit is connected to the set line, and the second input is connected to the shift input of the decoder and to one of the inputs of a three-input coincidence circuit. The second input of this coincidence circuit is connected to the output of the flip-flop and to the input of the inverter. The third input is connected to the second input terminal, and the output of the coincidence circuit is connected to the digit-by-digit frequency line.

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USSR

UDC 547.26'118

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MINGALYEVA, K. S., RAZUMOVA, N. A., PETROV, A. A., YEV'IKHOV, Zh. L., and BAGROV, F. V., Leningrad Technological Institute imeni Lensovet

"Dipole Moments of Derivatives of Trivalent Phosphorus Which Contain a Dioxaphospholane Ring"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 11, Nov 1971, pp 2,431-2,434

Abstract: In trivalent phosphorus compounds, hybridization of the phosphorus atom varies readily in response to change in the type of substituent, and thanks to this the phosphorus may exhibit bifilarity. However, there is very little published information on variation in the dipole moments of compounds containing trivalent phosphorus. The present study, based on the dipole moment method, is intended to show the mutual effect of atoms in compounds containing dioxaphospholane rings. Data of electrographic research on molecules of 2-chloro-1,3,2-dioxaphospholane and triethyl phosphite were used to compute dipole moments. The group moment of the dioxaphospholane cycle was estimated from M. J. Aroney's data. Moments of the phosphorus-halogen bonds were determined from the dipole moments of the corresponding phosphorus trihalides. Laboratory measurements were made using dilute solutions in benzene at 20±0.05°. All experimental and calculated data are included in the paper. It is concluded that increase in the electron-acceptor capacity of the substituents is accompanied by an increase in the dipole moment.

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USSR

UDC 547.341

YEVTIKHOV, Zh. L., RAZUMOVA, N. A., and PETROV, A. A., Leningrad Technological Institute imeni Lensovet

"Condensation of Alkylphosphonous Esters With 1,3-Dienes"

Leningrad, Zhurnal Obshechey Khimii, Vol 41 (103), No 2, Feb 71, pp 479-480

Abstract: Alkylphosphonous acid esters condense with 1,3-dienes analogously to arylphosphonous acid esters. The IR spectra of the products show bands corresponding to the C=C bond frequencies at 1612-1613 cm^{-1} , P-C at 1236 cm^{-1} , and P-O-C at 1058-1062 cm^{-1} ; no P=O band was observed. Physical properties of two compounds are reported: 1-methyl-1,1-glycol-3-phospholine, b.p. $60^{\circ}/1.0 \text{ mm}$, d_4^{20} 1.1320, n_D^{20} 1.5010; and 1-ethyl-1,1-glycol-3-methyl-3-phospholine, b.p. $72^{\circ}/1 \text{ mm}$, d_4^{20} 1.0728, n_D^{20} 1.4910. The condensation is faster than that of ethyl-enechlorophosphate and isothiocyanate, but slower than that of the glycol esters of phenylphosphonic acid, which may be due to the absence of the conjugation of the methyl group with phosphorus, resulting in vacant d-orbitals.

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USSR

UDC 547.341

YEVTIKHOV, Zh. L., SHURUKHIN, B. B., RAZUMOVA, N. A., and PETROV, A. A.
Leningrad Technological Institute imeni Lensovet

"Reaction of Phenyl Ester of Ethyleneglycolphosphorous Acid With 1,3-Dienes"

Leningrad, Zhurnal Obschey Khimii, Vol 41 (103), No 2, Feb 71, pp 480-481

Abstract: Investigation of the condensation of phenylethylene phosphite with 1,3-dienes showed that the reaction occurs without the elimination of the glycol radical and that it goes faster than an analogous reaction with alkyl esters. This indicates that beside the $p-\pi-d_{\pi}$ interactions the $p-\pi$ conjugation must also be important, so that the P-OPh bond is more labile than the P-OCH₃. Physical properties of two compounds are reported: 1-(2-phenoxyethoxy)-3-phospholine-1-oxide, m.p. 47-48°, b.p. 180°/1.0 mm, d_4^{20} 1.2201, n_D^{20} 1.5526; and 1-(2-phenoxyethoxy)-3-methyl-3-phospholine-1-oxide, m.p. 49-50°, b.p. 204°/1.0 mm, d_4^{20} 1.1902, n_D^{20} 1.5480.

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1/2 030
UNCLASSIFIED
PROCESSING DATE--04DEC70
TITLE--ARBUZOV REARRANGEMENT OF GLYCOLPHOSPHOROUS ACID DERIVATIVES -U-
AUTHOR--(03)-RAZUMOVA, N.A., YEVTIKHOV, ZH.L., PETROV, A.A.
COUNTRY OF INFO--USSR
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(4), 933-4
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ORGANIC PHOSPHORUS COMPOUND, GLYCOL, FLUORIDE, MOLECULAR
STRUCTURE, HETEROCYCLIC OXYGEN COMPOUND, IR SPECTRUM, NMR SPECTRUM,
ELECTRON ACCEPTOR
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3006/1514
STEP NO--UR/0079/70/040/004/0933/0934
CIRC ACCESSION NO--AP0135175
UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0135175

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ETBR DOES NOT REACT EVEN UNDER DRASTIC CONDITIONS WITH BROMIDES, CHLORIDES, OR ISOTHIOCYANATES OF CYCLIC PHOSPHITES OF GLYCOLS AND THESE DERIVS WITH ELECTRON ACCEPTOR GROUPS DISPLALY INHIBITION OF THE SN2 ATTACK OF THE PHOSPHITE ON THE C ATOM OF RX. IN FLUORIDES OF SUCH ESTERS, HOWEVER, THE CONJUGATION OF UNSHARED ELECTRON OF F WITH 3D ORBITALS OF P PROVIDE A STRONGLY NEG. CHARGE ON P, MAKING POSSIBLE THE ARBUZOV TYPE REACTION WITH ETBR. I WITH R EQUALS H OR ME HEATED WITH ETBR 40-50 HR AT 140-50DEGREES GAVE BRCH SUB2 CHROP(O)ETF: R EQUALS H, 83PERCENT, B SUB3 97DEGREES, N PRIME20 SUBD 1.4240, D PRIME20 1.4839; R EQUALS ME, 87PERCENT, B SUB1 90DEGREES, 1.4381, 1.4334, CONFIRMED BY IR AND NMR SPECTRA. THUS THE DONOR ACCEPTOR RELATIONSHIP IN THE ARBUZOV REACTION AND IN THE CONDENSATION WITH DIENES IS MUTUALLY CONTRADICTORY. WHILE IN THE ARBUZOV REACTION P ACTS AS A DONOR OF ELECTRONS RELATIVE TO RX, IN THE CONDENSATION OF P COMPS. WITH DIENES IT SERVES AS AN ELECTRON ACCEPTOR.

FACILITY: LENINGRAD. TEKHNOL. INST. IM. LENSOVETA, LENINGRAD, USSR.

UNCLASSIFIED

USSR

UDC: 547.341

RAZUMOVA, N.A., ~~YEVTIKHOV, ZH.L.~~, and PETROV, A.A., Leningrad Technological Institute imeni Lensovet, Leningrad, Ministry of Higher and Secondary Specialized Education RSFSR

"Arbuzov Rearrangement of Glycolphosphorous Acid Derivatives"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, pp 933-934

Abstract: For purposes of comparing the mechanism of the condensation reactions of various trivalent phosphorus derivatives with 1,3-diene hydrocarbons with the mechanism of the classical Arbuzov rearrangement, the authors studied the reactions of a series of glycolphosphorous acid derivatives (ethylene- and propyleneglycolphosphorous acid fluorides) with ethyl bromide. The reaction products are the acid fluoride of β -bromoethyl ester of ethylphosphinic acid and the acid fluoride of β -bromoisopropyl ester of ethylphosphinic acid. The structure of the resultant compounds was confirmed by IR and N(P)MR spectra. The results indicate that the donor-acceptor interrelationships in the classical Arbuzov reaction and in the condensation

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RAZUMOVA, N. A., et al., Zhurnal Obshchey Khimii, Vol 40, No 4, Apr
70, pp 933-934

reaction with dienes with one and the same phosphorus components are mutually contradictory: in the Arbuzov rearrangement phosphorus has the function of electron donor with respect to the alkyl halide, while in the condensation reaction it is an electron acceptor.

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1/2 014
 UNCLASSIFIED
 TITLE--THE EFFECT OF AUTOSTRAINS OF E. COLI ON THE LEVEL OF ANTIBODIES TO
 SOME CAUSATIVE AGENTS OF INTESTINAL INFECTIONS -U-
 AUTHOR--(02)-EBERT, L.YA., YEVTUSHENKO, A.D.
 COUNTRY OF INFO--USSR
 SOURCE--ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII 1970, NR 3,
 PP 42-45
 DATE PUBLISHED-----70
 SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
 TOPIC TAGS--ANTIBODY, ESCHERICHIA COLI, GASTROINTESTINAL DISEASE
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--1990/1465
 CIRC ACCESSION NO--AP0109525
 STEP NO--UR/0016/70/000/003/0042/0045
 UNCLASSIFIED

2/2 014
CIRC ACCESSION NO--AP0109525
ABSTRACT/EXTRACT--(U) GP-0-

UNCLASSIFIED

PROCESSING DATE--09OCT70

ABSTRACT. THE WORK WAS DEVOTED TO THE STUDY OF THE CAPACITY OF E. COLI, AS A REPRESENTATIVE OF NORMAL INTESTINAL MICROFLORA, TO CAUSE IMMUNITY IN THE HOST'S ORGANISM. EXPERIMENTS WERE CARRIED OUT ON RABBITS, TO WHICH AFTER THE DETERMINATION OF THE INITIAL LEVEL OF IMMUNOLOGICAL REACTIONS, A SUSPENSION OF E. COLI AUTOSTRAINS WAS INJECTED (250 MILLION MICROBIAL CELLS BY THE OPTIC STANDARD). IN ASSOCIATION WITH BACTEREMIA THERE WAS AN INCREASE OF THE NUMBER OF LEUKOCYTES IN THE PERIPHERAL BLOOD AND OF LYSOZYME LEVEL IN THE SERUM; VARIATIONS OF THE LATTER DIRECTLY DEPENDED ON BACTEREMIA. A RISE OF AGGLUTININS NOT ONLY TO THE ANTIGENS OF THE E. COLI AUTOSTRAIN, BUT ALSO TO S. TYPHI AND SH. SONNEI WAS NOTED IN THE BLOOD. THIS LED TO THE CONCLUSION THAT, AS A REPRESENTATIVE OF NORMAL INTESTINAL MICROFLORA, E. COLIA PRODUCED A SIGNIFICANT EFFECT ON FORMATION OF NATURAL RESISTANCE NOT ONLY AGAINST OWN MICROFLORA, BUT ALSO AGAINST SOME CAUSATIVE AGENTS OF INTESTINAL INFECTIONS.

UNCLASSIFIED

Materials

USSR

UDC 620.10

GELLER, YU. A., Doctor of Technical Sciences, Professor; YEVTUSHENKO, A. T., Aspirant; MOISEYEV, V. F., Candidate of Technical Sciences, Docent, Moscow Institute of Machine Tools and Instruments

"Study of the Effect of the Composition and Structure of Die Steels on Wear Resistance Under Shock-Abrasive Wear"

Moscow, Izvestiya vysshikh uchebnykh zavedeniy, Mashinostroyeniye, No. 12, 1971, pp 109-115

Abstract: Die steels of the basic structural classes 6KhNV, 6KhZFS, 7KhG2VM, Kh6VF, Kh12F1 and Kh12M were studied since many dies are used under shock-abrasive conditions and data for determining a rational selection of the steel and its heat treatment are not available. The hardness of the steels was varied by heat treatment from 38 to 625 HRC and viscosity varied from 0.5 to 7.0 kGm/cm². The steels also differed in the amount of residual austenite and the carbide phase. The wear resistance was determined under shock-abrasive wear on the basis of attached abrasive particles under a shock energy of 0.75 and 2.0 kGm from the weight loss and character of the wear. The study showed

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USSR

GELLER, YU. A., et al, Izvestiya vysshikh uchebnykh zavedeniy, Mashinostroyeniye, No. 12, 1971, pp 109-115

that the wear resistance of alloyed die steels under shock-abrasive wear is determined by the total effect of the hardness, viscosity, the amount of the carbide phase, and the residual austenite. The hardness effect was the most considerable. An increase in it with a fixed quantity of carbides and austenite in the structure is accompanied by a rise in wear resistance. An increase in viscosity achieved by isothermal tempering, i.e., without grain growth and a drop in hardness, improves wear resistance. The effect of the carbide phase is the function of the hardness and viscosity of the steel: it improves the wear resistance at high hardness (59-60 HRC) and somewhat reduces it at lower hardness (49-51 HRC). Results have shown that an increase in the amount of austenite improves the wear resistance if the austenite retains sufficient stability under cooling to -60°C . The greatest wear resistance is exhibited by alloyed die steel at 0.6% C.

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USSR

UDC 532.526.4

GRESHILOV, Ye. M., YEVTUSHENKO, A. V., LYAMSHEV, L. N.

"Fluctuations in Pressure During Flow of Weak Solutions of Polymers Along Rough Boundaries"

Moscow, Doklady Akademii Nauk SSSR, Vol 207, No 6, 1972, pp 1,288-1,291.

Abstract: Results are presented from studies of spectral characteristics of boundary-layer fluctuations in pressure with turbulent flow of weak solutions of polymers along rough boundaries. The experimental studies were performed in a low-noise hydrodynamic gravitation-type channel. All measurements were performed at the end of the working sector, where the flow was stabilized. Roughness was created by applying grains of sand in two fractions to both of the broad walls of the working sector of the channel. The effect of reduced resistance and damping of small-scale turbulence is retained when the polymer solution flows along rough boundaries even when the roughness appears in a transient mode. This may mean that the mechanism of damping of turbulence and the effect of reduction of resistance when a polymer solution flows along smooth boundaries is not directly related to stabilization of vortices on the boundary of the viscous sublayer as has been earlier assumed. The primary processes occur in the zone of generation of turbulence or the buffer zone of turbulence of the boundary layer.

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USSR

UDC 577.3:612.744:612.015.32

KOLODUB, F. A., and YEVTUSHENKO, G. I., Khar'kov Scientific Research Institute of the Hygiene of Labor and of Occupational Diseases, Khar'kov

"Characteristics of Metabolism in the Skeletal Muscles of Rats Under the Effect of a Pulsed Low-Frequency Electromagnetic Field"

Kiev, Ukrayinsk'kiy Biokhimichniy Zhurnal, Vol 45, No 3, May/Jun 73, pp 356-361

Abstract: Rats were exposed to a pulsed electromagnetic field with a frequency of 7 kilocycles, pulse duration of 130 microsec, a 10 sec interval between pulses, and an intensity of 72 kA/m for 3 hrs per day during 15 days, or to a field with the same characteristics but an intensity of 24 kA/m for 1.5 hrs per day during 1.5, 3, or 6 mos. The results of the experiments indicated that the action of the electromagnetic field reduced the content of ATP and creatine phosphate in skeletal muscles because of a disturbance in the conjugation between oxidation and phosphorylation. Glycolysis was intensified with the result that the content of glycogen decreased and that of lactate increased. Simultaneously the deamidation of protein was intensified (the content of protein amido N decreased) and the deamination of adenosine, adenylic acid, and glutamic acid increased in the absence,

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USSR

KOLODUB F. A., and YEVTUSHENKO, G. I., *Ukrayins'kiy Biokhimichniy Zhurnal*,
Vol 45, No 3, May/Jun 73, pp 356-361

because of the ATP deficiency, of a corresponding intensification of glutamine synthesis. The adenosine and adenylate deaminases were activated. There was an increase in the content of ammonia in the skeletal muscles, which reached a level of 76.3% above normal. It was shown in earlier work by the authors that electromagnetic fields of low frequency produce spasms and muscular dystrophy.

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USSR

UDC 613.647:614.89

MAKSIMENKO, N. V., YEVTUSHENKO, G. I., and GONCHAROVA, N. N., Khar'kov
Scientific Research Institute of Labor Hygiene and Occupational Diseases,
Khar'kov

"Fundamentals of the Screening of Electromagnetic Fields"

Moscow, Gigiyena i Sanitariya, No 2, Feb 73, pp 108-110

Abstract: Exposure of personnel to the action of electromagnetic fields may constitute an occupational hazard. The most effective procedure for protecting personnel against these fields is electromagnetic screening. The simplest method of carrying out engineering calculations for metal screens to be used for this purpose that are effective in the long-wave range has been proposed by D. N. Shapiro (Radiotekhnika, No 4, 1955). Screens calculated by this method are being applied for the elimination of radio disturbances at present.

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Public Health, Hygiene and Sanitation

USSR

UDC 615.847.6-07:616.15-074

KOLODUB, F. A. and YEVTUSHENKO, G. I., Kharkov Scientific Research Institute of Labor Hygiene and Occupational Diseases

"Value of Some Biochemical Blood Parameters for the Early Diagnosis of Disorders Caused by Low-Frequency Pulsed Electromagnetic Fields"

Kiev, Vrachebnoye Delo, No 6, 1972, pp 131-135

Abstract: Exposure of rats to chronic, low-intensity pulsed electromagnetic fields for 6 months resulted in metabolic disturbances in the liver, kidneys, heart, skeletal muscles, and brain tissue of animals manifested by changes of varying duration in glucose, pyruvic and lactic acids, ammonia, glutamine, urea, total protein and protein fractions, and pseudocholinesterase, catalase, and peroxidase activities. The changes were particularly pronounced in the blood lactic acid and ammonia levels within two weeks. Unlike the other biochemical indices, however, they did not return to normal even as long as 30 to 60 days after the end of the experiment. Thus, a determination of blood lactic acid and ammonia would seem to be a worthwhile clinical method of detecting incipient pathology in humans exposed to low-frequency pulsed electromagnetic fields.

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USSR

UDC 577.1:612.015.32:538.6

KOLODUB, F. A., YEVTUSHENKO, G. I., Kharkov Scientific Institute of Hygiene of Labor and Occupational Diseases

"Characteristic Features of the Carbohydrate-Energy Metabolism of the Brain of Rats Under the Effect of a Low-Frequency Pulsed Electromagnetic Field"

Kiev, Ukrains'kiy Biokhimichnyi Zhurnal, Vol 44, No 4, 1972, pp 492-496

Abstract: It was established that for multiple (15 sessions) and chronic (1, 5, 3 and 6 months) effects of the low-frequency pulsed electromagnetic field (7 kilohertz) at an intensity of 72 and 24 kiloamps/meter, respectively, the processes of oxidation and phosphorylation separate in the brain of the rats as a result of attenuation of the inorganic phosphate esterification. Simultaneously with this, the glycogen and glucose contents in the brain tissue drop, and lactate accumulates. The disturbance of acid phosphorylation processes and partial switching of carbohydrate decomposition to the glycolytic process lead to a reduction in the amount of macroergic compounds (creatine phosphate and ATP) in the brain tissue and a simultaneous accumulation of the dephosphorylated ATP derivatives -- ADP and AMP.

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USSR

UDC 612.014.426.015.3

KOLODUB, F. A., and YEVTUSHENKO, G. I., Institute of Labor Hygiene

"Biochemical Aspects of the Biological Effect of a Low-Frequency Pulsed Electromagnetic Field (LFPEF)"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 6, 1972, pp 13-17

Abstract: Pronounced metabolic disturbances in the brain, heart, liver, and skeletal muscles were produced by LFPEF. ATP, creatinine phosphate, and glycogen became deficient and lactic acid and ammonia compounds accumulated. A study of amidation and deamidation elucidated the nature of the disorders observed in the various organs.

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USSR

UDC 615.471:613.647:612.014.426

KOLIUKH, G. D., and YEVTUSHENKO, G. I., Candidate of Medical Sciences, Kharkov Scientific Research Institute of Labor Hygiene and Occupational Diseases

"Experimental Equipment for the Study of the Biological Effect of Pulsed Electromagnetic Fields (PEMF)"

Moscow, Gigiyena i Sanitariya, No 11, Nov 1971, pp 113-114

Abstract: Designed and built jointly by the Institute of Labor Hygiene and Occupational Diseases and the Polytechnical Institute in Kharkov, the equipment generates PEMF of up to 400,000 a/m. It includes the following basic parts: the control unit for turning the equipment on and monitoring the various parameters; a high voltage transformer and rectifier unit; a battery of high voltage condensers; an induction unit which also houses a container for experimental animals; a commutator-trigatron which discharges the pulses at selected intervals; a pulse-ignition device which controls the commutator-trigatron; and a power input unit. The various parts are mounted to form two installation units. The high-power discharge current impulse which is fed through the induction coil has the form of damped harmonic oscillations. The experimental animal container easily accommodates mice, rats, guinea pigs, and rabbits.

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1/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--TIME CORRELATION TELEMETERING SYSTEMS -U-
AUTHOR--YEVTUSHENKO, I.M.
COUNTRY OF INFO--USSR
SOURCE--AVTOMATIKA, VOL. 15, JAN.-FEB. 1970, P. 49-55
DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.
TOPIC TAGS--TELEMETRY SYSTEM, SIGNAL CORRELATION

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1984/0401 STEP NO--UR/0102/70/000/000/0049/0055
CIRC ACCESSION NO--APO055186
UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--A00055186

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PRINCIPLES ARE CONSIDERED OF DESIGNING A NEW GROUP OF TELEMETERING SYSTEMS WHICH WERE CALLED TIME CORRELATION ONES. THE RATIOS ARE PRESENTED, CHARACTERIZING THE DISTORTIONS OF THE CORRELATION FUNCTION WITH SINGLE AND BINARY TRANSFERS OF ELEMENTARY SIGNALS OF PSEUDORANDOM POLAR VIDEOSIGNAL. THE PECULIARITIES ARE STATED OF REQUIREMENTS TO DESIGNING THE TIME CORRELATION SIGNALS IN TELEMETERING SYSTEMS. THE MAIN STRUCTURAL SCHEMES ARE DESCRIBED OF TIME CORRELATION TELEMETERING SYSTEMS AND TIME CORRELATION CONVERTERS.

UNCLASSIFIED

USSR

UDC 621.398

SVIRIDOV, V. V., YEVTUSHENKO, I. N., and TOLKACHEV, V. YU.

"Choice of the Optimal Distribution Function in a Remote Information System for the Operational Collection of Integral Information"

V sb. Avtomatiz. sistemy upravleniya (Automated Management Systems--collection of works), Cheboksary, 1973, pp 9 - 16 (from RZh Avtomatika Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 73, abstract No 11 A467)

Translation: A calculation and choice of optimal distribution of primary integral information processing functions for a fixed structure and arrangement of a remote information system are carried out. Three variations of centralization are compared on a combination of information and cost characteristics, using a vector preference criterion. One illustration, one table, six bibliographic citations.

Abstract by the authors.

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UNCLASSIFIED

PROCESSING DATE--30OCT70

1/2 011

TITLE--TESTING NEW FORMS OF THE PREPARATION MURBETOL ON SUGAR BEET

PLANTINGS -U-

AUTHOR--(02)--KHGOAKOVSKIY, P.P., YEVTUSHENKO, L.S.

COUNTRY OF INFO--USSR

SOURCE--KHIM. SEL. KNOZ. 1970, 8(2), 127-9

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--HERBICIDE, AGRICULTURE CROP, SOIL TYPE/(U)MURBETOL HERBICIDE,
(U)MC1488 HERBICIDE, (U)MC14PA HERBICIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/1369

STEP NO--UR/0394/70/008/002/0127/0129

CIRC ACCESSION NO--AP0125017

UNCLASSIFIED

2/2 011

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125017

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FIELD TESTS WERE MADE ON LOW HUMUS, LEACHED, HEAVY CHERNOZEM; PH OF THE ARABLE SOIL LAYER, 6.4; PH OF SUBSOIL, 7.0; INITIAL WEEDINESS, 47-60 PLANTS-M PRIME2, ANNUAL GRASSES PREVAILING. THE ACTION OF NEW FORMS OF MURBETOL WAS COMPARED AT LEVELS: COMMON, 40, 60, 80 L.-HA; A-1, 16, 22, 27 L.-HA; MC-1488, 6, 9, 12, KG-HA; MC-14PA, 8, 11, 14 KG-HA; CONTROL PLOTS WITH HAND WEEDING, AND PLOTS WITHOUT WEEDING. THE PREPNS. WERE ADDED TO THE SOIL A DAY BEFORE SOWING, AND 3 DAYS AFTER SOWING. THE BEST WEEDKILLING ACTION WAS WITH COMMON MURBETOL, WHICH LEFT ONLY SEVERAL PLANTS-M PRIME2; SLIGHTLY WORSE WITH MURBETOL A-1, AND MARKEDLY WORSE WITH MC-1488 AND MC-14PA.
FACILITY: ULADOVO-LYULINETSKAYA OPYT.-SELEKTS. STA., USSR.

UNCLASSIFIED

USSR

UDC 621.385.623.4

BORISOV, L.M., ZAKHAROVA, A.N., YEVTUSHENKO, O.V., ZHARYY, YE. V., KAUFMAN, G.M.,
PETROV, D.M., SAMORCDOVA, G.A.

"Experimental Television Klystron With High Efficiency"

Elektron. tekhnika. Nauchno-tekhn. sb. Elektron. SVCh (Electronic Technology. Scientific-Technical Collection. Microwave Electronics), 1970, No 7, pp 160-162
(from RZh--Elektronika i yeye primeneniye, No 11, November 1970, Abstract No 11A126)

Translation: The development is reported of an experimental klystron, the parameters of which were optimized for a specified current and voltage with the aid of an electronic computer. The electronic efficiency of the klystron produced amounts to 70 percent. With an amplification band of 1.3 percent and a shift of the maximum amplitude-frequency characteristic to the low-frequency side, the maximum efficiency (with respect to power in the load) exceeds 60 percent with an amplification factor of 40 db. Summary.

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USSR

UDC 621.791.89:546.621

~~YEVTUSHENKO~~ O. V., BURYKINA, A. L., and ARCHAKOVA, G. G., Institute of Problems of Material Science, Academy of Sciences UkrSSR

"Titanium Carbide Diffusion Welding in Vacuum"

Kiev, Avtomaticheskaya Svarka, No 2, Feb 70, pp 50-51

Abstract: A study was made of the effect of parameters of the regime of diffusion welding in vacuum on the properties of titanium carbide weld joints. The results of the investigation allow recommendation of the following optimal regime: temperature 1800°C, duration 10 minutes, and degree of rarefaction not lower than $5 \cdot 10^{-2}$ mm Hg at ≤ 1.0 kg/mm² specific pressure.

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Acc. Nr. 0043733

Abstracting Service: 5/70
INTERNAT. AEROSPACE ABST.

Ref. Code: UR0226

A70-23123 # Soldering of the boron carbonitride with high melting-point metals (Paika karbonitrida bor s tugoaplavkimi metallami). G. G. Archakova, A. L. Burykina, O. V. Evtishenko, and E. M. Prshedromirskaja (Akademiia Nauk Ukrainskoi SSR, Institut Problem Materialovedeniia, Kiev, Ukrainian SSR). Poroshkovaia Metallurgii, vol. 10, Jan. 1970, p. 52-55, in Russian.

Development of a high-temperature soldering technique for soldering the boron carbonitride with the niobium, molybdenum and tungsten, using the molybdenum disilicide as a solder. A study is made of the electrical resistance and gas tightness up to 10 atm of this soldered joints.

Z.W.

ALS

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REEL/FRA
19770139

18

USSR

ARCHAKOVA, G. G., BURYKINA, A. L., YEVZHEHENKO, G. V., and PRSHEDROMYRSKAYA, YE. M., Institute for Problems of Material Science, Academy of Sciences UkrSSR

"Soldering of Carbonitride With Refractory Metals"

Kiev, Academy of Sciences Ukr SSR, Poroshkovaya Metallurgiya, No 1, Jan 70, pp 52-55

Abstract: A method was developed for boron carbonitride soldering with refractory metals (niobium, molybdenum, and tungsten) using molybdenum disilicide as a refractory solder. In contrast to a previously developed soldering technique in an induction furnace in an argon medium, the soldering was accomplished in a vacuum. In certain cases a molybdenum powder (5 to 7%) was added to the refractory solder in order to decrease the temperature. A schematic diagram of the soldering setup is given and the soldering technique is described. Microstructure photographs of different fusion samples are given, and data on the electrical resistance of soldered boron carbonitrides with three metals are presented. The gas permeability of samples with pressure drops up to 10 atm was investigated. The experimental setup is shown schematically. The results obtained show that the soldering technique ensures the conservation of the electric resistance of

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USSR

ARCHAKOVA, G. G., et al, Poroshkovaya Metallurgiya, No 1, Jan 70, pp 52-55
soldered elements within the limits of 10^{13} ohm/cm and a gas density of the
soldered elements from 1 to 10 atm. Orig. art. has: 3 figures, 2 tables, and
2 references.

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USSR

UDC 530.12:531.18+538.3

YEVTUSHENKO, S. P.

"I. Rigid Nonrotational Motion in a Two-Dimensional Space"

V sb. Gravitatsiya i teoriya odnositel'n. (Gravitation and the Theory of Relativity -- Collection of Works), vyp. 7, Kazan', Kazan' University, 1970, pp 34-37 (from RZh-Fizika, No 2, Feb 71, Abstract No 2B111)

Translation: A natural generalization of the concept of motion of a body as an absolutely solid state to the relativistic case is motion for which the orthogonal interval between the world lines of two close points of the body is preserved. This condition is expressed by a differential equation for 4-velocity of a fixed point of the body. By using this equation for the non-rotational case, the author shows that at every point of the world line it is possible to construct a unit vector frame with a time unit vector along the world line such that the unit vectors of each of the three spatial unit vectors of the frame will define a set of geodetic 4-velocity vectors orthogonal to the field. It is shown that in a two-dimensional time space all three sets will be in a single-parametric set of hyperplanes.

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UDC 530.12:531.18_538.3

USSR

YEVTUSHENKO, S. P.

"II. Study of Born Equations of Rigid Motion in a Two-Dimensional Space"

V sb. Gravitatsiya i teoriya otноситel'n. (Gravitation and the Theory of Relativity — Collection of Works), vyp. 7, Kazan', Kazan' University, 1970, pp 38-41 (from RZh-Fizika, No 2, Feb 71, Abstract No 2B112)

Translation: After investigating the differential equation of motion of points of a rigid (in the Born sense) body $A_{\alpha\beta} = u_{\alpha;\beta} + u_{\beta}u^{\alpha}u_{\alpha;\beta} +$

$u_{\beta;\alpha} + u_{\alpha}u^{\sigma}u_{\beta;\sigma} = 0$, where $u^{\alpha} = dx^{\alpha}/ds$ is a 4-velocity field, the author shows that in the two-dimensional time space the equations with identical indexes $\alpha = \beta$ are corollaries of equations with different indexes $\alpha \neq \beta$. When $\alpha \neq \beta$, the general solution of this equation has the form:

$$u_{\alpha}/u_{\beta} = \psi_{\alpha\beta}(x^{\alpha} + x^{\beta}u_{\beta}/u_{\alpha}, x^{\tau}, x^{\delta}) \tag{1}$$

where summation with respect to α, β does not occur; $\alpha, \beta, \tau, \delta$ are not equal to each other; and $\psi_{\alpha\beta}$ satisfies the algebraic conditions $\psi_{\alpha\beta} = 1/2$

USSR

YEVTUSHENKO, S. P., Gravitatsiya i teoriya otноситel'noy (Gravitation and the Theory of Relativity -- Collection of Works), vyp. 7, Kazan', Kazan' University, 1970, pp 38-41 (from RZh-Fizika, No 2, Feb 71, Abstract No 2B112)

$(\psi_{\beta\alpha})^{-1}$, $\psi_{\alpha\gamma}/\psi_{\beta\gamma}$. Thus, the problem of finding rigid motion is reduced in the general case to the solution of finite equations (1) with respect to u_{α} .

USSR

UDC 669.184

YEVTUSHENKO, V. B., MIKHNEVICH, YU. F., KULIKOV, V. O., GIZATULIN, G. Z.

"Technological Process for Making, Killing, and Pouring O8Yu Nonaging Bessemer Steel"

Dnepropetrovsk, Metallurgicheskaya i gornorudnaya promyshlennost', No 2 (74), 1972, pp 16-17

Abstract: The technological processes for making, killing, and pouring O8Yu nonaging Bessemer steel are discussed. In 1966-1969, the Donetsk Scientific Research Institute of Ferrous Metallurgy and the Zhdanov Metallurgical Plant imeni Il'ich performed research to develop these processes for cold-rolled sheet O8Yu Bessemer steel for complex and supercomplex drawing. The results of these studies are discussed. The state of oxidation of the metal is affected by the intensity of blowing and ore additions for temperature correction at the end of blowing. The application of solid cast iron in the amount of 600-700 kg per melt was most effective in lowering the oxidation state of the metal in the Bessemer converter. Scavenging was carried to a carbon content of 0.06% and lower, but the scavenging intensity rarely exceeded $1.9 \text{ nm}^3/\text{min} \cdot \text{ton}$ of steel. Fifteen versions of introducing aluminum into the metal were investigated. The most optimal version was introduction of the primary aluminum as a monolith in a meltable packaging placed in the ladle on a false stopper

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USSR

YEVTUSHENKO, V. B., et al., Metallurgicheskaya i gornorudnaya promyshlennost',
No 2 (74), 1972, pp 16-17

before tapping. With the optimal version of alloying the primary large surface defect of the O8Yu steel slabs was bottom splash. This defect was best controlled by improving the organization of the metal stream.

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USSR

UDC: 518.9

GRACHEV, N. I., YEVTUSHENKO, Yu. G.

"Some Properties of Minimax Problems"

V sb. Issled. operatsiy. vop. 2 (Operations Research--collection of works. No 2), Moscow, 1971, pp 28-41 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V766)

Translation: The authors pose the problem of finding the minimax $I_1 = \min_{y \in Y} \max_{x \in X} K(x, y)$ (X and Y are subsets of Euclidean spaces E_m and E_n). The

solution of this problem is the function $\bar{x}(y)$ which satisfies the equality $K(\bar{x}(y), y) = \max_{x \in X} K(x, y)$ and the set $N \subset Y$, where $K(\bar{x}(y_*), y_*) = \min_{y \in Y} K(\bar{x}(y), y)$ for points

y_* of set N . For $X=[a, b]$, $Y=[c, d]$ a reduction of the problem is made, i. e. the solution is sought among the functions which satisfy the equation $(x(y)-a)(x(y)-b)K_x(x(y), y) = 0$ and the inequality $(x(y)-a)^2(x(y)-b)^2 K_{xx}(x(y), y) < 0$. The functions $\bar{x}(y)$, $K(\bar{x}(y), y)$ and others are studied. A "local minimax" is defined and its sufficient conditions are formulated. Some results are generalized to the case where X and Y are n -dimensional parallelepipeds. L. Bregman.

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172 014 UNCLASSIFIED PROCESSING DATE--22 OCT 70
TITLE--APPROXIMATE CALCULATION OF OPTIMAL CONTROL PROBLEMS -U-

AUTHOR--YEVTUSHENKO, YU.G.

COUNTRY OF INFO--USSR

SOURCE--PRIKLADNAIA MATEMATIKA I MEKHANIKA, VOL. 34, JAN.-FEB. 1970, P.
95-104

DATE PUBLISHED-----70

SUBJECT AREAS--MATHEMATICAL SCIENCES, PHYSICS

TOPIC TAGS--APPROXIMATION CALCULATION, OPTIMAL AUTOMATIC CONTROL,
NONLINEAR SYSTEM, VARIATIONAL PROBLEM, PARAMETRIC MOTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/1545

STEP NO--UR/0040/70/034/000/0095/0104

CIRC ACCESSION NO--AP0106291

UNCLASSIFIED

272 014

UNCLASSIFIED

PROCESSING DATE--2300170

CIRC ACCESSION NO--AP0106291

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. APPLICATION OF THE AVERAGING METHOD FOR THE SOLUTION OF A WIDE RANGE OF PROBLEMS INVOLVING THE OPTIMAL CONTROL OF SYSTEMS THAT CAN BE REDUCED TO THE STANDARD FORM OF SYSTEMS WITH RAPIDLY ROTATING PHASE. THE PROPOSED MODIFICATION OF THE AVERAGING METHOD IS A FURTHER DEVELOPMENT OF THE KRYLOV-BOGOLIUBOV TECHNIQUE. THE OVERALL SCHEME OF APPROXIMATE COMPUTATION IS EXPLAINED, AND SOLUTIONS ARE GIVEN FOR A NUMBER OF VARIATIONAL PROBLEMS INVOLVING OPTIMAL PARAMETRIC EXCITATION AND OPTIMAL REDUCTION IN THE ENERGY OF A ROTATING PENDULUM. THE PROPOSED APPROACH IS EFFECTIVE IN THE APPROXIMATE SYNTHESIS OF OPTIMAL CONTROL FOR STRONGLY NONLINEAR SYSTEMS.

UNCLASSIFIED

USSR

UDC 632.95.022.8

IVANOVA, G. B., ROSLAVTSEVA, S. A., POLYAKOVA, V. K., and YEVTYUSHINA, T. M., All-Union Scientific Research Institute of Chemicals Used for Plant Protection

"Development of the Resistance of Houseflies to Phthalophos"

Moscow, Khimiya v Sel'skom Khozyaystve, No 9, 1971, pp 40-42

Abstract: It was previously established [S. A. Roslavitseva, et al., Med. parazitol., No 1, 1970] that after selection of a strain of houseflies resistant to diazinone by methylethylthiophos, the tolerance level to the latter did not change (X 4-5). After selection by phthalophos for 14 generations, the resistance of the flies to phthalophos increased by 9 times with an invariant level of resistance to methylethylthiophos. Thus, a study was made of the rapid development of the resistance to phthalophos by investigating the reaction of a laboratory strain of flies not subjected to treatment by insecticides to the compounds. Phthalophos [O, O-dimethyl-(N-phthaloiimidomethyl)-diphosphosphate] dissolved in acetone was used in the experiment.

On selection of each generation of mature flies from a sensitive laboratory population by phthalophos a rapid increase in resistance occurred: in 1/2

USSR

IVANOVA, G. B., et al., *Khimiya v Sel'skom Khozyaystve*, No 9, 1971, pp 40-42

generation F_8 , the resistance to the insecticide increased by 10 times, in generation F_{12} , by 20 times and in generation F_{27} , by more than 1,000 times. In the presence of an increase in resistance to phthalophos by 20 times, a high cross resistance to ruelene ($x \approx 34$) and koral ($x \approx 12$) occurred. In the presence of 1,000-fold resistance of the imaginal stage, the larvae of the flies of the resistant race were more resistant than the larvae of the sensitive race by no more than 2 or 3 times. The vitality and sensitivity of the eggs of flies from the strains R_{phth} and S to phthalophos were identical. At the beginning of selection by phthalophos, the egg production of the flies increased. Later, in generation F_{25} , the egg production of the highly resistant flies of the R_{phth} strain differed little from the egg production of the flies of the sensitive strain S.

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USSR

UDC 632.951

ROSLAVTSEVA, S. A., IVANOVA, G. B., YEVTYUSHINA, T. M., and POLYAKOVA, V. K.,
All Union Scientific Research Institute of Chemical Plant Protectants

"The Cross Resistance of Three Races of House Flies Resistant to Organophosphorus Preparations"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 8, No 8, Aug 70, pp 39-41

Abstract: The authors studied the possibility of developing cross resistance by selecting resistant flies with various organophosphorus preparations, as well as the dependence of the induced resistance on the selecting agent. The experiments were performed on the following races of flies: R_p , obtained from susceptible race S (All Union Scientific Research Institute of Chemical Plant Protectants) selected with phthalophos; R_m , derived from race S by selection with malathion (carbophos); R_a , obtained by selection with methylethylthiophos of a resistant race treated at first with Diazinon. Active ingredients of chlorophos, Rogor, methylacetophos, phthalophos, Phosalone, Co-Ral, DDVP, phoxime, and the commercial products Ruelene, Sumithion and carbophos, Baytex and bromophos were used for the study. The following preparations are recommended on the basis of resistance development and induction data for the
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USSR

ROSLAVTSEVA, S. A., et al., Khimiya v Sel'skom Khozyaystve, Vol 8, No 8, Aug 70, pp 39-41

eradication of flies in livestock houses: Rogor (most toxic for susceptible and resistant races), DDVP, chlorophos, Fitos, Sumithion and malathion (resistance to malathion develops very slowly). The use of phthalophos against flies is not recommended. Nor should livestock housing be treated with phthalophos, Phosalone (especially if malathion was used previously for a long time against flies), Co-Ral or Ruelene.

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Foundry 4

USSR

UDC 669.18:621.746.58

DOROKHOV, V. I., PALYANICHKA, V. A., KLEMESHOV, G. A., YEVTYUTOV, V. P.,
GLAZOV, V. I., PANASENKO, V. G., RYABININ, B. G., and ROSTORGUYEV, V. D.,
Ukrainian Scientific Research Institute of Metals

"Casting of Large Sheet Ingots of Low-Alloy Steel Under Protective Slag
Coating"

Moscow, Metallurg, No 3, Mar 72, pp 17-19

Abstract: Joint investigations of the Ukrainian Scientific Research Institute of Metals and the Zhdanov Plant imeni Il'ich, revealed that stratifications in sheets of silicomanganous steel can be caused by accumulations of macro-inclusions of endogenic origin or increased content of hydrogen. Experiments in casting sheet ingots of silicomanganous steel O9G2S, weighing 118-27.0 tons, under a protective coating of synthetic slag, are described. The experiments were conducted in order to decrease stratifications resulting from nonmetallic impurities. It was found that by using slag with optimum physico-chemical properties in casting steel, the content of oxide inclusions can be lowered by more than 30% and stratifications can be practically eliminated in thick sheets. The nonmetallic inclusions do not change
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USSR

UDC 669.141.241-412:658.562

OSTROUSHKO, A. V., KAZACHKOV, Ye. A., KOROTICH, I. K., KULIK, V. A., and YEVTYUTOV, V. P., Zhdanov Metallurgical Institute; Plant imeni Il'ich

"Improving the Surface of Heavy Plate Ingots"

Moscow, Metallurg, No 1, Jan 71, pp 23-25

Abstract: Use was made of production data on 1825 melts of carbon and low-alloy steels to study the effect of technological parameters of metal pouring on the surface quality of heavy plates produced from ingots of low-alloy steel. The processing of these data failed to establish a link between the technological parameters and the extent of the defect (double skin) on the plates. It was found that double skin is caused primarily by the oxidation of metal splashes adhering (in the process of pouring) to the inner surface of the corrugated faces of the ingot molds; the secondary cause of double skin formation are subcutaneous blowholes which are close to the surface of the ingot. The use of a graphite sulfite cellulose suspension for lubricating the ingot mold and simultaneous increase in the pouring rate make it possible to reduce the number of double-skin rejects on plates.

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1/2 016 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--HETEROGENEUS CATALYTIC REACTIONS PROCEEDING WITH THE PARTICIPATION
OF A NONSTOICHIOMETRIC COMPONENT -U-
AUTHOR--YEYDUS, YA.T.
COUNTRY OF INFO--USSR
SOURCE--IZV. AKAD. NAUK SSSR SER. KHIM. 1970, (2), 362-8
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--HETEROGENEUS CATALYSIS, POLYMERIZATION, ISOMERIZATION,
HYDROGENATION, CATALYTIC CRACKING, DEALKYLATION, SOLVENT ACTION, METAL
CATALYST

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1964 STEP NO--UR/0062/70/000/002/0362/0368

CIRC ACCESSION NO--AP0123745
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123745

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. HETEROGENEOUS REACTIONS OF HYDROPOLYMERIZATION, DOUBLE BOND MIGRATION, CONFIGURATIONAL ISOMERIZATION, HYDROGENATION, DEHYDROGENATION, HYDROGENOLYSIS, DEALKYLATION, DEHYDROCYCLIZATION, DECARBOXYLATION AND CRACKING, AS WELL AS VARIOUS OXIDATIVE REACTIONS PERFORMED WITH CATALYSIS BY METALS AND THEIR SALTS OR OXIDES, WERE DISCUSSED IN TERMS OF DEPENDENCE ON THE NONSTOICHIOMETRIC COMPONENT PRESENT; THE LATTER COULD BE CO, O SUB2, H SUB2, H SUB2 O, NH SUB3, HCL, ETC. IN LIQ. PHASE REACTIONS, THE SOLVENT OFTEN PLAYS THE ROLE OF SUCH AN AGENT. FACILITY: INST. ORG. I.H.M. IM. ZELINSKOGO, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.373:530.145.6

YEYLENKRIG,
G.S.

GOYKHMAN, V. Kh., GOL'DFARB, V. M., DASHKEVICH, I. P., EYLENKRIG, G. S.

"Use of a High-Frequency Plasmatron to Determine the Emittance of Some Gases, and Also for Spectral Analysis of Solutions"

V sb. Primeneniye plazmatrona v spektroskopii (Use of the Plasmatron in Spectroscopy-- collection of works), Frunze, "Ilim", 1970, pp 82-87 (from RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10D228)

Translation: The emittance of oxygen is measured in the visible region of the spectrum at temperatures of 6,000-9,000°K. It is shown that the spectral distribution of oxygen emission is due chiefly to recombination processes. Preliminary studies are conducted into the use of a high-frequency plasmatron for spectral determination of a number of elements. Three illustrations, bibliography of 31 titles. Resumé.

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1/2 012 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--GAS CHROMATOGRAPHIC SEPARATION OF UNSATURATED HYDROCARBONS, USING
SILVER NITRATE SOLUTIONS AS STATIONARY PHASES. 1. EFFECT OF OPERATING
AUTHOR--KUNINGAS, K., RANG, S., YEYSEN, D. ~~XXXXXXXXXX~~ Y
COUNTRY OF INFO--USSR
SOURCE--EESTI NSV TEAD. AKAD. TIOM., KEEM., GEOL. 1970, 19(1), 30-5
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--STEMEOCHEMISTRY, CHEMICAL SEPERATION, ISOMER, MOLECULAR
STRUCTURE, GAS CHROMATOGRAPHY, CHROMATOGRAPHIC SEPERATION, OCTANE,
NONANE, DECANE, THERMAL EFFECT, ALIPHATIC ALKANE, ALIPHATIC ALKENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/1067 STEP NO--UR/0470/70/019/001/0030/0035
CIRC ACCESSION NO--AP0104465
UNCLASSIFIED

272 012

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0104465

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GAS CHROMATOGRAPHIC SEPNs. OF GEOMETRIC ISOMERS OF C SUB8 MINUS SUB13 STRAIGHT CHAIN ALKENES, BY USING AGNO SUB3 SOLNS. (IN ETHYLENE GLYCOL, DIETHYLENE GLYCOL, POLYETHYLENE GLYCOL 400 (I), DECANE, 1,10,DIOL, HEXANE, 1,6,DIOL, BUTANE, 1,4,DIOL (II), BUTANE, 1, 3,DIOL, BUTANE, 2,3,DIOL, OR 2,BUTENE, 1,4,DIOL) AS THE STATIONARY PHASES, WAS STUDIED. CHROMOSORB SUPPORTS, HE CARRIER GAS, AND A THERMAL COND. DETECTOR WERE USED. THE EFFECTS OF THE SAMPLE SIZE, TEMP., AND THE HE FLOW RATE ON THE COLUMN PERFORMANCE ARE DISCUSSED. COLUMNS CONTG. AGNO SUB3 IN I OR IN II GAVE THE BEST SEPNs. OPTIMUM TEMPS. WERE 40-60DEGREES, 60-80DEGREES, AND 80-100DEGREES FOR ISOMERS OF C SUB8 MINUS SUB9, C SUB10 MINUS SUB11, AND C SUB12 MINUS SUB13 ALKENES, RESP. RELATIVE ERRORS WERE LESS THAN OR EQUAL TO 3.5PERCENT FOR THE ANAL. OF SYNTHETIC DECENE AND DODECENE ISOMERIC MIXTS. ON AN AGNO SUB3-II COLUMN AT 80 AND 100DEGREES, RESP.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--11SEP70
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AUTHOR--KUNINGAS, K., RANG, S., YEYSEN, D.

COUNTRY OF INFO--USSR

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DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--STEMEOCHEMISTRY, CHEMICAL SEPERATION, ISOMER, MOLECULAR
STRUCTURE, GAS CHROMATOGRAPHY, CHROMATOGRAPHIC SEPERATION, OCTANE,
NONANE, DECANE, THERMAL EFFECT, ALIPHATIC ALKANE, ALIPHATIC ALKENE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1067

STEP NO--UR/0470/70/012/001/0030/0035

CIRC ACCESSION NO--AP0104465

UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0104465

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GAS CHROMATOGRAPHIC SEPNS. OF GEOMETRIC ISOMERS OF C SUB8 MINUS SUB13 STRAIGHT CHAIN ALKENES, BY USING AGNO SUB3 SOLNS. (IN ETHYLENE GLYCOL, DIETHYLENE GLYCOL, POLYETHYLENE GLYCOL 400 (I), DECANE, 1,10,DIOL, HEXANE, 1,6,DIOL, BUTANE, 1,4,DIOL (II), BUTANE, 1, 3,DIOL, BUTANE, 2,3,DIOL, OR 2,BUTENE, 1,4,DIOL) AS THE STATIONARY PHASES, WAS STUDIED. CHROMOSORB SUPPORTS, HE CARRIER GAS, AND A THERMAL COND. DETECTOR WERE USED. THE EFFECTS OF THE SAMPLE SIZE, TEMP., AND THE HE FLOW RATE ON THE COLUMN PERFORMANCE ARE DISCUSSED. COLUMNS CONTG. AGNO SUB3 IN I OR IN II GAVE THE BEST SEPNS. OPTIMUM TEMPS. WERE 40-60DEGREES, 60-80DEGREES, AND 80-100DEGREES FOR ISOMERS OF C SUB8 MINUS SUB9, C SUB10 MINUS SUB11, AND C SUB12 MINUS SUB13 ALKENES, RESP. RELATIVE ERRORS WERE LESS THAN OR EQUAL TO 3.5PERCENT FOR THE ANAL. OF SYNTHETIC DECENE AND DODECENE ISOMERIC MIXTS. ON AN AGNO SUB3-II COLUMN AT 80 AND 100DEGREES, RESP.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--LIQUID VAPOR EQUILIBRIUM IN THIOPHENE, NITROMETHANE, METHANOL,
THIOPHENE, AND METHYL ETHYLKETONE THIOPHENE SYSTEMS -U-
AUTHOR-(02)-KUDRYAVTSEVA, L.S., EYSEN, O. *YEYSEN, O.* Y
COUNTRY OF INFO--USSR
SOURCE--ZH. PRIKL. KHIM. (LENINGRAD) 1970, 43(3), 708-11
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--PHASE EQUILIBRIUM, THIOPHENE, NITROMETHANE, METHANOL, KETONE,
GAS CHROMATOGRAPHY, AZEOTROPIC MIXTURE, DISTILLATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1995/1420 STEP NO--UR/0080/70/043/003/0708/0711
CIRC ACCESSION NO--AP0116867
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0116867

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EQUIL. IN SYSTEMS THIOPHENE (I) MENO SUB2 AT 75DEGREES, MEQH-I AT 55DEGREES, AND MECDET-I AT 75DEGREES WAS STUDIED BY GAS CHROMATOG. AND VACUUM DISTN. ALL 3 SYSTEMS ARE NONIDEAL AND SHOWED POS. DEVIATIONS FROM RAULT'S LAW. AZEOTROPIC MIXTS. WERE FORMED FOR I-MENO SUB2, B.P. 82.7DEGREES, CONTG. 0.817 MOLE FRACTION I AND FOR MEQH-I WITH A B.P. 59.4DEGREES, T NTG. 0.667 MOLE FRACTION III. ACTIVITY COEFF. GAMMA1 AND GAMMA2 FOR BOTH COMPONENTS WERE CALCD. ON THE BASIS OF THE EQUATION $\log \gamma_1 = B(1 - X_1) + C(1 - X_1)^2 + D(1 - X_1)^3$ (1 MINUS 2X SUB1) PLUS C(6X SUB1 (1 MINUS X SUB1) MINUS 1) PLUS D(1 MINUS 2X SUB1)(1 MINUS 8X SUB1 (1 MINUS X SUB1)) (X SUB1 IS MOLE FRACTION OF COMPONENT (1)); THE CONSTS. WERE (SYSTEM, B, C, AND D GIVEN): MENO SUB2, 4504, 0.0448, 0.0308; MEQH-I, 0.5782, MINUS 0.1491, 0.0992; MECDET-I, 0.0487, MINUS 0.0143, 0.0053. FACILITY: INST. KHIM., TALLIN, USSR.

UNCLASSIFIED

USSR

UDC 576.311.1

FLUYER, F. S. and YEZEPCHIK, Yu. V., Institute of Epidemiology and Microbiology
imeni N. F. Gamaleya, Academy of Medical Sciences USSR, Moscow

"Some Chemical and Physicochemical Properties of Bacillus cereus Exo- and
Enterotoxin"

Moscow, Biokhimiya, No 1, 1973, pp 136-142

Abstract: Fractionation of B. cereus strain 96 toxin on a column with Biogel
P-150 produced 2 fractions, one lacking in lecithinase and hemolytic activity
but markedly lethal to mice and cats, the other possessing high lecithinase and
hemolytic activity but not lethal to animals even at high doses. This shows
that the lethal and enterotoxic activity of B. cereus is due to its exotoxin and
not lecithinase C. The toxin was found to be a protein readily soluble in water
and salt solutions, inactivated by heating, treatment with trypsin, urea,
salts of heavy metals, EDTA, hydrogen sulfide, formaldehyde, and change in pH.
The toxin contains 17 amino acids (but not cysteine).

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1/2 017 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--SEROLOGICAL STUDY OF A SOMATIC COMPONENT ISOLATED FROM COR.
DIPHtheriae -U-
AUTHOR--(03)--KOSTYUKOVA, N.N., KADYROVA, KH.V., YEZEPCHUK, YU.V.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, 1970, NR 4,
PP 59-64
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--SEROLOGIC TEST, DIPHTHERIA, ANTIGEN, AGGLUTINATION,
CARBOHYDRATE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAme--1990/1538 STEP NO--UR/0016/70/000/004/0059/0064
CIRC ACCESSION NO--AP0109598
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--09OCT76

CIRC ACCESSION NO--AP0109598

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS PRESENT THE RESULTS OF IMMUNOLOGICAL STUDY OF SURFACE FRACTIONS OF THE BODIES OF DIPHTHERIA BACILLI, OBTAINED BY THE METHOD OF SALT EXTRACTION AT VARIOUS PH VALUES (1,7,11) AND BY CHLOROFORM TREATMENT. ALKALI SOLUBLE FRACTION PROVED TO BE THE MOST ACTIVE. IT WAS ALSO THE RICHEST IN PROTEIN AND CARBOHYDRATES. ALL THE FRACTIONS CONTAINED A GROUP ANTIGEN PRESENT IN 7 OF 8 STRAINS OF C. DIPHTHERIA UNDER STUDY, WHICH VARIED BY TOXIGENICITY, BIOCHEMICAL AND SEROLOGICAL PROPERTIES. BESIDES, THE ALKALI SOLUBLE FRACTION CONTAINED 2 TYPE SPECIFIC ANTIGENS. TYPE SPECIFICITY OF THE STRAINS REVEALED IN THE REACTION PRECIPITATION WITH THE ALKALI SOLUBLE ANTIGENS OF THESE STRAINS DID NOT CONFORM COMPLETELY TO THE TYPE SPECIFICITY DETERMINED WITH THE AID OF AGGLUTINATION REACTION WITH LIVE CULTURES. WAYS OF OBTAINING PRECIPITATIONS AND HEMAGGLUTINATING SERA TO VARIOUS ANTIGENS OF DIPHTHERIA BACILLI WERE PUT FORWARD.

UNCLASSIFIED

MICROBIOLOGY

USSR

UDC 576.851.252.097.29

NIKOLAYEVA, I. S., YEZEPCHUK, YU. V. and EUGROVA, V. I., Institute of Epidemiology and Microbiology imeni Gamaleya, Academy of Medical Sciences USSR, Moscow

"A Method of Isolating Staphylococcus Enterotoxin Type A"

Moscow, Zhurnal Mikrobiologii Epidemiologii i Immunobiologii, No 1, 1973, p 134

Abstract: Enterotoxin type A, whose properties are not yet known in detail and which is a frequent cause of food poisoning, was isolated from Staphylococcus strain 264 grown for 48 hrs at 37°C in a nutrient medium containing amino acids and casein hydrolysate. The culture liquid was centrifuged, and the sediment was heated at 100°C for 30 minutes and then concentrated by freeze-drying. Prior to the tests, the dry material was dissolved in a minimum amount of distilled water, dialyzed, and the volume brought up to one-fifth of the initial culture liquid volume. The crude enterotoxin was then purified through precipitation with 2 volumes of 96% ethanol cooled to 5°C. The minimum toxic dose of the purified preparation contained 3.42-4.29 mg of nitrogen per kg and, after intravenous injection into cats, it produced a marked reaction in all animals, with typical clinical signs of poisoning. In gel diffusion with homologous

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NIKOLAYEVA, I. S., Zhurnal Mikrobiologii Epidemiologii i Immunobiologii, No 1, 1973, p 134

serum, the preparation yielded three precipitation lines. Electrophoresis in agar revealed three antigens, with two relatively immobile and the third accumulating in the cathode zone of the immunophoregram. Disk electrophoresis in polyacrylamide gel revealed the presence of five components in the preparation. Thus, precipitation with ethanol yields a toxic but unhomogeneous preparation, and further research is necessary in order to isolate homogeneous enterotoxins.

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USSR

UDC 62-50 3

YEMEL'YANOV, S.V.; UTKIN, V.I.; TARIN, V.A.; KOSTYLEVA, N.Ye.; SHUELADZE, A.M.; YEZEROV, V.B.; DUBROVSKIY, Ye.N.

"Theory of Systems with Variable Structure" (book)

Teoriya Sistem s Peremennoy Strukturoy [English version above], Moscow, Nauka Press, 1970, 592 pp

Annotation: This book presents a new division in the theory of automatic control -- the theory of systems with variable structure (VSS) belonging to the class of nonlinear automatic control systems. A broad range of problems is covered. The problems of control of objects with constant and variable parameters in the mode of free motion and with external perturbing forces are studied. Considerable attention is given to solution of the problem of stability of the systems in question. Methods are suggested for controlling objects with many controlled quantities. Methods are presented for synthesis of adaptive systems with variable, simple solutions. The capabilities of methods

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YEMEL'YANOV, S.V., et al., Teoriya Sistem s Peremennoy Strukturoy, Moscow, Nauka Press, 1970, 592 pp

from the theory of systems with variable structure with incomplete information on the state of the system are studied. Problems related to the application of variable structure systems in problems of filtration are analyzed; a qualitative comparison of linear optimal filters and filters with variable structure is presented.

181 figures; 137 biblio. refs.

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YEMEL'YANOV, S.V., et al., Teoriya Sistem s Peremennoy Strukturoy, Moscow, Nauka Press, 1970, 592 pp

- 4. Control of Forced Movement in Systems with Variable Structure
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