

2/2 009

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0134253

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CTENOPHTHALMUS (EUCTENOPHTHALMUS) NAIRICUS IS DESCRIBED. NINE MALES AND 4 FEMALES OF THIS SPECIES WERE FOUND IN A NEST OF MICROTUS SOCIALIS (KAFANSKY REGION, ARMENIAN SSR). THE NEW SPECIES BELONGS TO THE SAME GROUP AS C. CONGENER ROTH., 1907 AND C. SECUNDUS WAGNER, 1916. FEMALES RESEMBLE C. STRIGOSUS ROST. ET SOLOV., 1964 IN THE FORM OF THE APICAL EDGE OF STERNITE VII. THERE IS SCLEROTIZATION UNDER THE EDGE OF STERNITE VII.

UNCLASSIFIED

USSR

UDC: 538.323:621.378

ARUTYUNYAN, V. M. and AVETISYAN, G. K.

"Reflection and Capture of Charged Particles by a Plane Electromagnetic Wave in a Medium"

Moscow, Kvantovaya elektronika, No 7, 1972, pp 54-56

Abstract: The interaction of charged particles with a plane electromagnetic wave in a medium with an index of refraction greater than unity is examined. If the wave field exceeds some critical value, the external particle cannot penetrate the wave nor can a particle within the wave break out of it. The cause of this phenomenon is that in a medium of this type, the velocity of the particle may be equal to the phase velocity of the wave, and the particle may absorb or eject Cerenkov photons. Also considered in this brief communication is the motion of the particle in the field of the wave, the analysis for which begins with the classical equations of motion of a relativistic particle, and is limited to the case in which the index of refraction of the wave exceeds unity. The case in which the particle is initially inside the wave is examined, and some possible applications of the effect are briefly explored.

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USSR

UDC 621.382.2

AVETISYAN, G.KH., ZUEKOV, A.M., MADOYAN, S.G.

"Investigation Of  $n^+Ga_{1-x}In_xAs$ -- $p^+GaAs$  Tunnel Heterojunctions"

V sb. Arsenid galliya (Gallium Arsenide--Collection Of Works), Issue 3, Tomsk, Tomsk University, 1970, pp 145-151 (from RZh--Elektronika i yeye primeneniye, No 3, March 1971, Abstract No 3B399)

Translation: The voltampere characteristics are investigated of tunnel diodes made with type  $n^+GaInAs$ -- $p^+GaAs$  heterojunctions. The dependence is studied of the properties of heterojunctions on the composition of the electrode material, on the polarity of the surface (111), and on the ambient temperature. A comparison is made of the voltampere characteristics with homogeneous and heterogeneous p-n junctions. A tunnel diode with a heterogeneous p-n junction is inferior in its characteristics to a tunnel diode with a conventional p-n junction. 4 ref. Summary.

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USSR

UDC 621.382.002

FEDOTOV, YA.A., MADOYAN, S.G., AVETISYAN, G.KH., MANAGAROV, V.D., REPNIKOV, G.I.

"Properties Of  $p^+$ Ge-nGaAs Structure Prepared By The Liquid Epitaxy Method"

Elektron.tekhnika. Nauch.-tekhn.sb. Poluprovodn. pribory (Electronic Technics. Scientific-Technical Collection. Semiconductor Devices), 1971, Issue 4(61), pp 31-38 (from RZh:Elektronika i yeye primeneniye, No 5, May 1972, Abstract No 5B579)

Translation: The optimum conditions were determined for the growth of high-quality layers of Ge on GaAs by the liquid epitaxy method (from a solution in Ge). The optimum supercooling of the solution for preparing ideal layers was calculated. (It was found to be  $\sim 15^\circ \text{C}$ .) The calculation was confirmed by experiment. With supercoolings above  $50^\circ \text{C}$  the perfection of the layers sharply deteriorated. Heterojunctions of  $p^+$ Ge--nGaAs were prepared without intermediate layers of the solid solution Ge + GaAs and without a "false" junction at the interface resulting from diffusion of arsenic in the Ge. 9 ref. Ye.G.

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USSR

UDC 532.529

AVETISYAN, I. A., ZAVARZINA, N. A., LISTROV, A. T.

"Invariant-Group Properties of the Equations of Motion of a Liquid With Bubbles"

Sb. nauch. tr. fak. prikl. mat. i mekh. Voronezh. un-ta (Collection of Scientific Works of the Faculty of Applied Mathematics and Mechanics of Voronezh University), 1971, No. 1, pp 109-117 (from RZh-Mekhanika, No 3, Mar 72, Abstract No 3B953)

Translation: The flow of a mixture of liquid and gas bubbles is discussed. Although the initial equations are written in the approximation of a two-velocity continuous medium, subsequently the rates of both phases are considered as coinciding. The equations finally obtained take into account in particular the relaxation effects associated with oscillations in the volume of the bubbles, where pulsations in the bubbles are considered isothermal. Further considered are linearized equations of the quasi-one-dimensional nonstationary flow of the mixture in a tube of variable cross section  $F = F(x)$  and the invariant-group properties of the corresponding differential equations are investigated.  $H$ -invariant solutions are then obtained and optimal systems of operators are described that are permitted by the initial system of equations in three cases, when the

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AVETISYAN, I. A., et al, Sb. nauch. tr. fak. prikl. mat. i mekh. Voronezh. un-ta, 1971, No. 1, pp 109-117

following condition is fulfilled:

$$f'' + ff' = 0 \left( f = \frac{1}{F} \frac{dF}{dx} \right)$$

and when this condition is not fulfilled. The solutions obtained describe in a one-dimensional approximation the flow of the mixture of liquid and bubbles in tubes of varying cross section. The second part of the article discusses under the same assumptions two-dimensional (plane) nonstationary flow. A Laplace transformation with respect to time is applied to the initial equations and then the equation for the representation of pressure is investigated and solved by invariant-group methods. 6 ref. A. N. Krayko.

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Water Treatment

USSR

UDC 532.61

TRAPEZNIKOV, A. A., and AVETISYAN, R. A., Institute of Physical Chemistry, Academy of Sciences USSR

"Effect of a Wave on the Ability of Monolayers of Cetyl and Octadecyl Alcohol to Reduce Water Vaporization"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 44, No 11, Nov 70, pp 2873-2878

Abstract: In previous articles by the authors studying properties of monolayers of different substances in connection with their ability to reduce water vaporization in the case of a quiet surface and under the action of a wave, it was shown that the wave has a direct effect on the vaporization resistance  $r$  of a cetyl alcohol monolayer. The present article studies the effect of a wave on the vaporization resistance  $r$  of monolayers of cetyl and octadecyl alcohol, compressed in various ways ("gradual" and "rapid" methods), at various two-dimensional pressures  $F$ . It is shown that there is very little increase in the area of the wavy surface over that of the flat surface for the wavelength and

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USSR

TRAPEZNIKOV, A. A., and AVETISYAN, R. A., Zhurnal Fizicheskoy Khimii, Vol 44, No 11, Nov 70, pp 2873-2878

amplitude being used. Wave action at all  $F < 40$  dynes/cm results in reduced vaporization resistance. This may be due to reduced interaction of the alcohol molecules in the monolayer, increased mobility of the molecules in the monolayer and the appearance in the monolayer of additional fluctuation intervals which facilitate penetration of the water molecules. The wave does not reduce vaporization resistance at high  $F$  ( $> 40$  dynes/cm). The results thus confirm the authors' previous conclusions regarding the direct effect of a wave on vaporization resistance.

5915

CSO: 1841-W

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1/2 016 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--EFFECT OF THE AGING OF MONOLAYERS OF N,OCTADECANOL AND  
HYDROXYETHYLATED OCTADECANOLS ON SURFACE TENSION AND THE MONOLAYER  
AUTHOR--(02)-TRAPEZNIKOV, A.A., AVETISYAN, R.A.  
COUNTRY OF INFO--USSR A  
SOURCE--ZH. FIZ. KHIM. 1970, 44(1), 140-4  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ALCOHOL, SURFACE TENSION, CHEMICAL PURITY, EVAPORATION, WATER,  
MOLECULAR INTERACTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1995/1402 STEP NO--UR/0076/70/044/001/0140/0144  
CIRC ACCESSION NO--AP0116849  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0116849

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CHANGES OF TWO DIMENSIONAL PRESSURE (F) AND RESISTANCE OF WATER EVAPN. (R) DURING AGING OF MONOLAYER OF N,OCTADECANOL AND HYDROXYETHYLATED OCTADECANOLS WERE MEASURED. MEASUREMENTS WERE DONE ON QUIET AND VIBRATIVE SURFACES. THE VIBRATION CAUSED A DECREASE OF F AND ACCELERATED THE PROCESS OF AGING. DIFFERENT REGROUPING AND CHANGES OF INTERACTION AMONG MOL. OF THE MONOLAYER WERE SUGGESTED FOR EXPLANATION OF THE EXPTL. DATA. THEY INCLUDED PARTIAL DEHYDRATION AND CHANGES OF A CHAIN CONFORMATION. THE EFFECT OF IMPURITY WAS ALSO TAKEN INTO CONSIDERATION. FACILITY: INST. FIZ. KHIM., MOSCOW, USSR.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--ISOMERIZATION OF N,BUTENES ON NICKEL ZEOLITE CATALYSTS -U-  
AUTHOR--ISAKOV, YA.I., LAPIDUS, A.L., AVETISYAN, R.V., SENDEL, A.K.,  
MINACHEV, KH.M.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (1), 57-63  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ISOMERIZATION, BUTENE, NICKEL, ZEOLITE, CHEMICAL KINETICS,  
CATALYST ACTIVITY, DIMERIZATION, ETHYLENE, ION EXCHANGE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAKE--1984/1674 STEP NO--UR/0062/70/000/001/0057/0063  
CIRC ACCESSION NO--A0200278  
ZZZZZZZZZZZZ UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--A0200278

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETIC DATA WERE REPORTED IN GRAPHIC AND TABULAR FORM FOR THE TITLE REACTIONS OF A MIXT. OF 1 AND 2 BUTENES OVER SYNTHETIC ZEOLITES WITH VARYING AMTS. NI, CA AND DY, PREPD. BY PREVIOUSLY REPORTED METHODS. THE ZEOLITES OF TYPES CAA, CAX, CAY, DY AND HM AS WELL AS NI,CONTG. DERIVS. WERE VERY ACTIVE IN TRANSPOSITION OF DOUBLE BOND IN THE BUTENES AND THE MOST ACTIVE WERE NI-NAY, CAX, 5PERCENT NI-DY AND 5PERCENT NI-HM CONTACTS. THE ZEOLITES OF THE Y TYPE SHOWED INCREASING ACTIVITY WITH INCREASING DEGREE OF EXCHANGE OF NA BY NI IONS. BESIDES TRANSPOSING THE DOUBLE BOND, THE CATALYSTS ALSO BROUGHT ABOUT FORMATION OF MECH: CH SUB2 AND HIGHER HYDROCARBONS, MAINLY AMYLENES, AS WELL AS INTERCONVERSION OF CIS AND TRANS FORMS OF BUTENES. THE SUGGESTION OF PRIMARY FORMATION OF 2 BUTENE ON ION EXCHANGING NI, ZEOLITE CATALYST IN DIMERICATION OF C SUB2 H SUB4 WAS CONFIRMED.

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UNCLASSIFIED

USSR

UDC 631.847.2

NALBANDYAN, A. D., AVETISYAN, V. A., and MELIKSETYAN, R. G., Institute of Microbiology, Academy of Sciences Armenian SSR

"Lyophilization of Pea Nodule Bacteria"

Yerevan, Biologicheskii Zhurnal Armenii, Vol 24, No 3, Mar 71, pp 24-29

Abstract: Study of the lyophilization of nodule bacteria for the purpose of preparing dry nitrargin was initiated at the Moscow Department of the All-Union Scientific Research Institute of Agricultural Microbiology. Recently work on the subject was also conducted at the Laboratory of Biological Fixation of Atmospheric Nitrogen, Institute of Microbiology, Academy of Sciences Armenian SSR. In the work carried out there, nodule bacteria of pea plants (strain 144) were cultivated in a medium containing (in %) molasses 1 (sucrose content  $\geq$  45%), corn extract 0.3,  $(\text{NH}_4)_2\text{SO}_4$  0.05,  $\text{K}_2\text{HPO}_4$  0.05,  $\text{NaCl}$  0.02,  $\text{MgSO}_4$  0.02 (pH 7-7.2). Shake culturing was carried out for 48 hrs. After 24 hrs of culturing, molasses 1, corn extract 0.3,  $(\text{NH}_4)_2\text{SO}_4$  0.05,  $\text{K}_2\text{HPO}_4$  0.05% were added to the medium. Biomass in the amount of 15-18 g/l. accumulated, which was separated by centrifuging. To reduce the drop in the bacterial titer during lyophilization, in the course of which the temperature increased from minus 20 to + 8-16°C, protective agents 1/2

USSR

NALBANDYAN, A. D., et al., *Biologicheskii Zhurnal Armenii*, Vol 24, No 3, Mar 71, pp 24-29

were added before freezing to the paste obtained on centrifuging. The most effective combination of protective agents was molasses 20%, bentonite 30%, upon the addition of which the drop in bacterial titer at 1-8°C during lyophilization decreased significantly. Freezing of the paste consisting of bacteria and protective agents was carried out with solid CO<sub>2</sub> + isopropyl alcohol at minus 75 - minus 80°C for 1 hr. The frozen mixture was stored at minus 40 - minus 50°C for a period  $\leq$  24 hrs and then subjected to lyophilization in vacuo. A bacterial preparation with a residual water content of 2.03% was obtained on drying. This preparation could be stored at 4-5°C for 6-7 mos in vacuo and 4-5 mos at atmospheric pressure without a significant decrease of the bacterial titer.

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USSR

UDC 548.736.6

AVETISYAN, YE. I., CHICHAGOV, A. V., and BELOV, N. V., Moscow State University imeni M. V. Lomonosov

"Crystal Structure of NaGd Orthosilicate"

Moscow, Kristallografiya, Vol 15, No 5, Sep-Oct 70, pp 1066-1067

Abstract: NaGd orthosilicate is obtained from the  $\text{Na}_2\text{O}-\text{Gd}_2\text{O}_3-\text{SiO}_2-\text{H}_2\text{O}$  system by the method of hydrothermal crystallization at a 40 percent concentration of NaOH,  $T = 450^\circ \text{C}$ ,  $P = 1000 \text{ atm}$ . Tetragonal body-centered cell parameters:  $a = 11.63$ ,  $c = 5.41$  Å. Corresponding to the diffraction symbol  $4 / m\bar{1}$  - / are three Fedorov groups; viz.,  $I4 / m$ ,  $I4$ , and  $I\bar{4}$  (no piezo effect). The cell dimensions, type, and symmetry confirm the authors' previous conclusion that NaGd silicate is isostructural with  $\text{NaSmSiO}_4$ .

The purpose of the present study was to refine the coordinates of the atoms and to elucidate the position of  $\text{H}_2\text{O}$  molecules in

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AVETISYAN, YE. I., et al., Kristallografiya, Vol 15, No 5, Sep-Oct 70, pp 1066-1067

the structures of synthetic sodium-rare earth silicates of the B type. The article lists the coordinates of the basis atoms and atomic spacings in the structure of  $\text{NaGdSiO}_4$ . The formula for tetragonal B-type silicates should include one-fourth of an  $\text{H}_2\text{O}$  molecule; viz.,  $\text{NaTRSiO}_4 \cdot 0.25\text{H}_2\text{O}$ . The article cites a special analysis by M. A. SHISHKOVSKAYA (Moscow State University) on the  $\text{H}_2\text{O}$  content of NaGd silicate.

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USSR

UDC: 621.372.81.011.2

MOVSISYAN, A. M. and AVETISYAN, Yu. O., Yerevan State University

"Investigating the Conductivity of a Waveguide With Dynamic Slippage Between Particle Bunches and Wave"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR -- Fizika, vol 7, No 4, 1972, pp 285-287

Abstract: This paper is based in part on an earlier article in the same journal noted above (Zhileyko, G. I., et al, 5, 205, 1970) which investigated the longitudinal dynamics of charged particles in the field of a traveling electromagnetic wave with independent variable-equilibrium energy. The purpose of the present paper is to determine how the field and the equilibrium phase depend on the waveguide conductivity, whose magnitude is a function of the waveguide geometry and the velocity of the electromagnetic wave propagated through it. To determine the waveguide conductivity, the authors use the generally accepted equation of the power of the side field (the oscillator field) as the sum of the grouped particle beam power and the waveguide field power. An expression is obtained for the dynamic slippage phase including the waveguide  
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USSR

UDC: 621.372.81.011.2

MOVSISYAN, A. M., et al, Izvestiya Akademii nauk armyanskoy SSR---  
Fizika, vol 7, No 4, 1972, pp 283-287

conductivity. It is found that for a given beam current, oscillator power, equilibrium phase, and waveguide conductivity, the amplitude and phase of the radiation field in any section of the waveguide can be determined.

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UDC 612.84

USSR

DANILOV, V. I., DEMIRCHOGLYAN, G. G., <sup>S</sup>SAVERIGYAN, Z. A., ALLAKHVERDYAN, M. A.,  
GRIGORYAN, Sh. V., and SAVERIGYAN, G. Kh., Laboratory of Optical Reception,  
Academy of Sciences Armenian SSR

"Possible Mechanisms of the Magnetic Sensitivity of Birds"

Yerevan, Biologicheskii Zhurnal Armenii, Vol 23, No 8, Aug 70, pp 26-34

Abstract: The possible role of the pecten in the eyes of birds as a photoreceptor and orientation factor which responds to Earth's magnetic fields during flight is discussed. The structure of the organ is described, and the results of investigations of its role and functions are reported. The processes which take place in the pecten of birds under the influence of an alternating magnetic field are as follows: As a result of irregularities in flight paths (e.g., changes in speed and altitude, head movements, etc.) the magnetic field stimulates heparin secretion and causes its concentration in the vascular network of the pecten. As a result of its negative electric charge and chemical properties, the heparin produces the excitation of the central nervous system. Through electromagnetic induction the alternating magnetic field causes the appearance of electromagnetic forces in the blood vessels of the pecten, which tend to irritate the vascular receptors of the pecten and the optical nerve fibers (with which the pecten is in contact). The combined action of the magnetic field and light on the pecten

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DANILOV, V. I., et al, Biologicheskii Zhurnal Armenii, Vol 23, No 8, Aug 70,  
pp 26-34

creates conditions for a photomagnetic effect in the organ, leading to the formation of diffused electric waves which tend to excite the optical nerve fibers. On this basis, the pecten may be regarded as performing the functions of a biological photomagnetic magnetometer. Further experimental and theoretical study of this hypothesis are necessary.

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AVETISYANTS, B. L.

So: JPKS 53801  
12 AUG 71

UDC 613.693:629.7.048.4:612.223.111:661.183.124

AMNOSILICAGELS: REGENERABLE SOLVENTS FOR ABSORBING CARBON  
HYDROGEN SULFIDE AND WATER VAPOR

(Article by I. A. Danilychev, V. V. Stralok, T. N. Burushkina, V. K. Cherkasov, B. L. Avetisyan, and Y. H. Manzhov, Moscow, Kosmicheskaya Biokhimiya i Rentgen, Moscow, Vol 5, No 3, 1971, pp 77-79, submitted 24 February 1969)

One of the principal requirements imposed on atmospheric purification systems in spacecrafts is the capacity for effectively absorbing carbon dioxide exhaled by man. The carbon dioxide adsorbents used are unregenerable chemical adsorbents of the type of different peroxide compounds of alkali metals and regenerable sorbents: synthetic zeolites (N. S. Torochashnikov, et al.; Smylie and Naumont).

Although a system for air purification based on synthetic zeolites has been well developed, it has a number of serious inadequacies. In particular, the use of zeolites makes it necessary to use preliminary air drying to the dew point: 60-70°; considerable energy expenditures are required for the thermovacuum regeneration of synthetic zeolites.

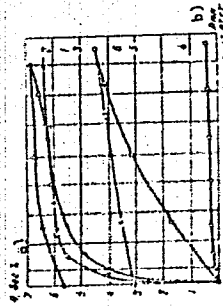


Fig. 1. Isotherms of CO<sub>2</sub> and H<sub>2</sub>S adsorption and desorption on amino-silicagel. 1) Isotherm of CO<sub>2</sub> adsorption; 2) Isotherm of CO<sub>2</sub> desorption; 3) Isotherm of CO<sub>2</sub> adsorption in presence of water vapor; 4) Isotherm of CO<sub>2</sub> adsorption in control sample; 5) Isotherm of H<sub>2</sub>S in presence of water vapor; 6) Isotherm of H<sub>2</sub>S desorption. a) % by weight; b) P mm Hg.

Life Support System

USSR

UDC: 512.25/.26+519.3:330.115

AVETISYAN, Dzh. A., BERTINOV, A. I., GOLUBKOV, Yu. A.

"Application of the Principle of Dynamic Programming to the Problem of Optimizing a Function of Many Variables"

V sb. Avtomatizir. elektroprivod v nar. kh-ve (Automation of Electric Drive in the National Economy--collection of works), T. 1, Moscow, "Energiya", 1971, pp 19-21 (from RZh-Kibernetika, No 7, Jul 71, Abstract No TV627)

Translation: The paper deals with the possibilities of constructing algorithms for direct search of the optimum based on R. Bellman's recurrent formulas. The set of resultant equations, in a number equal to the number of variables in the function to be optimized, provides the possibility of constructing computational algorithms of direct search for the maximum which are readily computerizable. Comparative estimates show the preferability for use of these algorithms to find a localized optimum. Their basic advantages are simplicity and identical search process both inside and outside the search region. Bibliography of six titles. Authors' abstract.

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USSR

UDC: 632.95

AVETYAN, M. G., NIKOGOSYAN, L. L., MATSOYAN, S. G., Institute  
of Organic Chemistry, Academy of Sciences of the Armenian SSR

"A Method of Making 2-Chloroethyl-2-thiocynoethylamine"

USSR Author's Certificate No 345142, filed 27 May 70, published  
15 Aug 72 (from RZh-Khimiya, No 10, May 73, abstract No 10N560P  
by T. Ya. Ogibina)

Translation: A method is proposed for synthesizing 2-chloroethyl-2-thio-  
cyanoethylamine (I). The compound is used as a biologically active material  
in agriculture because of the presence of the  $\beta$ -chloroethyl and  $\beta'$ -thio-  
cyanoethyl groups in the molecule. Example: 0.1 mole of N-(2-chloroethyl)-  
-ethylenimine in 100 ml of  $C_6H_6$  is added over a 30 minute period to 20 ml of  
dry ethyl solution containing 0.3 mole of HSCN with cooling by ice water,  
the mixture is agitated for one hour at about  $20^{\circ}C$ , and the product is  
isolated from the organic solution and washed in absolute ether yielding  
19.7 g of thiocyanide of compound I,  $C_6H_{10}ClN_3S_2$ , melting point  $78-9^{\circ}C$   
(Acetone).

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USSR

UDC 617-001.28-092.9-085.272.6:576.963.32

AYRAPETYAN, F. O., AVETYAN, N. G., and ALAVERDYAN, M. I., Radiobiology Sector, Ministry of Health, Armenian SSR

"Chemical Protection and Comprehensive Treatment of Acute Radiation Sickness in Mice Irradiated With Sublethal Doses"

Yerevan, Biologicheskiye Zhurnal Armenii, No 7, 1971, pp 75-80

Abstract: White mice received L-cysteine prior to irradiation (500 r) and immediately afterward chondroitinsulfuric acid, signamycin, colimycin, and vitamin B<sub>6</sub> daily for 20 days. All the animals developed typical radiation sickness, but the symptoms were much milder and recovery set in sooner in the treated animals than in the irradiated but untreated control. For example, restoration of the WBC set in after 7 to 10 days, whereas leukocytopenia persisted and increased in the controls. The survival rate of the experimental animals was 80 to 82% compared with 22% in the controls. The viscera of the treated animals contained far fewer hemorrhages than the controls. The combination of cysteine, antibiotics, and vitamin B<sub>6</sub> was effective in restoring tissue permeability, thus inhibiting the development of postradiation hemorrhages and blocking autoinfectious processes. In view of the complexity of the pathogenesis of acute radiation sickness and the variety of pathological changes,

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AYRAPETYAN, F. O., et al., Biologicheskiye Zhurnal Armenii, No 7, 1971,  
pp 75-80

therapy must be comprehensive and include agents that act on the main syn-  
dromes: hematopoietic, hemorrhagic gastrointestinal, and infectious disorders.

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USSR

UDC 542.91+542.742+547.834.2

SHIROYAN, F. R., AVETYAN, V. T., TOLMAYAN, A. G., Institute of Fine Organic Chemistry imeni A. L. Mndzhoyan, Academy of Sciences of the ArmSSR, Yerevan

"Indole Derivatives. XLIII. 3-Alkyl-9-Methoxy-12b-Methyl-1,2,3,4,6,7,12,12b-Octahydroindolo(2,3-a)quinolizines"

Yerevan, Arayanskiy Khimicheskiy Zhurnal, Vol 26, No 2, 1973, pp 147-152

Abstract: The paper describes synthesis of 3-alkyl-9-methoxy-12b-methyl-1,2,3,4,6,7,12,12b-octahydroindolo(2,3-a)quinolizines. It was found by thin-layer chromatography that these bases form two diastereomers. The IR spectra show the trans configuration of the quinolizidine fragment in one or both diastereomers. The hydrochlorides of these bases were pharmacologically tested, and the results will be given in a future paper.

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Nitrogen Compounds

USSR

UDC 547.752+547.834.2

SHIROYAN, F. R., and AVETYAN, V. T. Institute of Fine Organic Chemistry  
imeni A. L. Mndzhoyana, Academy of Sciences Armenian SSR (Yerevan)

"Derivatives of Indol. XXXV. 1-Alkyl-12b-methyl-1,2,3,4,6,7,12,12b-  
octahydroindole (2,3-a)quinolizines"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 25, No 1, 1972, pp 61-65

Abstract: The title compounds were synthesized in conjunction with a study  
of their pharmaceutical properties. Both stereoisomers were obtained.  
Examination of the IR spectra indicated that the predominate form was the  
trans conformation. Intermediate derivatives are given together with their  
percent yield, melting point, molecular formula, theoretical and experimental  
percent composition, and important peaks in the IR spectra.

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UDC 577.1:615.7/9

USSR

AVEZBAKIYEV, I., and DANILOVA, T. G.

"Primary Toxicological Characteristics and Cumulative Properties of 2,5- and 3,4-dichloronitrobenzenes"

V sb. Gigiyena v usloviyakh sharkogo klimata (Hygiene in a Hot Climate -- collection of works), Tashkent, "Meditsina," 1970, pp 136-143 (from RZh-Biologicheskaya Khimiya, No 9, May 71, Abstract No 9 F1866 by M. Sh.)

Translation: Data on the structural changes in tissues of the myocardium, brain, liver, and kidneys and on changes in the concentration of RNA, DNA, and glycogen are presented.

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USSR

UDC 662.997:662.9

AVEZOV, R. R., ZAKHIDOV, R. A., UMAROV, G. YA., MINCHUK, V. I.,  
Physicotechnical Institute, Academy of Sciences, Uzbek SSR imeni  
S. V. Starodubtsev

"Results of Experimental Research on the Combined Operation of  
a Heat-Pump Solar Power Installation With a System of Radiation  
Heating and Cooling of a Building"

Tashkent, Geliotekhnika, No 5, 1970, pp 56-59

Abstract: The combination of solar water heaters with a heat pump and a radiation system of heating and cooling permits the development of an efficient system for the use of solar energy for heating. In summer, the hot water produced by the solar water heater may be used for household needs, and the glassed surface of the solar installation can be used at night for removal of the heat of condensation. Thus, the same equipment can serve for cooling as well as for heating. In 1968-1970 the Physicotechnical Institute of the Academy of Sciences, Uzbek SSR jointly with the Tashkent Zonal Scientific Research Institute

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USSR

AVEZOV. R. R., et al, Geliotekhnika, No 5, 1970, pp 56-59

of Experimental and Standard Planning conducted experimental research on the heating and cooling of buildings by means of a solar-installation and heat-pump combination. It was demonstrated that the combined operation of a solar heater, a heat pump, and a system of radiation heating permits the use of comparatively low heat-carrier temperatures; this increases the conversion factor of the heat pump and the efficiency of the solar installation. 2 figures, 6 bibliographic entries.

2/2

- 31 -

USSR

UDC 541.544.6

SEME NOVSKAYA, T. D., AVGUL', V. T., and CHMUTOV, K. U., Institute of Physical Chemistry, Acad. Sc. USSR, Moscow

"The Rate of Diffusion of Ions in the Anion Exchange Resin VP-1A in the 20-230°C Interval"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 46, No 5, May 72, pp 1191-1195

Abstract: To determine the dependence of the ionic diffusion coefficients in an ion exchange resin on temperature, the study was carried out of the form of stationary front of the  $\text{ClO}_4^-$  ions and complex zinc chloride and cadmium chloride anions on the anion exchange resin VP-1A. It has been found that increasing the temperature from 20 to 180°C increases 40 fold the rate of diffusion in the resin. The anomalous character of the diffusion rate was analyzed as a function of temperature on the basis of diffusion laws for ionic crystals. It has been shown that the VP-1A anion exchange resin could be utilized in acid medium at high temperatures.

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- 28 -

USSR

UDC 681.325.025

AVGUST, V. I., Khar'kov Polytechnical Institute

"A Device for Measuring the Characteristics of Fine Magnetic Films"

USSR Author's Certificate, Class G 01 r 33/02, No 33740, filed 26 May 69, published 21 June 72 (from RZh-Avtomatika Telemekhanika i Vychislitel'naya Tekhnika, No 3, Mar 73, Abstract No 3 A393 P)

Translation: A device is proposed for measuring the characteristics of thin magnetic films. The device contains a pulse field source and a variable low-frequency field source, connected to the counting and recording windings respectively, and a counting amplifier, connected to the recording winding. To improve the accuracy of measurement, there is a circuit for recording the maximum pulse amplitude, voltage dividers, discriminators, a converter, flip-flops, diodes, inverters, and an indicator. The output of the amplifier is connected through a diode to the input of the voltage divider and to the input of the maximum pulse amplitude recording circuit, the output of which is connected through the appropriate voltage dividers and discriminators to the input of the first and second flip-flops; the other inputs of the latter are connected through the inverter and the diode to the output of the amplifier, while the outputs of the flip-flops are connected to the inputs of a third flip-flop, whose output is connected to the indicator through the converter. Two illustrations.

1/1



USSR

UDC 681.327.66-416

AVGUST, V. I., ONISHCHENKO, A. P., and PANNIKOV, S. I., Khar'kov Poly-technical Institute

"A Device for Measuring the Coercive Force of Thin Magnetic Films"

USSR Author's Certificate, No 280668, Filed 3 Apr 69, Published 4 Dec 70  
(from Referativnyy Zhurnal -- Avtomatika, Telemekhanika, i Vychislitel'naya Tekhnika, No 8, 1971, Abstract No 8B238 P)

Translation: A device for measuring the coercive force of thin magnetic films is proposed. It contains a source of a sinusoidal magnetic field which reverses the magnetization of a film, an amplifier for the voltage induced by the current which remagnetizes a film, null-balance devices, a flip-flop, and a measuring instrument. The device is distinguished by the fact that a differentiating circuit is connected in front of the voltage amplifier, while the output of the amplifier and the output of the power source are connected to the null-balance devices. The purpose of this is to increase the precision of the device's measurements. In order to automate the measurements, the outputs of the null-balance devices are connected to a circuit which forms a time interval between the output pulse of the null-balance devices in direct-current voltage. 2 illustrations.

1/1

USSR

UDC: 621.317.4

AVGUST, V. I., Knar'kov Polytechnical Institute imeni V. I. Lenin

"A Method of Determining Deviation of the Axis of Anisotropy of Cylindrical Thin Magnetic Films from the Direction of a Magnetic Field Circulating About the Periphery of the Cylinder"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obratzsy, Tovarnyye Znaki, No 5, 1970, p 65, patent No 261564, filed 23 Jul 68

Abstract: This Author's Certificate introduces a method of determining deviation of the axis of anisotropy of cylindrical thin magnetic films from the direction of a magnetic field circulating about the periphery of the cylinder by passing an alternating current through the specimen to be tested and applying a pulsed magnetic field directed along the axis of the specimen. As a distinguishing feature of the patent, the measurement process is automated by converting the quantity which characterizes the angle of deviation to a constant alternating voltage whose polarity changes with the polarity of the voltage pulses induced in the specimen, and measuring its average value, which is proportional to the quantity being determined.

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USSR

UDC 546.8'261

KLIMASHIN, G. M., ~~AVGUSTINIK, A. I.~~, and SMIRNOV, G. V.

"The Carbonitride and Oxycarbide Phases of Titanium and Zirconium"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, Vol 8,  
No 5, 1972, pp 843-845

Abstract: Titanium and zirconium oxycarbides and carbonitrides are synthesized in a vacuum of  $10^{-3}$  -  $10^{-5}$  mm Hg at 2020-2300° K over a broad concentration interval. The preparates synthesized are studied metallographically, chemically, and by x-ray methods. The areas of existence of single-phase solid solutions are established. It is concluded that the areas of existence of the oxycarbide and carbonitride phases decrease in the sequence from titanium to hafnium.

1/1

USSR

UDC 541.123+546.831'261:541.12.03

AVGUSTINIK, A. I., KLIMASHIN, G. M., GOLIKOVA, O. A. and SMIRNOV, G. V.,  
Leningrad Technological Institute imeni Lensovet, Department of the Chemistry  
and Technology of High-Grade Ceramics

"The Effect of Nitrogen on Certain Properties of Zirconium Carbide in the  
Homogeneity Region"

Ivanovo, Izvestiya Vysshikh Uchebnykh Zavedeniy, Khimiya i Khimicheskaya  
Tekhnologiya, Vol XIII, No 10, 1970, pp 1,389-1,392

Abstract: It is known that existing methods of preparing zirconium carbide  
(and also the monocarbides of the transition metals of groups IV-VI) do not  
yield products of desired purity, owing to the presence of unbound carbon  
(up to 1.5-2.0%), nitrogen and oxygen; but the effects of these impurities  
have not been well studied.

The authors made a roentgenographic and metallographic study of the specific  
effect of the presence of nitrogen in zirconium carbide.

Data were obtained on the relationship between nitrogen content and the  
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USSR

AVGUSTINIK, A. I., et al, Izvestiya Vysshikh Uchebnykh Zavedeniy, Khimiy i Khimicheskaya Tekhnologiya, Vol XIII, No 10, 1970, pp 1,389-1,392

following aspects of zirconium carbonitrides: (1) crystal lattice parameter; (2) crystal lattice parameter, with constant carbon content; (3) electrical conductivity; (4) thermal emf; (5) melting temperature; (6) microhardness; and (7) thermal conductivity. All data are illustrated graphically.

2/2

- 14 -

USSR

UDC 621.791.052.004:12.669.295

AVDEYEVA, T. P., Engineer, and ISHTYKOV, YU. V., Engineer

"Weld Joint Properties of Titanium Alloy VT20"

Moscow, Svarochnoye Proizvodstvo, No 11, 1973, pp 24-25

Abstract: The ductility, static strength and fatigue strength of weld joints produced from titanium alloy VT20 with a thickness of 3mm were investigated. The samples for testing were produced by argon-arc welding with a tungsten electrode in the bottom and overhead positions as well as in the bottom position for gas-shield, pulse-arc welding. Seams produced by continuous arc welding in the bottom and overhead positions had defects. It was found that the static strength of the weld joints was almost the same for all the investigated modes of welding with the static strength of the seam being equal to 90-94% of the base-metal strength. Fatigue tests are more characteristic of weld joint properties than static tests for argon-arc welded samples and it was found that the fatigue strength of joints made by a continuous arc was 33 kgf/mm<sup>2</sup> and by pulse-arc--20 kgf/mm<sup>2</sup>. 4 figures, 1 table, 5 bibliographic references.

1/1

1/2 031 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--EVALUATING THE RESISTANCE OF TRANSPARENT PAINT AND VARNISH COATING  
TO COHESION AND ADHESION DEGRATION -U-  
AUTHOR-(04)-AVILOV, G.V., LAVRENTYEV, V.V., SEREBRENNIKOV, A.I., UPENSKIY,  
V.I.  
COUNTRY OF INFO--USSR  
SOURCE--LAKOKRASOCH. MATER. I KH PRIMEN. 1970, (1), 52-4  
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--PAINT, VARNISH, COHESION STRENGTH, PLASTIC FILM, METAL TO  
NONMETAL BONDING, POLYSTYRENE RESIN, POLYSILOXANE, SILICONE COATING,  
MATERIAL DEGRADATION, MECHANICAL FAILURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1997/0426 STEP NO--UR/0303/70/000/001/0052/0054

CIRC ACCESSION NO--AP0119362  
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--23OCT70

2/2 031

CIRC ACCESSION NO--AP0119362

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

ABSTRACT. TRANSPARENT COATINGS WERE APPLIED TO A STRONG TRANSPARENT FILM. THE COATED FILM WAS DRAWN BACK AND FORTH UNDER TENSION OVER THE EDGE OF A STEEL BLOCK. THE APPEARANCE OF CRACKS IN THE COATING WAS RECORDED AUTOMATICALLY BY MEASURING THE RATIO OF TRANSMITTED TO REFLECTED LIGHT. THE NO. (N) OF PASSES WAS TAKEN AS THE FLEX DURABILITY. THE ADHESION DURABILITY WAS DETD. BY APPLYING PRESSURE ON THE FILM AT THE STEEL BLOCK EDGE WITH A DIAGONALLY PLACED RUBBER ROLLER. THIS REDUCED THE NO. OF PASSES TO N SUB1. THE DIFFERENCE (N MINUS N SUB1) WAS TAKEN AS THE COHESION STRENGTH OF THE COATING. THE FOLLOWING RESULTS ARE REPORTED (COATING N, N SUB1 GIVEN): POLYSTYRENE COTG. POLY(DIPHENYLSILOLANE), 44, 13; ORGANOSILICONE LACQUER (I) (UNPLASTICIZED), 9,4; PLASTICIZED I, 575, 125.



1/2 009 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--STUDIES OF BOTTOM RELIEF AND SEDIMENTS OF THE SOUTHWESTERN APICAL  
SHELF -U-  
AUTHOR-(02)-AVILOV, I.K., GERSHANOVICH, D.E. *A*  
COUNTRY OF INFO--USSR  
SOURCE--OKEANOLOGIYA, 1970, VOL 10, NR 2, PP 301-306  
DATE PUBLISHED-----70

SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, EARTH SCIENCES AND  
OCEANOGRAPHY, BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--MARINE GEOLOGY, PHYTOPLANKTON, OCEAN BOTTOM TOPOGRAPHY, BOTTOM  
SEDIMENT, CONTINENTAL SHELF/(U)KNIPOVICH OCEANOGRAPHING SHIP

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REFL/FRAME--1990/1380

STEP NO--UR/0213/70/010/002/0301/0306

CIRC ACCESSION NO--AP0109452

UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0109452

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESULTS OF THE MARINE GEOLOGICAL STUDIES ON A VNIRO CRUISE OF THE R. V. AKADEMIK KNIPOVICH ARE BEING CONSIDERED. A NARROW SHELF SOUTH OF THE CONGO RIVER MOUTH IS CHARACTERIZED BY DIFFERENT SEDIMENT COMPOSITION IN ITS DIFFERENT PARTS. TERRIGENOUS SEDIMENTS WERE FOUND TO BE REPLACED BY CARBONATE SEDIMENTS IN THE VICINITY OF THE CUNENE RIVER MOUTH. HIGH CONCENTRATIONS OF SOME MOST IMPORTANT SEDIMENT COMPONENTS ARE CAUSED BY PECULIAR SEDIMENT FORMING FACTORS. SAMPLINGS IN THE ZONES OF THE INTENSIVE DEVELOPMENT OF DIATOM PHYTOPLANKTON AND ITS MASS DEATH WITHIN THE SHELF AREA NEAR THE WALFISH BAY REVEALED SEDIMENTS WITH ABNORMALLY HIGH CONTENT OF ORGANIC MATTER (FROM 15 TO 23PERCENT) PREVIOUSLY NOT FOUND ANYWHERE IN THE OPEN SHELF AREAS. IN THE LUDERITZ AREA, TERRIGENOUS MUDDY SAND BEYOND THE SHELF ZONE CONTAINS TO 8.4PERCENT ELEMENTARY PHOSPHORUS, THIS VALUE BEING MUCH IN EXCESS OF THE PHOSPHORUS CONTENT OF THE KNOWN CARBONATE PHOSPHORITE PLATFORMS OF THE AGULHAS BANK AND FORMING APPROXIMATELY TWO-THIRDS OF THE AMOUNT OF PHOSPHORUS BOUND INTO PHOSPHORITE NODULES. AT THE OUTER EDGE OF THE SHELF NORTH OF THE CONGO RIVER MOUTH AND NEAR LUDERITZ, SEDIMENTS CONTAIN AN UNUSUALLY HIGH AMOUNT OF IRON (16.5 AND 9.9PERCENT RESPECTIVELY) AT A RELATIVELY SMALL CONCENTRATION OF PELITE PARTICLES (23 AND 6.5PERCENT). THE HIGH IRON CONCENTRATIONS CAN APPARENTLY BE RELATED TO GLAUCONITE (MORE THAN 80PERCENT AND APPROXIMATELY 40PERCENT).

FACILITY: VSESOUZNYI  
N-1 INSTITUT MORSKOGO RYBNOGO KHOZYAYSTVA I OKEANOGRAFI.

UNCLASSIFIED

Veterinary Medicine

USSR

UDC 636.2:616.988.4

LEBEDEV, A. I., AVILOV, V. S., KOVALEV, L. V., and REVENKOV, A. G., Candidates of Veterinary Science All Union Institute of Experimental Veterinary Medicine

"Virus-Neutralizing Activity of Extracts of Tongue Epithelial Tissue and Serum From Animals Recovered From Foot-and-Mouth Disease"

Moscow, Doklady Vsesoyuznoy Ordena Lenina Akademii Sel'skokhozyaystvennykh Nauk imeni V. I. Lenin, No 1, 1971, pp 39-40

Abstract: A definite relationship was observed between the results of the virus-neutralization reaction with tongue epithelial tissue extracts and serum obtained from animals 4 months after recovering from foot-and-mouth disease caused by the type A22 strain 20/432 virus. The index of neutralization was comparatively high in both cases - 2.5 to 4.5 lg LD<sub>50</sub>. On the other hand, no such relationship was found 9 to 12 months after the animals recovered. A high level of virus-neutralizing antibodies was found in the serum at this time, but the tissue extracts had virtually no virus-neutralizing capacity. Titration of the type A22 virus grown in a culture of cattle tongue epithelium revealed that the accumulation of virus in epithelium obtained 9 to 12 months after the disease was on the average 2 logarithmic units higher than in epithelium obtained after 4 months.

1/2

USSR

LEBEDEV, A. I., et al, Doklady Vsesoyuznoy Ordena Lenina Akademii Sel'skokhozyaystvennykh Nauk imeni V. I. Lenin, No 1, 1971, pp 39-40

Based on the results of their experiments and on the literature data, the authors concluded that the type-specific immunity of epithelial tissue from animals recovering from foot-and-mouth disease is largely attributable to specific cellular (tissue) factors.

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UDC 535.33

USSR

AVILOVA, I. V., BIBERMAN, L. M., VOROB'YEV, V. S., ZAMALIN, V. M., KOBZEV, G. A., MNATSAKANYAN, A. KH., and NORMAN, G. E., Institute of High Temperatures of the Academy of Sciences USSR

"Optical Properties of Hot Gases. CO<sub>2</sub> + N<sub>2</sub> Mixture"

Moscow, Teplofizika Vysokikh Temperatur, Vol. 8, No. 1, Jan/Feb 70, pp 1-11

Abstract: Elementary radiation processes associated with the presence of carbon atoms, either free or in molecules, in planetary atmospheres are studied. Certain spectral and integral characteristics of CO<sub>2</sub> and N<sub>2</sub> mixtures are calculated and compared. Particular attention is given to the composition 90% CO<sub>2</sub> + 10% N<sub>2</sub>, which approximately corresponds to the atmosphere of Venus according to data from "Venera-4" and "Mariner-5". Computer programs and a computational technique developed earlier by the authors were used to obtain absorption cross sections for processes associated with atomic hydrogen in CO<sub>2</sub> + N<sub>2</sub> mixtures. The absorption cross sections of CN, CO, CO<sub>2</sub>, and C<sub>2</sub> are given for the temperatures 4000, 8000, and 12,000°K. The degree of blackness  $\epsilon$ , the Rosseland average A, and the Planck average B were calculated for  $T = (6-10) \cdot 10^3 \text{°K}$  and  $P = 0.1-10 \text{ at.}$

1/2

USSR

AVILOVA, I. V., et al, Teplofizika, vysokikh temperatur, Vol. 8, No. 1, Jan/  
Feb 70, pp 1-11

A comparison with experimental data showed that the authors' method of tabulating optical properties of hot gases is applicable to  $\text{CO}_2 + \text{N}_2$  mixtures and produces satisfactory accuracy. From the gas dynamics aspect, the calculations show that radiation transfer plays a considerable role in entry into planetary atmospheres. It is pointed out that the degree of blackness of the mixture studied here is considerably greater than that of air and that the difference is especially great in relatively low temperatures.

2/2

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1/2 040 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--OPTICAL PROPERTIES OF HOT GASES. CARBON DIOXIDE NITROGEN MIXTURES  
-U-  
AUTHOR--(04)-AVILOVA, I.V., BIBERMAN, L.M., ZAMALIN, V.M., KOBZEV, G.A.  
COUNTRY OF INFO--USSR *A*  
SOURCE--TEPLOVIZ. VYS. TEMP. 1970, 8(1), 1-11  
DATE PUBLISHED-----70  
  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--CARBON DIOXIDE, NITROGEN, ABSORPTION COEFFICIENT, ABSORPTION  
SPECTRUM, LIGHT ABSORPTION, TEMPERATURE DEPENDENCE, PRESSURE EFFECT,  
VENUS PLANET, ATMOSPHERIC OPTIC PHENOMENON  
  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1987/0139 STEP NO--UR/0294/70/008/001/0001/0011  
CIRC ACCESSION NO--AP0103818  
UNCLASSIFIED

2/2 040

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0103818

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A PREVIOUSLY DESCRIBED CALCG. AND COMPUTER PROGRAMMING PROCEDURE (B., ET AL., 1964; A., ET AL., 1969) WAS APPLIED TO THE DETN. OF THE ABSORPTION CROSS SECTIONS RELATED TO C ATOMS IN CO SUB2 PLUS N MIXTS. AND OF THE SPECTRAL AND INTEGRAL CHARACTERISTICS OF THE CO SUB2 90 PLUS N SUB2 10PERCENT MIXT. (CORRESPONDING TO THE VENUS ATM.). THE RESULTS ARE PRESENTED OF THE CALCN. OF SOME PARAMETERS, FOR A TEMP. OF (6-10) TIMES 10 PRIME3 DEGREE SK AND A PRESSURE OF 0.1-10 ATM. THE DATA AGREE SATISFACTORILY WITH MEASUREMENTS. FACILITY: INST. VYS. TEMP., MOSCOW, USSR.

UNCLASSIFIED



1/2 018 UNCLASSIFIED PROCESSING DATE--27NOV70  
TITLE--SYNTHESIS AND STUDIES OF POLYFERROMONOHALOPHENYLSILOXANES -U-  
AUTHOR--(03)-BYKOV, V.T., AVILOVA, T.P., SHAPKIN, N.P.  
COUNTRY OF INFO--USSR  
SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(4), 724-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL SYNTHESIS, SILOXANE, BENZENE DERIVATIVE, HYDROLYSIS,  
CHEMICAL REACTION KINETICS, BROMINATED ORGANIC COMPOUND, ORGANIRON  
COMPOUND, CHLORINATED ORGANIC COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--3006/1260 STEP NO--UR/0459/70/012/004/0724/0729  
CIRC ACCESSION NO--AP0134934  
UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134934

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

POLY(FERRO(MONOCHLOROPHENYL)SILOXANES) (I) AND  
POLY(FERRO(MONOBROMOPHENYL)SILOXANES) (II) WERE OBTAINED BY A REACTION  
OF CLC SUB6 H SUB4 SICL SUB3 OR BRC SUB6 H SUB4 SICL SUB3 (IN PHME) WITH  
NAOH, FECL SUB3, AND ALUM. THE YIELD OF I AND II INCREASED, WHEREAS FE  
CONTENT AND FRACTIONAL DISTRIBUTION THEREOF DECLINED IN THE COURSE OF  
THE REACTION. HYDROLYSIS KINETICS OF I AND II SUGGESTED THAT THE  
CLEAVAGE RATE OF THE SI-O-FE BOND AT THE LIG. LIG. INTERFACE WAS A  
FUNCTION OF THE DIFFUSION RATE. BOTH I AND II WERE STABLE TO  
400-60DEGREES, BUT I EXHIBITED HIGHER HYDROLYTIC STABILITY.

FACILITY: DAL'NEVOST. GOS. UNIV., VLADIVOSTOK, USSR.

UNCLASSIFIED

US3R

UDC 621.428.001.5

KOPELEV, S. Z., Engineer, GUROV, S. V., Engineer, and  
AVILOVA-SHUL'GINA, N. V., Engineer

"Increasing the Cooling Effectiveness of the Inlet Edge of  
Turbine Blades"

Moscow, Teploenergetika, No 12, 1971, pp 38 -41

Abstract : The cooling effectiveness of turbine blades with air passages in the inlet edge was experimentally investigated on blades of two types: thin-walled blades with inserted deflector and transversely arranged cooling air passages and blades with a cast loop-like deflector in the hollow. The investigation results are discussed by reference to diagrams showing the input-output characteristics and the cooling intensities of the inlet edge and of all blade parts ( inlet-, outlet-, and back edges ) of both blade types. Possibilities to increase the cooling intensity of the inlet edge of blades by air by-pass from the edge inner hollow into the flow part of the turbine are analyzed. It is demonstrated that in cases where the available pres-

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USSR

KOPELEV, S. Z., et al, Teploenergetika, No 12, 1971, pp 38-41

sure differential in the cooling system permits a reliable air flow from the inlet edge hollow into the flow part of the turbine, the by-pass of air represents an effective means of increasing the cooling intensity. Four illustr., three biblio. refs.

2/2

- 115 -

USSR

UDC: 536.244

KOPELEV, S. Z., GUROV, S. V., ~~AVILOVA-SHUL'GINA, M. V.~~

"Heat Exchange in the Cooled Flow Part of the Turbine"

Moscow, Izvestiya Akademii Nauk SSSR--Energetika i Transport,  
No. 4, 1971, pp 105-111

Abstract: The heat exchange at the outer and inner surfaces of the vanes of a turbine takes place in a field of centrifugal forces. The purpose of this article is to settle the question of the competence of extending the data acquired under static conditions to the conditions of vane operation in turbines, as well as the question of the criteria characterizing the effect of the field of centrifugal forces on the heat exchange. Results of theoretical and experimental work relating to these questions are given in this article. The theoretical part of the work begins with the equation of motion, taken from the system of equations describing the heat exchange process in a continuous, non-

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USSR

KOPELEV, S. Z., et al., Izvestiya Akademii Nauk SSSR - Energetika i Transport  
No 4, 1971, pp 105-111

isothermic flow of an incompressible gas around the vane profile, in terms of the centrifugal forces. The assumption is made that the radial cooling channel in the vane is a tube of constant cross section. The experimental work involved research into vanes with transverse cooling channels; a table of the basic geometrical characteristics for the vane lattice is given.

2/2

USSR

UDC: 621.438-253.5-71

KOPELEV, S. Z., GUROV, S. V., AVILOVA-ZHUL'GINA, M. V.

"Investigation of Heat-Exchange Processes in Cooled Gas Turbine Blades"

Teplofiz. i teplotekhnika. Resp. mezhved. sb. (Thermal Physics and Heat Engineering. Republic Interdepartmental Collection), 1970, vyp. 17, pp 97-104 (from RZh-Turbostroyeniye, No 8, Aug 70, Abstract No 8.49.106)

Translation: Data are given from an investigation of processes of heat exchange at the output edges of air-cooled gas turbine blades over a broad range of variations in Reynolds numbers on the air and gas side, and also in the temperatures of gas, air and turbine walls. It is shown that with a reduction in the Reynolds number calculated from the parameters of the gas in a narrow cross section of interblade channels (taking the chord of the blade as the characteristic linear dimension) of less than  $0.5 \cdot 10^6$ , the extent of the region of the laminar boundary layer on the profile of the cooled blade increases appreciably both on the convex and concave sides, and in the case of nondetached flow may extend right up to the outlet edge. Dimensionless heat-exchange relationships are given for the air and gas which can be used to determine the temperature of the outlet edge with precision satisfactory for practical purposes. Bibliography of nine titles. 1/1

Instruments and Equipment

USSR

UDC 612.014.45+612.8

AVIRON, V. M., ADRIANOV, O. S., VYKHODTSEVA, N. I., GAVRILOV, L. R., MERING, T. A., and SIROTYUK, M. G., Institute of Acoustics, Academy of Sciences USSR, and Brain Institute, Academy of Medical Sciences USSR

"Destruction of Deep-Lying Brain Structures With Focused Ultrasound"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti, No 5, 1971, pp 1,110-1,113

Abstract: An apparatus designed to minimize the loss of ultrasonic energy at high frequencies and intensities of ultrasound is described. It consists of an oscillator, ultrasound emitter, universal standard stereotaxic device to hold the animal, and a device to permit ultrasound to be transmitted to the animal's brain. The focusing emitter rests on a concave resonant plate of piezoelectric ceramic 85 mm in diameter with a focal length of 70 mm. Acoustic energy is transmitted from the emitter to the brain through degassed water (or physiological saline). Degassed water is poured into a rubber bottle connected to the frame of the emitter and inot a small funnel attached to the animal's head. The article concludes with a description of the surgical technique recommended for preparing the brains of rabbits and rats prior to ultrasonication.

1/1



USSR

AVIULLIN, E. N.

"Method of Calculation of Unstable Aerodynamic Loads on Thin Wing of Finite Span Performing Elastic Harmonic Oscillations in a Subsonic Stream"

Uch. Zap. Tsentr. Aerogidrodinam. In-ta [Scientific Writings of Central Institute of Aerodynamics and Hydrodynamics], 1972, Vol 3, No 6, pp 94-100 (Translated from Referativnyy Zhurnal Mekhanika, No 5, 1973, Abstract No 5B261, by V. I. Putyata).

Translation: A method is suggested for approximate solution of an integral equation from the linear theory of an oscillating load-bearing surface with arbitrary values of Strouhal number and arbitrary subcritical values of M number. The solution is based on replacement of the load-bearing surface by a system of discrete horseshoe-shaped vortices and corresponding replacement of the integral equation with a system of algebraic equations. The double integrals included in the coefficients of the equation are calculated approximately by expansion of the integrands into Taylor series (with integration along the chord) and replacement with interpolation polynomials (with integration along the span). It is considered that the aerodynamic

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USSR

AVTULLIN, E. N., Uch. Zap. Tsentr. Aerogidrodinam. In-ta, 1972, Vol 3, No 6, pp 94-100.

characteristics produced by this method agree satisfactorily with those produced by other methods. Expressions are produced for the matrices of the generalized forces, and the aerodynamic rigidity and aerodynamic damping factors. 7 biblio. refs.

2/2

## Functional Analysis

USSR

UDC 517.54

AYKHADIYEV, F. G., ARSENT'YEV, L. A.

"Sufficient Conditions for Univalence of Analytical Functions"

Moscow, Doklady Akademii Nauk SSSR, Vol 198, No 4, 1971, pp 743-746

Abstract: Let  $g(t)$  be a function which is meromorphic in the domain  $D$ , and let  $\{g, t\} = [g''(t)/g'(t)]' - [g''(t)/g'(t)]^2/2$  be a Schwartzian. Mehari [Bulletin of American Mathematical Society, Vol 55, No 6, 1949, page 545] proved the following: If the function  $g(t)$  is multivalent that is,  $g(t_1) = g(t_2)$  for certain  $t_1$  and  $t_2 \in D$ ,  $t_1 \neq t_2$  then the nontrivial solution  $u_0(t)$  is found for the equation

$$u''(t) + 1/2\{g, t\}u(t) = 0, \quad (N)$$

which vanishes at the same points  $t_1$  and  $t_2$ . Let  $p(t)$  be regular in  $D$ . Setting  $w(t) = u(t) \exp \int [p(t)/2]dt$ ,

$$w''(t) + p(t)w'(t) + q(t)w(t) = 0 \quad (1)$$

with the coefficients  $p(t)$  and  $q(t)$  which are regular in  $D$  and satisfy the

1/2

AVKHADIYEV, F. G., et al., Doklady Akademii Nauk SSSR, Vol 198, No 4, 1971, pp 743-746

condition

$$-p'(t) - p^2(t)/2 + 2q(t) = \{g, t\}. \quad (2)$$

Considering  $w_0(t) = u_0(t) \exp \int [p(t)/2]dt$ , we find that  $w_0(t) \neq 0$  and  $w_0(t_1) = w_0(t_2) = 0$ . Therefore, investigation of the univalence of the function  $g(t)$  reduces to investigation of the nonvariability of the solution of equation (1) with condition (2). Using equation (N), Nehari obtained the sufficient conditions of univalence expressed in terms of the Schwartzian. In this article simpler conditions are found which turn out to be convenient in applications.

When investigating the solvability of the basic inverse boundary value problems univalence conditions expressed in terms of the region of variation of the derivative of the mapping function are needed. In particular, the following problem arises. Let  $m \leq |f'(z)| \leq M$  and  $|\arg f'(z)| \leq \alpha$  for  $|z| < 1$  or  $|z| > 1$ . The question is, for which  $\alpha$  and  $q = \ln(M/m)$  will the function  $f(z)$  be univalent.

Some restrictions on  $q$  and  $\alpha$  which encompass the case of  $\alpha > \pi/2$  not investigated earlier are indicated in the theorems proved.

2/2

1A2-----017 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--FLUORINE 19 NMR IN CADMIUM AND MERCURY ANHYDROUS AND HYDRATED  
DIFLUORIDES -U-  
AUTHOR--GAGARINSKIY, YU.V., POLISHCHUK, S.A., YAROSHEVSKAYA, N.F.,  
~~AVKHITSKIY, L.V.~~  
COUNTRY OF INFO--USSR **A**  
SOURCE--SPECTROS. LETT. 1970, 3(1), 23-6  
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--NMR SPECTRUM, MERCURY COMPOUND, CADMIUM COMPOUND, FLUORIDE,  
FLUORINE, ISOTOPE, MAGNETIC MOMENT, CRYSTAL HYDRATE, HYDROGEN BONDING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1989/1331

STEP NO--US/0000/70/003/001/0023/0024

CIPC ACCESSION NO--AP0107804

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UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107804

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PRIME19 F NMR SPECTRA OF HGF SUB2 AND HGF SUB2.2H SUB2 O WERE OBSD. AT 150DEGREEK AND COMPARED WITH THOSE OBSD. BY A., ET AL. (1969) FOR CDF SUB2 AND CDF SUB2.2H SUB2 O. THE CHEM. SHIFTS FOR HGF SUB2 AND HGF SUB2.2H SUB2 O WERE 536 PLUS OR MINUS 8 AND 538 PLUS OR MINUS 8 PPM, RESP., AND THE 2ND MOMENTS WERE 5.9 PLUS OR MINUS 0.3 AND 17.1 PLUS OR MINUS 0.8 OE PRIME2, RESP. THE H POSITIVE 2ND MOMENT FOR HGF SUB2.2H SUB2 O WAS 28.5 PLUS OR MINUS 0.8 OE PRIME2, DEMONSTRATING THE EXISTENCE OF H BONDING, APPARENTLY OF THE OH, F TYPE, IN THE CRYSTAL HYDRATES..

USSR

UDC 621.387.233

AVLAKHORA, R. G., LARSHINA, S. I., POLYAKOVA, A. A., ROGOVA, G. N.

"Study of Oxide Cathode Sputtering in Hydrogen Thyatron With Current Commutation of Short Duration"

Elektron. tekhnika. Nauchno-tekhn. sb. Gazorazryadn. pribory (Electronic Technology. Scientific-Technical Collection. Gas-Discharge Devices), 1970, Issue 4(20), pp 49-53 (from RZh--Elektronika i yeye primeneniye, No 5, May 1971, Abstract No 5A165)

Translation: It is demonstrated by the method of radioisotopes that in hydrogen thyratrons with commutation of pulses of 100 nsec duration, intense ion bombardment of the cathode takes place. Summary.

1/1

1/2 054 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--EXPERIMENTAL STUDY OF HEAT TRANSFER IN A SPHERE AND A PLATE IN A  
SUPERSONIC RAREFIED GAS FLOW -U-  
AUTHOR--AVLEYEVA, V.KH.  
COUNTRY OF INFO--USSR A  
SOURCE--AKADEMIIA NAUK SSSR, IZVESTIIA, MEKHANIKA ZHIDKOSTI I GAZA,  
MAR.-APR. 1970, P. 191-196  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, METHODS AND EQUIPMENT  
TOPIC TAGS--SPHERIC SHELL STRUCTURE, FLAT PLATE, SUPERSONIC FLOW, RAREFIED  
GAS, CONVECTIVE HEAT TRANSFER, COPPER, WIND TUNNEL TEST  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/1202 STEP NO--UR/0421/70/000/000/0191/0196  
CIRC ACCESSION NO--AP0124856  
UNCLASSIFIED



2/2 054

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0124856

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS OF WIND TUNNEL EXPERIMENTS IN STUDYING THE AVERAGE CONVECTIVE HEAT TRANSFER IN A COPPER SPHERE AND A COPPER PLATE IN A SUPERSONIC RAREFIED GAS FLOW INCIDENT AT A ZERO ANGLE OF ATTACK. A METHOD PROPOSED BY DRAKE AND BAKER (1953) IS USED IN DETERMINING THE MEAN EQUILIBRIUM TEMPERATURE AND THE AVERAGE COEFFICIENT OF CONVECTIVE HEAT RELEASE FROM TEMPERATURE MEASUREMENTS IN THE FLOW AND IN THE COPPER SHELLS CONTAINING INTERNAL SOURCES OF HEAT. CURVES ARE PLOTTED TO ILLUSTRATE THE EXPERIMENTAL RESULTS.

UNCLASSIFIED

USSR

UDC 669.046.5

BASHLIY, F. I., KOLGANOV, G. S., KOZIN, G. N., and AVORONOV, Yu. F.

"Quality of Metal Produced With Bath Oxygen Blowing"

Moscow, V sb. "Sovremennyye problemy kachestva stali" (MISI5) (Collection of Works, Modern Problems of Steel Quality) (Moscow Institute of Steel and Alloys), Izd-vo "Metallurgiya," No 61, 1970, pp 107-110

Translation of Abstract: Results are presented of an investigation of the effect of oxygen blowing on metal acidity. Attention is given to the method of subdeoxidation of low-carbon steels by silicon with the purpose of lowering the metal acidity and reducing the development of gas bubbles. 2 figures, 3 tables, 6 references.

1/1

USSR

UDC 632.95

1

GILLER, S. A., EGERT, V. E., LIYELGALVE, A. A., AVOTA, L. YA., and SHIMAN-  
SKAYA, M. V.

"Methods of Determining Residual Quantities of Phenazone in Foodstuffs,  
Soil, Water and Air"

Tr. 2-go Vses. soveshch. po issled ostatkov pestitsidov i profilakt.  
zagryazneniya imi produktov pitaniya, kormov i vnesh. sredy (Works of the  
Second All-Union Conference on Investigation of Residues of Pesticides, and  
Prevention of Pesticide Contamination of Foodstuffs, Fodder and the External  
Environment), Tallinn, 1971, pp 271-272 (from RZh-Khimiya, No 11, Jun 72,  
Abstract No 11N454)

Translation: In order to determine residual amounts of phenazone, (the  
specimen is) hydrolyzed with a 40% sodium hydroxide solution in the presence  
of zinc dust, the resultant aniline is distilled (without water vapor) and  
diazotized, and coupled with  $\alpha$ -naphthylamine, and the optical density is  
determined (on 537 nm). The sensitivity of the method is 1 mg/kg.

1/1

Beryllium

USSR

UDC 535.211:539.37

PAPIROV, I. I., AVOTIN, S. S., KRIVCHIKOVA, E. P., and KORNIYENKO, L. A.

"Deformation of Single Beryllium Crystals Subjected to Laser Radiation"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar/Apr 73, pp 147-148

Abstract: Samples were produced by zone melting, and after grinding and electropolishing were subjected to laser pulses of  $\sim 10^{-3}$  sec. duration at 0.6940  $\mu$  wavelength. The irradiation surface had orientation (0001) and (11 $\bar{2}$ 0). Optical and electron microscope analysis showed extensive plastic deformation around the crater produced by a focused laser beam. The plastic deformation was characterized mainly by presence of twin crystals oriented at 60 and 120° with respect to the circular zone (0.5-1 mm wide) formed around the crater. The presence of tetrahedral twin crystals indicates the complex nature of the plastic deformation. Dendrite structure was also observed around the crater, and it was formed mainly by twin crystals of various sizes. A transverse glide of dislocations from the basal plane (0001) to the prismatic (1010) was also observed. There were many small craters around the large crater, the nature of which remains unexplained. The whole picture of deformation differed markedly from that observed during a static deformation.

1/1

Beryllium

USSR

UDC 669.725:621.785.78

AVOTIN, S. S. and PAPIROV, I. I., Physicotechnical Institute, Academy of Sciences Ukrainian SSR

"Aging of Beryllium Single Crystals"

Moscow, Metallovedeniye i termicheskaya obrabotka metallov, No 2, 1972, pp 77-78

Abstract: The microhardness of hardened and aged beryllium of various degrees of purity has been studied. The measurements were made at room temperatures on single crystals grown by zone melting (about 99.8% pure) and slow cooling of the melt in a BeO crucible (about 99.7% pure). The heating for hardening at 1000°C for 1 hr and the aging at 570-750°C for 0.5-50 hrs were done in vacuum at about  $1 \cdot 10^{-6}$  mm Hg. The results of the study indicate that the microhardness anisotropy increases with the purity of beryllium. A similar dependence of hardness anisotropy was also observed with an increase in test temperatures. Thus, the change in the ratio of  $H_{50I}/H_{50II}$  as a result of increasing the purity of monocrystals will be equal to that produced by increasing the aging temperature by 200-300°C. (1 illustration, 1 table, 3 bibliographic references).

1/1

Beryllium

USSR

UDC 669.725:539.377

AVOTIN, S. S., PAPIROV, I. I., TIKHINSKIY, G. F., KORNIYENKO, L. A., and  
NIKOLAYENKO, A. A., Physicotechnical Institute, Academy of Sciences, Ukrainian  
SSR

"Bend Tests on High-Purity Beryllium"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 32, No 1, Jul 71, pp 123-130

Abstract: An investigation of beryllium single crystal plastic deformation was carried out by bending in the temperature region of 77-300°K. The nature of the stressed state in bend depends essentially on the ratio of sample width to thickness (b/h) and on the geometrical conditions of testing. Single crystals of beryllium with b/h = 2 with three orientations (force parallel to a-axis, force parallel to b-axis, and force parallel to c-axis for hexagonal beryllium) were subjected to a force with a load rate of 0.2 mm/min; the distance between supports was 10 mm. The crystals were produced by zone melting and cut by a electric arc. Relative residual electrical resistance of a single crystal was  $P_{4,2K}/P_{300K} = 0.005-0.006$  and for polycrystalline beryllium--0.004. The samples were mechanically polished, and annealed in a vacuum of  $10^{-6}$  torr at 700°C (polycrystals) and at 1200°C (single crystals) for 20 minutes. This study permitted explanation of the slip of screw dislocations with a Burgers vector c and dislocation type (cta). For  
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USSR

AVOTIN, S. S., et al., Sverdlovks, Fizika Metallov i Metallovedeniye, Vol 32, No 1, Jul 71, pp 123-130

ordinary forms of strain (tension and compression) and low temperatures the indicated forms of strain were not previously observed. A study of the temperature relationship of bending ductility showed that single crystals with a b-axis orientation of force (force parallel to b-axis) have a bend angle greater than  $90^{\circ}$  down to  $77^{\circ}\text{K}$  while the most ductile single crystals were those with the force applied along the a-axis. An anomaly was observed in the temperature relationship of yield strength in single crystals with the force applied along the c-axis. On the basis of the change in strain with temperature, the conclusion was made that there is a change in transverse slip with temperature. Six figures, 24 bibliographic references.

2/2

- 7 -

AVOTINA, M. P.

nuclear physics

AVOTINA, M. P.

NEW BOOKS OF SAKVA PUBLISHED WORKS  
[List of books, Moscow, Uchenye Zapiski, Section, No. 11, November  
1971, pp. 131-134]

Mathematical, Technical and Engineering Sciences

Avotina, M. P., and Zolotareva, A. V.: Podrobnaya teoriya yadernogo chislennogo metoda (Detailed theory of the numerical method of nuclear physics), Leningrad, 1971, 190 pages, 1360 copies, 1 r 30 k.

Avotina, M. P.: Teoriya funktsionallykh avtomaticheskikh ustroystv (Theory of functional automatic devices), Institute of Machine Science, Moscow, 1971, 144 pages, illustrated, 2500 copies, 52 k.

Gabarov, R., and Kirillova, F.: Kachestvennaya teoriya optimal'nkh protsessov teoreticheskiye osnovy (Qualitative theory of optimal processes: theoretical foundations), Moscow, 1971, 508 pages, 6000 copies, 7 r.

Gelfand, I. M.; Ginzburg, Ye. G.; Smol', E. E.: Funktsii i grafiki osnovnykh sil'em (Functions and graphs: basic techniques), Moscow, 1971, 90 pages, 200,000 copies, 13 k.

Gribenkov, Ye. A., and Ryabov, Yu. A.: Novyye kachestvennyye metody resheniya zadach (New Qualitative Methods in Celestial Mechanics), Moscow, 1971, 442 pages, 2700 copies, 2 r 02 k.

Grigoryan, A. T.: Mekhanika ot antichnosti do nashikh dney (Mechanics from Antiquity to the Present Day), Moscow, 1971, 312 pages, illustrations, 15,000 copies, 1 r 34 k.

Zakharin, A. G.; Baalov, V. P.; Danilov, V. I.: Metody ekonomicheskogo sravneniya variantov v energetike (Methods of Economic Comparison of Variants in Power Engineering on the Principle of Minimum Outlays), Power Engineering Institute Imeni G. M. Krzhizhnevskiy, Moscow, 1971, 174 pages, 1500 copies, 64 k.

- 149 -  
Uchenye Zapiski  
vol. 11, no. 11, 1971



1/2 010 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--SEPARATION OF MONORIBONUCLEOTIDES ON THE ANION EXCHANGER AV-17 -U-  
AUTHOR--(05)-ULASTE, V., LAZDINS, I., BANDERE, R., SMORODINA, I.V., AVOTS,  
A.  
COUNTRY OF INFO--USSR  
SOURCE--PRIKL. BIOKHM. MIKROBIOL. 1970, 6(1), 90-4  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--YEAST, NUCLEOTIDE, RNA, ION EXCHANGE CHROMATOGRAPHY/(U)AV17  
ANION EXCHANGER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1996/0611 STEP NO--UR/0411/70/006/001/0090/0094  
CIRC ACCESSION NO--AP0117839  
UNCLASSIFIED

2/2 010

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0117839

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ALK. HYDROLYZATES OF YEAST RNA WERE SEPD. WITH A HCL GRADIENT ON THE ANION EXCHANGER AV-17 IN THE CL PRIME NEGATIVE FORM (CROSS SECTIONAL AREA OF THE COLUMN 0.07 CM PRIME2, HEIGHT 4-6 CM, AMT. OF RNA HYDROLYZATE SEPD. 10-20PERCENT OF THE EXCHANGER CAPACITY, ELUTION VELOCITY IS SIMILIAR TO 3 ML-MIN-CM PRIME2). TO IMPROVE THE SEPN. PROCESS EQUATIONS WERE DERIVED WHICH RELATE THE SEPN. CAPACITY AND QUALITY TO THE ELUTION RATE, GRADIENT CHARACTERISTIC, AND AMT. OF HYDROLYZATE INTRODUCED. FACILITY: INST. ORG. SYN., RIGA, USSR.

UNCLASSIFIED

USSR

UDC 539.26 + 547.466

AVOYAN, R. L., ARAKELOVA, E. R., and ARUTYUNYAN, E. G., Institute of Fine Organic Chemistry Imeni A. L. Mndzhoyan, Academy of Sciences Armenian SSR, (Yerevan)

"Conformation and Physiological Activity of Molecules. VI X-ray Structural Analysis of the  $\gamma$ -Diethylaminopropyl  $\alpha$ -Diphenylacetate Hydrobromide"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 26, No 9, 1973, pp 713-719

Abstract: A complete x-ray structural analysis of the title compound has been carried out. Its crystals are monoclinic. The parameters of the unit cell are found to be:  $a = 17.26$ ,  $b = 7.43$ ,  $c = 17.45 \text{ \AA}$ ,  $\beta = 110.5^\circ$ ,  $N = 4$ , space group  $P2_1/c$ . The structure has been determined by the heavy atom method using the least square calculations up to  $R = 0.197$ . The nitrogen atom is attached to bromine through a  $3.38 \text{ \AA}$  hydrogen bonding. The physiological activity characteristic of the title compound is discussed by comparing its structural relationship with those of acetylcholine and L(+)-muscarine.

- END -

1/1

CSO: 1841-W

USSR

UDC 541.69+543.422.8

MNDZHOYAN, A. L. (Deceased), AVOYAN, R. L., AVETISYAN, A. A., and ARUTYUNYAN, E. G., Institute of Fine Organic Chemistry Imeni A. L. Mndzhoyan, Acad. Sc. Armenian SSR (Yerevan)

"Conformation and Physiological Activity of Molecules. II. X-ray Structural Analysis of Diteline"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol 25, No 8, 1972, pp 710-717

Abstract: Final results of the x-ray structural analysis of diteline are reported. The compound -- the dimethiodide of dimethylaminoethyl ester of succinic acid -- is used in medicine as a muscle relaxant. Three dimensional x-ray diffraction analysis showed the parameters of the elementary cell to be:  $a = 12.79$ ;  $b = 8.29$ ;  $c = 9.73 \text{ \AA}$ ;  $\beta = 96.8^\circ$ ;  $N = 2$ ; and the coordination number =  $P_{21}$ . The number of independent reflections was 630. The structure was determined by the heavy atom method and correlated by Fourier analysis and by the method of least squares up to  $R = 0.135$ . The molecule has the shape of a horse-shoe. The  $N^+CCO$  fragments are gauche. The  $N^+ \dots N^+$  interatomic distance has been determined to be  $7.75 \text{ \AA}$ .

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USSR

UDC 541.69+543.422.8

AVOYAN, R. L., ARAKELOVA, E. R., AVETISYAN, A. A., and ARUTYUNYAN, E. G.,  
Institute of Fine Organic Chemistry Imeni A. L. Mndzhoyan, Acad. Sc. Armenian  
SSR (Yerevan)

"Conformation and Physiological Activity of Molecules. I. Roentgenographic  
Study of the  $\gamma$ -Diethylaminopropyl Ester Hydrobromide of  $\alpha$ -Ethoxydiphenyl-  
acetic Acid"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol. 25, No 8, 1972, pp 702-709

Abstract: A total X-ray structural analysis has been carried out on the hydro-  
bromide of  $\gamma$ -diethylaminopropyl ester of  $\alpha$ -ethoxydiphenylacetic acid -- an  
analog of the medicinal preparation etpenal with both the nicotino- and mus-  
caryolytic activity. On the basis of three dimensional series of Petterson and  
Fourier analysis and by the method of least squares up to  $R = 0.165$  the  
crystalline structure was determined. The elementary cell is monoclinic with  
following parameters:  $a = 19.87$ ,  $b = 7.71$ ,  $c = 16.78$ ,  $\beta = 114.5^\circ$ ,  $N = 4$  (coordi-  
nation number  $P_{21}$ ). The number of independent non-zero reflections is 640.

The coordination of the N-atom is represented by a "deformed" tetrahedron, three  
sites being occupied by carbon atoms  $C_{19}$ ,  $C_{20}$ , and  $C_{22}$ , the fourth -- by the  
hydrogen atom of the  $N-H \cdots Br$  hydrogen bond. The  $H \cdots Br$  distance is  $3.44 \text{ \AA}$ .  
1/1

Nitrogen Compounds

USSR

UDC 542.91+547.853.3

KHAZHAKYAN, L. V., KRAMER, M. S., AVOYAN, R. S., AROYAN, A. A., Institute of Analytical Organic Chemistry im. A. L. Mindzhoyan of the Armenian SSR Academy of Sciences (Yerevan)

"Pyrimidine Derivatives. XXVII. Study of the Tautomerism in Some Substituted 5-(*p*-alkoxybenzyl)pyrimidines"

Yerevan, Armyanskiy Khimicheskiy Zhurnal, Vol XXIV, No 12, 1971, pp 1079-1080

Abstract: Infrared spectroscopy was used to study the structure of 5- and 6-(*p*-alkoxybenzyl)pyrimidines, potentially tautomeric compounds. Data are presented indicating an amino structure for 2-methyl-4-amino-5-(*p*-alkoxybenzyl)-6-methylpyrimidines, a keto structure for 4-hydroxypyrimidine, a diketo structure for the uracil derivatives with some amount of the hydroxy configuration along with the basic dihydroxy configuration and mercapto-hydroxy structure for 2-mercapto-4-hydroxy-5-(*p*-alkoxybenzyl)-6-methylpyrimidines. The presented article is only a summary of a report, the complete text is available at the All-Union Institute of Scientific and Technical Information, Registration No 3361-71, 18 August 1971.

1/1

USSR

UDC 621.396.6.013.3-50

AVRAAMOV, I.S., and SEMAKIN, YE. V.

"Detection of Local Overheating In Automatic System Units by the Shadow Method"

V sb. Materialy k 3-v Nauch.-tekhn. konf. po avtomatizir. elektroprivodu, nadezhnosti elektr. ustroystv i avtomatizatsii proiz-va (Materials on the Third Scientific and Technical Conference on Automated Electric Drive, the Reliability of Electrical Devices and the Automation of Production -- Collection of Works), Novokuznetsk, 1970, pp 159-163 (From RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 1, Jan 72, Abstract No 1A472 by B. U.)

Translation: The reliability of automatic equipment elements and devices depends largely on the ambient temperature and the degree of overheating through dissipated power. In this connection there is practical interest in methods permitting the detection of overheated elements in units and devices and an estimate of the amount of overheating. The shadow method, used in optical, gas-dynamic, and hydrodynamic research, consists in the following: The convective heat fluxes rising over the overheated elements are regions of optical inhomogeneity in the surrounding air. By placing the part under study in a bundle of parallel light beams and recording distortions of the beam parallelism resulting from the optical inhomogeneities, we make it possible to determine the location of the overheated regions and, from the intensity of the distortions, the excess

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USSR

AVRAAMOV, I.S., et al., Materialy k 3-y Nauch.-tekhn. konf. po avtomatizir. elektroprivodu, nadezhnosti elektr. ustroystv i avtomatizatsii proiz-va, Novokuznetsk, 1970, pp 159-163

of the flux temperatures over the ambient temperature. The use of the method for the study of various automatic equipment elements (electron tubes, resistors, low-powered electric motors) is considered. 5 illustration. Bibliography with 3 titles.

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USSR

PAISOV, I. V., AVRAAMOV, YU. S., LOKSHINA, L. I., EL'KHONES, N. M., and CHIKHLADZE, K. V., Moscow Institute of Steel and Alloys

"Influence of Germanium on the Structure and Properties of Steel"

Moscow, IVUZ Chernaya Metallurgiya, No 3, 1971, pp 126-128.

Abstract: Steel with moderate and low carbon contents was produced in an induction furnace. The chemical compositions of the steels studied were, %:

C	Si	Ge	Mn	S	P
0.44	1.01	-	0.69	0.023	0.0096
0.44	-	1.00	0.60	0.017	0.0067
0.09	3.18	-	0.35	0.026	0.0084
0.057	-	3.18	0.73	0.026	0.0063
0.09	2.39	-	0.30	0.027	0.0054
0.067	-	2.24	0.84	0.027	0.0063

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USSR

PAISOV, I. V., et al., IVUZ Chernaya Metallurgiya, No 3, 1971,  
pp 126-128

The steel alloyed with germanium has lower strength but much higher ductility than silicon steel. The sharp increase in ductility of this steel after annealing may be found very valuable in the production of thin sheet transformer and dynamo steel.

2/2

- 65 -

USSR

PAISOV, I. V., AVRAAMOV, YU. S., LOKSHINA, L. I., EL'KHONES, N. M., and CHIKHLADZE, K. V., Moscow Institute of Steel and Alloys

"Influence of Germanium on the Structure and Properties of Steel"

Moscow, IVUZ Chernaya Metallurgiya, No 3, 1971, pp 126-128.

Abstract: Steel with moderate and low carbon contents was produced in an induction furnace. The chemical compositions of the steels studied were, %:

C	Si	Ge	Mn	S	P
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0.44	-	1.00	0.60	0.017	0.0067
0.09	3.18	-	0.35	0.026	0.0084
0.057	-	3.18	0.73	0.026	0.0063
0.09	2.39	-	0.30	0.027	0.0054
0.067	-	2.24	0.84	0.027	0.0063

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USSR

PAISOV, I. V., et al., IVUZ Chernaya Metallurgiya, No 3, 1971,  
pp 126-128

The steel alloyed with germanium has lower strength but much higher ductility than silicon steel. The sharp increase in ductility of this steel after annealing may be found very valuable in the production of thin sheet transformer and dynamo steel.

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- 65 -

1/2 012  
UNCLASSIFIED  
PROCESSING DATE--09OCT70  
TITLE--DRIVING FORCES OF GRAIN GROWTH DURING THE FORMATION OF RIBBED  
TEXTURE IN IRON SILICON ALLOYS -U-  
AUTHOR--AVRAAMOV, YU.S.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAU. NAUK SSSR, SER. FIZ. 1970, 34(2), 305-9  
DATE PUBLISHED--70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--IRON ALLOY, SILICON STEEL, TRANSFORMER STEEL, METAL TEXTURE,  
GRAIN GROWTH  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PRUXY REEL/FRAME--1995/0192  
STEP NO--UR/0048/70/034/002/0305/0309  
CIRC ACCESSION NO--AP0115896  
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0115896

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FORMATION OF RIBBED TEXTURE IN TRANSFORMER STEELS WITH 3PERCENT SI IS DETD. BY THE INFLUENCE OF SURFACE ENERGY ON THE GROWTH OF GRAINS IF THE SURFACE OF A SHEET IS RELATIVELY FREE FROM OXIDE FILMS AND AT THOSE TIMES AT WHICH A GRAIN GROWS THROUGH THE WHOLE SHEET THICKNESS T. DEPENDENCE OF THE SURFACE ENERGY ON THE ORIENTATION OF GRAINS INCREASES AS THE CONC. OF IMPURITIES IN THE MATERIAL OR ATM. INCREASES, OR AS THE RATIO  $T/R$ , WHERE R IS THE MEAN RADIUS OF GRAINS, DECREASES. FACILITY: MOSK. INST. STALI SPLAVOV, MOSCOW, USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--090C170  
TITLE--NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY OF CYCLOPENTADIENYLMETALS.  
I. PMR SPECTRA OF METHYLDICHLORSILYL CYCLOPENTADIENE -U-  
AUTHOR-(03)-SERGEYEV, N.M., AVRAMENKO, G.I., USTYNYUK, YU.A.  
COUNTRY OF INFO--USSR                      **A**  
SOURCE--J. ORGANOMETAL. CHEM. 1970, 22(1), 63-78  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--PROTON, MAGNETIC RESONANCE, ORGANOSILICON COMPOUND, CYCLIC  
GROUP, SPECTRUM, ISOMER  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1992/1838 STEP NO--NE/0000/70/022/001/0063/0078  
CIRC ACCESSION NO--AP0112822  
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0112822

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PMR SPECTRA OF METHYLDICHLOROSILYLCYCLOPENTADIENE SHOW THE PRESENCE OF ALL 3 ISOMERIC FORMS EQUILIBRATED THROUGH A PROTOTROPIC REARRANGEMENT. THE SATN. TRANSFER TECHNIQUE APPLIED TO THE 5 ISOMER DEMONSTRATES THIS TO UNDERGO A FAST METALLOTROPIC REARRANGEMENT. THE SIGNALS ARE ASSIGNED TO ISOMERS OR NUCLEI BY DOUBLE RESONANCE. THE SPECTRUM OF THE MAIN VINYLIC ISOMER HAS BEEN ANALYZED COMPLETELY INCLUDING THE SIGNS OF THE CONSTS. WITH THE ASSUMPTION THAT PRIME3 J(HH) IS GREATER THAN 0 AND PRIME4 J(HH) IS SMALLER THAN 0, THIS ISOMER IS 1,METHYLDICHLOROSILYLCYCLOPENTADIENE. THE SPECTRUM OF 2,METHYLDICHLOROSILYLCYCLOPENTADIENE PRESENT AT A CONCN. SMALLER THAN OR EQUAL TO 5PERCENT HAS BEEN PARTIALLY ANALYZED. FACILITY: NMR LAB., M. V. LOMONOSOV STATE UNIV., MOSCOW, USSR.

UNCLASSIFIED



1/2 019 UNCLASSIFIED PROCESSING DATE--09OCT70  
TITLE--NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY OF CYCLOPENTADIENYLMETALS.  
III. ANALYSIS OF THE SPECTRUM OF 5, METHYLDICHLOROSILYCYCLOPENTADIENE  
AUTHOR--(03)--SERGEYEV, N.M., AVRAMENKO, G.I., USTYNYUK, YU.A.  
COUNTRY OF INFO--USSR            A  
SOURCE--J. ORGANOMETAL. CHEM. 1970, 22(1), 79-88  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--MAGNETIC RESONANCE, PROTON, SPECTRUM, ORGANOSILICON COMPOUND,  
CYCLIC GROUP, ACTIVATION ENERGY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1992/1839 STEP NO--NE/0000/70/022/001/0079/0088  
CIRC ACCESSION NO--AP0112823  
UNCLASSIFIED

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PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0112823

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE PMR SPECTRUM OF 5, (METHYLDICHLOROSILYL)CYCLOPENTADIENE IS ANALYZED AT VARIOUS TEMPS. AT MINUS 10DEGREES, NO DYNAMIC PROCESS OCCURS AND THE SPECTRUM IS DESCRIBED AS AN AAPRIME BBPRIME X SYSTEM. THE PARAMETERS OF THE SYSTEM HAVE BEEN ANALYZED COMPLETELY. THE TICKLING EXPTS. SHOW THAT THE DOWNFIELD SIGNAL BELONGS TO THE 1,4, PROTONS. THE ASSIGNMENT, AS WELL AS THE NATURE OF THE UNSYMMETRIC COLLAPSE, SHOW THAT THE METAL MIGRATES PREDOMINANTLY THROUGH A 1,3, SHIFT. THE METHYNE PROTON LINE WIDTH HAS BEEN MEASURED VS. TEMP. AT 0-50DEGREES AND THE ACTIVATION ENERGY OF THE METALLOTROPIC REARRANGEMENT IS 9 PLUS OR MINUS 1 KCAL.MOLE PRIME NEGATIVE1. THE PROTOTROPIC REARRANGEMENT PROCEEDS, CETERIS PARIBUS, BY 6 TO 7 ORDERS SLOWER. FACILITY: NMR LAB., M. V. LOMONOSOV STATE UNIV., MOSCOW, USSR.

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AVRAMENKO, L. E., VILENSKIY, YU. B., IVANOV, B. M., OL'SHEVSKAYA, I. A.,  
POCHINOK, V. YA., SKRIPNIK, L. I., FEDOROVA, L. N., FEDOROVA, I. P.

"Synthesis of Tetrazoles, Triazoles, Triazenes, and Azo Compounds and a Study of  
Them as Additives to Silver Halide Photographic Emulsions. I. Synthesis, Struc-  
ture, Chemical Properties, and Photographic Activity"

Uspekhi nauchn. fotogr. (Advances in Scientific Photography), 1970, Vol. 14,  
pp 5-11 (from RZh-Fizika, No 12(I), Dec 70, Abstract No 12D1333)

Translation: Data on the synthesis, structure, and properties of over 300 organic  
compounds intended for stabilizing and defogging or depressing additives in AgHal  
emulsions are presented; in certain cases these substances were also optical  
sensitizers. Among the 40 tetrazoles not all were stabilizers of the photoemul-  
sions; there was also established a difference in the chemical behavior in similar  
reactions. This duality is explained by the existence of azido-tetrazole tauto-  
merism in many condensed tetrazoles; stabilization is caused by adsorption by ions

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of the AgHal lattice of these azido forms in which there is an increased electron density on the heterocyclic N atom. Many stabilizers were observed among the triazoles, and not only condensed triazoles; among these many could be converted into cyanin dyes by combining stabilizers and optical sensitizers. It is shown that it is necessary for a stabilizer that three N atoms enter into the ring, as in triazoles: a considerable number of stabilizers of AgCl-emulsion was also found among the triazenes. These compounds are simultaneously optical sensitizers, defoggers, and depressers; in AgBr-emulsions only the last two properties are retained, in view of differences in the formation of ion-dipole compounds of AgCl and AgBr lattices with a polar triazene molecule. Of the azo compounds only nonsymmetric substances with heterocyclic radicals were photographically active. 31 references.

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AVRAMENKO, I. F., VILENSKIY, YU. B., IVANOV, B. M., OL'SHEVSKAYA, I. A.,  
POCHINOK, V. YA., SKRIPNIK, L. I., FEDOROVA, L. N., FEDOROVA, I. P.

"Synthesis of Tetrazoles, Triazoles, Triazines, and Azo Compounds and a Study of Them as Additives to Silver Halide Photographic Emulsions. II. Photographic Study of Material"

Uspekhi nauchn. fotogr. (Advances in Scientific Photography), 1970, Vol. 14, pp 12-23 (From RZh-Fizika, No 12(I), Dec 70, Abstract No 12D1334)

Translation: Three indices are introduced to evaluate quantitatively various types of photographic activity of materials synthesized previously: (see RZh-Fizika, No12(I), Dec 70, Abstract No 12D1333): stabilizing, depressing, and defogging effects and certain combinations of these parameters in the kinetic curves for sensitivity and fogging in the second aging before and after introduction of the substances tested. If the substance was at the same time an optical sensitizer, the value of the depressing index was negative. Besides the testing of substances in AgCl- and AgBr(I)-emulsions, the kinetics of their adsorption by AgHal, the absorption spectrum in solution and after adsorption by AgHal, and the sensitization spectrum was studied. A correlation

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AVRAMENKO, L.F., et al, Uspekhi nauchn. fotogr., 1970, Vol 14, pp 12-23  
was found for condensed

tetrazoles between the stabilizer and the irreversible adsorption of material and between the depressing and defogging agents and reversible adsorption; irreversible adsorption on a small portion of the AgHal surface was sufficient for total stabilization. The same was true for the stabilization of triazenes. Depression of fogging was apparently always associated with the slowing down of the appearance of reversibly adsorbed substances, although in many cases there simultaneously occurred desensitization or slowing down of aging. Certain connections were established between photographic activity and the structure and substitutes in molecules of triazoles and optical sensitizers on the basis of their quaternary salts and also in molecules of heterocyclic azo compounds. The formation of iono-dipole or coordinated compounds of the material with AgHal was necessary for stabilization, which requires the coincidence of their dipole distances; the latter partially explains the differences in the behavior of materials in AgCl- and AgBr(I)-emulsions. One must take into account, however, that in view of the large homeopolarity of the bond in AgBr, even in AgCl, the latter requires more polar stabilizers. 12 references.

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1/2 028 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--CALCULATIONS OF RATE CONSTANTS OF ELEMENTARY REACTIONS. 3. NATURE  
OF THE COMPENSATION EFFECT IN GAS PHASE REACTIONS OF RADICALS WITH  
AUTHOR--(02)--AVRAMENKO, L.I., KOLESNIKOVA, R.V.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (2), 327-35  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--FREE RADICAL, CHEMICAL REACTION RATE, COMPLEX COMPOUND, GAS  
STATE, GAS PHASE REACTION, OXYGEN, METHANE, ETHANE, ETHYLENE, ALCOHOL,  
ALDEHYDE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--2000/0800 STEP NO--UR/0062/70/000/002/0327/0335  
CIRC ACCESSION NO--AP0124469

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124469

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. FROM FACTORS THAT AFFECT THE MAGNITUDE OF THE PREEXPONENTIAL FACTORS IN REACTION RATE EXPRESSIONS, THE REACTION DATA FOR O ATOMIC ATTACK ON SIMPLE ORG. MOLES., E.G. CH<sub>4</sub>, C SUB2 H SUB6, C SUB2 H SUB4, MECH:CH SUB2 ME SUBC:CH SUB2, (MECH:)SUB2, ROH, AND RCHO, WERE TABULATED AS TO ACTIVATION ENERGY AND PREEXPONENTIAL COEFFS. THE DIFFERENT TYPES OF TRANSITION COMPLEXES IN SUCH REACTIONS CHARACTERIZE THE DIFFERENT TYPES OF OVERALL REACTIONS. THE DIFFERENCES ARE EXPRESSED IN TERMS OF NO. OF ROTATIONAL DEGREES OF FREEDOM ASSUMING VIBRATIONAL STATISTICAL SUMS ARE CLOSE TO UNITY. REACTIONS WITH LARGE ACTIVATION ENERGY, I.E. CLEAVAGE REACTIONS, FORM A TRANSITION COMPLEX IN WHICH MANY ROTATIONAL DEGREES OF FREEDOM EXIST AND THIS LEADS TO A LARGE PREEXPONENTIAL FACTOR. REACTIONS WITH LOWER ACTIVATION ENERGY FORM COMPLEXES WITH ELSS DEGREES OF ROTATIONAL FREEDOM AND THUS MORE RIGID STRUCTURE, LEADING TO LOWER PREEXPONENTIAL FACTOR AND APPEARANCE OF COMPENSATORY EFFECTS IN REACTION RATES.  
FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

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UDC 533.922

~~AVRAMENKO, N. I.~~, KUZNETSOV, V. S., KUZNETSOVA, N. P., NIKOL'SKIY, N. A.,  
and FIDEL'SKAYA, R. P.

"Calculation of Phase Focusing of Intensive Bunches of Charged Particles in  
Direct-Action Accelerators"

Moscow, Atomnaya Energiya, Vol 32, No 5, May 72, pp 437-440

Abstract: The study of particle dynamics in direct-action accelerators re-  
quires consideration of the Coulomb interaction of particles in a bunch, as  
well as the velocity spread of the particles. Such a problem is complicated  
to solve in a full volume, since the particle motion has to be considered in  
a six-dimensional coordinate and velocity space. To simplify the problem,  
it is assumed that the longitudinal motion of the particles of the bunch does  
not depend on their radial coordinates, nor the radial motion of the particles  
on their axial coordinates. It is also assumed that the particle density  
distribution in the transverse phase space is microcanonical and at a given  
moment of time is the same for any cross-section of the bunch  $z = \text{const}$ .  
These assumptions permit reducing the six-dimensional problem of the phase

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AVRAMENKO, M. I., et al., Atomnaya Energiya, Vol 32, No 5, May 72, pp 437-440

focusing of a bunch to a two-dimensional problem concerning the longitudinal coordinates and velocities of particles. The article considers a nonstationary case. No constraints are imposed on the particle density distribution function in the longitudinal phase space. A description is given of the calculation method used to study peculiarities of the formation of intensive bunches of nanosecond duration in direct-action accelerators. A diagram is given showing successive variations in the configuration of the longitudinal phase volume, the linear charge density distribution, and the longitudinal Coulomb repulsive force along a bunch during passage through an accelerator. It is shown that, due to the nonlinearity of the longitudinal Coulomb forces, the configuration of the longitudinal phase volume of the bunch is considerably distorted, which phenomenon limits the bunching factor.

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AVRAMENKO, M. I., KUZNETSOV, V. S.

"Phase Focusing of Intense Ion Bunches of Nanosecond Duration"

Moscow, Elektrofizicheskaya Apparatura, No 9, 1971, pp 63-68

Abstract: The formation of intense ion bunches with a duration of 1-5 ns in direct-action accelerators has aroused a good deal of interest recently. This article presents a method of computing the parameters of such bunches of ellipsoidal form, in drift space and in a uniform electrical field of the accelerator tube, in the presence of initial velocity modulation. The ellipsoidal formation is obtained in accelerators with a discontinuous system of a constant beam and a buncher between the ion source and the accelerator tube. Situations in which the axial semiaxis of the bunching is greater or less than the radial semiaxis are considered. It is shown that if the intensity of the uniform electric field satisfies the condition  $E \ll U_0/a_0$ , where  $U_0$  is the potential at the input of the accelerator tube and  $a_0$  is the length of the axial

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AVRAMENKO, M. I. et al, Elektrofizicheskaya Apparatura, No 9,  
1971, pp 63-68

semiaxis of the bunching before the tube, the bunching will maintain its ellipsoidal shape even in the acceleration region. The method developed in this article was applied to the type NG-400 accelerator; the experimental data thus obtained was found to be in good agreement with computed results.

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