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PRIMARY SOURCE: Fiziologiya Rasteniy, 1970, Vol 17, Nr 1,
pp 28-30

DEPENDENCE OF DARK RESPIRATION ON AIR HUMIDITY AND
TEMPERATURE AND ON THE ENTROPY PRODUCED IN THE LEAF SYSTEM

Florov, R.Y.; Stovanov, Zh. V.

Higher Forest-Engineering Institute, Sofia and Forestry Institute, Sofia, Bulgaria

The respiration rate in oak (*Quercus peclungulata* Ehrh.) leaves in dry or humid air and the entropy produced as determined on basis of heat and moisture transfer between the leaf and surrounding air were investigated. In dry air the respiration rate and entropy produced are is higher than in humid air. The heat of dissipation calculated on basis of the entropy produced is in dry air almost equal to the respiration energy. There is a discrepancy between these quantities in moist air; this is probably due to changes in the pathways of respiration.

REEL/FRAME
19731151

USSR

ZVEREV, V. Yu., FLOTNIKOV, V. N.

"Method of Dynamic Programming in Problem of Control of One Class of Multi-dimensional Production Processes"

Izbr. Tr. Vses. Mezhvuz. Simpoz. po Prikl. Mat. i Kibernet., Gor'kiy, 1967. [Selected Works of All-Union Interuniversity Symposium on Applied Mathematics and Cybernetics, Gor'kiy, 1967], Moscow, Nauka Press, 1973, pp 298-301 (Translated from Referativnyy Zhurnal Kibernetika, No 6, 1973, Abstract No 6V548, by the authors).

Translation: The possibility is studied of using the method of dynamic programming for optimal operational and organizational control of an object consisting of several parallel units. The technological process in each unit is a cyclical process, consisting of a number of successive stages. The problem of optimization consists in minimization of a certain goal function of down time. Functional equations are produced and the number of possible control strategies is estimated. The problem is studied as applicable to the organization of operational and organizational control of an open hearth furnace section.

EAST GERMANY

FLUCK, E., Professor, Dr., REUTERT, P. J., Dr., and BINDER, H., Dr., Institute for Inorganic Chemistry, University (Institut fuer Anorganische Chemie der Universitaet), Stuttgart.

"Dithiophosphoric Acid Betaines"

Leipzig, Zeitschrift fuer Anorganische und Allgemeine Chemie, Vol 397, No 3, Apr 73, pp 225-236

Abstract: The synthesis of compounds of the general formula $C_5H_5N-P(S)_2X$, where X denotes F, $N(CH_3)_2$, and Br; the reactions of pyridiniumhalogenodithiophosphoric betaines with alcohols; the reactions of pyridinium-fluorodithiophosphoric betaines with hydrohalogenic acids; and the reactions of pyridinium-dithiophosphoric betaines with Lewis bases were described. In addition, methods for the synthesis of pyridiniummethoxyfluoro-, pyridiniummethoxyfluoro-, pyridiniumalkoxyfluoro-, pyridiniumchlorofluoro-dithiophosphates, and trimethylammoniumfluorodithiophosphoric betaine was described. The chemical shifts, coupling constants, and other structural characteristics of the compounds synthesized were presented on the basis of nuclear magnetic resonance spectrometric data. Twelve references, including 4 German and 8 Western. (Manuscript received 23 Oct 72).

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USSR

UDC 576.311.1

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

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

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

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

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BUDAGOV, YU. A., VINOGRADOV, V. B., VOLOD'KO, A. G., DZHELEPOV, V. P.,
 KLADNITSKIY, V. S., KUTSIDI, N. K., Tbilisi State University, LOMAKIN, YU. F.,
 MAKSIMENKO, V. A., MARTINSKA, G., FLYAGIN, Y. B., KHARZHEYEV, YU. N., and
 SHANDOR, L.

"Possible Existence of $\pi^- \delta^-$ -Resonance With a Mass of 270 MeV"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 13,
 No 12, 20 Jun 71, pp 665-668

Abstract: The preliminary results of this experiment were presented in 1970 at the Fifteenth International Conference on High-Energy Physics in Kiev. The authors find experimental signs of the possible existence of a new meson resonance. They observe a narrow peak when $M = 270$ MeV in the spectrum of effective masses of the system $\pi^- \delta^-$, which forms in the reaction $\pi^- p \rightarrow \pi^- p + (2.3)\delta^-$ at 5 GeV/c. The authors study events of the type $\pi^- p \rightarrow \pi^- p + (2.3)\delta^-$ which satisfy the following conditions: (1) the protons are identified by ionization and stopping in the camera, and the impulses of the protons do not exceed 900 MeV/c; (2) the length of the tracks of secondary charged particles from the star is no less than 2 cm, and the impulses of these particles are measured with an accuracy of $1/2$

BUDAGOV, YU. A., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 13, No 12, 20 Jun 71, pp 665-668

accuracy no worse than 30%; (3) the δ -quanta have impulses greater than 30 MeV/c, measured with an accuracy no worse than 25%; (4) the scattering angles between the two δ -quanta do not exceed 2° . As a result of the experiment, the authors find that the effect which they observed is caused by the existence of a new meson resonance. The figures depict the distribution by effective mass of quanta. The article contains 2 figures and a bibliography of 7 entries.

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USSR

BUDAGOV, YU. A., VINOGRADOV, V. B., VOLOD'KO, A. G., DZHELEPOV, V. B., KIRILLOV-
 -UGRYUMOV, V. G., Kladnitskiy, V. S., Kuznetsov, A. A., Lonakin, Yu. F., Mel'nikova,
 N. N., Ponomov, A. K., Flyagin, V. B., Shlyapnikov, P. V., Martinska, G. (1),
 Bolbea, V. (2), Nikhul, A. (2), Momojanu, D. (2), Ponta, T. (2), Felea, S. (2),
 and Chadraa, B. (3), Joint Institute of Nuclear Research; (1) University imeni P.
 I. Shafarik, Koshitse, Czechoslovak SSR; (2) Institute of Atomic Physics, Bucharest,
 Romania; (3) Physics Institute of the Academy of Sciences Mongolian People's Repub-
 lic, Ulan-Bator

"Study of the Mass Spectrum of a ΛK -System in $\pi^- p$ -Interactions at 4 and 5.1 GeV/c"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol. 11, No. 1,
 5 Jan 70, pp 31-35

Abstract: The results of a study of the spectrum of the effective masses of a
 ΛK -system are reported. The spectrum was obtained in investigating $\pi^- p$ -interactions
 in a 24-liter and a 1-meter propane bubble chamber irradiated in π^- -meson beams of
 the proton synchrotron of the Joint Institute of Nuclear Research with pulses of
 4 and 5.1 GeV/c, respectively. An investigation of the structure of the effective
 mass spectrum of a ΛK -system was of interest from the viewpoint of observing new

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USSR

BUDAGOV, YU. A., et al, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol. 11, No. 1, 5 Jan 70, pp 31-35

resonances with zero strangeness and the decays of different isobars via the channel $N^* \rightarrow \Lambda + K$, to determine the relative probabilities of these decays. Approximately 230,000 photographs were analyzed for each bubble chamber. The effective mass spectra of ΛK^0 combinations for events in which the decays of a Λ -hyperon and a K^0 -meson were simultaneously recorded in the chamber are graphed. The graphs show a considerable excess in the number of events above the background in the mass region 1.61-1.96 Gev/c². It is shown that this anomaly is not associated with the reflection of known resonances Y^* (1385) and K^* (890) in the ΛK^0 -spectrum. The total excess in the number of events over the background in the mass interval 1.61-1.96 Gev/c² was 114 ± 13 . The experimental data verify the existence of two resonances with masses about 1685 and 1935 Mev/c² and widths of the order of 150 Mev/c². It is concluded that the anomaly observed in the effective mass spectrum of ΛK can be explained only by the decay of the isobar S_{11} (1710), P_{11} (1750) via the channel $N^* \rightarrow \Lambda + K$ or by the existence of a new resonance with mass about 1685 Mev/c², as the data of R. Erbe et al indicate.

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1/2 011 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--RESISTANCE OF GROG, DINAS, AND SILICEOUS REFRACTORIES TO THE ACTION
OF BASIC OPEN HEARTH SLAGS -U-
AUTHOR-(03)-FLYAGIN, V.G., RUTMAN, D.S., PEREPELTSYN, V.A.
COUNTRY OF INFO--USSR F
SOURCE--OGNEUPORY 1970, 35(3), 32-7
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--OPEN HEARTH FURNACE, SLAG, REFRACTORY MATERIAL
CONTROL MARKING--NO RESTRICTIONS
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CIRC ACCESSION NO--AP0118044
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118044

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RESISTANCE OF DIFFERENT REFRACTORIES TO THE ACTION OF THE BASIC SLAG (SIO SUB2 17.58, AL SUB2 0 SUB3 4.80, FEO 10.50, CAO 46.12, MGO 15.60, AND MNO 5.38PERCENT) WAS STUDIED. THE CONTENT OF 2CAO.SIO SUB2 DETD. BY PETROGRAPHIC ANAL. WAS 50PERCENT. THE SLAG RESISTANCES WERE EVALUATED ACCORDING TO THERMODYNAMIC CONSTS. OF INTERACTIONS OF REFRACTORIES WITH SLAGS AND ACCORDING TO SOLY. OF REFRACTORIES IN THE SLAG. THE SLAG RESISTIVITY OF SIO SUB2 AND MULLITE AS MAIN PHASES OF SILICEOUS AND GROG REFRACTORIES TO THE ACTION OF 2CAO.SIO SUB2 WAS CONSIDERED. THE CALCN. OF THE ISOBARIC POTENTIAL AND EQUIL. CONST. WAS CARRIED OUT FOR VARIOUS REACTIONS AT 1400, 1500, AND 1600DEGREES. THE EQUIL. CONST. K WAS CALCD. ACCORDING TO THE FORMULA $\text{LOG } K \text{ EQUALS MINUS } (\Delta F / T \text{ DEGREES} - 4.575T)$, WHERE ΔF IS THE ISOBARIC ISOTHERMAL POTENTIAL, AND T IS TEMP. OF REACTION. FOR THE REACTION CORRESPONDING TO FORMATION OF ANORTHITE AND CORUNDUM THE MAX. ΔF DEGREES WAS FOUND. THEREFORE, ACCORDING TO THERMODYNAMIC CALCNS., SIO SUB2 IS MORE STABLE THAN MULLITE TO THE ACTION OF BASIC SLAGS. EXPTL., THE SLAG RESISTANCE OF THE DINAS, SILICEOUS, AND GROG REFRACTORIES WAS DETD. BY THE CRUCIBLE METHOD (D. N. POLUBOYARINOV, 1952). CRUCIBLES WERE HEATED TO 1500DEGREES WITH TEMP. INCREASE 250DEGREES-HR. THE DEGREE OF SOLY. OF CRUCIBLES IN THE SLAG WAS DETD. CHEM. THE GROG REFRACTORIES SHOW A LOW SLAG RESISTANCE. A HIGHRESISTANCE OF SILICEOUS REFRACTORIES IS CONDITIONED BY THE PRESENCE OF CRISTOBALITE IN THE PHASE COMPH. FACILITY: VOST. INST. OGNEUPOR., SVERDLOVSK, USSR.

UNCLASSIFIED

USSR

F

FLYAGIN, V. G., RUTMAN, D. S., PEREPELTSYN, V. A.

"Stability of Chamotte, Dinas, and Silica Refractories to the Action of Basic Open-Hearth Slags"

Moscow, Ogneupory, No 3, Mar 70, pp 32-37

Abstract: On the basis of the positive experience of the usage of semiacid bucket brick and silica rammed lining masses, the authors studied the slag resistance of chamotte, dinas, and silica refractories when exposed to basic open-hearth slag of the composition: 17.58% SiO₂, 4.80% Al₂O₃, 10.50% FeO, 46.12% CaO, 15.6% MgO, and 5.38% MnO. The thermodynamic parameters of the reaction between the refractory and the slag were calculated. Thermodynamic calculations showed that silica is apparently more resistant than mullite to the influence of basic slags rich in calcium silicate. The slag resistance of dinas, silica, and chamotte refractories was determined by measuring the concentration of the refractory in the slag melt by the crucible method. The zones of contact of slag and crucible were also studied microscopically. It was concluded that the increase slag resistance

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USSR

FLYAGIN. V. G., et al., Ogneudory, No 3, Mar 70, pp 32-37

of silica refractories in comparison with chamotte refractories is not only a result of the nature of the material, but also its capability for disintegration, related to the polymorphic conversions of quartz upon heating. Lower disintegration of products and higher slag resistance can be achieved by using roasted quartzite. However, this approach is not technologically suitable. Disintegration can be greatly decreased if the refractory contains 3-7% aluminophosphate binder, giving the product high density and strength.

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USSR

UDC 632.951:632.786

FLYAGINA, A. V., Scientific Research Institute of Plant Protection,
Tashkent

"Aftereffect of Insecticides on Insects"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 8, No 9, (83), Sep 70,
pp 38-39

Abstract: The article is a report on the results of tests undertaken by the Scientific Research Institute of Plant Protection in June 1967 to determine the aftereffects of insecticide treatment on the development and fertility of cutworm grubs. Sublethal doses of hexachlorocyclohexane, Phosalon (French), and nuvacron emulsion (Swiss) were tested. It was found that grubs of the first generation treated with sublethal doses of these insecticides showed markedly less development than those of the untreated control group. There was somewhat of a delay in emergence of the moths from the cocoons. The females from the control group and the groups treated with hexachlorocyclohexane and Phosalon laid fertilized eggs within 2-3 days of mating. Laying was delayed to 5-9 and even 10 days after mating in the group treated with nuvacron. Hatching for the control group was 869 grubs as com-
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USSR

FLYAGINA, A. V., et al., Khimiya v Sel'skom Khozyaystve, Vol 8,
No 9 (83), Sep 70, pp 38-39

pared with figures of 514 for the Phosalon group, 418 for the hexachlorocyclohexane group and 252 for the nuvacron group. Ten pairs of moths (male and female) and 20 grubs from each experiment were set aside for further study. Further studies showed that Phosalon, and especially nuvacron have the greatest effect on development of the various stages of this pest. Treatment of the grubs had almost no effect on the life span of the adult moths.

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USSR

UDC 537.533.2 + 537.534.8

ARIFOV, U. A., FLYANTS, N. N., and RAKHIMOV, R. R., Institute of Electronics, Academy of Sciences Uzbek SSR

"Secondary Emission From RbBr, Se, and CdTe Films Under Bombardment by Sodium Ions and Atoms"

Tashkent, Izvestiya Akademii Nauk Uzbekskoy SSR, Seriya Fiziko-Matematicheskikh Nauk, No 4, 1970, pp 45-47

Abstract: The article describes results of a study of electron emission from RbBr, Se, and CdTe films under bombardment by sodium ions and atoms in the 30-2500 eV energy range. It was found that the secondary electron emission coefficients increase monotonically with the energy of the bombarding particles for all the films, with electron emission greater in the case of atomic bombardment than ion bombardment for any energy value. Data are given on positive and negative ion emission for RbBr and CdTe films. The results show that electron emission from dielectric films under bombardment by alkali metal atoms proceeds more effectively than under bombardment by like ions.

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USSR

UDC 537.533.8

ARIFOV, U. A., FLYANTS, N. N., and RAKHIMOV, R. R.

"Secondary Emission of Some Dielectric and Semiconductor Films Under the Action of Bombardment by Na and K Ions and Atoms"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 35, No 2, Feb 71, pp 248-251

Abstract: The authors studied secondary electron emission, positive and negative, from CsI, RbBr, Se, and CdTe films under the action of sodium ion and atom bombardment and from RbBr and KCl films under potassium ion and atom bombardment in the 30-2500 ev range. Measurements were performed by the oscillographic double modulation method during continuous film application. It was found that electron emission from dielectric films under bombardment by alkali metal atoms proceeds more effectively than under bombardment by like ions. This conclusion fails to coincide with the conclusion reached by the authors in previous articles, which showed that the coefficient of kinetic electron emission is the same for bombardment of metals by like atoms and ions.

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Radiation Chemistry

USSR

UDC 541.182.65:541.15

MAZINA, G. R., PANICH, R. M., USTINOVA, Z. M., VOYUTSKIY, S. S., FODIMAN, N. M.,
KRATSHEYN, P. N., and KUZNETSOVA, G. I., Moscow Institute of Fine Chemical
Technology imeni M. V. Lomonosov

"Effect of Ionizing Radiation on the Properties of Fluorine-containing
Copolymer Latex"

Moscow, Kolloidnyy Zhurnal, Vol 33, No 5, Sep-Oct 71, pp 690-692

Abstract: The effect of ionizing radiation on the properties of fluorine-con-
taining copolymer latex was studied by using Co^{60} as a source, the radiation
dose ranging from 0.25 to 50 Mrad. The pH of the irradiated copolymer latex
became lower, as did the resistance to electrolytes. After irradiation the
coagulation threshold of the latex was also lowered with simultaneous coagula-
tion of globules and intraglobular crosslinking of the polymer. Increased
radiation dose resulted in greater three-dimensional lattice density. Irradia-
tion of the latex does not lead to formation of intraglobular chemical bonds
and to better film formation.

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FOFANOV, V. P.

GENERALIZATION OF MEDICAL CARE IN RURAL AREAS (ON THE MODEL OF
KALININGRADSKAYA OBLAST)

UDC: 610-085.701.02-73

Article by V.P. Fofanov, I.Ya. Dobrovolskiy, N.P. Sazonov,
I.A. Volkova, ~~and others~~, All-Union Scientific Research Institute of
Social Hygiene and Public Health Organization and N.A. Semashko,
USSR Ministry of Health, Moscow; ~~USSR Ministry of Health~~,
Kuselman, No 1, 1973, submitted 3 August 1972. pp 18-23

The program of the CPSU provides for meeting in full the
demands of the urban and rural population with respect to all forms of
highly qualified medical care. The need for bringing the level and
quality of medical care in rural areas closer to the level provided to
urban regions was indicated in the decision of a session of the USSR
Supreme Council (June, 1968) and Decree of the Central Committee of the
CPSU and USSR Council of Ministers, No 517 dated 5 July 1968: "On
Measures for Further Improvement of Public Health and Development of
Medical Science in the Country"; this was also discussed at the 24th
Congress of the CPSU.

The system of medical care based on the principle of stage
development and combining a set of therapeutic and prophylactic insti-
tutions, provides the rural population with all forms of qualified
specialized medical care. More than 100,000 different therapeutic and
prophylactic institutions participated in implementing this task in
1971; they included more than 15,000 hospitals, 247 of them oblast
hospitals (regional, republic level), 2,399 central rayon, 759 rayon
(numbered), and 11,051 rural district hospitals.

The existing system of public health organization has made it
possible to eliminate almost entirely the difference between avail-
ability of hospital care for the rural and urban population. This is
achieved, to some extent, by hospitalization of rural residents in
urban hospitals. In some republics, more than 40 percent of the rural
population was hospitalized in urban hospitals in 1970. For the USSR
as a whole, an average of 204 per 1,000 rural residents were hospital-
ized, and this applied to 207 per 1,000 urban residents.

SPS 58275
21 JUL 73

FOGEL N. Ya.

Acc. Nr:

A0043670

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1970, Vol 58, Nr 2, pp 387-393

ANISOTROPY OF THE CRITICAL CURRENT IN A SINGLE CRYSTAL OF A SUPERCONDUCTING ALLOY Pb-In

V. G. Volotskaya, N. Ya. Fogel

Anisotropy of the critical current of cylindrical single crystals of the superconducting alloys Pb - 24 at.% In and Pb - 12 at.% In, is investigated in a broad range of field strengths $H_{c1} < H < H_{c2}$ and for various treatments of the surface. The long axis of the sample, along which the transport current is directed, coincides either with direction [100] or with direction [110]; the magnetic field is perpendicular to the current. Measurements of critical current anisotropy in etched samples shows that the character of the anisotropy reflects the crystallographic symmetry of the sample. Critical current maxima are observed when the magnetic field is oriented along the directions <100>, <110> and <111>. The dependence of the anisotropy magnitude on magnetic field strength is studied. A major role in determining the magnitude of the critical current is played by surface pinning of the vortexes and the anisotropy observed is related to the state of the surface layer of the single crystals.

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REEL/FRAME
19770074

USSR

FOGEL, Ya. M, et al (Physicotechnical Institute of Low Temperatures of the Ukrainian Academy of Sciences, Khar'kov State University)

"Effect of Helium Atom Injection on the Superconducting Properties of Indium Films"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, February 1974, pp 626-634

Abstract: The characteristics of the superconducting transition (T_c , H_{c1} , H_{c2}) of thin indium films irradiated by various doses of helium ions are measured. Injection of helium particles leads to a pronounced increase of H_{c1} and H_{c2} due to a decrease in the length of the electron mean free path and to an insignificant increase of T_c of the indium films. On the basis of the experimental results and of a comparison of the experimental and theoretical results of other authors, it is concluded that the method of injecting helium atoms into thin superconducting metallic films allows one to study, under a broad range of conditions and in a purer form, the effect of the mean free path length of electrons in a metal on the superconducting properties of thin films.

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SSR
KOVAL', A. D., VYAGIN, G. I., BOBKOV, V. V., KLIMOVSKIY, Yu. A., STRAL'CHENKO, S. S.,
and FOGEL', Ya. M., Khar'kov State University. imeni A. M. Gor'kiy

"On the Question of the Difference in Composition of Charged and Neutral Particles
Knocked out of Gallium Arsenide by a Beam of Ar⁺ Ions"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 43, No 8, Aug 73, pp 1753 - 1754

Abstract: A previous study in which Ar⁺ particles had an energy of 2 kev showed that the positively charged secondary particles were primarily Ga⁺_n ions and complexes, with As⁺_n particles being 2 - 3 orders of magnitude less frequent, while the neutral secondary particles were all arsenic atoms or complexes. Two types of gallium arsenide crystals were used as targets, (100) and (111), with no discernible difference in the distribution of secondary particles ejected between the two types. It is theorized that the difference in distribution is related to processes between the departing secondary particles and the surface of the solid and that these processes are determined by the velocity of the departing particles and the relative arrangement of energy zones of the solid body and excited levels of the particles.

The present work extends this investigation, using a beam of Ar⁺ particles at 25 kev. The spectrum of the emitted particles in the visible light range was recorded. It consisted entirely of two resonance lines of GaI at 4172 and 4033 angstroms. These were found to be produced by Ga particles at energies on the

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USSR

KOVAL', A. D. et al., Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 43, No 8, pp 1753 - 1754

order of 2 - 3 kev. This is understandable, since the resonance level at 3.1 ev of the Ga atom, the transition from which to the base level produces fast excited Ga particles, is in resonance with a zone of free conductivity levels of the GaAs monocrystal, leading to a high probability of resonance ionization, while a significant portion of the levels of the As atom is in resonance with a forbidden zone of the crystal, making resonance ionization unlikely for these atoms. The neutral, emitted As atoms radiate in the vacuum ultraviolet and were not recorded in the experimental spectrum. Resonance ionization can occur for As atoms at an energy level of 7.6 ev, but only a small percentage reaches this level.

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USSR

GRITSYNA, V. V., KIYAN, T. S., KOVAL', A. G., FOGEL', Ya. M., SERYUGIN, A. L., MARTYNOV, I. S., Khar'kov State University imeni A. M. Gor'kiy

"Concerning the Mechanism of Luminescence of Polymer Films Which Arises as They are Being Formed Under Ion-Beam Bombardment of Solids"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 64, No 1, Jan 73, pp 207-216

Abstract: On the basis of experimental results, the authors suggest a new mechanism for luminescence of polymer films forming on a solid as a result of ion-beam dissociation of hydrocarbon molecules adsorbed on the surface of a bombarded target. It is shown that luminescence of atoms and molecules of helium and neon which arises during bombardment of metal targets by ions of He^+ or Ne^+ is emitted by particles of the corresponding gas located inside hollow spherulites formed during growth of the film under bombardment. The influence of the film temperature on the intensity of the emitted luminescence as well as the change in the nature and intensity of luminescence when there is a change in bombarding beams is explained on the basis of the proposed mechanism of luminescence of polymer films. A mechanism is also proposed for luminescence of polymer films
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USSR

GRITSYNA, V. V. et al., ZhETF, Vol 64, No 1, Jan 73, pp 207-216

formed on the surface of dielectric targets by ion-beam bombardment. It is assumed that luminescence in this case arises as a result of the excitation of gas which has accumulated in the cavities between the substrate and the polymer film where it is peeling off.

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Molecular Physics

USSR

FOGEL', Ya. M.; et al (Khar'kov State University)

"Change in the Character of the Effect of Oxygen on the Thermoemission of K^+ Ions"

Leningrad, Fizika Tverdogo Tela; August, 1972; pp 2265-70

ABSTRACT: The authors describe experiments in which they studied the effect of the initial stage of the oxidation of nickel strips on the character of the action of oxygen on a stream of K^+ ions. It is shown that when a nickel strip is kept in an atmosphere of oxygen for a sufficiently long time, nuclei of nickel oxides appear on its surface. The oxidation of nickel affected the character of the action of oxygen on the K^+ ions in various ways.

On the basis of a discussion of the results obtained, the following conclusions are drawn: (1) in the case in which the effect studied completely

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FOGEL', Ya. M., et al, Fizika Tverdogo Tela; August; 1972, pp 2265-70

disappears, nuclei of oxides are formed on all dislocations which are sensitive to the action of the gas; (2) in the case in which oxidation of the nickel leads to a lessening of the effect, the oxide nuclei obstruct only the part of the emergence of the dislocations which are sensitive to the action of the oxygen; (3) in the case in which the phenomenon studied is not affected by the oxidation of the nickel, the oxide nucleus is formed only at the emergence of the dislocations which are insensitive to the action of oxygen or at any of the other defects on the surface of the nickel. This work confirms the conclusion of other researchers (N. Cabrera - J. Chem. Phys., 53, 675, 1956; M. Martius - Can. J. Phys., 33, 466, 1955; F. W. Young - Acta. Met., 8, 117, 1960) that the formation of oxide nuclei takes place at the emergence of some dislocations on the surface of the metal.

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USSR

KOLOD, V. YA., TATUS, V. I., RYBALKO, V. F., ~~FOGEL, YA. M.~~, VODOLAZHCHEKHO,
V. V., and YEVSEYEV, V. M., Engineering Physics Institute, Academy of
Sciences Ukrainian SSR, Khar'kov

"Effect of Oxygen Pressure on the Initial Stage of Molybdenum Oxidation"

Leningrad, Fizika, Tverdogo Tela, Vol 13, No 6, 1971, pp 1521-1524

Abstract: The effect of oxygen pressure on the initial stage of oxidation of molybdenum was investigated using the technique of secondary ion-ion emission. Molybdenum strips were heated in vacuum up to a temperature of 1900°K , which completely cleaned their surfaces for the absorbed particles and particles of surface compounds. Each experiment began with the molybdenum surface brought to atomic purity. Then the molybdenum temperature was reduced from 1900°K to a temperature at which the experiment was conducted: namely, the range $300\text{-}1900^{\circ}\text{K}$. The kinetics of oxide accumulation on the surfaces of molybdenum strips was studied: the current I of a beam of secondary ions driven off from the oxide molecule under study was plotted as a function of time t . The oxygen pressure was varied within the limits $5 \cdot 10^{-8} - 1 \cdot 10^{-6}$ torr. The following ion species were investigated: MoO_2^+ ,

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KOLOD, V. YA., et al., Fizika Tverdogo Tela, Vol 13, No 6, 1971, pp 1521-1524

MoO_3^- , Mo_2O_3^+ , Mo_2O_6^+ , and Mo_2O^+ . An increase in oxygen pressure leads to the following: 1) a shortening of the latency. (time interval between the onset of oxygen adsorption and the instant of oxide formation on molybdenum surfaces); 2) a shortening of the time interval required for an equilibrium oxide film to form on surfaces; and 3) increased oxide concentration. The condition of the surface film (composition and concentration of oxides) is reproducible and reversible with variation in temperature and oxygen pressure. This indicates that the oxide film consists of a layer of surface oxides.

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UDC 537.534+535.337

GRITSYNA, V. V., KIYAN, T. S., GOUTTE, R., KOVAL, A. G., and FOGEL', YA. M.,
(R. Goutte affiliated with the National Institute of Applied Sciences, Lyons,
France)

"Effect of Nonradiative Transitions on the Emission Spectrum of Excited Particles
Knocked Out of Solid Targets by Fast Argon Ions"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, No. 3, Mar 71,
pp 578-584

Abstract: The effect of the resonance ionization process on the spectrum emitted by excited particles knocked out of solid targets - a metal (Cu), a semiconductor (Si), and a dielectric (Al_2O_3)-by 20 keV Ar^+ ions was studied. Results show that resonance processes of excitation loss occurring when excited particles fly off the surface of a solid have a considerable effect on the emission spectrum of particles knocked out of its surface by an ion beam. It is suggested that the location of energy levels of a solid with a known energy spectrum can be predicted on the basis of the radiation of the emission spectrum of particles knocked out of the surface of the solid by an ion beam.

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USSR

ABRAMENKOV, A. D., SEREJENIN, A. L., MARTINOV, I. S., SEMENOV, V. V., FOGEL',
YA. M., Physicotechnical Institute, Academy of Sciences USSR, Leningrad

"Formation of Islets From Copper Atoms Diffusing Over a Molybdenum Surface"

Leningrad, Fizika Tverdogo Tela, No. 12, Dec 71, pp 3496-3500

Abstract: The results of a direct study of the formation of islets in the diffusion of copper over molybdenum using optical and electron microscopes are presented. The theory of the formation of islets from atoms diffusing over the surface of a substrate was developed by A. D. Abramenkov, et al. According to this theory, based on the assumption that surface defects in the substrate are the locus for the formation of nuclei of islets, the diffusing material is distributed over the surface of the substrate in three zones if the diffusion times are sufficiently large. In zone III, which is furthest from the source of the diffusing material, there occurs only diffusion by atomic jumps from one adsorption point on the surface of the substrate to another. In this zone the concentration of diffusing material is still too low for the formation of nuclei of islets to occur at defects in the substrate surface. In zone II, where the concentration of diffusing material is higher,

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ABRAMENKOV, A. D., et al, Fizika Tverdogo Tela, No. 12, Dec 71, pp 3496-3500

islets from diffusing atoms are generated at defects in the substrate surface, and the dimensions of these islets increase with the course of time. In zone I, which lies next to the boundary of the source of diffusing material, the dimension of the islets reaches a maximum value which does not change with the further passage of time. The general conclusions of the theory of the formation of islets of diffusing material on a substrate surface were verified, and data were obtained on the formation of copper islets on molybdenum which agree quantitatively with the results of theoretical calculations. The agreement between experimental and theoretical values of the size of the islets was good despite certain assumptions made in the calculations. The direct measurement of the average diameter of the islets gave a value of $2 \cdot 10^{-5}$ cm, while a theoretical calculation yielded the value $3 \cdot 10^{-5}$ cm.

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USSR

GUSEV, V. A.; OKSYUK, A. A.; FOGEL', Ya. M. (Physicotechnical Institute, Ukrainian Academy of Sciences)

"Dissociation of Diatomic Molecules Into Ions by Impact of Fast Ions and Atoms"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; April 1972,
pp 1284-90

Abstract: The mass-spectrometer technique is employed for measuring the relative effective cross sections for formation of slow atomic negative ions produced in collisions between fast ions and atoms of hydrogen, helium, neon, argon, and krypton (3-50 keV energy) and O_2 , CO and NO molecules. The difference observed between the functions $\sigma_{\beta}^{-+}(v)$ and $\sigma_{\beta}^{-0}(v)$ is ascribed to the contribution to the measured cross section of processes involving dissociative electron capture by the target molecules. Some considerations regarding the mechanism of diatomic molecule dissociation into positive and negative ions are presented.

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UDC 537.582

REKOVA, L. P., MOZGIN, V. V., KISEL', O. V. and FOGEL', YA. M., Physicotechnical
Institute of the Academy of Sciences UkrSSR

"Effect of Gases on Thermoion Emission by Plastically Deformed Metals"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, No. 3, Mar 71,
pp 567-570

Abstract: The effect of oxygen on the emission of K^+ thermoions was used to study the plastic deformation of heated nickel strips during their stretching by a constant load. The idea of the experiment was to establish the mechanism of the effect of a gas on the thermoemission of ions of alkali metals in order to determine the nature of processes occurring under the plastic deformation of metals. According to current assumptions, it was expected that the effect of the action of the gas on thermoion emission of a heated metal, which disappears upon introducing dislocations into the motion with a sufficiently high velocity, should be restored upon stopping dislocations, independent of the method by which the dislocations were stopped. If this is so, the effect can disappear and then be restored upon the application of a stretching load to a metal strip, which will take it first into a state of temperature creep, after which there will then follow

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a state of strengthening of the strip characterized by the disappearance of temperature creep. These changes in the nature of the action of a gas on thermoion emission follow from current ideas about plastic deformation of metals according to which the state of temperature creep is associated with the motion of dislocations and the state of strength is associated with stopping them. These experiments support these hypotheses.

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1/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--FORMATION OF CHARGED AND EXCITED PARTICLES IN COLLISIONS BETWEEN
NOBLE GAS IONS OR ATOMS AND HYDROGEN MOLECULES -U-
AUTHOR-(05)-POLYAKOVA, G.N., GUSEV, V.A., YERKA, V.F., FOGEL, YA.M., ZATS,
A.V.
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 4, PP 1186-1196
DATE PUBLISHED-----70

F

SUBJECT AREAS--PHYSICS
TOPIC TAGS--EXCITATION CROSS SECTION, PARTICLE COLLISION, GAS IONIZATION,
HYDROGEN, EMISSION SPECTRUM, INERT GAS

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/1485 STEP NO--UR/0056/70/058/004/1186/1196
CIRC ACCESSION NO--AP0106241
UNCLASSIFIED

2/2 034 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0106241
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTIVE CROSS SECTIONS FOR H
SUB2 PRIME POSITIVE AND H PRIME POSITIVE PRODUCTION IN COLLISIONS
BETWEEN 3-40KEV HE, NE AND AR IONS OR ATOMS AND H SUB2 MOLECULES ARE
MEASURED BY THE MASS SPECTROMETER TECHNIQUE. THE EFFECTIVE CROSS
SECTIONS FOR THE H SUBALPHA AND H SUBBETA EXCITED LINES OF THE BALMER
HYDROGEN SERIES AND FOR SOME SPECTRAL LINES OF HE, NE AND AR ATOMS AND
IONS ARISING IN COLLISIONS BETWEEN 0.1-30 KEV ATOMS AND IONS OF THE SAME
NOBLE GASES AND H SUB2 MOLECULES ARE MEASURED BY THE MASS SPECTROSCOPIC
TECHNIQUE. THE RESULTS OF THE MEASUREMENTS SHOW THAT MANY SIGMA
(UPSILON) CURVES (SIGMA IS THE EFFECTIVE CROSS SECTION FOR A CERTAIN
COLLISION PROCESS AND UPSILON IS THE RELATIVE VELOCITY OF THE COLLIDING
PARTICLES) EXHIBIT PEAKS IN THE REGION OF SMALL IMPINGING PARTICLE
ENERGIES. THE PEAKS CANNOT BE EXPLAINED ON THE BASIS OF THE MASSEY
ADIABATIC CONDITION. POSSIBLE CAUSES OF THE PEAKS ARE DISCUSSED.
FACILITY: FIZIKO-TEKHNICHESKIY INSTITUT AN UKRAINSKOY SSR.

UNCLASSIFIED

USSR

KOPPE, V.T., KOVAL', A.G., FIZGEYER, B.M., ~~FOGEL'~~, Ya.M., IVANOV, S.I.,
Kharkov State University

"Measurement of the Effective Cross Sections and Excitation Functions for
Bands of the First Negative System of the N_2^+ Molecular Ion With the Excita-
tion of Nitrogen by Fast Electrons"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No 12, 1970, pp
1878-1883

Abstract: The effective cross section for the (0-0), (0-1), (0-2), (0-3),
(1-2) (1-3), and (1-4) bands of the first negative system of the N_2^+ ion
and the multiplet lines $\lambda = 5001 - 5005 \text{ \AA}$ in the NII spectrum were measured at
energies between 0.5 and 20 kev. The nitrogen was excited by electrons
with energies between 0.5 and 20 kev. In the region of overlapping energies
the experimental effective cross sections are in good agreement with the data
of quoted sources. A formula is presented which satisfactorily describes
the course of the excitation functions of the bands and lines investigated
at energies between 0.8 and 20 kev. 3 figures, 1 table, 10 bibliographic
entries.

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USSR

FOGEL', Ya. M., et al (Physicotechnical Institute, Ukrainian Academy of Sciences)

"Formation of Charged and Excited Particles in Collisions of He⁺, Ne⁺, and Ar⁺ Ions with CO Molecules"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, May 1971, pp 1597-1603

Abstract: The total effective cross sections for formation of CO⁺, C⁺, and O⁺ ions produced in collisions of He⁺, Ne⁺, and Ar⁺ ions (ion energy 3-50 keV) with CO molecules are measured by the mass-spectrometer technique. The spectroscopic technique was employed also for measuring the effective cross sections for formation of excited CO⁺, C⁺, and O⁺ ions in similar collisions (ion energy 0.12-30 keV). From the results of the measurements it can be concluded that many features of the $\sigma(v)$ curves (σ is the effective cross section for a certain collision process and v is the relative velocity of the colliding particles) can be explained on the basis of the adiabatic maximum rule. In the low-energy range the curves are found to deviate from those expected on the basis of Massey's adiabatic hypothesis.

USSR

GUSEV, V. A., OKSYUK, A.A., ~~FOGEL, Ya. M.~~, PILIPENKO, D. V., Physico-technical Institute, Academy of Sciences, Ukrainian SSR

"The Formation of Slow Atomic Negative Oxygen Ions in Collisions Between Fast Protons or Hydrogen Atoms and O₂ Molecules"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No 12, 1970, pp 1909-1916

Abstract: A method is developed for the investigation of processes involving the formation of negative ions in collisions between fast ions or atoms with gas molecules. The effective cross sections of the formation of O⁻ ions in collisions between 3-50 kev hydrogen ions or atoms and oxygen molecules are measured in terms of relative units. 4 figures, 16 bibliographic entries.

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USSR

UDC: 535.33:546.292

GRITSYNA, V. V., MIYAN, T. S., POGUE!, Ya. M., KOVAL', A. G., and KLIMOVSKIY, Yu. A.

"Glow of Slow Neon Particles Appearing in the Bombardment of Carbon Films by a Beam of Fast Neon Ions"

Leningrad, Optika i Spektroskopiya, Vol. 29, No. 4, 1970, pp 641-643

Abstract: This is the third paper published by the first four of the authors named above on the same subject. In the two earlier papers (ZhETF, Letters to the Editor, 9, 1969, p 212; 58, No. 5, 1970) the authors reported discovery of a glow from slow helium atoms and molecules resulting from prolonged bombardment of hard targets of Ni, Pd, Pt, Ta, and U by He⁺ ions. This paper reports experiments conducted with carbon films as the targets for beams of N⁺, Ar⁺, and Ne⁺, with a beam density of about 30 μ A/cm² and an ion energy of about 20 kev. When the N⁺ ions were used, no glow was registered for the slow nitrogen particles. There was also no glow for slow argon particles upon bombardment of the film with Ar⁺ ions. For the Ne particles, however, there was a glow, and the sole illustration in this short article shows the spectrum of this glow with a beam density of 10 μ A.

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Acc. Nr.: AP0042565

Ref. Code: UPO293
JPRS 50162

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Modeling Distribution of Solar Radiation

(Abstract: "Modeling the Distribution of Solar Radiation Energy in the Spectral Region 500-1,500 A Using a Gas-Jet Source," by E. T. Verkhovtseva, A. V. Kravchenko, V. S. Osyka and Ya. M. Fogel'; Moscow, Kosmicheskiye Issledovaniya, Vol VIII, No 1, 1970, pp 140-145)

In earlier articles (E. T. Verkhovtseva, et al., Zh. Prikl. Spektroskopii, 7, 1967, 859; Optika i Spektroskopiya, 25, No 3, 1968, 440) the authors described the design and results of testing of a source of vacuum UV radiation based on the excitation of a supersonic jet of gas flowing into a vacuum by a dense electron beam. An important characteristic of this source is that it can be introduced in a rather large solid angle into a space with a superhigh vacuum without employing a differential pumping system and without using any windows separating the light source from the space of the superhigh vacuum. This property of the gas-jet source allows its use for study of phenomena which occur in solid bodies which are in a superhigh vacuum exposed to a light flux. The gas-jet source can produce a light flux in a broad spectral range, including the near IR, visible and UV spectral regions. The energy distribution in the radiation spectrum of the gas-jet source is dependent on the type of gas, the pressure in the jet and on the energy of the exciting electrpn. The objective of this

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study was determining the operating regime of the source in which the energy distribution of the radiation in the spectral region 500-1,500 A would be close to the energy distribution of solar radiation in this same spectral range. It was found that the radiation energy distribution of a mixture of Ar + $6.5 \cdot 10^{-2}\%$ Kr + $1 \cdot 10^{-3}\%$ Xe + $1.8 \cdot 10^{-4}\%$ CH₄ is closest to the distribution of solar energy.

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F
FOGEL', Ya. M.; POLYAKOVA, G. N.; et al (Physics-Engineering Institute,
Ukrainian Academy of Sciences)

"Formation of Charged and Excited Particles during Collisions of Ions and Atoms
of Inert Gases with Hydrogen Molecules"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; April 1970; pp 1186-96

ABSTRACT: By means of mass spectroscopic methods the authors measured the effective cross sections of the formation of H_2^+ and H^+ ions occurring during collisions of 3 to 40-kev ions and atoms of He, Ne, and Ar with H_2 molecules. During collisions of 0.1 to 30-kev atoms and ions of these inert gases with H_2 molecules the effective excitation cross sections of the H_α and H_β lines of the Balmer series of hydrogen and certain spectral lines of atoms and ions of He, Ne, and Ar were measured by means of spectroscopic methods. The results of the measurements show that many curves $\sigma(v)$ (σ is the effective collision cross section, v is the relative velocity of the colliding particles) in the region of small velocities of the incident particles have maxima which cannot be explained on the basis of the Massey adiabatic criterion. The possible causes of the occurrence of these maxima are discussed.

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USSR

FOGEL, Ya. M; POLYAKOVA, G. N., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki;
April 1970, pp 1186-96

The article includes three equations and three figures. There are also two tables. Table 1 shows 11 different atomic and ionic reactions which take place. Table 2 lists the maximum velocities which occur. There are 20 references.

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1/2 020 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--STUDY OF THE PROCESS OF PURIFICATION OF MOLYBDENUM FROM CARBON
IMPURITIES BY THE METHOD OF SECONDARY ION ION EMISSION -U-
AUTHOR--(04)-KULOT, V.YA., TATUS, V.I., RIBALKO, V.F., FOGEL, YA.M.
COUNTRY OF INFO--USSR
SOURCE--UKRAINS'KII FIZICHNII ZHURNAL VOL. 15, FEB 1970, P. 266-268
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--MOLYBDENUM, OXIDATION, CARBON, CHEMICAL PURIFICATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/1394 STEP NO--UR/0185/70/015/000/0266/0268
CIRC ACCESSION NO--AP0107867
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0107867

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DESCRIPTION OF EXPERIMENTS IN WHICH A METHOD OF SECONDARY ION EMISSION DESCRIBED BY FOGEL* (1967) WAS APPLIED IN STUDYING THE PROCESS OF REMOVAL OF CARBON IMPURITIES FROM MOLYBDENUM FOIL SAMPLES AT 1900 DEG K IN OXYGEN. DECARBONIZATION OF SAMPLES WAS CONTROLLED IN THESE EXPERIMENTS BY MEASURING THE SECONDARY CARBON ION BEAMS WITH THE AID OF A MASS SPECTROMETER. THE AMOUNTS OF CARBON RETAINED BY MOLYBDENUM SAMPLES AFTER A 6 HR HEATING WERE FOUND TO BE LOW ENOUGH TO HAVE NO EFFECT ON MOLYBDENUM OXIDATION.
FACILITY: AKADEMIIA NAUK UKRAINS*KUI RSR, PIZIKO TEKHNIHNII INSTITUT, KHARKOV, UKRAINIAN SSR.

UNCLASSIFIED

1/2 035 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--EJECTIN OF SLOW EXCITED HELIUM ATOMS AND MOLECULES FROM A CARBON
FILM PRODUCED BY BOMBARDING SOLID TARGETS WITH FAST HELIUM IONS -U-
AUTHOR-(04)-GRITSINA, V.V., KIYAN, T.S., KOVAL, A.G., FOGEL, YA.M.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
NR 5, PP 1491-1496
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--ION BOMBARDMENT, HELIUM, ATOM, MOLECULE, LUMINESCENT MATERIAL,
CARBON, LUMINESCENCE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/0009

STEP NO--UR/0056/70/058/005/1491/1496

CIRC ACCESSION NO--AP0127659

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0127659

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. LUMINESCENT SLOW HELIUM ATOMS AND MOLECULES WERE OBSERVED BY BOMBARDING VARIOUS SOLID TARGETS WITH 20 KEV HE PRIME POSITIVE IONS. THIS LUMINESCENCE IS DUE TO THE SLOW HELIUM ATOMS AND MOLECULES EJECTED FROM THE CARBON FILM PRODUCED ON THE TARGET SURFACE AS A RESULT OF INTERACTION BETWEEN THE BOMBARDING BEAM IONS AND HYDROCARBON MOLECULES ADSORBED AT THE SURFACE. SOME CONSIDERATIONS PERTAINING TO THE LUMINESCENCE MECHANISM OF THE HELIUM ATOMS AND MOLECULES ARE PRESENTED. FACILITY: KHAR'KOVSKIY GOSUDARSTVENNYI UNIVERSITET IM. A. M. GOR'KOGO.

UNCLASSIFIED

1/2 040 UNCLASSIFIED PROCESSING DATE--20NOV70
 TITLE--APPLICATION OF THE METHOD OF SECONDARY ION ION EMISSION TO THE
 STUDY OF PROCESSES OCCURRING DURING THE INITIAL STAGES OF TITANIUM
 AUTHGR--(C4)-ABRAMENKOV, A.D., AZHAZHA, V.M., FDGEL, V.A.M., SHVACHKO, V.I.
 COUNTRY OF INFO--USSR
 SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, MAR. 1970, P. 519-523
 DATE PUBLISHED-----70

F

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

TOPIC TAGS--TITANIUM, MOLYBDENUM ALLOY, METAL VAPOR DEPOSITION,
 BIBLIOGRAPHY, METAL COATING, INTERMETALLIC COMPOUND, REFRACTORY METAL,
 METAL DIFFUSION, SPECTROGRAPHIC ANALYSIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--3001/0069

STEP NO--UR/0126/70/029/000/0519/0523

CIRC ACCESSION NO--AP0125904

UNCLASSIFIED

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PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0125904

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE INITIAL STAGES IN THE FORMATION OF A VAPORIZATION COATING OF TITANIUM ON MOLYBDENUM, USING SECONDARY ION ION EMISSION AND MASS SPECTRAL ANALYSIS. IT IS DEMONSTRATED THAT DURING COATING FORMATION, MOLYBDENUM ATOMS DIFFUSE FROM THE SUBSTRATE INTO THE COATING. THESE ATOMS DO NOT FORM INTERMETALLIC COMPOUNDS WITH TITANIUM. FACILITY: AKADEMIIA NAUK UKRAINSKOI SSR, FIZIKO-TEKHNICHESKII INSTITUT, KHARLOV, UKRAINIAN SSR.

UNCLASSIFIED

USSR

PISTRYAK, V. M., GNAP, A. K., KOZLOV, V. F., GARBER, R. I., FEDORENKO, A. I.,
FOGEL', Ya. M., Physico-Technical Institute, Academy of Sciences, Ukr SSSR,
Kiev.

"Distribution Profile of 30 and 100 KEV Boron Ions Intersticed in Silicon"

Leningrad, Fizika Tverdogo Tela, Vol 12, No 4, April 1970, pp 1261-1263

Abstract: Monocrystalline specimens of n-type silicon with (111) and (110) crystallographic orientations were investigated after alloying with ions of boron with energies of 30 and 100 kev in an accelerating unit with mass separations. Determination of the distribution profile of the boron ions intersticed in silicon during ion alloying was performed by a method of secondary ion-ionic emission on a mass-spectrometric device. Laminar sputtering of the specimens of ion-alloyed silicon (speed of sputtering ~ 0.0015 micron/sec) was produced by a beam of primary ions with energies of 14 kev and a current density of 0.1 ma/cm^2 . The secondary ions B_{11}^+ isolated by the magnetic analyzer were registered by an ion counter. The distribution profiles have satisfactorily narrow maxima embedded at depths of 0.3 micron (30 kev) and 0.43 micron (100 kev) for the (111) plane, and 0.33 micron (30 kev) and 0.49 micron (100 kev) for the (110) plane. The difference in the depths of the maxima of the distribution profile of the impurity at

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USSR

PISTRYAK, V. M., et al, Fizika Tverdogo Tela, Vol 12, No 4, April 1970,
pp 1281-1283

the same energies of the incident ions, but different crystallographic orientations of the targets, is explained by the better conditions of channeling of the incident particles in crystals with (111) orientations as compared with those of (111) orientations. The authors thank I. G. Gverdtsitel and A. I. Goldmashvil for the specimens submitted and for useful discussions. 1 fig. 6 ref. Received by editors 19 December 1969.

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UDC 53.07/.08+53.001.5

USSR

KUZNETSOV, V. A., NIKOLASHIN, ZH. P., FOGEL'SON, H. S.

"Obtaining and Studying Uncompensated and Structurally Complete Single Crystals of Silicon Highly Doped With Arsenic"

V sb. Kremniy i germaniy (Silicon and Germanium -- Collection of Works), No. 2, Moscow, "Metallurgiya," 1970, pp 82-84 (from RZh-Fizika, No 1, Jan 71, Abstract No 1A884)

Translation: Ge single crystals doped with As up to concentrations of $1 \cdot 10^{15}$ - $4 \cdot 10^{19}$ at/cm³ were obtained and studied. Conditions for growing and selecting the material to ensure obtaining Ge. of perfect structure with a low degree of compensation are given. The variation, with temperature, of the specific resistance and Hall coefficient and the spectra of the electron paramagnetic resonance in the temperature interval 1.7-10°K confirm the low degree of compensation and the perfection of the structure of Ge single crystals highly doped with As. Authors abstract.

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1/2 026 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--SOME FEATURES OF ESR AND SPIN LATTICE RELAXATION OF ELECTRONS IN GE
AND INSB WITH DIFFERENT DONOR CONCENTRATIONS --U-
AUTHOR--(031)-GERSHENZON, E.M., PEVIN, N.M., FOGELSON, M.S.
COUNTRY OF INFO--USSR
SOURCE--PHYSICA STATUS SOLIDI, 1970, VOL 38, NR 2, PP 865-870
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--SPIN LATTICE RELAXATION, ELECTRON, GERMANIUM, INDIUM ARSENIDE,
WAVE FUNCTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1989/0949 STEP NO--GE/0030/70/038/002/0865/0870
CIRC ACCESSION NO--AP0107478
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0107478

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONCENTRATION AND TEMPERATURE DEPENDENCE OF THE ESR LINEWIDTH IN N-GE AND N-INSB AND SPIN LATTICE RELAXATION TIMES IN GE:AS HAVE BEEN INVESTIGATED IN THE X BAND. ESR LINE NARROWING AND THE INCREASE OF THE SPIN LATTICE RELAXATION RATE WITH CONCENTRATION IN THE LOW CONCENTRATION RANGE ARE EXPLAINED BY OVERLAP OF THE DONOR ELECTRON WAVE FUNCTIONS. IN THE HIGH CONCENTRATION RANGE THE ESR DATA ARE COMPARED WITH THE THEORIES OF THE SPIN RELAXATION OF CONDUCTION ELECTRONS. FACILITY: LENIN STATE PEDAGOGICAL INSTITUTE, MOSCOW.

UNCLASSIFIED

USSR

UDC 536.46

ALESHIN, V. D., SVETLOV, B. S., FOGEL'ZANG, A. Ye., Moscow

"The Specifics of Combustion of Mixtures Consisting of Rapidly Burning Explosives"

Novosibirsk, Fizika Goreniya i Vzryva, No. 4, Dec. 70, p. 432-458.

Abstract: Combustion studies were performed using lead dinitrophenolate, with an oxygen balance of -47 and potassium perchlorate as an oxidizer. Mixed charges of fine powders were pressed at 4,000-6,000 kg/cm², then burned in a constant pressure bomb, with the nature and rate of combustion recorded by drum photography. It is found that the addition of the KClO₄ has little influence on the burning rate. The influence which it does have can be explained by assuming that the burning occurs only in the rapid-burning component, and that the KClO₄ acts solely to divide the explosive into small channels, thus decreasing the burning rate when additive particle size and concentration become sufficient to reduce the channel diameter to below the critical size.

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Explosives and Explosions

USSR

UDC: 541.127.6:126

FOGEL'ZANG, A. YE., and SVETLOV, B. S., Moscow Institute of Chemical Technology
Imeni D. I. Mendeleev, Moscow, Ministry of Higher and Secondary Specialized Edu-
cation RSFSR

"Relationship Between the Structure of Explosives and Their Combustion Rate"

Moscow, Doklady Akad. Nauk SSSR, Vol 192, No 6, Jun 70, pp 1322-1325

Abstract: Combustion of perchlorates and nitrates of aliphatic and aromatic mono- and polyamines was studied. It was shown that changing the reactivity of the oxygen containing group, the rest of the molecule being kept the same, changes the combustion rate by an order of magnitude or more, while changes in the structure of organic molecule portion exhibit a much lesser effect. For example, comparison of secondary explosives and of ballistic and pyroxylin powders with NO₂ group as the oxidizing agent showed that the combustion rate varied in the range of 3-4 times, and only when a transition was made to the perchlorates, which are quite similar by their stability and energetic characteristics to secondary explosives, an increase in the combustion rate of an order of magnitude and more was obtained.

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USSR

UDC 535.376

FCK, M. V., L'VOVA, Ye. Yu.

"Ionization Domains in Strong Fields and Motion of Luminescent Regions in Crystals"

Moscow, Izluchatel'naya Rekombinatsiya v Poluprovodnikovyykh Kristallakh (Radiation Recombination in Semiconductor Crystals), Trudy Ordena Lenina Fizicheskogo instituta imeni P. N. Lebedeva, pp 95-110

Abstract: Motion of luminescent regions at a velocity of about 0.04 cm/s was observed in manganese-activated sodium zinc germanate crystals from the cathode to the anode with the application of DC voltage. This effect is attributed to a new type of instability. The authors have given the name "ionization domains" to the regions induced by the electric field. A study is made of impact ionization in strong fields which may lead to a space charge region being developed and sustained in the crystal. Quantitative estimates made on the basis of experimentally measured values show that the field intensity in the double layer is of the order of $2 \cdot 10^6$ v/cm. The estimated effective cross section of donor ionization is of the order of $3 \cdot 10^{-14}$ cm².

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USSR

UDC 535.37

GOLUBEVA, N. P. and FOK, M. V.

"The Role of Oxygen in the Luminescence of Unactivated ZnS"

Minsk, Zhurnal Prikladnoy Spektroskopii, November 1973, pp 851-857

Abstract: This paper is the continuation of an earlier article by the authors named above and published in the same journal (17, 1972, p 261). In the earlier article, it was shown that in calcined and uncontaminated ZnS oxygen exists almost constantly as a result of the thermodynamics of the ZnS-ZnO system. The purpose of the present paper is to investigate the ultraviolet luminescence of ZnS and its connection with the oxygen. The authors find two-layered luminophores with an oxidized layer formed on a surface of ZnS crystals convenient for studying the role of ZnS oxidation in luminescence. In these experiments the luminescence spectra were measured by cathode excitation at 77°K, with the luminophores excited by a motionless beam with an accelerating voltage of 6 and 21 kev and the depth of penetration of the electrons amounting to 0.15 and 1.8 μ respectively. Curves of the spectra are given as functions of the degree of oxidation, and there is a table of luminescence intensity values for 1/2

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GOLUBEVA, N. P. and FOK, M. V., Zhurnal Prikladnoy Spektroskopii, November 1973, pp 851-857

various penetration depths of the exciting electrons. The authors find that oxygen plays a multiple role in the ZnS luminescence phenomenon. They express their gratitude to N. A. Gorbacheva for preparing the ZnS monocrystals, to A. A. Cherepnev for discussing the results, and to G. I. Vorob'yev and G. T. Kudel'kin for their assistance with the experimentation.

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UDC 535.37

USSR

ARKHANGEL'SKIY, G. Ye., GORBACHEVA, N. A., FOK, M. V.

"Influence of Lattice Structure on Luminescence and Electron Paramagnetic Resonance of Europium-Activated Zinc Sulfide"

Moscow, Zhurnal Prikladnoy Spektroskopii, Vol 19, No 3, Sep 73, pp 460-463

Abstract: It is shown that the emission spectrum of europium in cubic and hexagonal ZnS-Eu consists of four elementary bands, two of which ($h\nu_{\max}=1.75$ and 1.90 eV) occur in the spectrum of both phases. Investigation of the EPR spectra showed that europium is in the bivalent state and that a high concentration of the dopant favors formation of the cubic modification of zinc sulfide. The variation, with concentration, is found for the intensity ratio of bands $h\nu_{\max}=1.75$ and 1.90 eV in the hexagonal and cubic phases. The authors thank A. F. Nalgranyan, L. M. Tsyganova, and A. G. Glyadelkina for assisting in the work.

1/1

USSR

UDC: 621.371.1

FOK, V. A.

"Problems of Diffraction and Propagation of Electromagnetic Waves"

Moscow, Problemy difraktsii i rasprostraneniya elektromagnitnykh voln (cf. English above), "Sov. radio", 1970, 517 pp, ill. 2 r. 47 k. (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A234 K)

Translation: The first part of the monograph develops an asymptotic theory of diffraction based on the author's principle of the local field in the penumbral region on the surface of a conductive convex body. Reflection formulas are generalized to the case of reflection of an arbitrary wave from a surface of arbitrary shape. The second part deals with problems of propagation of radio waves in a homogeneous and in a nonhomogeneous atmosphere with regard to diffraction around the earth, including propagation in a nonhomogeneous atmosphere for an elevated source, and propagation through the tropospheric waveguide close to the earth. In the appendix, the author develops a theory of integral equations and presents tables of Airy functions, and also tables of auxiliary functions for computing current distribution. Forty-three illustrations, sixteen tables, bibliography of forty-four titles.

L. K.

1/1

- 55 -

PROCESSING DATE--20NOV70

1/2 020 UNCLASSIFIED
TITLE--FAMILIAL NEPHRITIS IN CHILDREN -U-

AUTHOR--(04)-IGNATOVA, N.S., BRISKINA, M.P., FOKEYEVA, V.V., ARTEMKINA,
L.N.

COUNTRY OF INFO--USSR

SOURCE--PEDIATRIYA 49(2): 8-13. ILLUS. 1970

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--PEDIATRICS, NEPHRITIS, AUDITION, HEREDITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3007/0342

STEP NO--UR/0546/70/049/002/0008/0013

CIRC ACCESSION NO--AP0135835
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0135835
ABSTRACT/EXTRACT--(U) GP-G-

ABSTRACT. A TOTAL OF 29 CHILDREN OUT OF 18 WITH FAMILIAL NATURE OF NEPHRITIS WERE OBSERVED. ALL THE PATIENTS WERE DIVIDED INTO THE FOLLOWING GROUPS: THE 1ST GROUP INCLUDED 7 CHILDREN OUT OF 4 FAMILIES IN WHOM THE DISEASE WAS CHARACTERIZED BY A DIFFERENT DEGREE OF THE NEPHROTIC SYNDROME MARKEDNESS; THE 2ND GROUP INCLUDED 22 CHILDREN FROM 15 FAMILIES IN WHOM STABLE HEMATURIA WAS ONE OF THE MAIN CLINICAL MANIFESTATIONS. IN 4 CHILDREN HEAMTURIA WAS COMBINED WITH DEFECTIVE EFARING, I.E. ALPORT'S SYNDROME WAS MARKED. THE DISEASE RAN A MORE SEVERE COURSE IN MALE PATIENTS, THE SEVERITY GREW WITH AGE AND WAS APPARENTLY DUE TO THE DEVELOPMENT OF ENPHROSCLEROSIS. THE DATA ARE GIVEN OF THE CLINICO GENETIC ANALYSIS REVEALING NUMEROUS CASES OF NEPHROPATHY IN SOME FAMILIES. POSSIBLE MECHANISMS OF GENETIC HEREDITY OF FAMILIAL NEPHROPATHY ARE DISCUSSED. FACILITY: DEP. PEDIAT., CENT. INST. POSTGRAD. MED., MOSCOW, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--CALCULATION AND EVALUATION OF THE PROPERTIES OF FOCUSING
COLLIMATORS -U-
AUTHOR--(03)-PAVLOV, V.G., FOKHT, A.S., ZUBOVSKIY, G.A.
COUNTRY OF INFO--USSR **F**
SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 6, PP 78-82
DATE PUBLISHED-----70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--COLLIMATOR, DIAGNOSTIC EQUIPMENT, RADIOACTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3002/1513 STEP NO--UR/0241/70/015/006/007&/0082
CIRC ACCESSION NO--AP0128908
UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0128908
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS PROPOSE A METHOD OF
CALCULATION AND QUANTITATIVE EVALUATION OF FOCUSING COLLIMATORS,
CALCULATIONS OF THE REALATION BETWEEN FOCUS CONTRASTNESS AND ITS DEPTH
ARE GIVEN. THE CALCULATION DATA WERE COMPARED WITH EXPERIMENTAL ONES.
THE ERROR IN CALCULATION OF THE FOCUS CONTRASTNESS MAY REACH 15PERCENT.
THE REFERRED TO TECHNIQUE IS PROPOSED FOR RADIODIAGNOSTIC
INVESTIGATIONS. FACILITY: MOSKOVSKIY NAUCHNO-ISSLED.
RENTGENO-RADIOLOGICHESKIY INSTITUT MZ RSFSR.

UNCLASSIFIED

1/2 030 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--THE INFLUENCE OF THE FACTOR OF DYNAMIC NONSHARPNESS ON THE
SCANNUGRAPHIC INFORMATION -U-
AUTHOR--(04)-ZUBOVSKIY, G.A., PAVLOV, V.G., FOKHT, A.S., KASATKIN, YU.N.
COUNTRY OF INFO--USSR
SOURCE--MEDITSINSKAYA RADIOLOGIYA, 1970, VOL 15, NR 6, PP 41-49
DATE PUBLISHED--70
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--RADIOGRAPHY, LIVER, LUNG, HEART, IMAGE CONTRAST
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3003/1025 STEP NO--UR/0241/70/015/006/0041/0049
CIRC ACCESSION NO--AP0130060
UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0130060

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS DISCUSS THE INFLUENCE OF THE FACTOR OF DYNAMIC NONSHARPNESS, WHICH OCCURS DURING SCANOGRAPHIC INVESTIGATION OF THE LIVER, LUNGS AND HEART IN THE PROCESS OF THEIR NORMAL ACTIVITY, ON THE ACCURACY OF THE IMAGE OBTAINED. IT WAS FOUND THAT THE REFERRED TO FACTOR DECREASES THE RESOLVING CAPACITY OF SCANNING AND STATISTICAL SIGNIFICANCE OF REGISTRATION. METHODS OF CORRECTING THIS FACTORS ARE PROPOSED. BEST RESULTS WERE OBTAINED WITH THE USE OF A GAMMACHAMBER, PROVIDED THE DURATION OF EXPOSITION IS NOT OVER THE TIME OF POSSIBLE BREATHING RETENTION, I. E. NOT MORE THAN 30 SECONDS. FACILITY: MOSKOVSKIY NAUCHNO-ISSLED. RENTGENO-RADIOLOGICHESKIY INSTITUT MZ RSFSR.

UNCLASSIFIED

USSR

UDC 547.446+547.447

~~FOKIN, A. F.~~, KOMAROV, V. A., DAVYDOVA, S. M., FROSINA, K. V., and ABDULGANIYEVA, Kh. A.

"Preparation of Difluoronitroketones"

Leningrad, Zhurnal Organicheskoy Khimii, Vol 7, No 6, Jun 71, pp 1165-1167

Abstract: The difluoronitroalcohols (I) were prepared by reacting difluoronitromethane with aldehydes in the presence of $K_2CO_3:O_2NCHF_2 + RCOH$. By oxidizing compounds I with chromic acid, the difluoronitroketones $O_2NCF_2C(=O)R$ (II; R = Me, Et, Pr, Ph) were obtained. The difluoronitroketones were distillable colorless liquids. As distinguished from nitroperfluoroacetone, the only fluoronitroketone known hitherto, which does not form either a semicarbazone or 2,4-dinitrophenylhydrazone, II (R = Me) formed a 2,4-dinitrophenylhydrazone (m. p. 122°). II (R = Me), on which the reactions of the CO group of compounds II were studied, formed a cyanohydrin (m. p. 38°, b. 73°/6 mm) on being acted upon by HCN in the presence of NaCN. Bromination of II (R = Me) in concentrated H_2SO_4 yielded the monobromopropanone $O_2NCF_2C(=O)CH_2Br$ and the dibromopropanone $O_2NCF_2C(=O)CHBr_2$. The properties of the new compounds that have been prepared are listed. The yields of II in the preparation from I were 51-85%.

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USSR

UDC 539.32+518.6

FOKIN, A. G., Moscow

"The Use of the Singular Approximation in the Solution of Problems of the Statistical Theory of Elasticity"

Zhurnal Prikladnoy Mekhaniki i Tekhnicheskoy Fiziki, No 1, 1972, pp 98-102.

Abstract: A method is developed for calculation of elastic fields and the effective moduli of microheterogeneous solids, within the framework of the theory of random fields. The solution is presented as an operator series, each term of which is based on the formal component of the second derivative of the Green tensor of the equilibrium equations. The zero approximation of this series considers the local portion of interactions between heterogeneity grains. The capabilities of the method are illustrated using the example of an isotropic mixture of two isotropic components. The article develops a single approach to the solution of the problem of describing heterogeneities of an elastic system, satisfying the equations of equilibrium. It can be extended to solution of other problems without particular difficulty. Other problems which can be solved by this method are suggested in an earlier work [Bolotin, V. V., Noskalenko, V. N., "Calculation of Macroscopic Constants of Strongly Isotropic Composite Materials," Izv. AN SSSR, MIT, No 3, 1969].

1/1

1/2 036 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--INTERGRANULAR THERMAL RELAXATION IN HETEROGENEOUS MEDIA -U-
AUTHOR-(02)-FOKIN, A.G., SHERMERGER, T.D. F
COUNTRY OF INFO--USSR
SOURCE--KIEV, AN UKR SSR, PRIKLADNAYA MEKHANIKA, VOL 6, NO 1, 1970, PP
10-16
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--THERMOELASTICITY, STRESS RELAXATION, INTERNAL FRICTION,
POLYCRYSTAL, CRYSTAL DEFORMATION, CALCULATION, YIELD STRESS, THERMAL
EXPANSION, THERMAL CONDUCTIVITY
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1987/0245 STEP NO--UR/0198/70/006/001/0010/0016
CIRC ACCESSION NO--AP0103903
UNCLASSIFIED

2/2 036

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0103903
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE SYSTEM OF THERMOELASTICITY EQUATIONS IN TERMS OF STRESSES AND STRAINS IS USED IN DETERMINING THE EFFECTIVE VALUES OF THE YIELD, THERMAL EXPANSION, AND THERMAL CONDUCTIVITY AND CAPACITY TENSORS. THESE EFFECTIVE VALUES CONTAIN QUASI-STATIC CORRELATION CORRECTIONS, AS WELL AS FREQUENCY DEPENDENT DYNAMIC CORRELATION ADDITIONS. THE RESULTS OBTAINED ARE USED IN DETERMINING THE INTERCRYSTALLINE THERMOELASTIC FRICTION CAUSED BY THERMAL FLUXES BETWEEN DIFFERENTLY DEFORMED CRYSTALS OF COMPOSITE NONTEXTURED MATERIALS. IT IS SHOWN BY NUMERICAL CALCULATIONS THAT THIS METHOD GIVES INTERNAL FRICTION VALUES WHICH ARE HIGHER THAN THOSE OBTAINED BY USING A DIFFERENT APPROACH. A COMPARISON OF THEORETICAL RESULTS WITH EXPERIMENTAL DATA FOR POLYCRYSTALLINE MATERIALS SHOWS THAT IN MANY CASES BETTER RESULTS ARE OBTAINED IF THE KARMAN CORRELATION FUNCTION IS USED.

UNCLASSIFIED

USSR

F
UDC 539.389

FOKIN, A. G. and SHERMERCOR, T. D. (Moscow)

"Intergranular Thermal Relaxation in Heterogeneous Media"

Kiev, AN UkrSSR, Prikladnaya mekhanika, Vol 6, No 1, 1970, pp 10-16

Abstract: The system of thermoelasticity equations in terms of stresses and strains is used in determining the effective values of the yield, thermal expansion, and thermal conductivity and capacity tensors. These effective values contain quasi-static correlation corrections, as well as frequency-dependent dynamic correlation additions. The results obtained are used in determining the intercrystalline thermoelastic friction caused by thermal fluxes between differently deformed crystals of composite non-textured materials. It is shown by numerical calculations that this method gives internal-friction values which are higher than those obtained by using a different approach. A comparison of theoretical results with experimental data for polycrystalline materials shows that in many cases better results are obtained if the Karman correlation function is used. Orig. art. has: 1 figure, 30 formulas and 10 references.

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USSR

UDC 541.6:541.57:547.1'118

LANDAU, M. A., FOKIN, A. V., KABANKIN, A. S.

"Quantum Chemical Calculations of Some Compounds of Tetra and Pentacoordinate Phosphorus by the CNDO Method"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, 1973, pp 2486-2490

Abstract: The CNDO method with the parameters described by J. A. Pople, et al., [*J. Chem. Phys.*, No 43, 136, 1965; No 44, 3289, 1966; No 47, 158, 1967; *J. Amer. Chem. Soc.*, No 90, 3309, 1968] was used to calculate 6 molecules of 4-coordinate phosphorus for which the geometric characteristics have been experimentally determined: $P(O)HF_2$, $PO(CH_3)_3$, $P(O)(OH)(CH_3)_2$, $P(O)(NH_2)_3$ and also $P(O)F_3$ and $P(O)(OH)_3$. For the last two molecules in the preceding calculations inexact geometric parameters were used and data were not presented on the populations of the individual atomic orbitals which are used in the present paper to calculate the paramagnetic component of the magnetic shielding constant of the ^{31}P nucleus. In the case of the $P(O)(NH_2)_3$ special attention was given to the fact that according to the x-ray diffraction data [G. L. Butlen, et al., *J. Chem. Soc., A*, 1804, 1969], one of the P-N bonds is 0.01 Å shorter than the $1/3$

USSR

LANDAU, M. A., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 11, 1973, pp 2486-2490

other two. Five molecules of 5-coordinate phosphorus having trigonal-bipyramidal structure were also calculated. In the calculation the actual configuration was used taking into account the deviation in certain cases of the $F_e PF_a$ angle from 90° (F_e denotes the equatorial fluorine atom in the trigonal bipyramid, and F_a , the axial fluorine atom): HPF_4 , CH_3PF_4 , $(CH_3)_2PF_3$, PF_5 and $(CH_3)_3PF_3$. Tabulated data are presented showing the results of calculating the POF_3 molecule by the CNDO method compared with the results of the nonempirical calculations. The relative variation of the charges of the different atoms in the molecule calculated by both methods has the same nature. The calculated charges of the atoms, the dipole moments and energies of the boundary orbitals of the 4 and 5-coordinate phosphorus molecules are also tabulated. In the case of fluorophosphoranes, consideration of the d-orbitals of phosphorus leads to better comparison of the calculated dipole moments with their experimental values.

The quantum chemical calculation of the six 4-coordinate phosphorus

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USSR

LANDAU, M. A., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya,
No 11, 1973, pp 2486-2490

molecules and five 5-coordinate phosphorus molecules revealed individual
details about the mechanism of certain reactions of these compound sand the
variation of their reactivity.

3/3

Nitrogen Compounds

- USSR

UDC 632.95

FOXIN, A. V., KOLOMIYETS, A. F., STUDNEV, YU. N., and RAPKIN, A. I.

"Process for the Preparation of the β -Rhodanine Ethyl Esters of Carboxylic Acids"

USSR Author's Certificate No 350-783, filed 30 Jul 70, published 20 Sep 72 (from Referativnyy Zhurnal -- Khimiya, No 11(II), 1973, Abstract No 11N579P by T. A. Belyayeva)

Translation: A process is described for the preparation of the β -rhodanine ethyl esters of carboxylic acids by the reaction of trimethyl- β -rhodane-thoxysilane (I) with an acyl halide at 0-120° in an organic solvent. For example, 7.2 g of FClCHCOCl are added 8.8 g of (I), heated with the simultaneous distilling of tri-methylchlorosilane and yielding 9.6 g of the β -rhodanine ethyl ether of fluorochloroacetic acid. The boiling point is 109-110°C/1 mm, the n_{20}^D is 1.4821, d_4^{20} is 1.4180. 5.4 g of the trimethylchlorosilane is added to a suspension of 5.3 g of KSCN in 35 ml of acetone, stirred at about 20° for two hours, to which is added 2.6 g of ethylene oxide. The reaction mixture is allowed to sit for 1 hour; the excess ethylene oxide is removed; the mixture is filtered and 6.3 g of $\text{KClCH}_2\text{COCl}$ is added to the filtrate. It is then allowed to sit for 1 hour at 20°. 8.3 g of the β -rodane
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USSR

FOKIN, A. V., et al., USSR Author's Certificate No 350783, filed 30 Jul 70, published 20 Sep 72

ethyl ethers of monochloroacetic acid is separated. The product has a boiling point of 119° at 1 mm, n_D^{20} of 1.5125 and a d_4^{20} of 1.3857. The following compounds were also prepared. The numbers given are the boiling point in $^{\circ}\text{C}/\text{mm}$ or the freezing point in $^{\circ}\text{C}$, the n_D^{20} , and d_4^{20} ; $\text{MeC(O)CH}_2\text{CH}_2\text{SCN}$, 72 - 3/1, 1.4765, 1.1891; $2,4\text{-Cl}_2\text{C}_6\text{H}_3\text{OCH}_2\text{C(O)OCH}_2\text{SCH}$, 35 - 6, -, -; $\text{CCl}_3\text{C(O)OCH}_2\text{CH}_2\text{SCN}$, 44 - 5, -, -; $\text{CF}_3\text{C(O)OCH}_2\text{CH}_2\text{SCN}$, 93 - 4/9, 1.4174, 1.4160; $\text{CF}_3\text{CF}_2\text{CF}_2\text{C(O)OCH}_2\text{CH}_2\text{SCN}$, 84 - 5, -, -; and $\text{PhC(O)OCH}_2\text{CH}_2\text{SCN}$, 137 - 8/1, 1.5631, 1.1960.

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USSR

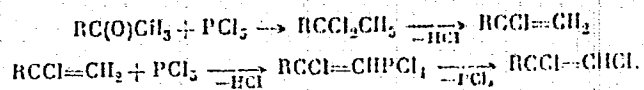
UDC 547.341

FOKIN, A. V., KOLOMIYETS, A. F., and SECHENNIKOV, V. S.

"Reactions of Phosphorus Pentachloride With Ketones"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), Vyp 4, 1972, pp 801-802

Abstract: The reaction of PCl_5 with ketones forms 2-(chloroalkenyl) phosphorotetrachlorides in addition to the gem-dichloroalkanes and chloroalkanes. The yield of the former can be increased with an excess of PCl_5 ; the yield of the latter two is increased somewhat by increasing the temperature and reaction time. Thus, in these reactions, the phosphorylation of the chloroalkene is the first step in the secondary rearrangement. The reactions in the PCl_5 -ketone system may be outlined as follows:



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USSR

UDC 547.27+547.562

FOKIN, A. V., KOLOMIYETS, A. F., SHCHENNIKOV, V. S., and STUDNEV, Yu. N.

"Reactions of 2-Aryl(Alkyl)thioethanols With Phosphoric Acid"

Leningrad, Zhurnal Organicheskoy Khimii, Vol 7, No 7, Jul 71, pp 1406-1407

Abstract: Reacting phosphoric acid with 2-aryl and 2-alkylthioethanols in solutions produces good yields of respective simple ethers. A mixture of 0.1 g-mole of aryl or alkylthioethanol, 50 ml toluene or xylene, and 0.5 g of anhydrous phosphoric acid is refluxed under a Dean-Stark trap as long as water is being produced. The reaction mixture is then cooled, dissolved in 50 ml benzene, washed with sodium carbonate until neutral, dried and vacuum distilled to yield the desired products.

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1/2 021 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--SYNTHESIZING ORGANIC DIFLUORAMINES -U-
AUTHOR--(02)-FOKIN, A.V., KOSYREV, YU.M.
COUNTRY OF INFO--USSR
SOURCE--ZH. VSES. KHIM. ODSHCHEST. 1970, 15(1) 81-91
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--FLUORINATED ORGANIC COMPOUND, FLUORINE, AMINE, CHEMICAL
SYNTHESIS, FLUORINATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/1579 STEP NO--UR/0063/70/015/001/0001/0091
CIRC ACCESSION NO--AP0112573
UNCLASSIFIED

2/2 021

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0112573

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A REVIEW THROUGH 1968 OF
FLUORINATION IN POLAR SOLVENTS AND DIFLUOROAMINATION WITH N SUB2 F SUB4,
HNF SUB2, AND CLNF SUB2, WITH 161 REFS.

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0135138

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FOLLOWING WERE PREPD. FROM CARBONYL COMPODS. AND HNF SUB2 IN CH SUB2 CL SUB2 AT MINUS 40DEGREES TO MINUS 70DEGREES, AS ADDUCTS OF THE GENERAL TYPE R SUB2 C(OH)NF SUB2 (R SUB2 SHOWN): ME SUB2; ME, ET; ME, H; ET, H; PR, H; ALSO THE ADDUCT OF ET SUB2 O WITH HNF SUB2. ALL THESE WERE DETECTED IN THE SOLN. BY PROTON NMR SPECTRA, WHICH WERE DESCRIBED. ALTHOUGH THE FORMAL STRUCTURES OF THE ADDUCTS ARE UNCERTAIN, THE LIKELY PRECURSORS TO THE ABOVE LISTED DIFLUOROAMINO ALCS. ARE ADDUCTS OF GENERAL TYPE R SUB2 CO.HNF SUB2 BONDED BY A FORM OF H BOND BETWEEN THE CARBONYL O AND THE N ATOM. INITIAL MIXING OF THE REACTANTS RESULTS IN A PROGRESSIVE SHIFT OF THE TRIPLET SIGNAL OF THE HNF SUB2 PROTON TOWARD WEAKER FIELDS; FOR MANY MIN. THE INTENSITY AND FORM OF THE SIGNAL HNF SUB2 REMAIN UNCHANGED, BUT ON LONGER EXPOSURE, AND ESP. AT ROOM TEMP., AN IRREVERSIBLE AND COMPLETE DISAPPEARANCE OF THE HNF SUB2 SIGNAL TAKES PLACE, ALONG WITH APPEARANCE OF A NEW SIGNAL FROM THE HYDROXYL PROTON IN THE DIFLUOROAMINO ALC. PRODUCT. WITH EQUIMOLAR PROPORTION OF REACTANTS, THE INITIAL SHIFT OF THE PROTON SIGNAL OF HNF SUB2 AMTS. TO AS MUCH AS 1-1.5 PPM.

UNCLASSIFIED

1/2 027 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--REACTION OF TETRAFLUOROHYDRAZINE AND NITRIC OXIDE WITH OLEFINS -U-
AUTHOR--(04)-FOKIN, A.V., ZIMIN, V.I., STUDNEV, YU.N., KOROTKOV, V.F.
COUNTRY OF INFO--USSR
SOURCE--ZH. ORG. KHIM. 1970, 6(4), 880-1
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CONDENSATION REACTION, NITRIC OXIDE, HIGH PRESSURE EFFECT,
OLEFIN RESIN, TETRAFLUOROHYDRAZINE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--2000/2157 STEP NO--UR/0366/70/006/004/0880/0881
CIRC ACCESSION NO--AP0125740
UNCLASSIFIED

2/2 027

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NU--AP0125740

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONDENSATION OF RCH:CHR PRIME1 WITH F SUB2 NNF SUB2-NO MIXT. UNDER PRESSURE GAVE A MIXT. OF F SUB2 NCHRCHR PRIME1 NF SUB2, F SUB2 NCHRCHR PRIME1 N(:O)NF, AND FCHRCHR RPIME1 N(:O)NF (R AND R PRIME1 GIVEN): H, H; AND H, BU. THE PRESENCE OF NO ACCELERATES THE REACTION. WITHOUT NO THE REACTION REQUIRES HIGHER TEMPS. AND PRESSURES.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--TRIS, DIFLUORAMINO, FLUOROMETHANE -U-
AUTHOR--(04)-FOKIN, A.V., GALAKHOV, V.S., RADCHENKO, V.P., DAVYDOV, A.V.
COUNTRY OF INFO--USSR F
SOURCE--U.S.S.R. 266,758
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED--01APR 70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CHEMICAL PATENT, CHEMICAL SYNTHESIS, METHANE, AMINE
DERIVATIVE, GUANIDINE, FLUORINATED ORGANIC COMPOUND
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3004/1740 STEP NO--UR/0482/70/000/000/0000/0000
CIRC ACCESSION NO--AA0132006

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AA0132006

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TRIS(DIFLUORODIAMINO)FLUOROMETHANE (I) WAS PREPD. BY TREATING GUANIDINE DERIVS. WITH FREE F₂, DILD. WITH AN INERT GAS, DURING COOLING FROM PLUS 30 TO MINUS 60DEGREES. INORG. SALTS OF GUANIDINE WERE USED TO INCREASE THE YIELD OF I.

UNCLASSIFIED

1/2 001 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--N,ALKYL,N,CYCLHEXYLPIPERIDINIUM IODIDES -U-
AUTHOR--(03)-TIMOFEYENKO, I.A., FOKIN, A.V., KIRILLOV, N.V.
COUNTRY OF INFO--USSR
SOURCE--Zh. OBSHCH. KHIM. 1970, 40(4), 941. F
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--IODINATED ORGANIC COMPOUND, PIPERIDINE, ALKYLATION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3006/1371 STEP NO--UR/0079/70/040/004/0941/0941
CIRC ACCESSION NO--AP0135045
UNCLASSIFIED

2/2 007

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0135045

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. ALKYLATION OF
N,CYCLOHEXYLPIPERIDINE WITH ALKYL IODIDES RESULTED IN MUCH TAR AND GAVE
BUT 40-70 PERCENT QUATERNARY SALTS IN 15-16 HR AT 135-140 DEGREES IN
AUTOCLAVE WITHOUT A SOLVENT. IN MECH, TAR FORMATION WAS REDUCED AND THE
REACTION REQUIRED ONLY 5 HR TO YIELD 85 PERCENT
N,ALKYL,N,CYCLOHEXYLPIPERIDINIUM IODIDES (ALKYL SHOWN): HEPTYL, M.
96-8 DEGREES; DECYL, M. 104-5 DEGREES.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--MECHANISM OF THE REACTION OF DIFLUOROAMINE WITH CARBONYL COMPOUNDS
-U-
AUTHOR--(04)-FOKIN, A.V., KOSYREV, YU.M., GALAKHOV, I.V., RAGULIN, L.I.
COUNTRY OF INFO--USSR
SOURCE--DDKL. AKAD. NAUK SSSR 1970, 192(1), 111-14
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--CHEMICAL REACTION MECHANISM, FLUORINATED ORGANIC COMPOUND,
AMINE, NITROGEN FLUORIDE, CARBONYL RADICAL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3004/1863 STEP NO--UR/0020/70/192/001/0111/0114
CIRC ACCESSION NO--AT0132125
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AT0132125

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. KINETIC CURVES FOR THE REACTION OF HNF SUB 2 WITH ME SUB 2 CO TO GIVE ME SUB 2 C(NF SUB2)OH WERE SHOWN. IT WAS CONCLUDED THAT DESPITE A SUPERFICIAL RESEMBLANCE TO CYANOHYDRIN FORMATION, THIS REACTION DIFFERS FROM IT. THE REACTION OF HNF SUB 2 PROCEEDS BY AN ELECTROPHILIC MECHANISM, OWING TO THE ACTIVITY OF THE UNSHARED ELECTRON PAIR AT THE CARBONYL O ATOM. THIS IS CONFIRMED BY THE INERTNESS OF (CF SUB3) SUB 2CO IN THIS REACTION, AND ITS HIGH ACTIVITY IN CYANOHYDRIN FORMATION. A REACTION SCHEME WAS SHOWN.

UNCLASSIFIED

USSR

UDC 542.91+669.2./8

NIKOLAYEV, A. V., Academician, and FOKIN, A. V., Corresponding Member of the Academy of Sciences USSR

"Direction of the Synthesis of Extractants for Nonferrous Metallurgy"

Moscow, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva imeni D. I. Mendeleev, Vol 15, No 4, 1970, pp 364-369

Abstract: An analysis is made of the advantages of extraction processes and the properties of organic substances used as extractants. The possibility of modifying extractants by changing their chemical structure is shown and qualities (selectivity, low solubility, chemical stability, low cost, easy regeneration, etc.) are determined which the extractant should possess for effective commercial use. A dependence is shown between the extracting ability of a substance and its solubility and stability, on the one hand, and the price of the recovered metal, and the prospects of reprocessing low-concentration solutions by producing inexpensive extractants with low solubility on the other hand. An analysis is made of the loss of extractants, consideration is given to the economic feasibility of their use for the recovery of metals of different concentration. Measures are presented for the reduction of the cost of extractants through use of raw materials from wastes of the chemical, petroleum, and wood chemical industries.

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USSR

NIKOLAYEV, A. V., et al, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva imeni
D. I. Mendeleev, Vol 15, No 4, 1970, pp 364-369

A price table of the more important extractants is given, and methods are pro-
sented for a systematic synthesis of new extractants for primary metals.

2/2

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1/2 025 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--REACTION OF TETRAFLUROHYDRAZINE WITH UNSATURATED NITRO COMPOUNDS
-U-
AUTHOR--(04)-~~FOKIN~~, A.V., NIKOLAYEVA, A.D., STUDNEV, YU.N., PROSHIN, N.A.
COUNTRY OF INFO--USSR F
SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (3), 717-18
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--FLUORONITRO COMPOUND, FLUORINATED ORGANIC COMPOUND, HYDRAZINE
COMPOUND, ORGANIC NITRO COMPOUND, CHEMICAL SYNTHESIS, CHEMICAL REACTION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/1881 STEP NO--UR/0062/70/000/003/0717/0718
CIRC ACCESSION NO--AP0123669
UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123669

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PASSING N SUB2 F SUB4 35 HR INTO
7.5 G 2,2,DINITRO,4,PENTENE IN MECN AT 70DEGREES UNDER N GAVE
36.4PERCENT F SUB2 NCH SUB2 CRR PRIME1 NF SUB2 (I) (R EQUALS H, R PRIME1
EQUALS CH SUB2 CME(NO SUB2) 2), B SUBO.008 46-8DEGREES, N PRIME20 SUBO
1.4512, D PRIME20 1.52. SIMILARLY WERE PREPD. THE FOLLOWING I (R AND R
PRIME1 SHOWN): H, CH SUB2 NO SUB2, B SUBO.04 47DEGREES, N PRIME20 SUBO
1.4403; ME, CH SUB2 NO SUB2, B SUBO.01 50DEGREES, 1.4780; H, CH SUB2
CF(NO SUB2) SUB2, B SUBO.1 65DEGREES 1.4416; H, CH SUB2 CH SUB2 CF(NO
SUB2) SUB2, B SUBO.003 56DEGREES, 1.4513; H, CME(NO SUB2) SUB2, B
SUBO.001 36DEGREES, 1.4380; AND ME, CH SUB2 CME(NO SUB2) SUB2, B
SUBO.001 64DEGREES, 1.4811. THE PRODUCTS WERE RATHER REACTIVE AND
UNSTABLE LIQS. ONLY MINDR DECOMP. TOOK PLACE UNDER THE ABOVE
CONDITIONS.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--REACTION OF TETRAFLUROHYDRAZINE WITH OXIMES -U-

AUTHOR--(04)-FOKIN, A.V., ZIMIN, V.I., STUDNEV, YU.N., PUNSOV, M.A.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (3), 719-20

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--OXIME, HYDRAZINE COMPOUND, PYRIDINE, FREON, FLUORONITRO
COMPOUND, FLUORINATED ORGANIC COMPOUND, CHEMICAL SYNTHESIS, CHEMICAL
REACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1999/1882

STEP NO--UR/0062/70/000/003/0719/0720

CIRC ACCESSION NO--AP0123670

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0123670

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. PASSING N SUB2 F SUB4 7-8 HR AT 80DEGREES INTO 10.6 ACETOXIME AND 9.6 G PYRIDINE IN FREON 112 GAVE AFTER TREATING THE PRODUCT WITH AQ. HCL 35PERCENT ME SUB2 C(NF SUB2) N(O): NF, B SUB30 54DEGREES, N PRIME20 SUB0, 1.3950, D PRIME20 1.325. N SUB2 F SUB4 PASSED AT 0DEGREES INTO RHO,HOC SUB6 H SUB4 NO IN CHCL SUB3 GAVE 30PERCENT RHO,HOC SUB6 H SUB4 N(O): NF, M. 83-4DEGREES, WHICH WITH ACCL GAVE IN 16 HRS. REFLUXING 45PERCENT ACETATE, M. 55-60DEGREES, B SUB1 101DEGREES. SIMILARLY WAS PREPD. MEETC(NF SUB2) N (O):NF. ONLY IN THE PRESENCE OF PYRIDINE WAS IT POSSIBLE TO ISULATE N FLUORO DERIVS. FROM SUCH A REACTION. WHEN N SUB2 F SUB4 WAS PASSED INTO DIMETHYLGLYOXIME IN THE 4-5 HR AT 60-50DEGREES, REMOVAL OF THE SOLVENT GAVE A RATHER UNSTABLE YELLOWISH LIQ., WHICH ON BEING HEATED EVOLVED N OXIDES BUT WHOSE CHEM. COMPN. SUGGESTED THE STRUCTURE (MECN(O): NF) SUB2.

UNCLASSIFIED

USSR

UDC 547.26'118

MAKLYAYEV, F. L., KIRILLOV, N. V., FOKIN, A. V., and RUDNITSKAYA, L. S.

"Synthesis of Phosphonocarboxylic Acid Esters With Unlike Radicals"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 5, May 70, pp 1014-1015

Abstract: The authors synthesized previously undescribed representatives of phosphonocarboxylic acid esters with unlike alkoxy radicals at the phosphorus by the addition of dialkyl phosphites with unlike radicals to esters of α, β -unsaturated carboxylic acids in the presence of sodium methylate.

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USSR

UDC 547.822.4

TIMOFEYENKO, I. A., FOKIN, A. V., and KIRILLOV, N. V.

"N-Alkyl-N-cyclohexylpiperidinium Iodides"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 4, Apr 70, p 941

Abstract: The authors attempted to obtain representatives of N-alkyl-N-cyclohexylpiperidinium iodides ($R=C_7-C_{10}$) by the usual method -- alkylation reaction of tertiary alcohols of cyclic structure with alkyl iodides. Corresponding quaternary salts were obtained, but the process proceeded with significant resinification, and the yield of quaternary salts was not over 40-47 percent. The reaction was staged in an autoclave at 135-140° without a solvent, reaction time 15-16 hours. Experiments using the synthesis of N-heptyl- and N-decyl-N-cyclohexylpiperidinium iodides as an example showed that if this reaction is staged in acetonitrile, there is a sharp decrease in the formation of resinous products and in the reaction time to five hours, with an increase in the yield of iodides to 83-85 percent.

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1/2 008 UNCLASSIFIED PROCESSING DATE--11SEP70
TITLE--O-ACYLATION OF PHENOL WITH CARBOXYLIC ACIDS -U-
AUTHOR--FOKIN, A.V., KOLOMIYETS, A.F., STUDNEV, YU.N., KUZNETSOVA, L.D.
COUNTRY OF INFO--USSR
SOURCE--IZVSTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR, NO 2, SERIYA
KHIMICHESKIKH NAUK, 1970, NR 1, PP 87-90
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--PHENOL, CARBOXYLIC ACID, ESTER, ACYL RADICAL
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1984/1766 STEP NO--UR/0289/70/000/001/0087/0090
CIRC ACCESSION NO--AP0100346
UNCLASSIFIED