$\Phi = 1 - P_{k,k+1} - P_{k,k+2} - \ldots - P_{k,n}$ must, when acting on the coordinate function give zero, P_{ij} denotes the operators of the pairwise exchange of the operators i + j. The function symmetrized according to Young obviously meets conditions 1.- and 2.-. The author shows that this function also meets condition 3.- of cyclic symmetry, i.e. that the identity ΦJ holds. The proof is traced step by step. Every function symmetrized by means of the Young operator meets the conditions of Fok. In the reverse direction the relation is obviously more complicated. The symmetrization by means of Young operators is then convenient when from a coordinate function, which in general is asymmetric, a function with the necessary symmetry properties should be constructed. When, however, the function is already known it is more useful to verify, whether the symmetry conditions of Fok are satisfied than to carry out this verification by means of the Young operators. Both methods are equivalent in

On the Symmetry of the Coordinate Wave Function of a Many-Electron System SOV/56-34-2-27/55

their character and substitute each other.
There are 1 figure and 3 references, 2 of which are Soviet

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: October 14, 1957

Card 4/4

24(5)
AUTHOR: Demkov, Yu. N. SOV/56-36-1-13/62

TITLE: The Symmetry Group of an Isotropic Oscillator
(Gruppa simmetrii izotropnogo ostsillyatora)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 36, Nr 1, pp 88-92(USSR)

ABSTRACT: The author investigates an n-dimensional isotropic oscillator, the system of units being chosen in such a manner that the frequency, Planck's constant, and the mass are equal to 1. The energy operator of the system then has the form

$H = (1/2)\sum_{k=1}^{n} (p_k^2 - x_k^2)$ and the energy levels

$E_m = m + (n/2)$ $(m = 0, 1, 2, \ldots)$ of the system are degenerated. This degeneration is due not only to spherical symmetry of the system. Short reference is made to several previous papers dealing with this subject. In the present paper it is shown that the definition of the group of the isotropic oscillator, which was given with the help of interference operators and deriving elements (such as have already previously been

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described by the author) and G. A. Baker's definition by means of canonical transformations are equivalent. First, it is stated that the commutation relation between the infinitesimal operators (derived in previous papers (Refs 1, 2)) agree with the commutation relations between the infinitesimal matrices of the threedimensional linear unitary group. The matrix of the infinitely small linear unitary transformation can be written down as $U = I + i\varepsilon L$. Here I denotes the unit matrix, L - an arbitrary Hermitian matrix, and ε - a small parameter. Next, the commutation relations between the linearly independent infinitesimal matrices are given. The symmetry group defined in the aforementioned previous papers is isomorphic with respect to the unitary group and, consequently also to the symmetry group investigated by Baker. Generalization for the case $n > 3$ is trivial. It is then shown that the two above-named groups are equivalent. The author also investigates a special case of canonical transformation in which only one pair of coordinates and momenta is transformed. In this case it is possible, without a general restriction, to investigate a onedimensional oscillator. Formulas for the time dependence of the wave function of the oscillator are given. In the

following, another type of transformations is investigated in which there is participation of 2 pairs of coordinates and momenta. In the case of the third type of transformation investigated, i. e. in the case of a pure rotation, the corresponding component of the angular momentum serves as infinitesimal operator. Finally the explicit shape of the kernel is determined (with an accuracy up to one normalization factor) for the unitary unit matrix of the transformation. The isotropic oscillator is, by the way, an example for a system in which the energy operator is fully expressed by infinitesimal operators of the symmetry group. In such cases it is possible, from the symmetry properties of the system alone, to derive also all its other properties (energy levels, degree of degeneration, Green's function etc). There are 4 Soviet references.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: January 23, 1958

24(5)

AUTHORS: Demkov, Yu. N., Yermolayev, A. M. SOV/56-36-3-[illegible]/71

TITLE: Fok Expansion for Wave Functions of Systems of Charged Particles (Razlozheniye Foka dlya volnovykh funktsiy sistemy zaryazhennykh chastits)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 896-899 (USSR)

ABSTRACT: Already in 1954 V. A. Fok found out (Ref 1) that the wave function of the ^1S-state of helium and helium-like ions can be expanded in a double series with r-th and ln r-th degree ($r = \sqrt{r_1^2 + r_2^2}$, r_1 and r_2 = distance of the 1. and 2. electron respectively from the nucleus). Fok also developed a method for the successive determination of development coefficients which turn out to be homogeneous functions of zero-th order of the Cartesian coordinates of the electrons. The authors of the present paper show that such an expansion (which is named after Fok) is of general character and may be applied to any system consisting of an arbitrary number of charged particles. The present paper is intended to generalize the method for such

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Fok Expansion for Wave Functions of Systems of Charged Particles

SOV/56-36-3-36/71

systems and for states of any symmetry. The authors proceed from the Schrödinger (Shredinger) equation of a steady-state wave function in Cartesian coordinates; they then pass on to spherical coordinates in the configuration space and give the solution of this equation in form of a series $\psi = \sum_n \sum_p a_{np} r^n (\ln r)^p$. For the a_{np} a system of equations is then given, which is investigated in the following. For $n = 1, 2, 3 \ldots$ and $p < n$ the wave function must be set up as $\psi = \sum_{n=0}^{\infty} \sum_{p=0}^{n} a_{np} r^n (\ln r)^p$ and for $n = 0, 1, 2 \ldots k-1$ as $\psi = \sum_{n=0}^{\infty} \sum_{p=0}^{[n/2]} a_{n+k,p} r^{n+k} (\ln r)^p$.

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Fok Expansion for Wave Functions of a System of Charged Particles

As regards a more detailed investigation of the solution of the system of equations given for the a_{ng} and also for other problems, reference is made to an article by ... . Kornol'yev in "Vestnik Leningradskogo univ ersiteta". The authors finally thank V. A. Fok for his valuable advice. There are 4 references, 2 of which are Soviet.

Leningradskiy gosudarstvennyy universitet
(Leningrad State University)

September 22, 1956

DEMKOV, Yu. N.
p. 2

PHASE I BOOK EXPLOITATION SOV/4157

Akademiya nauk SSSR. Vychislitel'nyy tsentr

Sbornik standartnykh i tipovykh programm dlya BESM (Collection of Standard and Typical Programs for the BESM [High-Speed Electronic Computer]). Moscow, 1960. 73 p. Errata slip inserted. 5,000 copies printed.

Resp. Ed.: V.M. Kurochkin, Candidate of Physics and Mathematics; Ed. of Publishing House: M.V. Yakovkin; Tech. Ed.: I.F. Kuz'min.

PURPOSE: This book is intended for digital computer programmers.

COVERAGE: The book is a collection of 10 articles giving 10 programs for the solution of various mathematical and numerical problems using the BESM (High-Speed Electronic Computer). No personalities are mentioned. There are no references.

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Card 3/3

DEMKOV, Yu.N.

Variational principales for nonstationary problems of quantum mechanics and the perturbation theory. Zhur.eksp.i teor.fiz. 38 no.6:1879-1885 Je '60. (MIRA 13:7)

1. Leningradskiy gosudarstvennyy universitet.
(Quantum theory)

85694

S/056/60/038/006/037/049/XX
B006/B070

24.4500

AUTHOR: Demkov, Yu. N.

TITLE: Variational Principles for Nonsteady Problems of Quantum Mechanics and Perturbation Theory

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 6, pp. 1879 - 1886

TEXT: The object of the present work was to formulate a variational principle which is invariant with respect to the normalization of wave functions and can be used in the case of nonorthogonal wave functions of the initial and final states. The problem is to find a solution Ψ_1 of the Schrödinger equation $H\Psi = ih\partial\Psi/\partial t$ satisfying the initial condition $\Psi_1(t_1) = \varphi_1$. The quantity a_{12} which is to be determined ($a_{12} = \int \varphi_2^* \Psi_1(t_2) d\tau$) gives the probability of a transition of the system from the state φ_1 at the time t_1 to the state φ_2 at the time t_2. The operator H is assumed to be self-adjoint and time-dependent, and the functions φ_1 and φ_2 to be non-

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orthogonal. The following solution for a_{12} is obtained for the steady case:

$$a_{12} = St\left\{\int \Phi_2(t_2)\Phi_1(t_2)d\tau + \frac{1}{ih}\int_{t_1}^{t_2} dt\int \Phi_2^*(H-ih\frac{\partial}{\partial t})\Phi_1\, d\tau\right\} \quad (8).$$

$\Phi_1(t_1) = \varphi_1$; $\Phi_2(t_2) = \varphi_2 = \Psi_2(t_2)$; $\delta\Psi_1(t_1) = \delta\Psi_2(t_2) = 0$. If now it is possible to break H into a perturbational and a nonperturbational part in two ways ($H = H_1+V_1 = H_2+V_2$), expressions for a_{12} can be obtained in first perturbation-theoretical approximation, but, as is shown, the uniqueness of this expression cannot be guaranteed. It is now shown in the present paper how the formulation of the variational principle is to be altered in order to guarantee the uniqueness of perturbation theory for an arbitrary choice of trial functions, and automatic invariance of the expression obtained for the transition probability with respect to the addition of a time function to the energy operator. For this purpose, a new variational principle is obtained instead of (8):

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Variational Principles for Nonsteady Problems of Quantum Mechanics and Perturbation Theory

S/056/60/038/006/037/049/XX
B006/B070

$a_{12} = St\left\{\int \Phi_2^*(t_2)\Phi_1(t_2) \exp\left[-\frac{i}{h}\int_{t_1}^{t_2} Ldt\right]d\tau\right.$; it fulfills all the requirements. $L = \int \Phi_2^*(H - ih\partial/\partial t)\Phi_1 d\tau \Big/ \int \Phi_2^*\Phi_1 d\tau$. The choice of trial functions for problems concerning the decay of the quasi-steady state and charge exchange are then discussed. The main equations for the charge exchange for large impact parameters are derived on the basis of the new variational principle. V. A. Fok and G. F. Drukarev are thanked for discussions and advice. There are 5 references: 3 Soviet, 2 British, and 1 US.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: January 19, 1960

Card 3/3

S/044/61/000/007/048/055
C111/C222

16.6800

AUTHORS: Demkov, Yu.N., and Senyukov, R.V.

TITLE: A program for the solution of a system of linear equations according to the method of elimination with the choice of a principal element

PERIODICAL: Referativnyy zhurnal Matematika, no. 7, 1961, 47, abstract 7 V 307, ("Sb. standartn. i tipovykh programm dlya БЭСМ"(BESM)., M., An SSSR, 1960, 17-20)

TEXT: This is a complete program in the instructions of the BESM, a short description of the block diagram and an instruction for the use of the program for the solution of the system B = AX with a maximal order equal to 30.

[Abstracter's note : Complete translation.]

Card 1/1

23808
S/020/61/138/001/012/023
B104/B201

24.4500 (1395, 1538)

AUTHOR: Demkov, Yu. N.

TITLE: Virial theorem for the classical problem of particle scattering by a center of force.

PERIODICAL: Doklady Akademii nauk SSSR, v. 138, no. 1, 1961, 86-89

TEXT: By way of introduction, the author discusses the importance of the virial theorem in classical mechanics and deals with its introduction into quantum mechanics. Concerning the problem of the continuous spectrum of the energy operator the author has been the first to obtain a formula for the problem of the scattering of particles by a center of force, corresponding to the virial theorem (Demkov, DAN, 89, 249 (1953)). This formula has been already extended to complicated problems of the collision theory (inelastic exchange processes), to the Dirac equation, and to problems of the quantum field theory. A corresponding generalization in classical mechanics has not been undertaken so far. The author uses a concrete example to show how this generalization can be achieved. Proceeding from the Hamiltonian variation principle, he defines the action

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functional $S = \int_{t_1}^{t_2} L(q_1, \ldots, q_n; \dot{q}_1, \ldots, \dot{q}_n; t)dt$. For the case of $q_i(t)$ corresponding to a real motion, the following relation is known to hold for the variation:

$$\delta S = \sum_{i=1}^{n} \frac{\partial L}{\partial \dot{q}_i} \delta q_i \Big|_{t_1}^{t_2}, \qquad (2)$$

By writing $\delta q_i(t) = \varepsilon q_i(t)$ (3) one obtains

$$\int_{t_1}^{t_2} \sum_{i=1}^{n} \left(\frac{\partial L}{\partial \dot{q}_i} \dot{q}_i + \frac{\partial L}{\partial q_i} \dot{q}_i \right) dt = \sum_{i=1}^{n} \frac{\partial L}{\partial \dot{q}_i} q_i \Big|_{t_1}^{t_2}. \qquad (4)$$

ε is an infinitely small parameter, and (4) is obtained from (1) and (2) by neglecting the terms with ε^2. Using (4) for different systems and different types of motion makes it possible to obtain the virial theorem for every concrete case. The right-hand and left-hand part of (4) are greatly

Virial theorem for the classical...

dependent upon the choice of generalized coordinates. Different formulations can thus be obtained for the virial theorem. The author examines the scattering of a particle with the mass m = 1 by a spherical center of force. As is known, the Lagrangian function for this case is $L = v^2/2 - U(r)$ (5). The Cartesian coordinates x, y, and z are used as generalized coordinates. One then obtains from (4):

$$\int_{t_1}^{t_2} (v^2 - r dU/dr) dt = \vec{v} \cdot \vec{r} \Big|_{t_1}^{t_2} \quad (6).$$

For $|t| \longrightarrow \infty$ the particle is assumed to move at the velocity v_∞. It is further assumed that at the moment $t = 0$ $r = r_0$ (r_0 - minimum value). Then, for a motion being symmetrical to the vector $\vec{r}_0 = \vec{r}(0)$ and at large $|t|$ the following relation holds: $r = s + v_\infty |t|$ (7). Thus, taking the energy conservation into account one obtains:

$$\int_{t_1}^{t_2} \left(2U + r\frac{dU}{dr}\right) dt = (v_\infty^2 t - \mathbf{v}\cdot\mathbf{r})\Big|_{t_1}^{t_2} \quad (9)$$

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from which, for $t_1 \longrightarrow \infty$ and $t_2 \longrightarrow \infty$, one has

$$\int_0^\infty \left(2U + r\frac{dU}{dr}\right)dt = v_\infty \lim_{t\to\infty}(v_\infty t - r) = -v_\infty s. \qquad (10)$$

The left-hand part of this formula is typical of the virial theorem, while the right-hand part can be assigned a simple geometrical significance. It is equal to the distance which the particle travels beginning with $t = 0$ for $t \longrightarrow \infty$ on a straight line at a uniform velocity. The right-hand part can be, however, also assigned another significance permitting a comparison with determined quantum-mechanical expressions. Formula

$$\int_0^\infty \left(2U + r\frac{dU}{dr}\right)dt = v_\infty \frac{\partial\eta}{\partial v_\infty}. \qquad (17)$$

is derived for the purpose, where $\lim_{t\to\infty}\{v_\infty t - r\} = \partial\eta/\partial v_\infty$ (16). (17) is compared with the corresponding formula from quantum mechanics:

$$2\int_0^\infty \left(2U + r\frac{dU}{dr}\right)\psi_l^2(r)\,dr = v_\infty^2 \frac{d\eta_l}{dv_\infty}. \qquad (18)$$

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where ψ_l is the radial function of the l-th partial wave, which is asymptotically put with $\psi_l \sim \sin(kr - l\pi/2 + \eta_l)$. The passage from the quantum-mechanical formula (18) to the classical formula (17) can be performed by substituting the semiclassical function

$$\psi_M(r) = \sqrt{\frac{v_\infty}{v_r}} \sin\left(\int_{r_0}^{r} v_r dr + \frac{\pi}{4}\right), \qquad (20)$$

for $\psi_l(r)$ in (18). Under the premise that at $r < r_0$ the function diminishes so rapidly that it can be put equal to zero, and that at $r > r_0$ it oscillates quickly, one obtains: $\psi_M^2 = \frac{1}{2}\frac{v_\infty}{v_r}$, and the desired link between the two formulas is thus found. For steady, coupled states with the energy E and the radial wave function ψ_E there is an analogous formula

$$\int_0^\infty \left(2U + r\frac{dU}{dr}\right)\psi_E^2 dr = 2E, \qquad (22)$$

whose analog in classical mechanics for finite motions is

$$\int_{t_1}^{t_2}\left(2U-2E+r\frac{dU}{dr}\right)dt=0, \qquad (23)$$

The deflection angle θ in the scattering of particles and the differential effective cross section σ can be expressed by the relations

$$\theta=2\frac{\partial\eta}{\partial M};\qquad \sigma=\frac{M}{2v_\infty^2}\left(\frac{\partial^2\eta}{\partial M^2}\right)^{-1}. \qquad (24)$$

V. A. Fok is mentioned. There are 11 references: 7 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

PRESENTED: December 26, 1960, by V. A. Fok, Academician

SUBMITTED: December 8, 1960

MYASNIKOV, Lev Leonidovich, doktor tekhn.nauk, prof.; DEMKOV, Yu.N., kand. fiz.-mat. nauk, nauchnyy red.; VOROB'YEV, G.S., red.izd-va; GURDZHIYEVA, A.M., tekhn. red.

[Atomic clocks]Atomnye chasy. Leningrad, Ob-vo po rasprostraneniiu polit. i nauchn. znanii RSFSR, 1962. 53 p. (MIRA 16:2)
(Atomic clocks)

DEMKOV, YU.N.

Charge exchange with small energy transfer.

Report submitted to the Third Intl. Conf. on the Physics of Electronic and Atomic Collisions, London, England 22-26 July 1963

Demkov, Yu. N.

10

ACCESSION NR: AP3004484 S/0048/63/027/008/0994/0995

AUTHOR: Bena, I. A.

TITLE: Second All-Union Conference on the Physics of Electron and Atom Collisions [Uzhgorod, 2—9 October 1962]

SOURCE: AN SSSR. Izvestiya, ser. fiz., v. 27, no. 8, 1963, 994-995

TOPIC TAGS: conference, electron collision, atom collision, collision physics

ABSTRACT: The II Vsesoyuznaya konferentsiya po fizike elektronny*kh i atomny*kh stolknoveniy (Second All-Union Conference on the Physics of Electron and Atoms Collisions), was held in Uzhgorod, 2—9 October 1962. The following reports were presented: "Theory of the charge-exchange process during atomic collisions," by Yu. N. Demkov; "Charge-exchange of multicharge ions," by I. P. Flaks; "Ionization due to atomic collisions," by N. V. Fedorenko; "Excitation of atoms and molecules due to electronic collisions," by I. P. Zapesochny*y; "Charge exchange and ionization during atomic collisions in the high-energy range," by V. S. Nikolayev; "Photoionization of gases and vapors by vacuum ultraviolet radiation," by Academician A. N. Terenin and F. I. Vilesov; "Effective cross sections of atomic collisions important in the theory of gaseous quantum generators," by I. I. Sobel'man; "Dissociation of molecules and ions during collisions of fast particles," by N. N. Tunitskiy; and "Corpuscular diagnostic of plasma," by V. V. Afrosimov.

ASSOCIATION: none

L 13628-63 EWT(1)/FCC(w)/BDS AFFTC/ASD IJP(C)
ACCESSION NR: AP3003132 S/0056/63/044/006/2007/2010

AUTHOR: Demkov, Yu. N.

TITLE: Definition of the symmetry group of a quantum system. The anisotropic oscillator

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2007-2010

TOPIC TAGS: group theory, symmetry group, unitary operator, anisotropic oscillator

ABSTRACT: The concepts of maximal, minimal, incomplete, and excessive symmetry groups are introduced in order to provide a more exact statement of the usual definition of the symmetry group as the group of unitary operators that commute with Hamiltonian, since the usual definition is not sufficient. A prescription is given for the construction of the minimal group. It is sufficient for this purpose to choose a group with the necessary dimensionalities for irreducible representation. As an example, a solution is found of the problem proposed by Jauch and Hill (Phys. Rev. v. 57, 641, 1940) of finding the symmetry group for the anisotropic oscillator. The simple example can be generalized to the case of any rational ratio of frequencies and to an oscillator with any number of degrees

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ACCESSION NR: AP3003132

2

of freedom, N. In the latter case the minimal symmetry group will be the N-dimensional unitary unimodular group. This problem will be treated in more detail in a paper by L. A. Il'kayeva, to be published in Vestnik Leningradskogo universiteta. Orig. art. has: 13 formulas.

ASSOCIATION: Leningradskiy gosudarstvenny*y universitet (Leningrad State University)

SUBMITTED: 04Jan63 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 004 OTHER: 003

Card 2/2

L 14680-63 EWT(1)/EWG(k)/BDS/EEC(b)-2/ES(w)-2 AFFTC/ASD/ESD-3/AFWL/SSD
Pz-7/P1-4/Po-4/Pab-4 AT/IJP(C)
ACCESSION NR: AP3005268 S/0056/63/0045/002/0195/0201

80
79

AUTHOR: Demkov, Yu. N.

TITLE: Charge exchange for small resonant defects

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 195-201

TOPIC TAGS: Massey criterion, Landau-Zener formula, resonant defect charge exchange, close energy-level transition, charge changing

ABSTRACT: A study has been made of charge-transfer processes, such as $A + B^+ \rightarrow A^+ + B$ and $A + B^- \rightarrow A^- + B$, taking place during collisions between atoms and ions. Only those cases were considered when the velocity of atoms is much smaller than that of external electrons and the kinetic energy of atoms is much greater than the electron energies. A general formula for the probability of electron-charge exchange is obtained for the case when the change in the electron energy is small compared with the distance from the closest levels in the two atomic systems. The derivation of the formula is analogous to that of the Bohr quantum conditions in the semiclassical method. A similar result has been obtained for a special case by Zener and Rosen. The significance of

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L 14686-63
ACCESSION NR: AP3005268

the Massey criterion, which determines the position of the effective cross-section peak, is examined in greater detail, and the oscillating nature of the differential cross section, which is similar to that in the case of resonance charge exchange, is established. The results can also be applied to a number of other processes, such as excitation transfer between s states during the collisions between atoms or ions. Orig. art. has: 14 formulas.

ASSOCIATION: Leningradskiy gosudarstvenny*y universitet (Leningrad State University)

SUBMITTED: 04Jan63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 005

Card 2/2

ACCESSION NR: AP4025947 S/0056/64/046/003/1126/1135

AUTHOR: Demkov, Yu. N.

TITLE: Detachment of electrons in slow collisions between negative ions and atoms

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964, 1126-1135

TOPIC TAGS: slow ion atom collision, electron detachment, bound electron, detached electron, detached electron distribution, ionization probability, continuous energy spectrum, discrete energy level, nonstationary quantum problem

ABSTRACT: The nonstationary quantum problem, in which a slow change of the external parameter causes the bound state of the quantum system to approach the continuous energy spectrum and eventually merge with it is considered from the point of view of the inapplicability

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ACCESSION NR: AP4025947

of the various formulas derived for the calculation of transitions between neighboring discrete levels. As applied to the collision between a negative ion and an atom, the calculations are aimed specifically at determining the probability that the electron will remain in the bound state, that is, the probability that no ionization will take place, and the determination of the energy spectrum of the electrons produced by the ionization. It is concluded from the general theory that the average momentum of the emitted electrons decreases slowly with decreasing velocity of the colliding particles. For small momenta the emitted electrons have an isotropic distribution proportional to the square of the momentum. At large momenta a characteristic exponential distribution is obtained. The applicability of the theory and the conditions under which the ionization probability is large is discussed. Although the formulation of the problem is general and can be applied to other problems as well, the results cannot be readily employed for the interpretation of the experimental data, which are insufficient even for simple

ACCESSION NR: AP4025947

colliding systems. "In conclusion I am grateful to V. A. Fok, G. F. Drukarev, G. V. Dubrovskiy, A. M. Ermolaev and other members of the Theoretical Division of the LGU Physics Department for a discussion of the work and for valuable advice." Orig. art. has: 3 figures and 20 formulas.

ASSOCIATION: Leningradskiy gosudarstvenny*y universitet (Leningrad State University)

SUBMITTED: 26Sep63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 005 OTHER: 002

Card 1/3

L 6765-65 EWT(l)/EPP(c)/EPA(w)-2/EEC(t)/T/EWA(c)-2 Pab-2h/Pr-4 IJP(c)/
AFWL/AFETR/ASD(a)-5/SSD/ASD(p)-3/ESD(gs)/ESD(t)/ESD(t) WW

ACCESSION NR: AP4046403 B/0056/64/047/003/0918/0924

AUTHOR: Domkov, Yu. N.; Brukarev, G. F.

TITLE: Decay and polarizability of a negative ion in an electric field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, no. 3, 1964, 918-924

TOPIC TAGS: Schrodinger equation, polarization, negative ion, helium, hydrogen

ABSTRACT: In view of the difficulties involved in solving the Schrodinger equation in the case of three-dimensional potential barriers, and in view of the ambiguities that arise when attempts are made to average such barriers, the authors demonstrate that a solution of the Schrodinger equation does exist in one simple limiting case when the variables cannot be separated. The case considered

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is a particle in a weakly bound s-state in a simple force field with small effective radius, and when the radius is allowed to approach zero the lower limits of the polarizability and decay constant are obtained. Using the approximation of the zero effective radius between an electron and an atom in such a system, the authors calculate the decay probability and polarizability of a negative ion in an electric field. The calculations yield a lower bound for these quantities in the case of a real potential with finite effective radius. The results show that the pre-exponential factor of the expression for the decay probability depends strongly on the type of field, and can differ in numerical value by several orders of magnitude. Possible improvements to the results, by making allowances for some of the simplifying assumptions made in the calculations, are discussed, and the results are compared with other calculations and with experiment for H^- and He^-. Orig. art. has: 2 figures and 14 formulas.

APPROVED FOR RELEASE: 06/12/2000 CIA-RDP86-00513R000310110012-2"

L 6765-65

ACCESSION NR: AP4046408

ASSOCIATION: Leningradskiy gosudarstvenny'y universitet (Leningrad State University)

SUBMITTED: 14Feb64 ENCL: 00

SUB CODE: NP NR REF SOV: 002 OTHER: 004

Card 3/3

DEMKOV, Yu.N.; KOMAROV, I.V.

Density matrix for a system of noninteracting fermions. Vest. LGU 20 no.10:18-28 '65. (MIRA 18:7)

DEMKOV, Yu.N.

Isotope effect in resonance dissociative electron capture and the study of quasi-stationary molecular states. Vest. LGU 20 no.10:150-151 '65. (MIRA 18:7)

L 2215-66 EWT(1) IJP(c)
ACCESSION NR: AP5019239 UR/0056/65/049/001/0257/0264

AUTHORS: Demkov, Yu. N.; Drukarev, G. F. 44,55

TITLE: Particle of low binding energy in a magnetic field

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 257-264

TOPIC TAGS: ion interaction, diamagnetism, particle interaction, potential well

ABSTRACT: This is a continuation of an earlier paper by the authors (ZhETF v. 47, 918, 1964), in which they considered a particle in a potential well of small radius (negative ion) situated in a strong electric field. The present article deals with the same system, but in a uniform magnetic field. The case of a shallow potential well is first considered, where there is no bound state in the absence of the field. It is then proved that, for an arbitrary shallow three-dimensional well, a bound state always appears when an arbitrarily weak field is switched on. In first approximation the binding energy is

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L 2215-66

ACCESSION NR: AP5019239

9

proportional to the square of the field, so that this phenomenon is reminescent of diamagnetism, but acts in the opposite direction. The magnetic field has a stabilizing influence on the particle, but real magnetic fields are too weak for such an effect to be observable with free atoms or electrons. It is shown, however, that for semiconductors at liquid-helium temperature and for electrons or holes with low effective masses the binding energy becomes comparable with kT, so that the bound state produced may be observed experimentally. If the potential well is sufficiently deep, so that there is a bound state in the absence of the magnetic field, there is the usual diamagnetic effect, which increases the total energy by an amount proportional to the square of the field and leads to expulsion of the system from the field. The binding energy of the particle increases with the field, so that the magnetic field again exerts a stabilizing influence on the particle. 'We thank A. G. Zhilich and A. V. Tulub for valuable discussions.' Orig. art. has: 1 figure and 38 formulas.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

44,55

Card 2/3

L 2215-66
ACCESSION NR: AP5019239

SUBMITTED: 27Jan65 ENCL: 00 SUB CODE: NP, EM

NR REF SOV: 004 OTHER: 001

Card 3/3 DP

L 3449-66 EWT(1) LJP(c)

ACCESSION NR: AP5017104 UR/0054/65/000/002/0150/0151

AUTHOR: Demkov, Yu. N. 44,55

TITLE: Isotopic effect in resonant dissociative capture of an electron and investigation of quasistationary states of molecules 21,44,55

SOURCE: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 2, 1965, 150-151 4455

TOPIC TAGS: electron capture, hydrogen, deuterium

ABSTRACT: The author describes briefly the quasistationary state AB^- which arises when an electron collides with a molecule AB. It is shown that under certain conditions the quasistationary molecule AB^- dissociates not into a negative ion and an atom, but into the initial molecule, which may remain in an excited vibrational state, and an electron with lower energy. This backward decay gives rise to several isotopic effects. In particular, the cross section for negative-ion production may be much smaller for D_2 than for H_2. This effect makes it possible to investigate the shape and width of the quasistationary potential curve for negative molecular ions. In view of the great mathematical difficulties involved in calculations for quasistationary states of diatomic molecules, this effect is regarded as a means of more thorough interpretation of the available experimental data.

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L 3449-66

ACCESSION NR: AP5017104 9

"I thank Professor W. L. Fite, Professor V. M. Dukel'skiy, and Professor G. F. Drukarev for a discussion of the questions touched upon in this article." Orig. art. has: 1 formula.

ASSOCIATION: none

SUBMITTED: 25Dec64 ENCL: 00 SUB CODE: NP

NR REF SOV: 001 OTHER: 003

BVK

Card 2/2

L 1404-66 EWT(1)

ACCESSION NR: AP5021128 UR/0056/65/049/002/0635/0641

44,55 44,55 45 42 B

AUTHOR: Demkov, Yu. N.; Murakhver, Yu. Ye.

TITLE: Calculation of the angular distribution of resonance charge exchange

21,44

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 635-641

TOPIC TAGS: helium, charge exchange, quantum resonance

ABSTRACT: The angular distribution of the resonance charge exchange of He^+ ions in helium is calculated in a quasiclassical approximation which eliminates some earlier difficulties in the reconciliation of the experimental results and theoretical classical approximations of the adiabatic theory developed for resonance charge exchange within the framework of the parametric method by one of the authors (Demkov, Uch. zap. LGU, fizika, v. 8, 74, 1952) and by others. Although the theory predicts an oscillating behavior for the resonance charge exchange probability as a function of the scattering angle, the experimentally observed maxima and minima of this probability never reach 0 and 1, respectively. In the present paper these difficulties, which are essentially connected with the ambiguity of the impact parameter and arise in all collision-theory problems, are circumvented because resonant charge exchange does not involve electronic transitions between the molecular states. Ac-

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L 1404-66
ACCESSION NR: AP5021128

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count is taken in the calculations of the relative motion of the nuclei for both symmetrical and antisymmetrical states. The conditions for the validity of the derived formulas for the angular distribution are analyzed, and the results are compared with experiment and with the less accurate calculations of E. Everhart (Phys. Rev. v. 132, 2083, 1963). It is shown in the conclusion that the results can be made more precise by taking into account the rotation of the quasimolecule, the transitions connected with the crossing of an infinite number of terms of like symmetry, and autoionization. The errors due to each of these factors are briefly discussed. Orig. art. has: 3 figures and 27 formulas. [02]

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: 06Mar65 ENCL: 00 SUB CODE: NP, ME

NO REF SOV: 004 OTHER: 014 ATD PRESS: 4099

Card 2/2 DP

L 5335-66 EWT(m) DIAAP

ACCESSION NR: AP5021135 UR/0056/65/049/002/0691/0698

AUTHORS: Demkov, Yu. N.; Drukarev, G. F. 28 24 B

TITLE: Second-order poles of the S matrix and resonance scattering 19

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 691-698

TOPIC TAGS: S matrix, resonance scattering, particle scattering, moving pole method

ABSTRACT: The scattering of particles by a central force field with a finite range is considered, under the assumption that the particles are slow, so that only the partial wave with zero angular momentum need be taken into account. The general pattern of the motion of the poles of the S matrix on the unphysical sheet of the complex plane of the energy is investigated as the potential energy is varied, with attention to the the transition from resonance scattering by the potential well, when there is a level close to the limit of the continuous spectrum, to scattering when there is a quasistationary state,

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L 5335-66

ACCESSION NR: AP5021135

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for example in the case of a potential well surrounded by a barrier. The S matrix is represented in terms of a Jost function and the conditions under which the zeroes of the Jost function coincide on the imaginary axis (corresponding to a second order pole of the S matrix) are discussed. It is shown that for a potential well with a barrier the second-order pole can lie near zero energy. Accordingly, for resonance scattering of low energy particles, it is necessary to use a two-pole approximation for the S matrix. Resonance scattering is also considered in the case in which two simple poles coincide or are close to each other. [1]We thank V. A. Fock, L. V. Faddeyev, and G. V. Dubrovskiy for a discussion of the questions considered in this paper.[1] Orig. art. has: 2 figures and 25 formulas.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet (Leningrad State University)

SUBMITTED: 16Mar65 ENCL: 00 SUB CODE: NP, GP

NR REF SOV: 007 OTHER: 004

Card 2/2 hdl

DEMKOV, Yu.N.

Electron detachment in slow collisions between negative ions and atoms. Zhur. eksp. i teor. fiz. 49 no.3:885-894 S '65.
(MIRA 18:10)

1. Leningradskiy gosudarstvennyy universitet.

L 12081-66 EWT(l)/EWA(m)-2 IJP(c) AT

ACC NR: AP5024710 SOURCE CODE: UR/0056/65/049/003/0885/0894

AUTHOR: Demkov, Yu. N.

ORG: Leningrad State University (Leningradskiy gosudarstvennyy universitet)

TITLE: Detachment of an electron in slow collisions between negative ions and atoms. II. Account of the finite size of the system

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 885-894

TOPIC TAGS: nuclear collision, electron emission, angular distribution, electron distribution, ion interaction

ABSTRACT: The first part of the paper (ZhETF v. 46, 1126, 1964) dealt with the detachment of an electron in a collision of the type $A^- + B$ under the limiting condition that the system AB is replaced by an effective potential well whose radius is assumed to be small compared with the wavelength of the emitted electrons. In the present paper this limitation is eliminated by replacing the system AB by an effective potential in the form of two wells of a small radius, using an approximation recently employed by O. B. Firsov and B. M. Smirnov (ZhETF v. 47, 232, 1964). It is assumed that when the nuclei come closer together

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L 12081-66
ACC NR: AP5024710

the state A_2^- vanishes and decays. The angular and energy distribution of the outgoing electrons are calculated for the symmetrical and antisymmetrical states. It is shown that allowance for the finite dimensions of the system has an unexpectedly small influence on the energy spectrum of the electrons. A general system of equations is obtained for the motion of a particle in the field of small-radius potential wells with variable depth. Author thanks G. F. Drukarev and L. D. Faddeyev for discussion of problems considered in the article. Orig. art. has: 4 figures and 25 formulas.

SUB CODE: 20/ SUBM DATE: 28Apr65/ NR REF SOV: 004

2/2

L 22129-66 EWT(1) AT

ACC NR: AP6004948 SOURCE CODE: UR/0056/66/050/001/0286/0294

AUTHOR: Demkov, Yu. N.; Komarov, I. V. 55 B

ORG: Leningrad State University (Leningradskiy gosudarstvennyy universitet)

TITLE: Ionization in slow collisions of two atoms

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 50, no. 1, 1966, 286-294

TOPIC TAGS: ionization potential, excitation energy, continuous spectrum, ground state, electron energy, line spectrum, wave function, excited state, particle collision

ABSTRACT: The authors consider the reaction $A + B \rightarrow A + B^+ + e$, in which the atoms are in the ground or in the excited states prior to the collision, but the excitation energy is smaller than the ionization potential. The simplest spherically symmetrical model is analyzed by way of an example. It is shown that the problem reduces to an analysis of the interaction of the state with an infinite number of parallel states and with a continuous spectrum, and the case is considered in which one energy level of the system crosses an infinite system of parallel levels adjacent to the ground state of the system AB^+. A general mathematical model is employed which yields the wave function, in the form of a contour integral, for the

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L 22129-66

ACC NR: AP6004948

nonstationary problem of the interaction between a system of parallel states and a state that intersects this system. Use is made of a mathematical formalism which is described elsewhere (DAN SSSR, in press), and whose earlier simpler applications were described by one of the authors earlier (Demkov, ZhETF v. 49, 885, 1965 and others). The kinetic energy of the atoms is assumed to be much higher than the ionization potential, so that the motion of the nuclei can be chosen classically and the corresponding nonstationary problem can be solved. The method can also be used in a quantum description of the nuclear motion which is required when the nuclear energy is near the threshold, provided the system of parallel levels is horizontal or only slightly inclined. The probabilities of ionization and of the formation of highly excited states are derived, and the smooth transition from the discrete spectrum (excitation) to the continuous spectrum (ionization) is traced. The limits of applicability of the theory are considered. Orig. art. has: 3 figures and 22 formulas.

SUB CODE: 20/ SUBM DATE: 28Aug65/ ORIG REF: 009/ OTH REF: 002

Card 2/2 BK

DEMKOVA, A.; CMELIK, M.

Inflammations of the osteoarticular system in salmonelloses.
Bratisl. lek. listy 43 Pt. 2 no.5:270-275 '63.

1. Mikrobiologicke oddelenie FN v Kosiciach, veduci doc. MUDr. L. Dubay, Ortopedicka klinika Lek. fak. Univ. P.J. Sararika v Kosiciach, veduci doc. MUDr. M. Haluzicky.
(SALMONELLA INFECTIONS) (JOINT DISEASES)
(BONE DISEASES) (SYNOVITIS)

VRBOVSKY, L.; DEMKOVA, A.; SELECKY, F.V.; Technicka spolupraca: SIKLOVA, M.

Protective effect of diethylaminoethylamide of dehydroabietic acid (substance E-25) in CaCl2-induced arrhythmias in rats. Cas. lek. cesk. 102 no.19:527-531 10 My '63.

1. CSAV, Chemicky ustav SAV, Bratislava, riaditel akademik J. Vasatko.

(PHENANTHRENES) (MYOCARDIAL DEPRESSANTS)
(ARRHYTHMIA) (CALCIUM) (CHLORIDES)
(RATS)

DUBAY,L.; DEMKOVA, A.; CERMAN, J.; LUKAN, J.; ZALUDKO, J.

Apropos of the significance of Corynebacterium in ozena. Cesk. otolaryng. 14 no.1:32-34 F'65.

1. Katedra krcneho lekarstva (veduci: prof. dr. M. Suster, DrSc.); Lekarskej fa'ulty University P.J. Safarika v Kosiciach a Infekcne oddelenie F.N. v Kosiciach (veduci: T. Mittermayer).

Pathology

CZECHOSLOVAKIA

KORPAS, J.; ANDRASINA, J.; BILCIK, P.; DEMKOVA, A.; KOHUT, A.; SZEPESSIOVA, A.; Institute of Experimental Pathology, Institute of Pathological Anatomy, Surgical Clinic, Radiologic Clinic of the Medical Faculty of the University of P.J. Safarik, and Microbiology Department of FN [abbreviation not explained] (Ustav experimentalnej patologie, Ustav patol. anatomie, Klinika chirurgicka, Klinika radiologicka LF UPJS a Mikrobiologicke oddelenie FN), Kosice.

"Method of Inducing Experimental Bronchitis."

Prague, Ceskoslovenska Fysiologie, Vol 14, No 5, Oct 1965; p 381-382.

Abstract: In 22 cats, intratracheal administration of 1 to 10 u of an aerosol of croton oil was studied. The latent state of 1 to 2 hours was followed by a prodromal stage of up to 20 hours, and manifest disease persisting for up to 5 days or so; returning to completely normal condition by about the 20th day. 1 Czech reference. Paper presented at the 7th Scientific Conference of the Medical Faculty of the P.J. Safarik University of Kosice, 26 May 65.

1/1

CZECHOSLOVAKIA

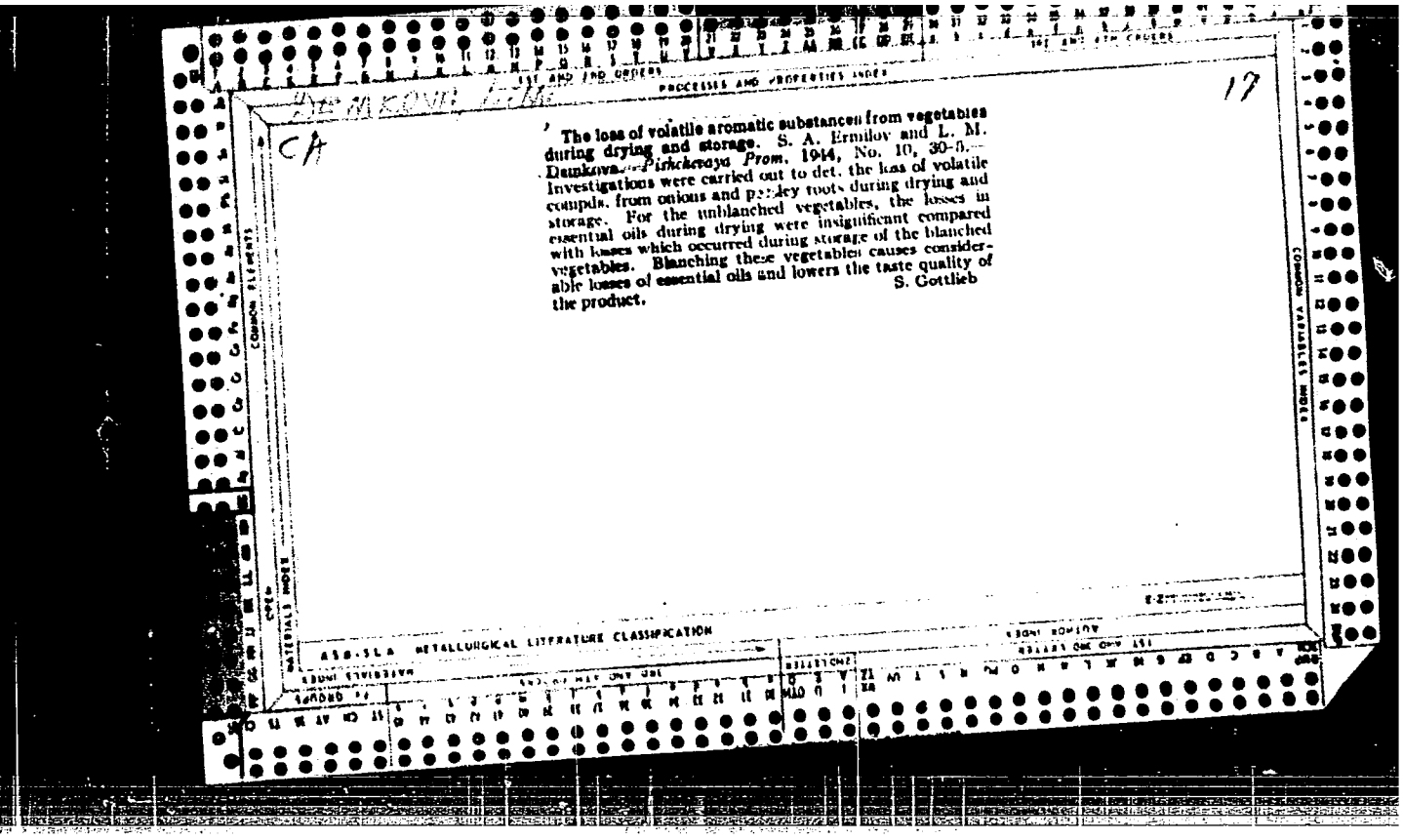
KORPAS, J., KOHUT, A., ANDRASINA, J., BILCIK, P., DEMKOVA, A., SZEPESIOVA, A; Institute of Experimental Pathology, Scientific Laboratory, Surgical Clinic, Institute of Pathological Anatomy, Microbiological Department of Okresni Institute of National Health, X-ray Clinic Medical Faculty, P.J.Safarik University, (Ustav Exper. patologie, Ved. labor Chirurgiokej Kliniky, Ustav Pat. Anatomie, Mikrobiol. Odd. KUNZ, Rontgen. Klinika Lek. Fak. UPJS) Kosice.

"Changes in the Cough of Cats Suffering from Spontaneous Bronchopneumonia."

Prague, Ceskoslovenska Fysiologie, Vol 15, No 2, Feb 66, pp 77-78

Abstract: Occurrence of spontaneous fibril septic and necrotic bronchopneumonia was studied. The cough caused by excitation of the tracheobronchitic region was stronger than that caused by excitation of the laryngopharyngitic mucous membrane. In experimental laryngotracheal bronchitis the sensitivity of the receptors in the respiratory tract decreases, in spontaneous bronchopneumonia it increases. 1 Figure, no references. Submitted at "16 Days of Physiology" at Kosice, 30 Sep 65.

1/1



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CA

The loss of volatile aromatic substances from vegetables during drying and storage. S. A. Ermilov and L. M. Dankova. *Pishchevaya Prom.* 1944, No. 10, 30-5.—Investigations were carried out to det. the loss of volatile compds. from onions and parsley roots during drying and storage. For the unblanched vegetables, the losses in essential oils during drying were insignificant compared with losses which occurred during storage of the blanched vegetables. Blanching these vegetables causes considerable losses of essential oils and lowers the taste quality of the product.

S. Gottlieb

DEMKOVICH, Venedikt Porfir'yevich; BARKOVSKIY, I.V., red.; BOL'SHAKOV, V.A., tekhn.red.

[Collection of problems in physics for grades 8-10 in secondary schools; a manual for teachers] Sbornik zadach po fizike dlia 8-10-kh klassov srednei shkoly; posobie dlia uchitelei. Leningrad, Gos. uchebno-pedagog. izd-vo M-va prosv. RSFSR, Leningr. otd-nie, 1957. 245 p. (MIRA 11:5)

(Physics--Problems, exercises, etc.)

DEMKOVICH, V.P. (Leningrad)

New collection of physics problems for grades 9-11. Fiz. v shkole 23 no.4:44-45 Jl-Ag '63. (MIRA 17:1)

DEMKOVICH, V.P.

Qualitative problems on optics. Fiz. v shkole 17 no.1: 76 Ja-F '57. (MLRA 10:2)

1. 278-ya srednyaya shkola, Leningrad.
(Optics--Problems, exercises, etc.)

DEMKOVSKIY, P.N., inzhener.

Mechanizing the marking of large machine parts. Vest.mash. 34 no.5:84-86 My '54. (MLRA 7:6)
(Marking devices)

DEMKOVSKIY, Petr Nikolayevich; YUDITSKIY, M.M., dotsent, otv.red.; BAZILYANSKAYA, I.L., red.; RUDNITSKAYA, I.T., tekhn.red.

[Theoretical fundamentals of layout and the mechanization of laying out processes] Teoreticheskie osnovy razmetki i mekhanizatsiia ee protsessa. Khar'kov, Izd-vo Khar'kovskogo gos.univ., 1960. 98 p. (MIRA 14:1)
(Laying out (Machine-shop practice))

5.1110

82504
Z/008/60/000/08/002/002
E142/E535

AUTHORS: Deml, F. and Gaislová, V.

TITLE: Preparation of High-Purity Arsenic I. Purification of Arsenic Trichloride

PERIODICAL: Chemické listy, 1960, No.8, pp.846-849

TEXT: High-purity arsenic is used during the preparation of semiconductors and also for the manufacture of some intermetallic compounds of the type $A^{III}_{B}V$. A high degree of purity is required as it affects the electrical properties of the substances. Pure arsenic is obtained by the thermal decomposition of arsenic trichloride in hydrogen. The authors describe an extraction method for separating traces of admixtures, especially of Sb, Fe and Cu from the compound. When arsenic trichloride is extracted with hydrochloric or sulphuric acid, most of the impurities go over into the liquid phase; arsenic trichloride itself is only moderately miscible with these acids. The systems $HCl/AsCl_3$ and $H_2SO_4/AsCl_3$ were found most satisfactory as they have a sufficiently high capacity, they have different densities, a sufficiently high separation coefficient and equilibrium is

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Preparation of High-Purity Arsenic I. Purification of Arsenic Trichloride

attained after a very short time. The preparation of the compound, the determination of its solubility in 10N-HCl and 10-12N H_2SO_4 are described, and graphs showing the percentage loss of $AsCl_3$ during extraction with the two acids (Figs. 1 and 2) are given. The method was tested by admixing Fe^{III}, Cu^{II} and Sb^{III} chlorides to arsenic trichloride and then extracting impure chloride by using the above method. The content of impurities was determined by qualitative spectral analysis; the sample containing Fe, Cu and Sb admixtures was subjected to quantitative analysis. Table 1 gives data on the amount of admixtures in the upper phase (in weight percent); Table 2 gives results of the spectral analysis and Table 3 the dependence of the number of extraction stages on the separation coefficient. It was found that high-purity arsenic containing approximately 10^{-2}% impurities could be obtained from the starting material by two extractions only. This process gives a higher degree of extraction than that obtained by the distillation method and can

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Z/008/60/000/08/002/002
E142/E535

Preparation of High-Purity Arsenic I. Purification of Arsenic Trichloride

be carried out more expediently. Acknowledgments are expressed to Engineer E. Rubeš for his interest and support and to Mrs. M. Musilova for carrying out the analyses. There are 3 figures, 3 tables and 8 references: 1 Czech, 3 Japanese, 3 German and 1 English.

ASSOCIATION: Výzkumný ústav sdělovací techniky A. S. Popova, Praha (Telecommunications Research Institute "A. S. Popov", Prague)

SUBMITTED: January 11, 1960

Card 3/3

Z/008/62/000/005/001/001
E112/E135

AUTHORS: Deml, František, and Novák, Ladislav

TITLE: Preparation of highly purified zinc by vacuum counter-current distillation

PERIODICAL: Chemické listy, no.5, 1962, 534-539

TEXT: A distillation unit from silica glass for the refining of zinc is described and operational details are given. The analytical procedures for purity determination of the refined zinc are based on differential rates of etching of crude and refined zinc. The distillation unit is designed for the refining of 4500-4800 g of zinc. As a laboratory procedure, the method is claimed to be superior to the refining of zinc by electrolysis or zone melting. A sketch of the apparatus is shown in Fig.1, where: A - distillation flask; B - column, packed with silica rings; C - inlet tube (for introduction of molten zinc); D - fused-on tube for thermocouple; E - side arm, connecting to: F - condenser; G - tube, holding heating element;

Card 1/3

Preparation of highly purified ...

H - connecting bell jar; K - receiver, which is attached to the bell jar by means of water-cooled brass flanges. The neck of the distillation flask is provided with indentations. The determined impurities of refined and unrefined zinc and analyses of zinc of different origins are tabulated.
There are 4 figures and 2 tables.

ASSOCIATION: Výzkumný ústav pro sdělovací techniku A.S. Popova, Praha
(A.S. Popov Research Institute for Telecommunication, Prague)

SUBMITTED: June 21, 1961

DEML, Frantisek

DEML, Frantisek; [redacted], Jiri

Preparation of high-purity arsenic. Pt.2. Chem Listy 58 no. 7:813-819 Jl '64.

1. A.S.Popov Research Institute of Telecommunication, Prague.

CZECHOSLOVAKIA

DEML, F

A.S.Popov Research Institute for Communications Engineering, Prague (Forschungsinstitut fur Nachrichtentechik A.S.Popov, Prag)

Prague, Collection of Czechoslovak Chemical Communications, No 3, March 1966, pp 1229-1236

"Preparation of pure gallium by reduction of gallic (3) chloride, using aluminum."

L 13833-66 EWT(m)/EWP(t)/EWP(b) DIAAP/IJP(c) JD/JG

ACC NR: AP6002679 SOURCE CODE: UR/0048/65/029/012/2225/2230

AUTHOR: Bedrosyan, P.; Bedike, T./ Demma, I./ Zaytseva, N.G./ Morozov, V.A.

TITLE: Gamma spectra of neutron deficient Os and Re isotopes/Transactions of the Fifteenth Annual Conference on Nuclear Spectroscopy and Nuclear Structure held at Minsk 25 January to 2 February 1965/

SOURCE: AN SSSR. Izvestiyal Seriya fizicheskaya. v.29, no. 12, 1965, 2225-2230

TOPIC TAGS: gamma spectrum, osmium, rhenium, beta decay,

ABSTRACT: Gamma spectra of short-lived Os and Re isotopes were investigated in order to improve or correct existing data. The instruments employed were a 40 x 40 mm NaI crystal scintillation spectrometer with a resolution of 10% at 662 keV and a fast-slow gamma-gamma coincidence spectrometer with a resolving time of 10 nanosec. The source was the osmium fraction from a gold target bombarded for 30 minutes with 660 MeV protons. Rhenium was repeatedly separated from the osmium source to serve as the rhenium source. Analysis of the osmium decay curve showed the presence of activities with half-lives of approximately 23 min, 90 min, and 23 hr. Gamma lines with half-lives less than 2 hr were observed at 120, 190, 240, 310, 510, 800, and 880 keV. It was not in general possible to assign definite half-lives to the different lines, but the decay of the intense 240 keV line was found to be complex with the two half-lives: ~30 min and 90 ± min. A gamma spectrum recorded 14 hours after separation of the osmium showed lines at 115, 180, 385, and 510 keV. Gamma-gamma coincidence measurements were undertaken in the 510 keV region. No coincidences were observed at 90°

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L 13833-66

ACC NR: AP6002679

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but coincidences were observed at 180°. The 510 keV line is accordingly ascribed to annihilation radiation. The decay of the annihilation radiation was complex, with half-lives of 23 ± 3 min and 3 ± 0.5 hr. The rhenium separated from the osmium source 38 min after beginning of accumulation decayed with two half-lives; 22 ± 3 min and 21 ± 2 hr. Associated with the short-lived activity there were observed gamma lines at 90, 135, 210, 260, 315, 440, 510, 600, 680, 760, 840, and 940 keV. Associated with the long-lived activity there was observed a gamma line at 365 keV; this activity is accordingly ascribed to Re^{181}. The present data are compared with the findings of Yu.Surkov, G.M.Chernov, A.K.Lavrukhina, and Z.V.Kronchenko (Izv. AN SSSR, Ser.fiz., 24, 119 (1960)), T.V.Malysheva, and B.A.Khotin (Izv. AN SSSR, Ser. Fiz., 25, 1256 (1961)), and I.S.Foster, I.W.Hilborn, and L.Yaffe (Canad. J. Phys.,36, 555 (1958)), and numerous points of agreement and disagreement are noted. The principal conclusion of the ensuing discussion is that the gamma spectrum of radioactive osmium is considerably more complex than was indicated by the findings of Surkov et al. (loc.cit.) and that further investigation of both the osmium and rhenium activities is necessary. The authors thank K.Ya.Gromov for discussing the results and T.M.Muminov for assisting with the measurements. Orig. art. has: 6 figures and 1 table.

SUB CODE: 18/ SUBM DATE: none ORIG. REF: 005 OTH REF: 001

Card 2/2

DEMNER, L.M.; OKSMAN, I.M., professor, zaveduyushchiy; VASILOV, S.I., dotsent, zaveduyushchiy; KOSTYLEV, M.V., direktor.

Preparation of dental bridges from stainless steel without soldering. (MLRA 6:7)
Stomatologiia no.3:53-54 '53.

1. Kafedra ortopedicheskoy stomatologii Molotovskogo meditsinskogo stomatologicheskogo instituta (for Demner and Oksman). 2. Kafedra fiziki Molotovskogo meditsinskogo stomatologicheskogo instituta (for Vasilov and Demner). 3. Molotovskiy meditsinskiy stomatologicheskiy institut (for Kostylev).
(Teeth, Artificial)

DEMNER, L.M.

Frequency and nature of anomalies of the maxillodental system in children suffering from osteoarticular tuberculosis. Stomatologiia 37 no.4:63-65 Jl-Ag '58 (MIRA 11:9)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - dots. Z.Ya. Shur) Permskogo meditsinskogo instituta (dir. - prof. I.I. Kositsyn) i kostno-sustavnogo tuberkuleznogo sanatoriya "Podsnezhnik" (glavnyy vrach V.V. Glushkova).
(MOUTH--ABNORMITIES AND DEFORMITIES)
(BONES--TUBERCULOSIS)

DEMNER, L.M., aspirant

Dental caries and ways of preventing it as revealed by data from an examination of children and adolescents in Kazan. Kaz. med. zhur. no.6:56-58 N-D '60. (MIRA 13:12)

1. Kafedra ortopedicheskoy stomatologii (zav. - prof. I.M. Oksman) Kazanskogo meditsinskogo instituta.
(KAZAN--TEETH--DISEASES)

DEMNER, L.M., assistent

Some problems of the fine structure of the hard tissues of a tooth in health and pathology. Stomatologiia 42 no.3:33-36 My-Je '63 (MIRA 17:1)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - prof. I.M. Oksman) i kafedry obshchey biologii (zav. - prof. V.V. Izosimov) Kazanskogo meditisnskogo instituta.

DEMNER, L.M.

New method of histological study of the hard and soft tissues of the same tooth by the use of serial ground and plain sections. Nauch. trudy Kaz. gos. med. inst. 14:157-158 '64. (MIRA 18:9)

1. Kafedra ortopedicheskoy stomatologii (zav. - prof. I.M. Oksman) Kazanskogo meditsinskogo instituta.

DEMNER, L.M., assistent

Incidence of dental caries in children with osteoarticular tuberculosis depending on the localization and gravity of the disease. Vop. obshchei stom. 17:16-17 '64.

Complicated dental caries and the hygienic state of the oral cavity in children with tuberculosis. Ibid.:30-32
(MIRA 18:11)

Demo Zh.

DREYFUS, Zh.K.; SHAPIRA, G.; SHAPIRA, F.; DEMO, Zh.

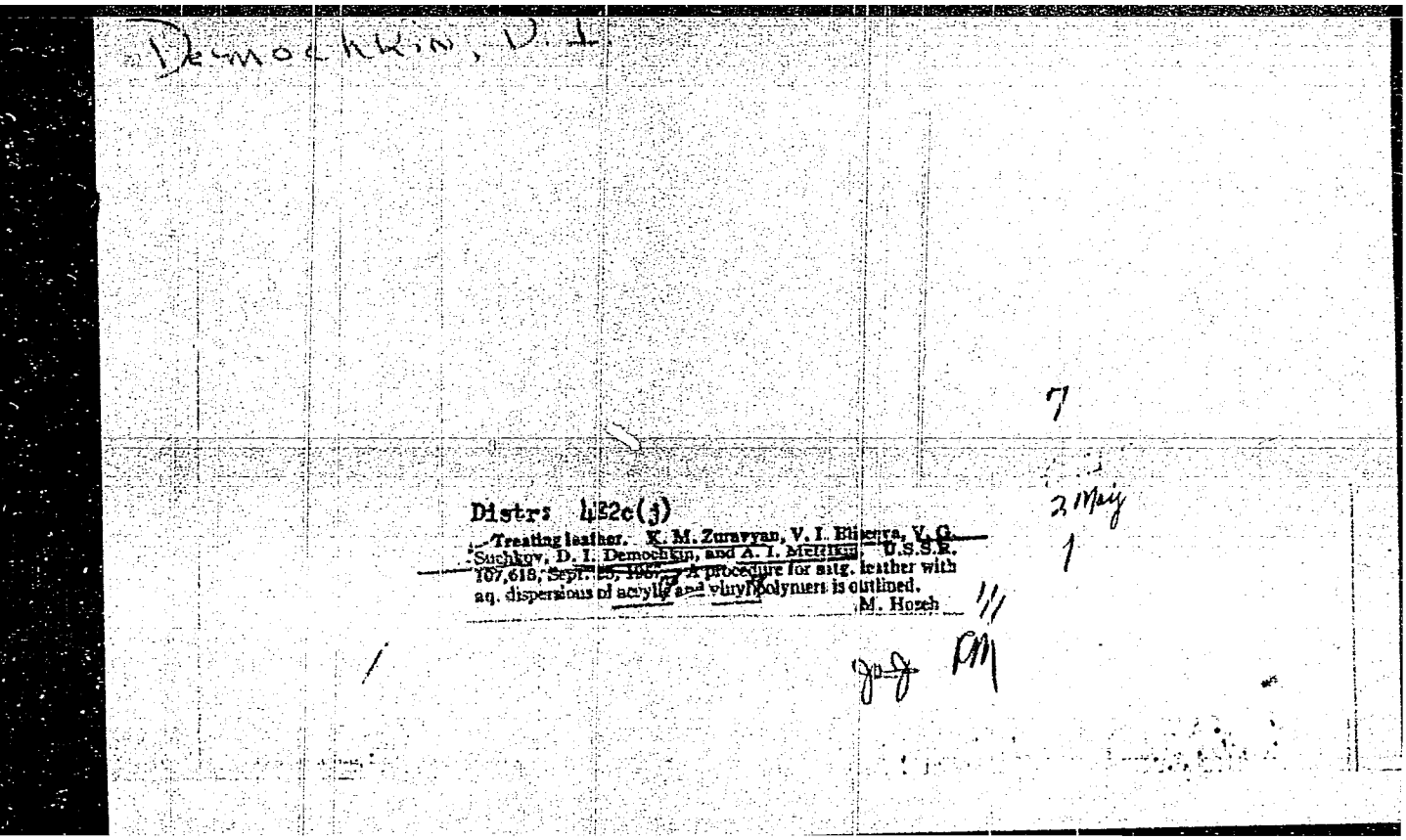
Studies on the biochemical aspects of human muscle diseases [with summary in English]. Vop.med.khim. 4 no.2:97-108 Mr-Ap '58. (MIRA 11:5)

1. Laboratoriya meditsinskoy i biologicheskoy khimii Gospitalya dlya bol'nykh detey (Parizh)

(MUSCLES, diseases
biochem. analysis of blood & musc. tissue in various dis. (Rus)

DEMOCHEV, N.V., inzh.; LAPINSKIY, A.N., inzh.

Using pneumatic cement loaders in loading gypsum into railroad cars. Stroi.mat. 5 no.12:28-29 D '59. (MIRA 13:3)
(Loading and unloading)
(Gypsum--Transportation)



Demochkin, D. I.

Distr: 4E2c(j)

Treating leather. K. M. Zuravyan, V. I. Elizarova, V. G. Suchkov, D. I. Demochkin, and A. I. Melikian. U.S.S.R. 107,618, Sept. 25, 1957. A procedure for satg. leather with aq. dispersions of acrylic and vinyl polymers is outlined. M. Hoseh

BORISOV, Ye.F., dots.; BREGEL', E.Ya., prof.; BUKH, Ye.M., dots.; VASHENTSEVA, V.M., dots.; GOLEVA, Yu.P., kand. ekon. nauk; GOLEVA, A.P., kand. ekon. nauk; DEMOCHKIN, G.V., dots.; DONABEDOV, G.T., kand. ekon. nauk; YERMOLOVICH, I.I., dots.; KALYUZHNYY, V.M., dots.; KORNEYEVA, K.G., dots.; KUZNETSOVA, A.S., prof.; MIROSHNICHENKO, V.S., dots.; MYASNIKOV, I.Ya., kand. ekon. nauk; PIKIN, A.S., dots.; SIDOROV, V.A.; SMIRNOV, A.D., dots.; SOLOV'YEVA, K.F., dots.; SOROKINA, I.F., dots.; TARUNIN, A.F., kand. ekon. nauk; KHARAKHASH'YAN, G.M., prof.; MENDEL'SON, A.S., red.; SHVEYTSER, Ye.K., red.; ROTOVA, R.S., red.; GARINA, T.D., tekhn. red.

[Economics of socialism] Politicheskaia ekonomiia sotsializma. Moskva, Gos.izd-vo "Vysshaia shkola," 1963. 476 p. (MIRA 17:2)

L 14263-66 EWT(1)/FS(v)-3 SCTB DD/RD
ACC NR: AT6003846 SOURCE CODE: UR/2865/65/004/000/0107/0118

AUTHOR: Abakumova, I. A.; Akhlebininskiy, K. S.; Bychkov, V. P.; Demochkina, N. G.; Kondrat'yev, Yu. I.; Ushakov, A. S.

42
41
B71

ORG: none

2,44,55

TITLE: Some data on the animal link in a closed ecological system

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 107-118

TOPIC TAGS: closed ecology system, space nutrition, commercial animal, animal husbandry

ABSTRACT: Data on the animal part of a closed ecological system such as might be used in spaceflight (based on unicellular algae, higher plants, animals, and man) are presented. Most of the information concerns chickens and ducks, good choices because they mature fast, produce a sufficient quantity of nutritious food, and have a high yield of meat and eggs per unit of feed. Comparative analysis shows that to produce 1 kg of meat and fat, cattle require approximately twice as much feed, and pigs 1.5 times as much

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feed as broiler chickens. Furthermore, new generations of chickens and ducks are easily raised by incubating fertilized eggs, and their offspring (taken together) weigh more than the offspring of other animals. The meat of chickens and ducks has more protein and is of higher food value than the protein of other animals. Calculations are made of the number of ducks required to provide a cosmonaut with his daily requirement of animal protein (40—45 g), and tables showing turnover of the flock are listed. For instance, it was concluded that 9 Peking ducks (40 days old) will feed a cosmonaut for 1 month. Fifty eggs are needed for food and hatching in the same period. The daily food and water requirement for this duck population is computed, together with the amount of respired CO_2. Analogous comparative data are listed for chickens. Charts of the nutritive content and caloric value of the food produced by chickens and ducks are included.

It is calculated that for 1 kcal of this food, 25.4 kcal of feed is expended for a duck, and 22.2 kcal for a chicken. Of course, the needs of other links in the closed system will determine whether chickens or ducks are finally chosen. Both animals have advantages: ducks, for instance, can be fed a

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higher percentage of green fodder, and they both mature and gain weight faster than chickens. It must be emphasized that these are only preliminary calculations. More information must be collected about these and other animals, and many experiments must be conducted with each in a closed ecological system. Orig. art. has: 9 tables. [ATD PRESS: 4091-F]

SUB CODE: 02, 06 / SUBM DATE: none / ORIG REF: 013 / OTH REF: 002

Card 3/3

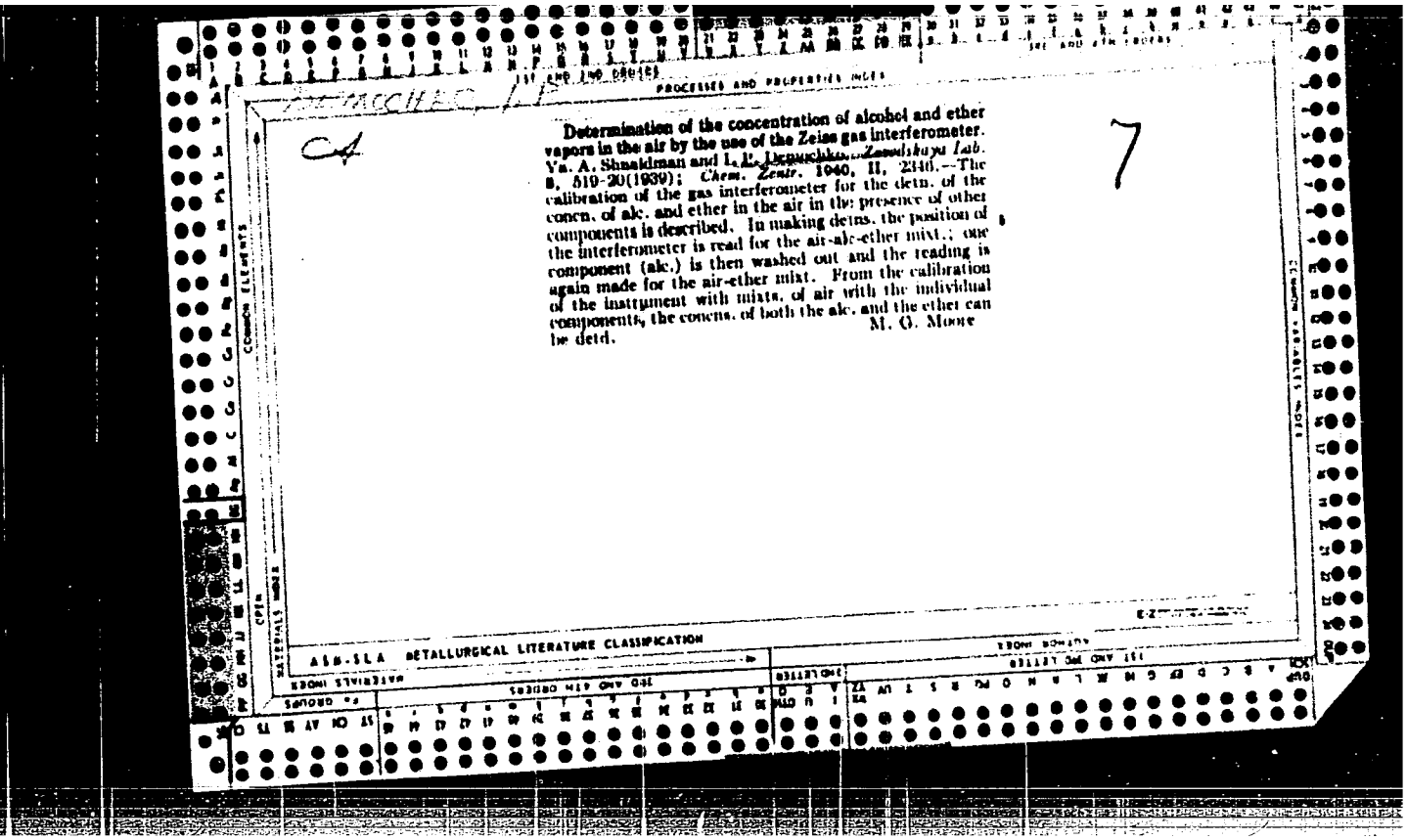
DEMOCHKO, Ivan Ivanovich; SHUBIN, Sergey Sergeyevich; LYUBIMOV, N.G., otv.red.; CHAMSKAYA, G.M., tekhn.red.

[SBL-4-2 scraper winch] Skrepernaia lebedka SBL-4-2. Moskva, Ugletekhizdat, 1959. 30 p. (MIRA 12:12)
(Coal mining machinery)

DEMOCHKO, Ivan Ivanovich; KUZNETSOV, Aleksandr Vasil'yevich; D'YAKOVA, G.B., red. izd-va; BOLDYREVA, Z.A., tekhn. red.; LOMILINA, L.N., tekhn. red.

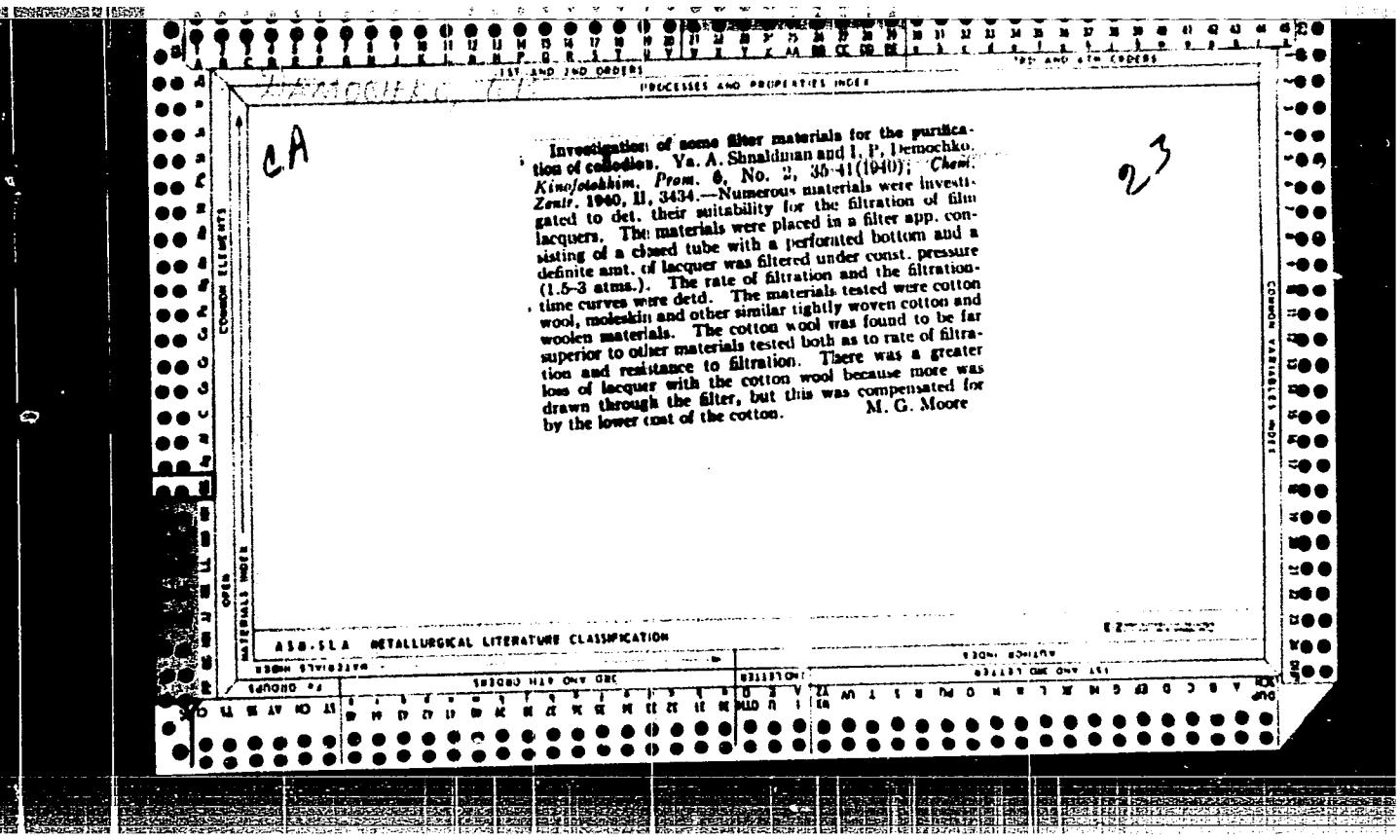
[BS-4 scraper hoists for filling materials] Butovye skrepernye lebedki BS-4. Moskva, Gosgortekhizdat, 1962. 55 p. (MIRA 15:5)

(Hoisting machinery) (Mine filling)



Determination of the concentration of alcohol and ether vapors in the air by the use of the Zeiss gas interferometer. Ya. A. Shnaidman and I. P. Ivanchikin. *Zavodskaya Lab.* 8, 519-20(1939); *Chem. Zentr.* 1940, II, 2346.—The calibration of the gas interferometer for the detn. of the concn. of alc. and ether in the air in the presence of other components is described. In making detns. the position of the interferometer is read for the air-alc-ether mixt.; one component (alc.) is then washed out and the reading is again made for the air-ether mixt. From the calibration of the instrument with mixts. of air with the individual components, the concns. of both the alc. and the ether can be detd.

M. G. Moore



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Investigation of some filter materials for the purification of collodion. Ya. A. Shnaldman and I. P. Demochko. *Kinofotokhim. Prom.* 6, No. 2, 35-41 (1940); *Chem. Zentr.* 1940, II, 3434.—Numerous materials were investigated to det. their suitability for the filtration of film lacquers. The materials were placed in a filter app. consisting of a closed tube with a perforated bottom and a definite amt. of lacquer was filtered under const. pressure (1.5-3 atms.). The rate of filtration and the filtration-time curves were detd. The materials tested were cotton wool, moleskin and other similar tightly woven cotton and woolen materials. The cotton wool was found to be far superior to other materials tested both as to rate of filtration and resistance to filtration. There was a greater loss of lacquer with the cotton wool because more was drawn through the filter, but this was compensated for by the lower cost of the cotton.

M. G. Moore

ATLASOV, I.P.; DEMOKIDOV, K.K.; DIBNER, V.D.; EGIAZAROV, B.Kh.; IVANOVA, A.M.; LOBANOV, M.F.; MARKOV, F.G.; RABKIN, M.I.; RAVICH, M.G.; SAKS, V.N.; SOKOLOV, V.N.; TKACHENKO, B.V.; USTRITSKIY, V.I.; NALIVKIN, D.V., nauchnyy red.; VASIL'YEV, R.P., red.; SOLOV'YEV, L.D., red.; NEKHOROSHEV, A.P., red.; DOLGONOS, L.G., tekhn. red.

[Geological map of the Soviet Arctic] Geologicheskaia karta Sovetskoi Arktiki. Sost. I.P.Atlasov [i dr.] Glav. red. F.G. Markov. ....Nauchn. red. D.V. Nalivkin. [Moskva] 1957. ..Col. map 89 x 131 cm. no. 4 sheets 51 x 72 cm. .. Scale 1:2,500,000. ..Inset: [Geological map of Wrangel Island] Geologicheskaia karta Ostrova Vrangelia, 1:1,500,000. (MIRA 11:8)
(Arctic regions--Geology--Maps)
(Wrangel Island--Geology--Maps)

DEMOKIDOV, K.K.; ROMANOVICH, B.S.; BUSHKANETS, Yu.S.; BELYAKOV, G.D.

Geology of the Novaya Zemlya islands and of Vaygach Island. Trudy Nauch.-issl. inst. geol. Arkt. 81:23-25 '57. (MIRA 11:5)

1. Sotrudniki Nauchno-issledovatel'skogo instituta geologii Arktiki.
(Novaya Zemlya—Geology) (Vaygach Island—Geology)

TKACHENKO, B.V.; RABKIN, M.I.; DEMOKIDOV, K.K.; VAKAR, V.A.; GROZDILOV, A.L.; BUTAKOVA, Ye.L.; STREIKOV, S.A.

Geology of the northern part of the Central Siberian Plateau. Trudy Nauch.-issl. inst. geol. Arkt. 81:133-242 '57. (MIRA 11:5)

1. Sotrudniki instituta geologii Arktiki.
(Central Siberian Plateau--Geology)

DEMOKIDOV, K.K.

Stratigraphic division of Cambrian sediments in the northern part of the Siberian Platform. Trudy NIIGA 67:3-12 '58.
(MIRA 12:10)

(Siberian Platform--Geology, Stratigraphic)

DEMOKIDOV, K.K.; CHERNYSHEVA, N.Ye.; PISARCHIK, N.K.; NEKRASOVA, O.M.

Stratigraphy and facies of the Cambrian of the Siberian Platform.
Trudy NIIGA 80:41-54 '58. (MIRA 14:11)
(Siberian Platform--Geology, Stratigraphic)

DEMOKIDOV, K.K.; LAZARENKO, N.P.

Recent data on the stratigraphy of Cambrian deposits on the western slope of the northern Kharaulakskiy Range. Sbor.st.po paleont.i biostrat. no.16:11-22 '59.
(MIRA 13:3)

(Kharaulakskiy Range--Geology, Stratigraphic)

DEMOKIDOV, K.K.

Biostratigraphic correlation of the upper section of the Cambrian system in the Soviet Arctic. Trudy NIIGA 111: 3-10 '60. (MIRA 14:7)
(Russia, Northern—Geology, Stratigraphic)

DEMOKIDOV, K.K.; LAZARENKO, N.P.; IKACHENKO, B.V., kand. geol.-mineral.nauk, red.

[Stratigraphy of the Upper Pre-Cambrian and Cambrian and the Lower Cambrian trilobites in the northern part of central Siberia and the islands of the Soviet Arctic.] Stratigrafiia verkhnego dokembriia i kembriia i nizhnekembriiskie trilobity severnoi chasti Srednei Sibiri i ostrovov Sovetskoi Arktiki. Moskva, Nedra, 1964. 286 p. (Leningrad. Nauchno-issledovatel'skii institut geologii Arktiki. Trudy, no.137) (MIRA 18:5)

DEMOKIDOVA, N.K. (Moskva); KABAK, Ya.M. (Moskva)

Simple methods for testing growth promoting preparations of the hypophysis. Probl.endok. i gorm. 3 no.2:111-113 Mr-Ap '57. (MIRA 10:10)
(SOMATOTROPIN, prep.
testing methods (Rus))

DEMOKIDOVA, N.K.

Testing growth hormone preparations in rats following thyroid block by methylthiouracil. [with summary in English]. Biul.eksp.biol. i med. 45 no.6:104-108 Je '58 (MIRA 11:8)

1. Iz laboratorii tekhnologii organoterapevticheskikh preparatov Vsesoyuznogo nauchno-issledovatel'skogo instituta myasnoy promyshlennosti (dir. B.M. Gorbatov) i laboratorii endokrinologii (zav. - prof. Ya.M. Kabak) Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova. Predstavlena deystvitel'nym chlenom AMN SSSR S.Ye. Severinym.

(THIOURACIL, rel. cpds.
methylthiouracil, growth hormone standard, in rats after thyroid block(Rus))
(SOMATOTROPIN, effects,
standard, in rats after methylthiouracil thyroid block (Rus))

DEMOKIDOVA, N.K.

State of some endocrine glands under the effect of methylthiouracil doses blocking the thyroid gland in rats. Biul eksp. biol. i med. 60 no. 10:46-49 O '65 (MIRA 19:1)

1. Institut gigiyeny truda i professional'nykh zabolevaniy (direktor - deystvitel'nyy chlen AMN SSSR A.A. Letavet) AMN SSSR, Moskva, i laboratorii endokrinologii (zav. - prof. Ya.M. Kabak [deceased] Moskovskogo gosudarstvennogo universiteta imeni M.V. Lomonosova. Submitted April 22, 1964.