Scattering of Longitudinally Polarized Electrons and Positrons on Polarized Electrons SOV/48-22-7-25/26

of the initial polarization of the electron: $P \approx s_2 \cos\theta$. If the energy of the particle is high and if the electron and positron spins are antiparallel before the collision, the scattered positrons remain completely polarized: $P \approx s_2$.

(3) and (4) still are valid in cases, where either the electron or the positron or both are not polarized at the beginning. The corresponding spin projection then equals zero. A.A.Sokolov proposed the subject, B.K.Kerimov discussed the investigation with the authors. There are 4 references, 2 of which are Soviet.

ASSOCIATION: Azerbaydzhanskiy gos. universitet im. S.M.Kirova
(Azerbaydzhan State University imeni S.M.Kirov
Moskovskiy gos.universitet im.M.N.Lomonosova
(Moscow State University imeni M.V.Lomonosov)

SOV/56-35-5-35/56

21(8)

AUTHORS: Mukhtarov, A. I., Gadzhiyev, S. A.

TITLE: The Radiative Disintegration of the $\pi^{\pm}$-Meson and the Consideration of Non-Conservation of Parity (Radiatsionnyy raspad $\pi^{\pm}$-mezona i uchet nesokhraneniya chetnosti)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 5, pp 1283-1285 (USSR)

ABSTRACT: The longitudinal polarization of particles is a consequence of the non-conservation of parity in the presence of weak interactions. The investigation of radiation decay $\pi^{\pm} \rightarrow \mu^{\pm} + \nu + \gamma$ shows that parity can also not be conserved in mixed interactions. For this purpose, the decay equation for the four-component theory of the neutrino is written down. The longitudinal polarization of the muon and the neutrino are accounted for by introducing a projecting operator of the form $\vec{\sigma}\,\hat{\vec{p}}/p$. The eigenvalues of this parameter(s_μ and s_ν) then describe the longitudinal polarization of the muon and the neutrino. Next, an expression for the decay probability

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SOV/56-35-5-39/56

The Radiative Disintegration of the π^{+}-Meson and the Consideration of Non-Conservation of Parity

of a resting pion will be derived. Three terms of this expression are due to the non-conservation of parity, i.e. to longitudinal polarization of the muon, neutrino and γ-quantum. In order to facilitate analysis of the expression for the disintegration probability, the pulse of the muon is assumed as being very small. The pulses of the γ-quantum are assumed as being anti-parallel. The analysis of the decay probability leads to the following results: a) If the spin of the muon is contrary to the direction of motion of the γ-quantum, the decay probability differs from "0" only if during decay a neutrino is emitted and if the emitted γ-quantum is polarized circularly to the right; b) If the spin of the muon points in the direction of motion of the γ-quantum, a decay of the pion is feasible under emission of one antineutrino and one γ-quantum with left circular polarization. If the pion decays under emission of a neutrino, its spin must then form an angle of 180° with the direction of the γ-quantum (if the pulse of the muon is small). In case of disintegration of the anti-neutrino this angle must be almost "0". There are 2 references, 1 of which is Soviet.

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SOV/56-35-5-35/56

The Radiative Disintegration of the π^{+}-Meson and the Consideration of Non-Conservation of Parity

ASSOCIATION: Azerbaydzhanskiy gosudarstvennyy universitet (Azerbaydzhan State University)

SUBMITTED: June 13, 1958

Card 3/3

MUKHTAROV, A.I.

Polarization of β-particles in $\mu^{+} \rightarrow e^{\pm} + \nu + \bar{\nu}$ decay. Uch. zap. AGU. Fiz.-mat. i khim. ser. no.3:35-41 '59. (MIRA 14:3)
(Mesons—Decay) (Beta rays)

27740
S/058/61/000/007/012/086
A001/A101

24.6600

AUTHORS: Mukhtarov, A.I., Bukh, F.O.

TITLE: Scattering of high-energy electrons from nuclei of light elements

PERIODICAL: Referativnyy zhurnal. Fizika, no. 7, 1961, 76, abstract 7B371 ("Uch. zap. Azerb. un-t. Fiz.-matem. i khim. ser.", 1959, no. 4, 57 - 67, Azerb. summary)

TEXT: Elastic and inelastic scattering of high-energy electrons from nuclei of light elements are considered in the first Born approximation with allowance for the form-factor of the nuclear charge. The distribution of density of Coulomb charge over the nucleus was selected in the form of Gauss functions, monomial, bimomial and trinomial whose parameters were determined from experiments on scattering of fast nucleons from nuclei of light elements. Angular distributions of scattering calculated in the study were compared with experimental data on electron scattering from C^{12} and Be^{9} for energies 187 and 127 Mev. It is shown that in the case of elastic scattering the Gauss monomial function $\rho(r) = N_0 \exp(-b_0 r^2)$ agrees better with experiments than binomial and trinomial Gauss functions.

V. Kerimov

[Abstracter's note: Complete translation]

Card 1/1

21(8)

AUTHORS: Kerimov, B. K., Mukhtarov, A. I., Gadzhiyev, S. A.

SOV/56-37-2-47/56

TITLE: Polarization Effects in the Decay $\pi^0 \rightarrow e^- + e^+ + \gamma$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 2(8), pp 575-576 (USSR)

ABSTRACT: Recently (Refs 1,2) cases of a charge exchange scattering of negative pions on hydrogen ($\pi^- + p \rightarrow \pi^0 + n$) with a subsequent decay of the neutral pion according to the Dalitts scheme into an electron-positron pair and into a γ-quantum were recorded. In the present paper the results of a calculation of the decay of the neutral pion according to the above scheme taking into account the spin states (of the longitudinal polarizations) of the electron-positron pair produced and of the γ-quantum are presented. The Hamiltonian of the direct interaction for the process mentioned above takes the form $H_{int} = eg\phi_{\pi^0}\left\{\psi^+_{e^-} O_i D^{-1}(\vec{\alpha}\vec{A}^+)\psi_{e^+} + (\psi^+_{e^-}\vec{\alpha}\vec{A}^+ D^{-1})O_i\psi_{e^+}\right\}$. In this equation ϕ_{π^0}, $\psi^+_{e^-}$, ψ_{e^+} and $\vec{A}^+$ denote the wave functions of the π^0 meson, the electron, positron, and of the

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γ-quantum. D represents the Dirac operator, $\vec{a} = \rho\vec{\sigma}$ the Dirac matrices, $O_i = \rho_2$ holding, if the π^0 meson is pseudoscalar, and $O_i = \rho_3$, if it is a scalar particle. In the sequel an expression for the probability of the decay in question $\pi^0 \rightarrow e^- + e^+ + \gamma$ is derived

$$dW(s_-,s_+,1,\theta) = \frac{e^2 g^2}{\hbar^2 c^4 (2\pi)^3} \frac{k_+^2 d\Omega_+(dk_-)}{k_{o\pi} k_+ K_- (k_{o\pi} - K_-) + k_{o\pi} K_- k_- K_+ \cos\theta} \cdot$$

$\cdot \{\Phi_1 + s_- s_+ \Phi_2 + 1 s_- \Phi_3 + 1 s_+ \Phi_4\}$. The rather lengthy expressions occurring in this equation for Φ_1, Φ_2, Φ_3, and Φ_4 are written down explicitly. The formula for $dW(s_-,s_+,1,\theta)$ gives the angular dependence and the energy dependence of the degree of longitudinal polarization and of the correlations between the polarizations (the terms $\sim s_- s_+, 1 s_-, 1 s_+$) in the decay $\pi^0 \rightarrow e^- + e^+ + \gamma$. This may be of use in the collection of data on the properties of the neutral pion. According to the

Polarization Effects in the Decay $\pi^0 \longrightarrow e^- + e^+ + \gamma$ SOV/56-37-2-47/56

formulas derived herein the decay probability in $\pi^0 \rightarrow e^- + e^+ + \gamma$ for the extreme relativistic decay electrons and positrons (if $k_-, k_+ \gg k_0$ and $\Phi_1 = \Phi_2$, $\Phi_3 = \Phi_4$ is true) differ from zero only if the electrons and the positrons of the pairs exhibit either a left or right polarization. The authors express their gratitude to A. A. Sokolov for the constant interest shown in this work. There are 5 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: May 16, 1959

Card 3/3

KERIMOV, B.K.; MUKHTAROV, A.I.; GADZHIYEV, S.A.

Longitudinal polarization of an electron-positron pair in the decay of a neutral π-meson. Izv.vys.ucheb.zav.;fiz. no.2:26-30 '60. (MIRA 13:8)

1. Moskovskiy gosuniversitet im. M.V.Lomonosova i Azerbaydzhanskiy gosuniversitet im. S.M.Kirova.
(Mesons--Decay)

S/139/60/000/03/035/045
E032/E314

AUTHORS: Gadzhiyev, S.A. and Mukhtarov, A.I.

TITLE: On the Disintegration of the μ^+ meson

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No 3, pp 195 - 197 (USSR)

ABSTRACT: The present paper is concerned with the process $\mu \rightarrow e + \nu \neq \nu + \gamma$. It is well known that on the two-component theory $s_\nu = -1/2$ for the neutrino and $s_{\bar{\nu}} = +1$ for the antineutrino. However, on the 4-component theory both the neutrino and the antineutrino have $s = \pm 1$ ($s_{\nu,\bar{\nu}} = \pm 1$). It is shown that on the two-component theory the probability of the above mode of disintegration of the μ-meson is identically zero (Eq 5). The two-component theory does not allow the above process through the scalar, pseudo-scalar and tensor variants of the interaction. Thus, an experimental confirmation of the fact that this mode is forbidden would be an additional confirmation of both of the two-component theory of the neutrino and

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On the Disintegration of the μ^{+}_{-} meson

and the universal interaction theory of Feynman and Gell-Mann (Ref 3). In the case of the VA variants of the interaction, the probability of disintegration is found to be proportional to $1 - s_{\nu} s_{\bar{\nu}}$ and is therefore finite on the two-component theory of the neutrino; the latter point will be investigated further in a future paper. Acknowledgments are made to Professor A.A. Sokolov and B.K. Kerimov for valuable advice and discussions.
There are 9 references, 4 of which are Soviet and 5 English.

ASSOCIATION: Azerbaydzhanskiy gosuniversitet imeni S.M. Kirova (Azerbaydzhan State University imeni S.M. Kirov)

SUBMITTED: May 21, 1959

VB

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S/139/60/000/006/022/032
E032/E414

24.6900

AUTHORS Mukhtarov, A. I., Bylanbekov, R. G. and Gadzhiyev, S. A.

TITLE Radiative Decay of the π^- Meson

PERIODICAL Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No.6, pp.142-146

TEXT After the discovery of the non-conservation of parity (Lee and Yang, Ref.1) in weak interactions it became necessary to review the theory of the various processes in which these interactions are involved. This has been done by various authors (Ref.1 to 10) who discussed in detail the β-decay of nuclei, non-radiative disintegrations of π and μ-mesons and so on. The radiative disintegration of the π-meson has been discussed by Ioffe, Rudik, Fry, Egyshi, Primakoff, Vedenov, Mukhtarov, Bund and other (Ref.15 to 18). In some of these papers, the non-conservation of parity was taken into account while in others the anomalous magnetic moment of the μ-meson was accounted for. The present authors report a study of the radiative decay mode of the π-meson

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Radiative Decay of the π^- Meson

$$\pi^- \rightarrow \mu^- + \nu + \gamma$$

on the basis of the theory of Dirac particles with oriented spins, and taking into account the anomalous magnetic moment of the μ-meson. The polarization and the angular distribution of the decay products are computed. However only the longitudinal polarization of the decay products is taken into account since it is an integral of motion and, as was shown by Sokolov et al (Ref 20) the transverse and time components of the spin pseudovector can easily be expressed in terms of the longitudinal component. Following the methods of Sokolov (Ref 13 and 21) the longitudinal polarization of the μ-meson and the neutrino is included with the aid of the projection operator $\sigma p / p$ whose eigenvalues are equal to twice the spin projection in the direction of their motion. The circular polarization of the γ-ray is taken into account with the aid

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Radiative Decay of the $\pi^{\pm}$ Meson

the vector

$$a_1 = \frac{1}{\sqrt{2}}(\beta + il[n\beta]),$$

Eq. p. 142

(Sokolov, Ref.21 and 22). In this expression β is a unit vector perpendicular to $\underline{n} = (\underline{\varkappa}/\varkappa)$; $h\underline{\varkappa}$ is the momentum of the γ-ray; $l = 1$ for right-handed polarization and $l = -1$ for the left-handed polarization. A general expression is derived for the decay probability using the four-component neutrino theory. This probability contains a term due to the anomalous magnetic moment of the μ-meson and when this term is put to zero the formula reduces to that given by Mukhtarov and Gadzhiyev (Ref.17). The general formula is, however, rather unwieldy but it can be simplified with the aid of the non-relativistic approximation. On this approximation, the differential decay

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Radiative Decay of the $\pi^{\pm}$ Meson

probability is given by

Eq. (11)

$$dW = \frac{e^2 g^2 \kappa^2 \, d\kappa \sin\theta \, d\theta}{16\pi c \hbar^2 \kappa_{0_\pi} \kappa_0^2} (\kappa_{0_\pi} - \kappa_0)\left[1 + \left(\frac{\mu'}{e}\right)\kappa_0\right]^2 (1 + l s_\nu)(1 - l\cos\theta). \quad (11)$$

where θ is the angle between the direction of motion of the μ-meson and of the photon. It is clear from this expression that if the spin of the μ-meson is antiparallel to the motion of the γ-ray ($\cos\theta = -1$) then the decay probability has a non-zero value only when an antineutrino is emitted and the γ-ray has a right-handed polarisation. If, on the other hand, the spin of the μ-meson is in the opposite direction, then one must allow the emission of a neutrino and a γ-ray with a left-handed polarization. It follows that if the neutrino is a completely longitudinally polarized particle, then the probability of a radiative π-decay has a non-zero value when the spins of all

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[illegible]

Bad three [illegible] of the π - Meson

The particles are all parallel or all antiparallel to their respective directions of motion. This conclusion is equivalent to the statement that the triangle formed by the angular momentum vectors is closed [illegible] angular momentum is conserved. Acknowledgments are expressed to Professor [illegible] A Sokolov and B.K Kerimov for interest and discussions [illegible] are 2 references [illegible]

[illegible] Azerbaydzhanskiy gosuniversitet imeni S.M.Kirova
Azerbaydzhan state university imeni S.M Kirov

SUBMITTED May 5, 1959 (initially)
January 25, 1960 (after revision)

Card 3/3

38400

S/058/61/000/009/007/050
A001/A101

24.6700

AUTHORS: Mukhtarov, A.I., Eilanbekov, R.G., Gadzhiyev, S.A.

TITLE: On the radiative decay of charged π -mesons

PERIODICAL: Referativnyy zhurnal, Fizika, no. 9, 1961, 37, abstract 9B126 ("Dokl. AN AzerbSSR", 1960, v. 16, no. 10, 935-940, Azerb. summary)

TEXT: The authors investigated angular and energy distributions at radiative decays $\pi \to \mu + \nu + \gamma$ and $\pi \to e + \nu + \gamma$ for the scalar and pseudoscalar variants of direct interaction with allowance for longitudinal polarization of the particles and anomalous magnetic moment of μ-meson (electron). It is shown that contribution in decay probability of the terms caused by the anomalous magnetic moments of the electron and μ-meson, amounts to $\approx 0.1\%$. In the non-relativistic approximation relative to the μ-meson the total probability of a radiative $\pi \to \mu$ decay does not depend on the longitudinal polarization of the μ-meson; in the case of a radiative $\pi \to e$ decay, high-energy electrons must be polarized along their momenta and positrons - in the opposite sense. The authors present the graphs of energy spectrum of electrons and angular distribu-

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A001/A101

On the radiative decay of charged π-mesons

tion of decay photons. They note that if in the formulae derived by them summing is carried out by polarization states of the electron (μ-meson) and photon and anomalous magnetic moment is neglected, the result of Vaks and Ioffe (RZhFiz, 1959, no. 7, 14829) is obtained.

B. Kerimov

[Abstracter's note: Complete translation]

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S/056/62/043/004/022/061
B102/B180

Polarization effects ...

obtained; s and s_ν characterize the longitudinal polarization of the electron and neutrino spins, l=1 denotes right-hand and l=-1 left-hand circular polarization; $k_{0\pi}$ is the pion rest mass, $c\vec{k}$, $(c\vec{k}\kappa)$ and $\vec{k}\vec{k}$, $(\vec{k}\vec{\kappa})$ are fermion (photon) energy and momentum, a and b are pion structural constants. After integrating with respect to photon and electron energies,

$$dW(\alpha, l, s) = \frac{Ak_{0\pi}^3 d\Omega}{2^{10}\alpha^6}(1 - ss_\nu)(s_\nu - l\lambda)^2\left\{\alpha\left(45 - \frac{181}{2}\alpha + 48\alpha^2 - \frac{87}{12}\alpha^3\right) + \right.$$
$$+ (1-\alpha)(45 - 63\alpha + 24\alpha^2 - 2\alpha^3)\ln(1-\alpha) + \qquad (4)$$
$$\left. + ls\left[\alpha\left(25 - \frac{69}{2}\alpha + \frac{46}{3}\alpha^2 - \frac{7}{12}\alpha^3\right) + (1-\alpha)(25 - 27\alpha + 6\alpha^2)\ln(1-\right.\right.$$

and summing over the electron and photon spin states

$$d\overline{W}(\alpha) = \frac{\overline{A}k_{0\pi}^3 d\Omega}{2^9\alpha^6}\left\{(1+\lambda^2)\left[\alpha\left(45 - \frac{181}{2}\alpha + 48\alpha^2 - \frac{87}{12}\alpha^3\right) + \right.\right.$$
$$+ (1-\alpha)(45 - 63\alpha + 24\alpha^2 - 2\alpha^3)\ln(1-\alpha)\Big] + \qquad (4')$$
$$\left.\left. + 2\lambda\left[\alpha\left(25 - \frac{69}{2}\alpha + \frac{46}{3}\alpha^2 - \frac{7}{12}\alpha^3\right) + (1-\alpha)(25 - 27\alpha + 6\alpha^2)\ln(1-\alpha)\right]\right\}.$$

$d\Omega = \sin\theta d\theta d\varphi$, $\alpha = \sin^2(\theta/2)$, $\overline{A} = (eag_A k_{0\pi}/\pi\hbar c)^2$.

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is obtained, which holds for any λ. For pion decay according to graph a, the photon (electron) angular distribution is

$$dW_l(a, l, s) = \frac{A_l k_{on} d\Omega}{2\pi a^3}(1 + ss_v)\left\{a + (1-a)\ln(1-a) + \right.$$

$$\left. + 2a^2(1-a)\left(\ln\frac{1}{1-y_{max}} - 1\right) + ls\left[a(1-2a) + (1-a)\ln(1-a)\right]\right\}. \quad (5).$$

From (4) and (5) it follows that for all weak interactions according to b, electrons and positrons are polarized in longitudinal opposite directions. For graph a in weak V, A interaction, the electron spin is parallel and the positron spin antiparallel to the momentum. With graph b and $\lambda = 1$ the photons from π^+ and π^- decay can be polarized only parallel (π^+) or antiparallel (π^-) to the direction of motion. For $\lambda = -1$ the inverse holds, and for $\lambda \neq 1$ the photons are circularly polarized. These selection rules are verified by examining the energy spectrum of electrons (positrons) and the angular distribution of photons (electrons). Only these spectra (and not, e. g., the photon energy spectrum and the $e^{\pm}$ polarization signs) yield information about the predominance of V-A or V+A variants: In V+A interaction, the photons from π^- decay are emitted at angles around $\Theta = \pi$, in V-A interaction around $\Theta = 0$. There are 3 figures.

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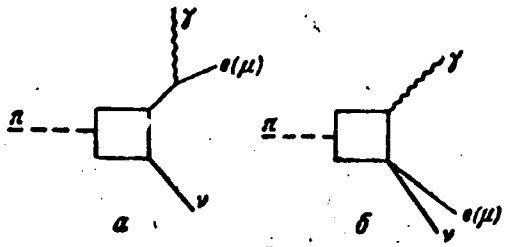
Polarization effects ...

S/056/62/043/004/022/061
B102/B180

ASSOCIATION: Azerbaydzhanskiy gosudarstvennyy universitet (Azerbaydzhan State University)

SUBMITTED: November 23, 1961 (initially)
May 28, 1962 (after revision)

Fig. 1.



Card 4/4

MUKHTAROV, A.M.

Connection of the oculomotor nerve with the cerebellum. Izv. AN Uz.SSR.Ser.med. no.5:45-47 '58. (MIRA 12:5)

1. Tashkentskiy gosudarstvennyy meditsinskiy institut, Kafedra normal'noy anatomii.

(OCULOMOTOR NERVE)

MUKHTAROV, A.M.

Intracerebral course of central fibers of the lateral root of the oculomotor nerve. Dokl. AN Uz.SSR no.5:55-57 '58. (MIRA 11:8)

1. Tashkentskiy gosudarstvennyy meditsinskiy institut. Predstavleno akademikom AN UzSSR A.Yu. Yunusovym.
(NERVE--INNERVATION)

MUKHTAROV, A.M., assistent

Connection between the oculomotor nerve and the posterior longitudinal fasciculus. Med. zhur. Uzb. no.4:42-45 Ap '60.
(MIRA 15:3)

1. Iz kafedry normal'noy anatomii (zav. - dotsent Kh.Z. Zakhidov) Tashkentskogo gosudarstvennogo meditsinskogo instituta.

(OCULOMOTOR NERVE)
(BRAIN)

MUKHTAROV, A.M., assistent

Intracerebral topography of the lateral trunk of the oculomotor nerve. Med. zhur. Uzb. no.5:32-35 My '60. (MIRA 15:3)

1. Iz kafedry normal'noy anatomii (zav. - dotsent Kh.Z. Zakhidov) Tashkentskogo gosudarstvennogo meditsinskogo instituta.

(OCULOMOTOR NERVE)
(BRAIN--LOCALIZATION OF FUNCTIONS)

MUKHTAROV, A.M., assistent

Interrelation of the oculomotor nerve with red nucleus. Med. zhur. Uzb. no.8:61-64 Ag '60. (MIRA 13:9)

1. Iz kafedry normal'noy anatomii (zav. - dotsent KH.Z.Zakhidov) Tashkentskogo gosudarstvennogo meditsinskogo instituta.
(OPTIC THALAMUS) (EYE—INNERVATION)

ZAKHIDOV, Kh.Z., dotsent; MUKHTAROV, A.M., assistent

Cerebellar connections of the trigeminal and the oculomotor nerves.
Med. zhur. Usb. no.12:57-59 D '60. (MIRA 14:1)

1. Iz kafedry normal'noy anatomii Tashkentskogo gosudarstvennogo meditsinskogo instituta.
(TRIGEMINAL NERVE) (OCULOMOTOR NERVE)
(CEREBELLUM)

MUKHTAROV, A. Z.

MUKHTAROV, A. Z. --"Directed Raising of Young Local Zebu-like Cattle of Uzbekistan." *(Dissertations For Degrees In Science and Engineering Defended at USSR Higher Educational Institutions)(29) Min Higher Education USSR, Uzbek Agricultural Inst imeni V. V. Kuybyshev, Smarkand, 1955

SO: Knizhnaya Letopis' N$_0$ 29, 16 July 1955

* For the Degree of Candidate in Agricultural Sciences

YULDASHEV, Sh.G.; MUKHTAROV, B.M.

Case of acute psychosis caused by Taeniarhynchus infestation.
Med.zhur.Uzb. no.10:84-85 O '58. (MIRA 13:6)

1. Iz Bukharskoy oblastnoy bol'nitsy (glavnyy vrach - I.I. Aminov).
(TAPEWORMS) (MENTAL ILLNESS)

[illegible]ROVA, Ch. K.= "On thermic dissociation of complex molecules." [illegible] Higher Education. Moscow Engineering-Physics Inst. Moscow, 1956. (Dissertations for the Degree of Candidate in Physicomathematical Sciences).

SO: Knizhnaya Letopis' No. 22, 1956

AUTHOR: Mukhtarov, Ch.K. SOV/51-6-2-7/39

TITLE: On Simultaneous Absorption of Light in Binary Mixtures (Ob odnovremennom pogloshchenii sveta v binarnykh smesyakh)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 2, pp 168-171 (USSR)

ABSTRACT: Ketelaar, Hooge and Fahrenfort (Refs 1, 2) reported experimental investigations of "simultaneous" absorption of light in compressed gases and in liquids. "Simultaneous" absorption is used to describe appearance of infrared absorption lines in mixtures of compressed gases or in solutions, absent in spectra of pure components of the mixture. Frequencies of the new absorption lines are given, within a few cm^{-1} by $\nu = \nu^a + \nu^b$, where ν^a and ν^b are the corresponding vibrational frequencies of pure components. The effect is due to vibrational excitation of two interacting molecules of different types (a and b) which absorbed simultaneously one quantum of frequency ν. The author derives a formula which relates the intensity of a "simultaneous"

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absorption line with the intensities of the corresponding component lines (ν^a and ν^b) in the infrared and Raman spectra. For a molecule with a centre of symmetry the author obtains a simple selection rule which makes it possible to find frequencies of "simultaneous" absorption lines. Acknowledgments are made to I.V. Obreimov and S.I. Pekar for their advice. The paper is entirely theoretical. There are 2 references, of which 1 is English and 1 French.

SUBMITTED: April 18, 1958.

IRODOV, Igor' Yevgen'yevich; MUKHTAROV, Ch.K., dotsent, nauchnyy red.; KUKOLEVA, T.V., red.; ANDRIYENKO, Z.D., red.; VLASOVA, N.A., tekhn.red.

[Collected problems in atomic physics] Sbornik zadach po atomnoi fizike. Moskva, Gos.izd-vo lit-ry v oblasti atomnoi nauki i tekhniki, 1960. 238 p. (MIRA 14:2)
(Nuclear physics)

S/020/62/144/006/010/015
B108/B102

AUTHORS: Bel'skiy, N. K., and Mukhtarov, Ch. K.

TITLE: Electron absorption spectrum of some bichromate crystals at low temperature. Interpretation of the spectra

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 6, 1962, 1269-1271

TEXT: At 20.4°K, various bichromates show a group of bands close to the long-wave absorption edge. The position of the band corresponding to greatest wavelength is nearly the same for all bichromates, which indicates that the electron transitions are only slightly dependent on the intermolecular interaction. The bichromate spectra apparently originate from the molecular ion Cr_2O_7, in the whole of which the electron transitions take place. These transitions combine with the vibrations of the Cr_2O_7 molecular ion as well as with the lattice vibrations. The Cr_2O_7 vibrations are attributed to O-Cr-O deformation vibrations. There are 2 figures.

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S/020/62/144/006/010/015
B108/B102

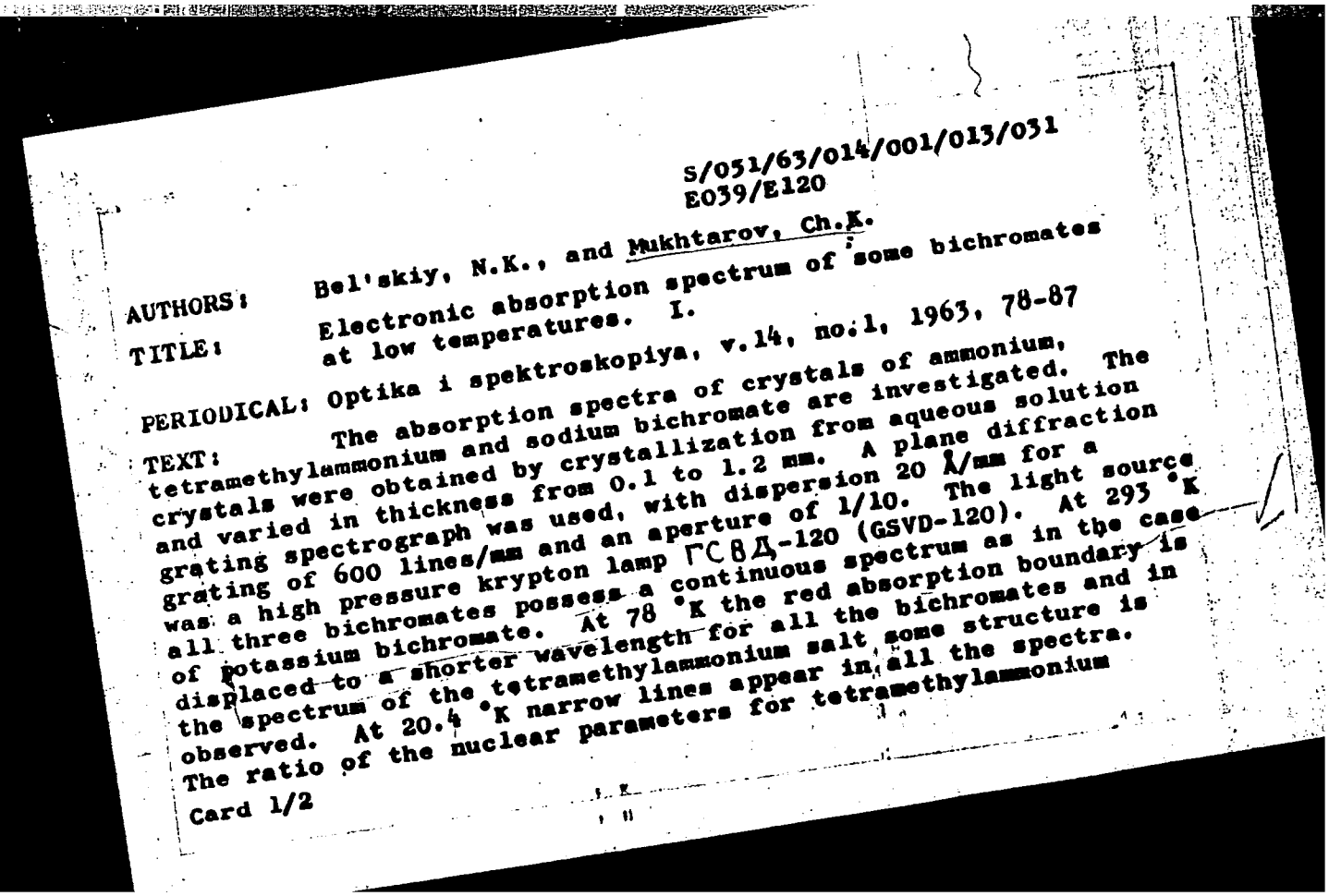
Electron absorption spectrum of...

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences USSR)

PRESENTED: February 19, 1962, by I. V. Obreimov, Academician

SUBMITTED: February 15, 1962

Card 2/2



S/051/63/014/001/013/031
E039/E120

AUTHORS: Bel'skiy, N.K., and Mukhtarov, Ch.K.

TITLE: Electronic absorption spectrum of some bichromates at low temperatures. I.

PERIODICAL: Optika i spektroskopiya, v.14, no.1, 1963, 78-87

TEXT: The absorption spectra of crystals of ammonium, tetramethylammonium and sodium bichromate are investigated. The crystals were obtained by crystallization from aqueous solution and varied in thickness from 0.1 to 1.2 mm. A plane diffraction grating spectrograph was used, with dispersion 20 Å/mm for a grating of 600 lines/mm and an aperture of 1/10. The light source was a high pressure krypton lamp ГСВД-120 (GSVD-120). At 293 °K all three bichromates possess a continuous spectrum as in the case of potassium bichromate. At 78 °K the red absorption boundary is displaced to a shorter wavelength for all the bichromates and in the spectrum of the tetramethylammonium salt some structure is observed. At 20.4 °K narrow lines appear in all the spectra. The ratio of the nuclear parameters for tetramethylammonium

Card 1/2

Electronic absorption spectrum of ... S/051/63/014/001/013/031
E039/E120

bichromate is a:b:c = 0.6168:1:0.4986; while that obtained from X-ray diffraction is a:b:c = 0.63:1:0.51. Full details of all the spectra are given and wavenumbers tabulated. The spectrum of a frozen aqueous solution of tetramethylammonium bichromate at 20.4 °K was also studied.
There are 11 figures and 8 tables.

SUBMITTED: November 20, 1961

Card 2/2

L 16891-63 EWT(1)/BDS/ES(w)-2 AFFTC/ASD/SSD Pab-4

ACCESSION NR: AP3005266 S/0056/63/045/002/0185/0187

60
58

AUTHOR: Mukhtarov, Ch. K.

TITLE: Molecular gyromagnetism

SOURCE: Zhur. eksper. i teoret. fiz., v. 45, no. 2, 1963, 185-187

TOPIC TAGS: gyromagnetism, molecular gyromagnetism, diatomic molecule, susceptibility, diamagnetism, paramagnetism

ABSTRACT: An approximate equation is presented for the magnetic moment of a molecule rotating as a whole, in which the moments of the electrons and nuclei do not cancel each other, owing to the spatial distribution of the nuclei and electrons. The resultant gyromagnetic moment of the molecule is of the order of $(e/2m_pc)M$, where M - mechanical momentum, e - electron charge, m_p - proton mass, c - velocity of light. It is shown further that the paramagnetic susceptibility connected with the gyromagnetic moment does not obey the Curie law, and is generally independent of the temperature. Under stationary conditions such paramagnetism is masked by the diamagnetism, which is larger in magnitude, but the relaxation time of this paramagnetism is connected with the time necessary to establish rotational equili-

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L 16891-63

ACCESSION NR: AP3005266

2

brium, making it essentially different from diamagnetism. A similar magnetic moment can be possessed by a rotating solid, such as a molecular crystal. "I consider it my pleasant duty to thank Academician I. V. Obreimov for interest and for many hints." Orig. art. has 3 formulas.

ASSOCIATION: Institut elementoorgandcheskikh soyedineniy Akademii nauk SSSR (Inst. of Organic-element Compounds, Acad. Sci. SSSR)

SUBMITTED: 28Dec62 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 002 OTHER: 000

Card 2/2

ACC NR: AP7002951 SOURCE CODE: UR/0020/66/171/006/1301/1304

AUTHOR: Mukhtarov, Ch. K.

ORG: Institute of General and Inorganic Chemistry, Academy of Sciences, SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Influence of the boundary of the active zone on the spectral composition of stimulated emission

SOURCE: AN SSSR. Doklady, v. 171, no. 6, 1966, 1301-1304

TOPIC TAGS: stimulated emission, laser cavity, laser radiation spectrum, laser optic material

ABSTRACT: The author shows that if dielectric boundaries exist inside a laser cavity, the spectral composition of the stimulated emission can no longer be determined under the assumption that the losses are independent of the axial index of the particular laser mode. The ratio of the energy densities in the two zones on the two sides of the dielectric boundary (where the refractive indices are different) is found to be strongly dependent on the axial index of the mode. An equation is then derived for the number of photons taking part in the different modes, and the order in which the various modes go into the lasing mode is estimated under the assumption that the pump energy is low. Several concrete examples, with different ratios of the two zones and with different zone parameters, are briefly discussed. Factors capable of increasing the losses in the individual modes and means of suppressing

Card 1/2 UDC: 535.3

ACC NR: AP7002931

the dispersive properties of a cavity with dielectric boundaries are mentioned. The author thanks Academician I. V. Obreimov for interest in the work and V. L. Livshits and V. N. Tsikunov for a discussion. This report was presented by Academician I. V. Obreimov 23 February 1966. Orig. art. has: 6 formulas.

SUB CODE: 20/ SUBM DATE: 21Feb66/ ORIG REF: 001/ OTH REF: 001

Card 2/2

ACC NR: AP7002418 SOURCE CODE: UR/0051/66/021/006/0720/0726

AUTHOR: Mukhtarov, Ch. K.

ORG: none

TITLE: Influence of dimensions of the active zone of the resonator on the spectral composition of stimulated emission

SOURCE: Optika i spektroskopiya, v. 21, no. 6, 1966, 720-726

TOPIC TAGS: stimulated emission, laser cavity, spectral distribution, line width, laser pumping, laser optic material

ABSTRACT: The axial-mode approximation is used to determine the influence of the dimensions of the active zone of the cavity resonator on the spectral composition of stimulated emission in the stationary generation mode, under conditions when the active medium occupies only a part (of length l) of the volume of the resonator (of length L). A differential equation is derived for the determination of the number of photons in the modes that participate in the stationary generation, and it is shown that when $l \ll L$ the spectral composition and the number of modes in the stable stationary generation depends strongly on l/L. Criteria are obtained which determine the number of modes in stationary generation as functions of l/L, the line width, and the pump energy. The effect of the relative position of the active zone and of the mirrors is analyzed. The results show that the spectral composition of the stimulated emission in the stationary state depends strongly on l/L and the smaller

UDC: 621.375.9: 535.01

Card 1/2

ACC NR: AP7002418

l/L, the smaller the number of axial modes in stationary generation. The criteria make it possible to predict when two or four modes will participate in the generation, and that when the resonator is sufficiently large not more than four modes will occur. The intervals of stable generation with different numbers of modes do not overlap for the case of two and four modes. An increase in L at fixed l affects the generation power only in that the diffraction losses increase. With increasing L, the number of modes decreases, and the spectrum becomes narrower. The author thanks B. L. Livshits and V. N. Tsikunov for active discussion and Academician I. V. Obreimov for interest in the work. Orig. art. has: 12 formulas and 1 table.

SUB CODE: 20/ SUBM DATE: 17Jun65/ ORIG REF: 002/ OTH REF: 001

Card 2/2

MAMEDOV, Sh.N., doktor tekhn. nauk, prof.; MUKHTAROV, G.G., red.

[Principles of selecting systems of mining underground ore deposits] Osnovy vybora sistem podzemnoi razrabotki rudnykh mestorozhdenii. Baku, Izd-vo AN Azerb.SSR, 1964. 103 p. (MIRA 18:6)

MUKHTAROV, I. A.

Reject

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
Cement, Concrete, and
Other Building Materials

Electrical properties of Azerbaidzhan marbles. I. A. Mukhtarov, I. G. Mamedov, and A. M. Gasanov. *Trudy Inst. Fiz. i Mat., Akad. Nauk Azerbaid. S.S.S.R., Ser. Fiz.* 5, 59-63(1951).—Tests were made of the specific surface resistance, specific vol. resistance, and strength of 50 specimens of Azerbaidzhan marble. Specific resistances were measured with special electrodes of Hg which was poured into a cylinder without a bottom and placed on the specimen which floated in a cup of Hg. Elec. strength was tested with com. a.c. with cylindrical electrodes with rounded edges. Only three specimens did not meet Russian standards for insulating materials. B. Z. Kamich

MUKHTAROV, I.A.

20-3-17/59

AUTHOR: Mukhtarov, I.A.

TITLE: The Microwave Spectrum of 1,2 - Fluorchloroethane (Mikrovolnovyy spektr 1,2-ftorkhloretana)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 115, Nr 3, pp. 486-487 (USSR)

ABSTRACT: The present paper investigates the microwave spectrum of the 1,2-fluor chlorine ethane molecule. The investigation of such molecules is especially interesting, because they can be in different isomeric states. In the approximation of the stiff asymmetric gyroscope the rotation spectrum of the 1,2-fluor chloro ethane molecule was calculated for different angles between the projections of the CF-bond and the CCl-bond on the axis square with the C-C-bond. The structural data used for these calculations are given here. According to these calculations a great number of absorption lines caused by rotation lies at frequencies of 10.000 - 30.000 megacycles. The microwave spectrum of the 1,2-fluor chloro ethane molecule at frequencies of from 10.000 to 20.000 megacycles was investigated by a radiospectroscope with Stark's modulation and in this manner many absorption lines were discovered. The general picture of distribution of

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The Microwave Spectrum of 1,2 - Fluorchloroethane

the observed lines is in good agreement with the picture calculated for $\alpha = 70^{\circ}$. Corresponding details are given. A table contains the values of the experimentally measured and theoretically calculated frequencies of the here-mentioned lines. By means of an analysis of the fine structure of these lines the constants of the quadrupole coupling in the direction of the main axes of inertia of the molecule $FH_2C-CH_2Cl^{35}$ were determined: $\chi_a = -23{,}5$ megacycles and $\chi_b = -8{,}8$ megacycles. The difference between the experimental and theoretical values of the frequency increases with increasing J. From the investigation of the spectrum of the 1,2-fluorchloroethane molecule the following results: A stable configuration with $\alpha = 70^{\circ}$, i.e. so-called "twisted" isomers, exists for the molecule examined here. There is 1 table.

ASSOCIATION: Physics Institute AN USSR imeni P.N. Lebedev (Fizicheskiy institut imeni P.N. Lebedeva Akademii nauk SSSR)

PRESENTED: February 27, 1957, by V.N. Kondrat'yev, Academician

SUBMITTED: February 21, 1957

AVAILABLE: Library of Congress

Card 2/2

AUTHOR: Mukhtarov, I. [redacted] SOV/48-22-9-40/40

TITLE: Rotation Constants of $FH_2C - CH_2Cl^{35}$ Molecules (Vrashchatel'nyye postoyannyye molekul $FH_2C - CH_2Cl^{35}$)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958, Vol 22, Nr 9, pp 1154 - 1156 (USSR)

ABSTRACT: This is an investigation of the centimeter-range spectrum of the fluoro-chloro-ethane molecule. Owing to the rotation of one of the atom groups (around a single bond) with respect to another group, resulting in a modification of the moments of inertia the molecule investigated may assume two isomeric states. Approximative computations of the frequencies and of the intensities of the absoprtion lines of the rotation transitions (model of a fixed asymmetric gyroscope of the fluoro-ethane molecule) for different values of the azimuth angle and of two chlorine isotopes showed the following: In the range of 10 - 30 kMc lines with an intensity of 10^{-6} - 10^{-8} cm^{-1} may be expected. The line intensities corresponding to the trans-isomer of the molecule are very small(10^{-9} - 10^{-11} cm^{-1}) and can hardly be detected. Between molecules containing

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either the isotope Cl^{35} and Cl^{37} the line frequencies of individual transitions differ by tens and hundreds of Mc. From table 1 can be seen that discrepancies exist between the experimental and the theoretical frequency values. They increase with rising J. In table 2 the theoretical values of the rotation constant and of the parameter of asymmetry x are given for varying α. The experience gained shows that a stable isomeric state of $FH_2C - CH_2Cl^{35}$ exists, with $\alpha = 70^{\circ}$. This is the so-called convolute isomer (svernutyy izomer) which is produced by a rotation about a single bond through an angle of 110° from the trans-configuration. From grounds of symmetry a rotation through 120° ($\alpha = 60^{\circ}$) should have been expected. The deviation of the azimuth angle by about 10° is apparently caused by the strong repulsion of the fluorine and chlorine atoms. Moreover, a number of lines of the Q-branch originating from the $FH_2C - CH_2Cl^{37}$ molecules was found and identified. This is to be covered by another paper.

The author acknowledges valuable suggestions given by A.M.Prokhorov. There are 2 tables and 5 references, 2 of

Rotation Constants of $FH_2C - CH_2Cl^{35}$ Molecules SOV/48-22-9-40/40

which are Soviet.

ASSOCIATION: Fizicheskiy institut im.P.N.Lebedeva Akademii nauk SSSR
(Institute of Physics imeni P.N.Lebedev, AS USSR)

Card 3/3

SOV/51-6-2-31/39

AUTHOR: Mukhtarov, I.A.

TITLE: Microwave Spectrum of the $FH_2C-CH_2Cl^{37}$ Molecule (Mikrovolnovyy spektr molekuly $FH_2C-CH_2Cl^{37}$)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 2, pp 260 (USSR)

ABSTRACT: The microwave spectrum of the $FH_2C-CH_2Cl^{35}$ molecule was reported earlier (Ref 1). The microwave spectrum of the $FH_2C-CH_2Cl^{37}$ molecule is reported here; the absorption lines of the latter molecule are weaker compared with $FH_2C-CH_2Cl^{35}$ in a natural mixture of isotopes. The absorption lines of the rotational transitions $1_{01}-1_{10}$, $2_{02}-2_{11}$, $3_{03}-3_{12}$, $4_{04}-4_{13}$, $5_{05}-5_{14}$ of the $FH_2C-CH_2Cl^{37}$ molecule were observed experimentally and identified; they correspond to the gauche-isomer configuration with the azimuthal angle $\alpha = 70^\circ$ (this is the angle between projections of the bonds CF and CCl onto the plane perpendicular to the C--C axis). Values of the quadrupole coupling constant were determined from the hyperfine structure of the rotational transition $1_{01}-1_{10}$. These constants had the following values for the chief axes of the $FH_2C-CH_2Cl^{37}$ molecule: $\chi_a = 17.6$ Mc/s, $\chi_b = -6.1$ Mc/s and $\chi_c = 23.7$ Mc/s. From the rotational transitions

Card 1/2

Microwave Spectrum of the $FH_2C-CH_2Cl^{37}$ Molecule

1_{01}--1_{10} and 2_{02}--2_{11} the values of A--C and χ (asymmetry index) were found to be 10744.55 Mc/s and -0.9262 respectively. Using these values of A--C and χ, frequencies of the absorption lines of the other transitions of the Q-branch were found. The table below gives the empirical values of frequencies of the Q-branch lines as well as their calculated values found using A--C and χ as determined above.

Transitions	Frequency (Mc/s)	
	Exper.	Calc.
1_{01}-1_{10}	10744.55	-
2_{02}-2_{11}	11152.15	-
3_{03}-3_{12}	11784.5	11784.7
4_{04}-4_{13}	12665.0	12666.3
5_{05}-5_{14}	13825.4	13828.1

The results given above show that there is a noticeable difference between the experimental and calculated values of frequencies of absorption lines, which is due to the effect of centrifugal perturbation as reported earlier (Ref 1). This is a complete translation. There is 1 ref.

SUBMITTED: August 1, 1958

Card 2/2

[redacted], I.A.

Microwave spectrum of the 1,1-,2-trifluoroethane molecule. Izv. AN Azerb.SSR. Ser. fiz.-mat. i tekh. nauk no.4:59-63 '62. (MIRA 16:2)

(Ethane--Spectra)

43309

5.3600

S/062/62/000/012/004/007
B117/B101

AUTHORS: Knunyants, I. L., Krasuskaya, M. P., Mysov, Ye. I., and Mukhtarov, I. A.

TITLE: Reactions of fluoro olefins. Communication 15. Catalytic hydrogenation of perfluoro cyclobutene

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 12, 1962, 2141-2145

TEXT: A Pd catalyst was used for the hydrogenation of perfluoro cyclobutene at room temperature. A mixture containing two isomers of 1,2-dihydroperfluoro cyclobutane was found to form: one (approximately 90%) with a boiling point of 63°C (d_4^{20} 1.5780; n_D^{20} 1.2985) and the other (less than 10%) with a boiling point of 27°C (d_4^{15} 1.5580; n_D^{15} 1.2970). Radiospectroscopic studies were made to determine the configuration of the isomers separated by distillation. An analysis of the rotational bands in microwave absorption spectra showed the isomer with the higher boiling point to have a cis-configuration and that with the lower boiling point to have a trans-configuration. Dehydrofluorination converted both isomers into

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1-hydroperfluoro cyclobutene, b.p. 26°C. Oxidation of the latter yielded tetrafluoro succinic acid m.p. 115-120°C. 1,1,2-trihydroperfluoro cyclobutane (83%; b.p. 50-52°C; d_4^{20} 1.441; n_D^{20} 1.3025) was obtained by hydrogenating 1-hydroperfluoro cyclobutene on a Pd catalyst. It was then dehydrofluorinated into 1,2-dihydroperfluoro cyclobutene, b.p. 53-54°C, and dibromide, b.p. 117-119°C, and dehydrobromated into 1-bromo-2-hydrotetrafluoro cyclobutene, b.p. 72-74°C. 1,1,2,2-tetrahydroperfluoro cyclobutane, b.p. 50°C, n_D^{20} 1.3038, was obtained by hydrogenating 1,2-dihydroperfluoro cyclobutene on Pd/Al_2O_3 at 60-70°C.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences USSR)

SUBMITTED: April 12, 1962

MUKHTAROV, I.A.

Studying the $F_2DC-CDF$ molecule by the radiospectroscopic method. Opt. i spektr. 14 no.5:728 My '63. (MIRA 16:6)

(Molecular rotation)

MUKHTAROV, I.A.

Microwave spectrum of the $F_2C=CHF$ molecule. Opt. i spektr. 15 no.4:563-564 O '63. (MIRA 16:11)

MUKHTAROV, I.A.

Microwave spectrum of the F_2HC - CDHF molecule. Dokl. AN SSSR 148 no.3:566-568 Ja '63. (MIRA 16:2)

1. Fizicheskiy institut im. P.N. Lebedeva AN SSSR. Predstavleno akademikom V.N. Kondrat'yevym.
(Molecular rotation) (Microwave spectroscopy)

MUKHTAROV, I.A.

Steadily rotating molecules of $FH_2C - CH_2Cl^{37}$. Izv. AN Azerb. SSR. Ser. fiz.-tekh. i mat. nauk no.6:37-41 '64.
(MIRA 18:6)

L 45930-66 EWT(m)/EWP(j) WW/JW/JWD/RM

ACC NR: AR6023265 SOURCE CODE: UR/0058/66/000/003/D043/D043

51
B

AUTHOR: Mukhtarov, I. A.

TITLE: Torsional satellites of rotational transitions of the molecule 1,1: 2-trifluorethane

SOURCE: Ref zh. Fizika, Abs. 3D363

REF. SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 3, vyp. 1, 1964, 248-254

TOPIC TAGS: microwave spectroscopy, molecular spectrum, isomer, spectral line

ABSTRACT: The microwave spectrum of the CH_2FCHF_2 molecules was investigated in the 7 -- 30 Gcs range. Starting from the model of the rigid asymmetrical top, the author was able to identify a series of lines of convoluted isomer. In the molecule $CHDFCHF_2$, the lines of the left and right convoluted isomers were observed separately. In the molecule $CHDFCHF_2$, a series of torsional satellites of the left and right convoluted isomers was identified. Several double lines of low intensity were observed in the spectrum of the molecule CHF_2CHF_2F. [Translation of abstract]

SUB CODE: 20

Card 1/1 blg

MUKHTAROV, I.A.

Determining the torsional vibration frequency [illegible] from the microwave spectrum. Opt. i spektr. 16 no.5:919 My '64. (MIRA 17:7)

MUKHTAROV, I.A.

Microwave spectrum of the trifluoroethylene molecule. Izv. AN Azerb. SSR. Ser.fiz.-tekh.i mat. nauk no.1:71-74 '65.

(MIRA 18:6)

L 11934-66 EWT(l)/EWT(m)/EWP(j)/EWA(c) IJP(c)/RPL WW/RM

ACC NR: AP6001655 SOURCE CODE: UR/0051/65/019/006/0976/0976

AUTHOR: Mukhtarov, I. A.

ORG: None

TITLE: Torsional satellites of the 1,2-chlorofluorethane molecule

SOURCE: Optika i spektroskopiya, v. 19, no. 6, 1965, 976

TOPIC TAGS: excited state, complex molecule, chlorine

ABSTRACT: The author notes that earlier he studied the microwave structure of the 1,2-chlorofluorethane molecule consisting of two asymmetrical groups of atoms with inhibited internal rotation around a single bond of the C-C axis. Further investigations revealed the presence of satellites for some absorption lines of the rotational transitions of the curved isomer. These satellites have been identified, just as the basic lines, by their superfine structure, connected with the quadripole moment of the chlorine atom nucleus. The satellite lines are approximately three times fainter in intensity than the fundamental state lines, but show good agreement in terms of superfine splitting with the basic lines within the limits of accuracy of the experiments. On the basis of experimental values for the frequencies of satellite lines $1_{0,1}$-$1_{1,1}$ and $2_{0,2}$-$2_{1,1}$ values of A-C = 10866.1 Mc and χ = -0.92466 have been obtained. The author notes that on the basis of this information the calculated frequencies of other lines show satisfactory agreement with experimentally observed values. A table is given illustrating the experimental values of

Card 1/2

L 11934-66

ACC NR: AP6001655

the frequencies of the lines of the fundamental and excited states. All frequencies refer to unshifted lines. The hypothesis is advanced that the satellites discussed belong to the first excited state of torsional oscillation around the C-C bond. Orig. art. has: 1 table.

SUB CODE: 20 / SUBM DATE: 20Mar65 / ORIG REF: 004 / OTH REF: 002

Card 2/2

L 11818-66 EWT(1)/EWP(m)/EWT(m)/EPF(n)-2/EWP(j)/EWA(c) RPL WW/RM

ACC NR: AP6001658 SOURCE CODE: UR/0051/65/019/006/0979/0980

44,55 44,55

AUTHOR: Mukhtarov, I. A.; Mukhtarov, R. I.

38 B 44,55

ORG: None

TITLE: Centrifugal perturbation constants of the 1,1,2-trifluoroethane molecule

SOURCE: Optika i spektroskopiya, v. 19, no. 6, 1965, 979-980

TOPIC TAGS: perturbation theory, complex molecule, molecular physics

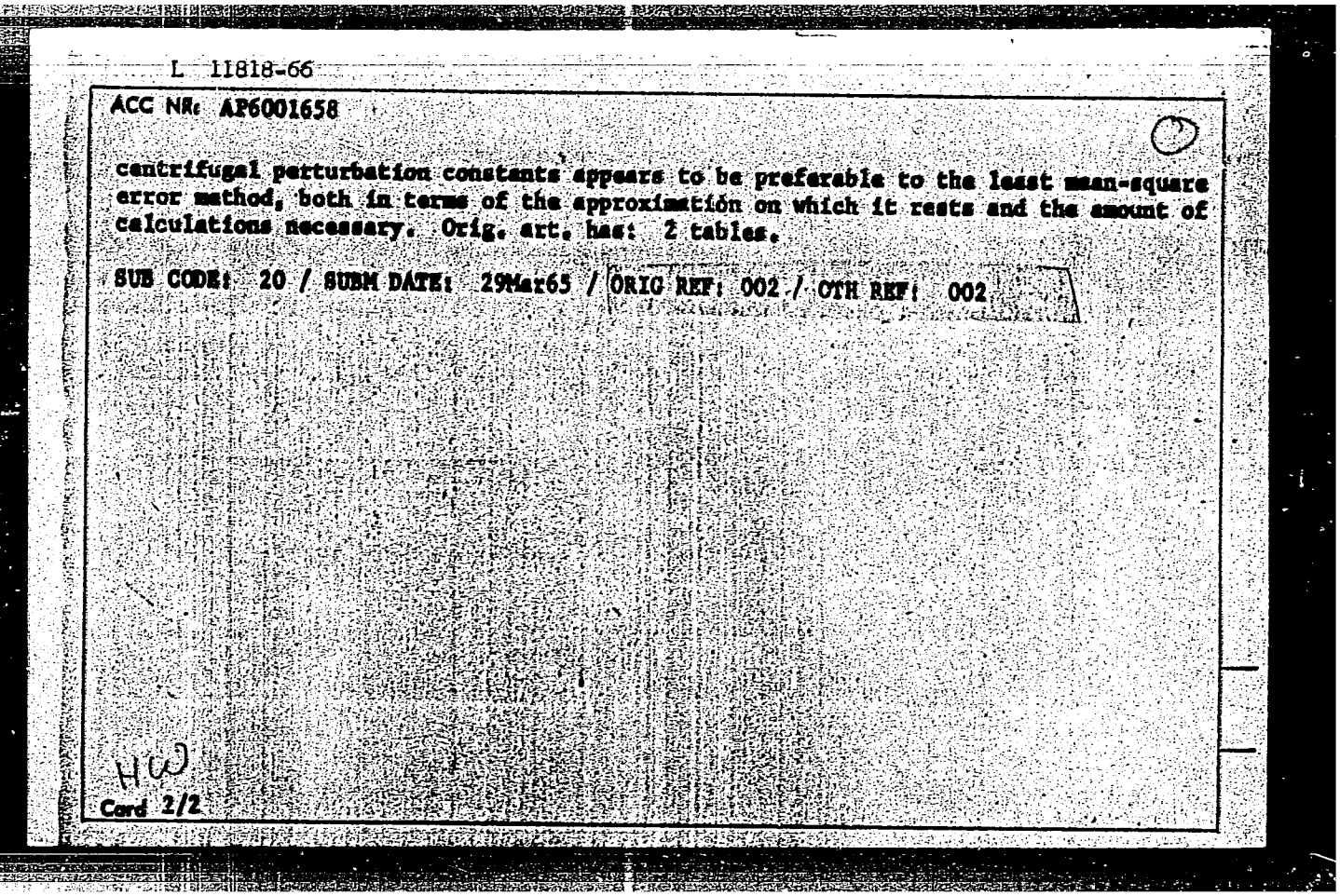
ABSTRACT: The authors consider the equation in the centrifugal perturbation theory 21,44,55 for the rotational energy of a molecule of the asymmetric gyroscope type:

$$W = W_0 + A_1 W_0^1 + A_2 W_0 J(J+1) + A_3 J^2 (J+1)^2 +$$

$$+ A_4 J(J+1)\langle P_z^2\rangle + A_5 \langle P_z^4\rangle + A_6 W_0 \langle P_z^2\rangle.$$

It is shown that the degree of accuracy that can be attained with this formula is inadequate. From the rotational transition lines of the 1,1,2-trifluoroethane molecule, 13 were selected having the least values of J and their frequencies were measured again with an error 0.02—0.04 Mc. A table is given showing the observed and calculated (without consideration of centrifugal perturbation) frequencies of the transitions used in the derivation of 9 equations with 9 unknowns: A, B, C, $A_1, \ldots A_6$. The values obtained in the solution of the system by the Newton method on a large computer are given. The relative error in the determination of A_i is less than 5×10^{-2}. The frequencies of four other transitions are computed. Good agreement is found with experimental data. The method employed for the determination of

Card 1/2 UDC: 535.338.42



L 11818-66

ACC NR: AP6001658

centrifugal perturbation constants appears to be preferable to the least mean-square error method, both in terms of the approximation on which it rests and the amount of calculations necessary. Orig. art. has: 2 tables.

SUB CODE: 20 / SUBM DATE: 29Mar65 / ORIG REF: 002 / OTH REF: 002

HW

Card 2/2

MUKHTAROV, I.S.

The microwave spectrum of 1,2-fluorochloroethane. Dokl. AN SSSR 115 no.3:486-487 Jl '57. (MIRA 10:10)

1. Fizicheskiy institut im. P.I.Lebedeva AN SSSR. Predstavleno akademikom V.N.Kondrat'yevym.
(Ethane)

GUSEYNOV, A.I.; MUKHTAROV, Kh.Sh.

Theorem of the existence of a bounded solution for nonlinear singular integral equations with a Cauchy kernel. Dokl. AN SSSR 146 no.2:288-291 S '62. (MIRA 15:9)

1. Azerbaydzhanskiy gosudarstvennyy universitet im. S.M. Kirova. Predstavleno akademikom I.N. Vekua.
(Integral equations)

GUSEYNOV, A.I.; MUKHTAROV, Kh.Sh.

Differentiability of nonlinear particular singular integral operators in L_p (—oo, oo) space. Uch zap. AGU. Ser. fiz.-mat. nauk no.2:11-19 '63. (MIRA 18:1)

L 13239-63 EWT(d)/FCC(w)/BDS AFFTC Pg-4 IJP(C)
S/044/63/000/003/032/047

AUTHOR: Mukhtarov, Kh. Sh.

56

TITLE: An investigation of a class of nonlinear singular integral equations with a Cauchy kernel for open contours

PERIODICAL: Referativnyy Zhurnal, Matematika, No. 3, 1963, 68, Abstract 3B307 (Uch Zap. Azerb. Un-t. Ser. Fiz-Matem. Nauk, no. 5, 1961, 31-42)

TEXT: The author investigates a nonlinear singular integral equation of the form

$$u(t)=\lambda\int_L \frac{f[t,\tau,u(\tau)]}{t-\tau}\,d\tau, \qquad (1)$$

where L is an aggregate of r open curves $a_1\smile b_1, \ldots a_r\smile b_r$ without common points. Pogorzelski (Referativnyy Zhurnal Matematika, 1959, 4800) considered problems of the solvability of this equation with certain restrictions on the function f. In this article the author has studied the question as to what additional restrictions must be imposed on f in order that equation (1) may be solved by successive approximations. Let us write

Card 1/2

L 13239-63

An investigation of a class....

S/044/63/000/003/032/047

$$K(t, \tau, u) - f(t, \tau, u) - f(\tau, \tau, u).$$

The additional condition found by the author is of the form

$$|K(t, \tau, u) - K(t, \tau, v)| < D|t-\tau|^{\alpha}|u-v|. \quad (2)$$

When this condition is satisfied along with the restrictions introduced in the above mentioned article by Pogorzelski, the author proves the solvability of equation (1) by successive approximations when λ is sufficiently small. In order to obtain this result the author establishes a number of ancillary results associated with the properties of the operator

$$Iu - \lambda \int_{L} \frac{f[t, \tau, u(\tau)]}{t-\tau} d\tau.$$

[Abstracter's note: Complete translation.]

Card 2/2

L 13238-63 EWT(d)/FCC(w)/BDS AFFTC Pg-4 IJP(C)
S/044/63/000/003/033/047

AUTHOR: Mukhtarov, Kh. Sh.

TITLE: An investigation of an infinite system of nonlinear singular integral equations with a Cauchy kernel for open contours

PERIODICAL: Referativnyy Zhurnal, Matematika, No. 3, 1963, Abstract 3B308 (Uch. Zap. Azerb. Un-t. Ser. -Matem. i Khim Nauk, no. 6, 1961, 23-33)

TEXT: Let us consider the contour L consisting of r open arcs $a_k \smile b_k$ without any common points. Let $B_m^{\alpha}, \alpha, \beta$ be a function space of the functions $u = u_m(t)$, $m = 1, 2, \ldots$ given on L and satisfying the conditions

$$|u_m(t)| < M\left[\prod_{i=1}^{r}|t-a_i||t-b_i|\right]^{-\alpha},$$

$$|u_m(t)-u_m(t_1)| <$$

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$$< M\,|t-t_1|^{\delta}\left[\prod_{i=1}^{r}|t-a_i|\,|t_1-b_i|\right]^{-(\alpha+\delta)},$$

with the metric

$$M>0,\quad 0<\alpha<1,\quad 0<\alpha+\delta<1,\quad 0<\delta<1,$$

$$\rho_{L_p(L,\sigma)}(u,v)=\sup_n\left\{\int_L \rho(t)\,|u_n(t)-v_n(t)|^p\,dt\right\}^{\frac{1}{p}},$$

$u, v \in B^{\infty}_{M,\alpha,\delta}$, $p>1$, weight

$$\rho(t)=\left\{\prod_{i=1}^{r}|t-a_i|\,|t-b_i|\right\}^{\alpha(p-1)}.$$

It is proved that the infinite system of nonlinear equations

$$u_m(t)=\lambda\int_L \frac{\Phi_m[t,\tau,u_1(\tau),\ldots,u_n(\tau),\ldots]}{t-\tau}\,d\tau, \quad (1)$$

$$m=1,2,3,\ldots,$$

has a unique solution in $B^{\infty}_{M,\sigma,\delta}$ for sufficiently small $|\lambda|$ when certain assumptions concerning the functions Φ_m are true. (For example, one of the assumptions is that the Φ_m satisfy a Hölder condition with the respective indices δ_1 and δ $(\delta<\delta_1<1)$ for t and τ, also a Lipschitz condition for the

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u_n). This solution can be found by successive approximations; here the successive approximations converge to a solution in the sense of the metric $L_p(L, \rho)$. Making use of the same assumptions, the author proves that the reduction method is also applicable to the system (1). The article contains misprints.

[Abstracter's note: Complete translation.]

Card 3/3

ACCESSION NR: AP4027711 S/0233/63/000/006/0107/0113

AUTHORS: Guseynov, A.I.; Mukhtarov, Kh.Sh.

TITLE: The structure of one nonlinear operator and existence theorem of a restricted solution for nonlinear singular equations with Cauchy kernel

SOURCE: AN AzerbSSR. Izvestiya. Seriya fiz.-matem. i tekhn. nauk, no. 6, 1963, 107-113

TOPIC TAGS: existence theorem, nonlinear operator, nonlinear singular equation, Cauchy problem analysis, continuous function, topology, Banach space

ABSTRACT: The necessary and sufficient conditions for the bounded operation of the operator

$FU = F[U(s)]$ from H_δ into $H_{\delta'}$, $0<\delta<1$, $0<\delta'<1$, are established. This result generates certain properties of the operator

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$$BU = \lambda \int_0^b \frac{K(x, s)F[U(s)]}{s - x} ds,$$

which is used to prove the existence and uniqueness of the restricted solution of the equation

$$U(x) = BU + \tilde{g}(x) \qquad (1)$$

in the space H_g. Three theorems are proven. Orig. art. has: 17 equations.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00

SUB CODE: MA NR REF SOV: 006 OTHER: 000

Card 2/2

ACCESSION NR: AP4038511 S/0020/64/156/003/0491/0494

AUTHORS: Guseynov, A.I.; Mukhtarov, Kh.Sh.

TITLE: Investigation of a class of non-linear singular integral equations with Cauchy kernel, over a class of functions vanishing at the end points

SOURCE: AN SSSR. Doklady*, v. 156, no. 3, 1964, 491-494

TOPIC TAGS: integral equation, singular, nonelinear, function space, Cauchy kernal

ABSTRACT: In an earlier paper, the authors have shown that an equation of type

$$u(x) = \lambda \int_a^b \frac{K[x, s, u(s)]}{s - x} ds$$

has a unique solution in Holder space $H_{K,\delta}$ over $[a,b]$, i.e. such that

$$|u(x)| \leqslant K, \quad |u(x + \Delta x) - u(x)| \leqslant K |\Delta x|^{\delta},$$

where K is a constant and $0 < \delta < 1$. Here they seek a solution to an equation of the form

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$$u(x) = \lambda q(x) \int_a^b \frac{f[u(s)]}{s-x}\, ds \qquad (2)$$

in the class $H^{\circ}_{M,\delta}$ over $[a,b]$, i.e. satisfying

$$|u(x)| \leqslant M l(x), \qquad (3)$$

$$|u(x+\Delta x) - u(x)| \leqslant M |\Delta x|^{\delta}, \qquad (4)$$

where $M = \text{const}$, $l(x) = (x-a)^{\delta}(b-x)^{\delta}$, $0 < \delta < 1$, $q(x) = (x-a)^{\delta_1} \times (b-x)^{\delta_1}$, $0 < \delta < \delta_1 < 1$.

A metric is introduced by setting

$$\rho_{C(l_1)}(u, v) = \max_{x \in [a,b]} l_1(x) |u(x) - v(x)|,$$

$$l_1(x) = [(x-a)(b-x)]^{-\delta'}, \quad 0 < \delta' < \delta.$$

(In this metric, $H^{\circ}_{M\delta}$ is closed, convex and compact.) The discussion also uses the space $\mathcal{L}_p(\rho)$ of functions u(x) such that

$$\int_a^b \rho(x) |u(x)|^p dx < +\infty$$

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where $\rho(x) = |(x-a)(b-x)|^{-\delta'\rho}$, $1 < \rho < \delta'^{-1}$.

and the operator K defined by

$$Ku = \lambda q(x) \int_a^b \frac{f[u(s)]}{s-x} ds$$

It is shown that if f(u) satisfies a Lipschitz condition on $[-M(b-a)^{\delta}, M(b-a)^{\delta}]$, there is a λ_0 such that for $|\lambda| < \lambda_0$, equation (2) has at least one solution $u(x) \in H^0_{\kappa,\delta}$. If f also satisfies a condition of the form

$$|Ku - Kv| \leq |\lambda| (b-a)^{\delta\kappa} AF \|u - v\|_{L_\rho(\sigma)},$$

then for $|\lambda|$ small enough, the solution is unique, and can be obtained by successive approximations, converging in both metrics $L_\rho(\sigma)$ and $C(l_1)$. These results can be extended to more general equations:

$$u(x) = \lambda q(x) \int_a^b \frac{f[x, s, u(s)]}{s-x} ds,$$

or

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$$u(x) = \lambda F[x, w(x)],$$

where

$$w(x) = q(x)\int_a^b \frac{f[x, s, u(s)]}{s - x}\, ds.$$

Orig. art. has: 15 equations

ASSOCIATION: Azerbaydzhanskiy gosudarstvenny*y universitet im. S.M. Kirova (Azerbaydzhan State University)

SUBMITTED: 06Jan64 ENCL: 00

SUB CODE: MA NR REF SOV: 003 OTHER: 000

Card 4/4

MUKHTAROV, Kh.Sh.

On some inequalities and their application to the study of nonlinear singular equations. Dokl. AN Azerb. SSR 21 no.4:3-8 '65.
(MIRA 18:7)

1. Institut matematiki i mekhaniki AN AzerSSR.

MUKHTAROV, Kh.Sh. (Makhachkala)

Study of one nonlinear singular equation with a Hilbert kernel.
Izv. vys. ucheb. zav.; mat. no.2:118-125 '65. (MIRA 18:5)

KOTEL'NIKOV, I.N.; MUKHTAROV, M.

Repairing spindle heads of piercing mills. Sbor.rats.predl.vnedr.v proizv. no.1:25 '61. (MIRA 14:7)

1. Azerbaydzhanskiy truboprokatnyy zavod.
(Machine tools--Maintenance and repair)

ACC NR: AP6032182 SOURCE CODE: UR/0096/66/000/010/0044/0049

AUTHOR: Mukhtarov, M. Kh. (Candidate of technical sciences)

ORG: none

TITLE: Experimental study of the boundary layer in turbine cascades at low Reynold numbers

SOURCE: Teploenergetika, no. 10, 1966, 44-49

TOPIC TAGS: gas turbine, boundary layer, ~~diffuser~~ turbine cascade, turbulent boundary layer, Reynolds number

ABSTRACT: The results are presented of an experimental study of the boundary layer in turbine cascades and on thin plates forming diffusing and converging ducts. A semi-empirical method for calculating the turbulent boundary layer is given. Orig. art. has: 5 figures and 9 formulas.

SUB CODE: 21,20/SUBM DATE: none/ ORIG REF: 002/ OTH REF: 001/

Card 1/1 UDC: 621.165.533.6.001.5

GANIYEV, A.; MUKHTAROV, R.

β-Picoline-monosubstituted nitroammonium complex compounds of trivalent cobalt. Uzb.khim.zhur. 6 no.6:18-22 '62.
(MIRA 16:2)

1. Institut khimii AN UzSSR.
(Cobalt compounds) (Ammonium compounds)
(Picoline)

L 33591-66 EWT(1) IJP(c)

ACC NR: AR6016171 SOURCE CODE: UR/0058/65/000/011/D010/D010

52
B

AUTHOR: Mukhtarov, R. I.

TITLE: Rotational transitions in molecules consisting of two asymmetrical tops with hindered internal rotation

SOURCE: Ref. sh. Fizika, Abs. 11D69

REF SOURCE: Tr. Komis. po spektroskopii, AN SSSR, t. 3, vyp. 1, 1964, 240-247

TOPIC TAGS: molecular structure, quantum theory, Hamiltonian, molecular theory, microwave spectroscopy, molecular potential barrier

ABSTRACT: Equations are obtained for the operator of transformation of the quantum-mechanical Hamiltonian into a form in which the term corresponding to rotation as a whole has the form of the ordinary rigid-top Hamiltonian, and there are no torsion-rotation interaction terms. In the case of identical tops, and also when one top is symmetrical, the transformation operator is easy to obtain. The problem is solved also under more general conditions. In the case of a low barrier it was possible to calculate the changes in the microwave spectrum of the molecule due to internal rotation. [Translation of abstract]

SUB CODE: 20/

Card 1/1 80

L 11818-66 EWT(l)/EWP(m)/EWT(m)/EPF(n)-2/EWP(j)/EWA(c) RPL WW/RM

ACC NR: AP6001658 SOURCE CODE: UR/0051/65/019/006/0979/0980

44,55 44,55 38 B 44,55

AUTHOR: Mukhtarov, L. A.; Mukhtarov, R. I.

ORG: None

TITLE: Centrifugal perturbation constants of the 1,1,2-trifluoroethane molecule

SOURCE: Optika i spektroskopiya, v. 19, no. 6, 1965, 979-980

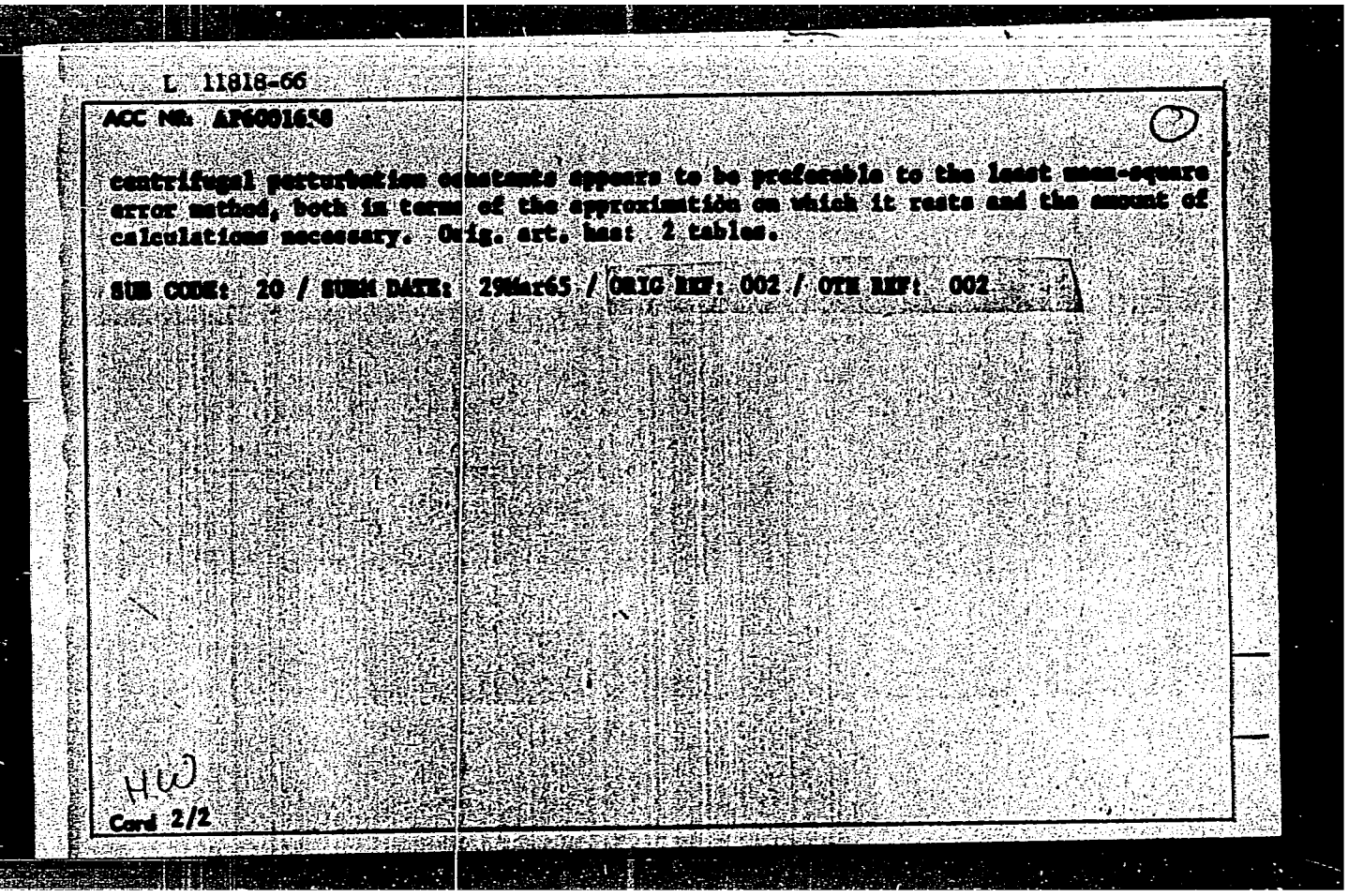
TOPIC TAGS: perturbation theory, complex molecule, molecular physics

ABSTRACT: The authors consider the equation in the centrifugal perturbation theory 21, 44, 55 for the rotational energy of a molecule of the asymmetric gyroscope type:

$$W = W_0 + A_1 W_1^1 + A_2 W_2^1 J(J+1) + A_3 J^2 (J+1)^2 + A_4 J(J+1) \langle P_z^2 \rangle + A_5 \langle P_z^4 \rangle + A_6 W_6 \langle P_z^6 \rangle.$$

It is shown that the degree of accuracy that can be attained with this formula is inadequate. From the rotational transition lines of the 1,1,2-trifluoroethane molecule, 13 were selected having the least values of J and their frequencies were measured again with an error 0.02—0.04 Mc. A table is given showing the observed and calculated (without consideration of centrifugal perturbation) frequencies of the transitions used in the derivation of 9 equations with 9 unknowns: A, B, C, $A_1 \ldots A_6$. The values obtained in the solution of the system by the Newton method on a large computer are given. The relative error in the determination of A_1 is less than 5×10^{-2}. The frequencies of four other transitions are computed. Good agreement is found with experimental data. The method employed for the determination of

Card 1/2 UDC: 535.14.23



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ACC NR: AP6001658

centrifugal perturbation constants appears to be preferable to the least mean-square error method, both in terms of the approximation on which it rests and the amount of calculations necessary. Orig. art. has: 2 tables.

SUB CODE: 20 / SUBM DATE: 29Mar65 / ORIG REF: 002 / OTH REF: 002

HW

Card 2/2

KALININ, S.K.; MARZUVANOV, V.L.; MUKHTAROV, S.M.

[Atlas of the arc spectrum of iron] Atlas dugovogo spektra zheleza. Moskva, Metallurgiia, 1965. 54 plates in folder. ___ [Text] 55 p. (MIRA 19:1)

SUBKHANKULOV, M.A.; MUKHTAROV, S.N.

Representation of a number in the form of a sum of two nonquadratic numbers. Izv.AN Uz.SSR.Ser.fiz.-mat.nauk no.4:3-10 '60.
(MIRA 13:9)

1. Institut matematiki im. V.I.Romanovskogo AN UzSSR.
(Numbers, Theory of)

MUKHTAROV, T.M.

Conditions for an efficient use of boring rigs in carrying out horizontal workings in hard rock. Trudy Inst. gor. dela AN Kazakh. SSR 17:50-54 '65. (MIRA 18:9)

GUSEYNOV, A.M., kand.biolog. nauk; MUKHTAROV, Z.M.

New data on the effectiveness of intravarietal crossing of cotton. Agrobiologia no.4:490-496 Jl-Ag 63. (MIRA 16:9)

1. Azerbaydzhanskiy nauchno-issledovatel'skiy institut khlopkovodstva.

(Azerbaydzhan--Cotton breeding)

FIL', U.G. [Fil', U.H.]; MUKHTAROVA, L.Ye. [Mukhtarova, L.IE.]; MUTSET, T.I.

Determining flavones in medicinal plants by paper chromatography. Farmatsev. zhur. 18 no.2:20-27 '63. (MIRA 17:10)

1. Kafedra farmakognozii Dnepropetrovskogo meditsinskogo instituta (zaveduyushchiy kafedroy dotsent K.Ye. Koreshchuk [Koreshchuk, K.I..]).

Mukhtarova, M. Yu

USSR /Cultivated Plants. Technical. Oleaginous. Sugar-Bearing. L-5

Abs Jour : Ref Zhur - Biol., No 6, March 1957, No 22785

Author : Mukhtarova, M.Yu.

Inst : Not given

Title : Smoke Tree as a Tannin Plant in Kazakhstan.

Orig Pub : Tr. Kazakhsk. s.-kh. in-ta, 1956, 5, No 1, 275-282

Abstract : Experimental stury of the smoke tree (Cotinus Coggygria Scop.) was conducted in 1952-1954 in the nursery of the Kazakh agricultural institute situated on dark chestnut soils of the foothill plain of the northern slope of Zailiy Ala-Tau, 840 m above sea-level. The experiments were conducted on 250 bushes (well grown, 15-20 years of age) replanted in 1951-1952, and also on seedlings in

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USSR /Cultivated Plants. Technical. Oleaginous. Sugar-Bearing L-5

Abs Jour : Ref Zhur - Biol., No 6, March 1957, No 22785

Abstract : in their first year of life. To determine the dynamics of tannin accumulation, samples of the leaves were taken once monthly from 15-20 plants: in 1953, from June 1 to September 1, and in 1954 from May 15 to September 15, separately from the lower, middle and upper shoot sectors, and from each sector of 5 - 7 tiers of leaves. In 1954, at the same dates samples of the bark and woody tissues of shoots were ta ken. Twice also the racemes of the smoke tree wera analyzed. The shoot growth and leaf formation of the smoke tree continued from the beginning of May to the beginning of August. Two intensive growth periods were noted: from June 17 to June 27, and from July 7 to July 17, when the added growth for 10 days consisted of 10 and 11 cm. The intensive growth is accompanied by an intensified leaf formation. The length of one-year shoots in a 3-year old plant

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USSR / Cultivated Plants. Technical. Oleaginous. Sugar-Bearing. L-5

Abs Jour : Ref Zhur - Biol., No 6, March 1957, No 22785

Abstract : on the average reaches 90 cm and in a 4-year old, 32 cm., (sic). These data characterize the smoke tree as a rapidly growing bush here. The maximal amount of tannin in plant leaves of the 3rd year (24.83%) and of the 4th year of life (23.4%) is observed at about August 1. The upper leaves of one-year olf shoots in plants of different ages at the end of the vegetative period contain more tannin than the lower ones, but in the period of the most intense growth (approximately the beginning of June) the upper leaves, on the other hand, have less tannin than the leaves of the lower and middle shoot sections. The maximum tannin is contained in leaves of 3-year old plants, somewhat less in 4-year old, still less in 5-year old. Leaves collected in August 17 from the same plant but grown under different

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USSR / Cultivated Plants. Technical. Oleaginous. Sugar-Bearing. L-5

Abs Jour : Ref Zhur - Biol., No 6, March 1957, No 22785

Abstract : illuminating conditions contained different amounts of tannin: 23.07% in illuminated ones, and 19.33% in shaded ones. During the period of intense growth (July) the bark contained up to 13.63% of tannin, which markedly diminished at the end of vegetation. The woody tissue of all ages contains about 1.5% tannins on the average, and the raceme at fruit ripening time -- 7%. In the author's opinion, only the smoke tree leaves are suitable for industrial utilization.

Card : 3/4

MUKHTAROVA, N.D.

Cerebrospinal fluid in the intoxication of the nervous system with granosan (in the early and late periods of the intoxication). Sov. zdrav.Kir. no.1:8-11 Ja-F '63. (MIRA 16:3)

1. Iz kliniki nervnykh bolezney (zav. - dotsent A.F. Usmanova) i respublikanskoy klinicheskoy bol'nitsy (glavnyy vrach - S.D. Rafikov) goroda Frunze.
(CEREBROSPINAL FLUID) (GRANOSAN--TOXICOLOGY)

RAKHMATULLAYEV, Kh.R.; RUZMATOV, S.R.; MUKHTAROVA, N.N.; KAYUMOV, A.V.

Todorokite from the central Kyzyl Kum. Uzb. geol. zhur. 7 no.6: 96-99 '63. (MIRA 17:8)

1. Institut geologii im. Kh.M. Abdullayeva AN UzSSR.