$$\begin{aligned}\mathcal{D} = {} & \Delta_1 A_0 + 2i\Delta_2 \sum_i \sigma_i (A_{i+1}A_{i+2}) + [B_1 - L' - M'] A_0 k^2 + \\ & + (L' - M') \sum_i A_i k_i^2 + 2N' \sum_{i>j} [A_i A_j] k_i k_j + B_2 \sum_i A_i' k_i + \\ & + B_3 \sum_i A_i k_{i+1} k_{i+2} + [C_1 - (l - m)] A_0 \varepsilon + m (1 - A_0) \varepsilon + \\ & + (l - m) \sum_i A_i \varepsilon_{ii} + 2n' \sum_{i>j} [A_i A_j] \varepsilon_{ij} + C_2 \sum_i A_i \varepsilon_{i+1,\, i+2}.\end{aligned} \qquad (3)$$

where

$$2\{A_i A_j\} = A_i A_j - A_j A_i \text{ и } 2[A_i A_j] = A_i A_j + A_j A_i.$$

holds for $\mathcal{D}$. $2\Delta_2$ is the spin-orbital splitting, $E_g = \Delta_1 - \Delta_2$ is the distance of the s-band from the nearest valency p-band. The two limiting cases: $E_g \ll 2\Delta_2$ and $E_g \gg 2\Delta_2$, are examined. (a) Semiconductors with a narrow forbidden band: $E_g = 0.23$ ev, $2\Delta_2 = 0.9$ ev. The matrix for $\mathcal{D}$ is written explicitly, and the eigenvalues are calculated. It is found that both isotropic and anisotropic deformation cause a relatively large variation in the effective mass of n-type InSb. An interesting aspect is that the variation of effective mass by anisotropic deformation is

37929

24.7700

S/181/62/004/005/017/055
B125/B104

AUTHORS: Bir, G. L., Normantas, E., and Pikus, G. Ye.

TITLE: Galvanomagnetic effects in semiconductors with degenerate bands

PERIODICAL: Fizika tverdogo tela, v. 4, no. 5, 1962, 1180 - 1195

TEXT: The more precise theory of galvanomagnetic effects in p-type Ge semiconductors presented here furnishes substantial corrections to the numerical values of the galvanomagnetic constants and explains the dependence of the Hall constant on the magnetic field observed experimentally. Allow for the influx of carriers from other bands involves "crossed relaxation times", changes the distribution function of light holes more than that of heavy ones, and likewise changes the contribution of the various types of carriers to the kinetic coefficients. Owing to the small contribution of light holes to the electrical conductivity, the effects due to light and heavy holes make about the same contributions. The relaxation times of longitudinal vibrations for $\gamma \to 0$ are given by

Card 1/5

$$\left.\begin{aligned}
\frac{1}{\tau_{11}} &= \frac{1}{\tau_{11}^{(L)}} + \frac{1}{\tau_{11}^{(T)}} = \frac{1}{\tau_0^{(L)}}\left[(1-\eta)^2 + \frac{3}{2}\frac{C_L^2}{C_T^2}\eta^2\right],\\
\frac{1}{\tau_{22}} &= \frac{1}{\tau_{22}^{(L)}} + \frac{1}{\tau_{22}^{(T)}} = \frac{1}{\tau_0^{(L)}}\left[(1-\eta)^2 + \frac{3}{4}\eta^2\left(1+\frac{C_L^2}{C_T^2}\right)\right],\\
\frac{1}{\tau_{12}} &= -\frac{1}{\tau_0^{(L)}}\frac{\eta}{5}\left[4(1-\eta) + 3\eta\frac{C_L^2}{C_T^2}\right].
\end{aligned}\right\} \qquad (2.18)$$

τ_{11} and τ_{22} may differ considerably. τ_{22} reaches a maximum at $\eta \simeq 0.75$. Using the transition probabilities for scattering inside and between the bands one obtains the relaxation times

S/181/62/004/005/017/055
B125/B104

Galvanomagnetic effects in ...

calculated with the aid of the present theory is twice that obtained by the simple theory. In the case of weak fields and for $\eta = 0$ and $\eta = 0.75$, the contributions of heavy holes are 26 and 64%, respectively, and increase with increasing magnetic field strength. At 80°K and a concentration of centers of about 10^{13} cm^{-3}, scattering from impurities is negligible. The calculations are to be continued. Average values for the constants of the deformation potential are given in an appendix. There are 6 figures and 1 table. The most important English-language reference is: C. Herring, E. Vogt. Phys. Rev., 101, 944, 1956.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AS USSR, Leningrad). Institut fiziki i matematiki AN Lit. SSR, Vil'nyus (Institute of Physics and Mathematics AS Litovskaya SSR, Vil'nyus)

SUBMITTED: December 23, 1961

Card 5/5

Band structure and piezoresistance... S/181/62/004/008/028/041
B108/B102

There are 3 tables.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors AS USSR Leningrad)

SUBMITTED: April 18, 1962

Card 2/2

39969

24.7100
9.2180

S/181/62/004/008/012/041
B125/B102

AUTHORS: Pikus, G. Ye., and Bir, G. L.

TITLE: Piezo resistance effects in PbS-PbTe crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 8, 1962, 2090-2108

TEXT: "Weak" piezo-resistance effects which are virtually independent of temperature arise from changes of the effective carrier masses, of the deformation potential constants, and of the elastic constants, as well as from changes in the geometric configuration of the specimen. Using the Schrödinger equation for the wave function $\chi_{nk} = U_{nk_0} e^{i\vec{k}\vec{r}}$ which takes account of the spin functions,

$$E_r(\mathbf{k}, \varepsilon) = E_r - E_r(\mathbf{k}_0) = D_{rr} + \frac{\hbar^2 k^2}{2m} + \sum_n{}' \frac{S_{rn}S_{nr}}{E_r - E_n} + \sum_n{}' \frac{D_{rn}D_{nr}}{E_r - E_n} + \sum_{n,m}{}' \frac{S_{rn}S_{nm}D_{mr} + S_{rn}D_{nm}S_{mr} + D_{rn}S_{nm}S_{mr}}{(E_r - E_n)(E_r - E_m)} - D_{rr} \sum_n{}' \frac{S_{rn}S_{nr}}{(E_r - E_n)^2}. \quad (4)$$

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The mean effective mass $m_a^* = (m_1^* m_2^* m_3^*)^{1/3}$ determines the state density. m_1^* m_2^* and m_3^* are the components of the tensor m^* in the main axes of the deformed crystal. If the tensor of the deformation potential constants has the components C', C" in the main axes, then

$$\left.\begin{aligned} \frac{\Delta\sigma_\perp}{\sigma_0} &= \frac{-2}{C}\left[\Delta C + \frac{3}{5}C''\right], \\ \frac{\Delta\sigma_\parallel}{\sigma_0} &= \frac{-2}{C}\left[\Delta C + \frac{1}{5}C''\right]. \end{aligned}\right\} \qquad (14)$$

are the conductivity changes in these axes. If the extrema of both zones are not in the center of the Brillouin zone, then

$$\Delta\sigma_{ij} = \sum_r u_{ij}^{(r)} \Delta n^{(r)} + \frac{n}{r} \sum_r \Delta u_{ij}^{(r)}, \qquad (19)$$

where $n^{(r)}$ is the number of carriers at a given extremum and $u^{(r)}$ are the corresponding components; n' is the total carrier concentration and r

PIKUS, G.Ye.; BIR, G.L.

Effects of piezoresistance in PbS-PbTe type crystals.
Fiz. tver. tela 4 no.8:2090-2108 Ag '62. (MIRA 15:11)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Piezoelectricity) (Semiconductors)

BIR, G.L.; PIKUS, G.Ye.

Band structure and piezoresistance effects in PbTe and PbSe.
Fiz. tver. tela 4 no.8:2243-2252 Ag '62. (MIRA 15:11)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Piezoelectricity) (Lead telluride)
(Lead selenide)

BIR, G.L.; TURSUNOV, A.

Effect of holes on the elastic constants of germanium. Fiz. tver. tela 4 no.9:2625-2628 S '62. (MIRA 15:9)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Germanium) (Elasticity)

L 19164-63 EWT(1)/BDS/EEC(b)-2 AFFTC/ASD/IJP(C) Pi-4 GG
ACCESSION NR: AP3005333 S/0181/63/005/008/2236/2247

62
59

AUTHOR: Bir, G. L.

TITLE: Intensity of permitted and forbidden lines of electron paramagnetic resonance

SOURCE: Fizika tverdogo tela, v. 5, no. 8, 1963, 2236-2247

TOPIC TAGS: permitted line, forbidden line, intensity, electron, paramagnetic resonance, matrix element, transition, wave function, intracrystalline field, interaction, hyperfine transition, electron spectrum

ABSTRACT: For probabilities of various hyperfine transitions the author has obtained expressions through squares of the model of matrix elements for irreducible groups of expressions, making it possible to compute probabilities of all transitions if the electron wave functions are known. Characteristics of the electron spectra for a small intracrystalline field are computed by means of perturbation theory, and clear expressions are obtained for the probabilities of hyperfine transitions. From the results it is concluded that, when hyperfine

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L 19164-63
ACCESSION NR: AP3005333

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interaction occurs and when an intracrystalline field is present, a strong angular dependence holds for the intensities of electron magnetic resonance lines. "The author expresses his thanks to M. I. Kornfel'd and L. S. Sochava for their interest in the work and for useful discussions on the results." Orig. art. has: 1 figure and 50 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors, Academy of Sciences, SSSR)

SUBMITTED: 25Mar63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 002 OTHER: 001

Card 2/2

BIR, G.L.

Intensity of allowed and forbidden lines of electron paramagnetic resonance. Fiz. tver. tela 5 no.8:2236-2247 Ag '63. (MIRA 16:9)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Paramagnetic resonance and relaxation)

ACCESSION NR: AP4004870 S/0181/63/005/012/3594/3606

AUTHORS: Bir, G. L.; Sochava, L. S.

TITLE: Intensity of allowed and forbidden EPR lines of Mn^{2+} in $SrCl_2$

SOURCE: Fizika tverdogo tela, v. 5, no. 12, 1963, 3594-3606

TOPIC TAGS: EPR, electron paramagnetic resonance, EPR line, forbidden EPR line, allowed EPR line, manganese doped strontium chloride, EPR line intensity, forbidden line, allowed line, manganese 2 +, strontium chloride

ABSTRACT: The authors have made experimental investigations on the angular dependence of the intensity of allowed and forbidden electron paramagnetic resonance lines for the axial spectrum of Mn^{2+} in a single crystal of $SrCL_2$. The data obtained have been compared with computations of angular dependence of line intensities on the basis of the theory previously proposed by Bir (FTT, 5, 2236, 1963). It is shown that this theory not only explains all the principal qualitative features of the phenomenon, but it is generally in full quantitative agreement with experimental data. It correctly describes the general behavior of the angular dependence of the indicated lines, and, in particular, it predicts the intensity

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ACCESSION NR: AP4004870

maximums of allowed lines at angles of 0 and 90. It predicts which allowed line will suffer for the growth of a forbidden line. The experiments show that though the intensity of an allowed line diminishes at 12° to 1/3 its value, the total intensity of all three lines remains constant. The data very convincingly show that the decrease in intensity of allowed lines is associatid solely with increase in intensity of forbidden lines. The theory also explains the sharper angular dependence of spectra having larger values of axial splitting, and it explains the differences between angular dependence of line intensities for various electron transitions and the different rates of intensity change in hyperfine components corresponding to different nuclear transitions. Only one minor deviation between theory and experiment was observed: the intensity of allowed lines declines and the intensity of forbidden lines increases more rapidly than theory indicates. A correction is proposed for this, based on assumptions made in the theory. "The authors express their sincere gratitude to M. I. Kornfel'd for his many valuable suggestions and discussions." Orig. art. has: 7 figures and 16 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AN SSSR)

Card 2/17

BIR, G. L.; PIKUS, G. Ye.

"The relaxation time and the width of the spin resonance line in semiconductors with degenerate bands."

report submitted for Intl Conf on Physics of Semiconductors, Paris, 19-24 Jul 64.

BIR, G. L.; ILISAVSKIY, Yu. V.; BLUM, A. I.

"The effect of uniaxial strain on the transport phenomena in p-Si."

report submitted for Intl Conf on Physics of Semiconductors, Paris, 19-24 Jul 64.

BIR, G.L.; SOCHAVA, L.S.

Intensity of allowed and forbidden electron paramagnetic resonance lines of Mn^{2+} in $SrCl_2$. Fiz. tver. tela 5 no.12:3594-3606 D '63. (MIRA 17:2)

1. Institut poluprovodnikov AN SSSR, Leningrad.

ACCESSION NR: AP4043375 S/0181/64/006/008/2478/2488

AUTHORS: Bir, G. L.; Butikov, Ye. I.; Sochava, L. S.

TITLE: Intensity of lines of electron paramagnetic spectrum of ions in a cubic crystal field

SOURCE: Fizika tverdogo tela, v. 6, no. 8, 1964, 2478-2488

TOPIC TAGS: electron paramagnetic resonance, hyperfine structure, angular dependence, cubic crystal, calcium fluoride, europium

ABSTRACT: This is a continuation of earlier research by some of the authors on the theory of the intensity of allowed and forbidden hyperfine EPR spectral components (G. L. Bir, FTT, v. 5, 2236, 1963) and on experimental investigations of the angular dependence of the intensity of EPR lines in an axial crystal-line field (G. L. Bir and L. S. Sochava, FTT, v. 5, 3594, 1963). The present study is devoted to the intensity of hyperfine lines of the EPR spectrum

ACCESSION NR: AP4043375

of ions in a cubic crystalline field. Formulas are derived, in the strong magnetic field approximation, for the dependence of the intensity of the hyperfine components of the EPR spectrum on the direction of the magnetic field relative to the crystal axis, and for the intensities of all the allowed and forbidden lines. It is shown that the angular dependence of the intensity is stronger for ions with a larger level splitting in the crystalline field, so that the experimental study of the angular dependence of the line intensities was made using the Eu^{2+} ion in the cubic crystal CaF_2. Since the strong magnetic field approximation results in this case in noticeable errors, the theory previously developed by the author is used to obtain exact numerical values of the hyperfine component intensities. The results of these calculations are in good agreement with all the obtained experimental data on the angular dependence of the intensities of the allowed and forbidden lines. "The authors thank M. I. Kornfel'd for a discussion of the results." Orig. art. has: 6 figures and 15 formulas.

Card 2/3

ACCESSION NR: AP4043375

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors, AN SSSR)

SUBMITTED: 25Mar64 ENCL: 00

SUB CODE: SS NR REF SOV: 004 OTHER: 006

Card 3/3

L 16741-65 EWT(1)/FSS(1) Pab

SOURCE: Pazhi Iverdogo tela

ACCESSION NR: AP5000565

allowed lines can be observed also in the presence of

AN SSSR,

SUBMITTED: 17Jun64

L 9650-66 EWT(1)/EWP(e)/EWT(m)/EEC(k)-2/T/EWA(h) IJP(c) AT/WH

ACC NR: AP5025375 SOURCE CODE: UR/0181/65/007/010/2978/2989

44,55 44,55 44,55 44,55

AUTHOR: Bir, G. L.; Bogomolov, V. N.; Krivitskiy, Ye. V.; Sulyatitskaya, T. Ye.

44,55

ORG: Institute of Semiconductors AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Piezoresistance of partially reduced rutile at temperatures of 78-500°K

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 2978-2989

21,44,55

TOPIC TAGS: titanium dioxide, pressure effect, piezoelectric effect, electric conductivity, semiconductor research, semiconductor theory

21,44,55

ABSTRACT: Piezoresistance tensors of rutile are measured from 78 to 500°K for various concentrations of current carriers. The experimental equipment and procedure and the shape of the specimens are described in detail. A phenomonological description is given for the effect of piezoresistance in rutile. The piezoresistance tensor is described by seven independent constants. Temperature relationships are derived for all components of the piezoresistance tensor. Data on conductance anisotropy and the elastic constants of rutile are used as a basis for calculating the seven coefficients of elastoconductivity in rutile as functions of temperature. The effect of hydrostatic pressure on the electrical conductivity of rutile at room temperature is investigated. Data on hydrostatic stress agree well with measurements of uniaxial de-

Card 1/2

L 9650-66

ACC NR: AP5025375

formation. The values and temperature behavior of the coefficients of elastoconductivity show that the minimum of the conduction band in this material is on the k_z axis and also indicate that the band is not degenerate. High volumetric coefficients of piezoresistance and the anomalous behavior of these coefficients with respect to temperature are characteristic features of piezoresistance effects in rutile. The volumetric coefficients of elastoconductivity increase approximately as T^{-1} in the high temperature region, reaching a maximum of very close to 80 at a temperature of very nearly 100°K. These coefficients decrease slowly with a further reduction in temperature. Two models are proposed for explaining these high volumetric coefficients of piezoresistance: the first is based on the assumption that there are two conduction bands and that the donor impurities are completely ionized, while the second assumes an incompletely ionized impurity. Both of these models agree partially with the experimental data available for rutile, but neither of them gives a satisfactory explanation of all phenomena in itself. It is possible that a two-band model combined with incomplete impurity ionization may give a better approximation. The authors take this opportunity to thank V. P. Zhuze for the support he gave to this work and for all his consultation during its completion. As in our previous papers, we used rutile single crystals produced in A. S. Bebchuk's laboratory and oriented by T. B. Zhukova and A. I. Zaslavskiy to whom we also extend our gratitude. Orig. art. has: 6 figures, 19 formulas.

SUB CODE: 20/ SUBM DATE: 26Apr65/ ORIG REF: 006/ OTH REF: 014

Card 2/2

ACC NR: AP5027421 SOURCE CODE: UR/0181/65/007/011/3392/3401

AUTHOR: Bir, G. L.; Vinokurov, I. V.

ORG: Institute of Semiconductors AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Forbidden transitions in the fine structure of a Gd^{3+} ion in a CeO_2 crystal

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3392-3401

TOPIC TAGS: gadolinium, cerium compound, oxide, forbidden transition, fine structure, EPR, crystal theory

ABSTRACT: This paper gives data from an experimental and theoretical study of lines due to forbidden transitions with $\Delta M \neq \pm 1$ in the fine structure of the electroc paramagnetic resonance spectrum for a Gd^{3+} ion in CeO_2. Expressions are found in the first approximation of perturbation theory with respect to $a/g\beta H$ for the matrix element of the forbidden transition $W_{M,N}(N \neq M \pm 1)$ for an ion located in a cubic crystal field. Here a is the constant of interaction with the crystal field. The authors study the angular relationship for intensity of various types of forbidden electron paramagnetic resonance lines of trivalent gadolinium in cerium dioxide. The experiments are done with orientations of the external magnetic field in planes {100} and

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ACC NR: AP5027421

{110}. Theoretical considerations indicate an identical angular relationship for all forbidden lines corresponding to a single type of transition. However, a somewhat different angular relationship is observed experimentally for various lines belonging to a single type of forbidden transition. It is assumed that this is due to use of only the first approximation in the theoretical calculations, and that successive approximations would reveal differences in angular relationships for various lines. The formulas derived give a satisfactory description on the whole of the observed angular relationships. Orig. art. has: 3 figures, 1 table, 17 formulas.

SUB CODE: 07,20/ SUBM DATE: 03May65/ ORIG REF: 003/ OTH REF: 003

Card 2/2

L 05778-67 EWT(1) ...

ACC NR: AP6031446 SOURCE CODE: UR/0056/66/051/002/0556/0569

AUTHOR: Bir, G. L.

ORG: Institute of Semiconductors, Academy of Sciences SSSR (Institut poluprovodnikov Akademii nauk SSSR)

36
B

TITLE: Jahn—Teller effect on impurity centers in semiconductors

SOURCE: Zh eksper i teor fiz, v. 51, no. 2, 1966, 556-569

TOPIC TAGS: impurity center, semiconductor, anisotropic medium, cubic crystal, ionization potential, Jahn Teller effect

ABSTRACT: The static Jahn—Teller effect on impurity centers in semiconductors is investigated. The interaction between the impurity center and lattice is analyzed as an interaction with an elastic anisotropic medium. The nature and value of splitting the ground state of the impurity center are obtained for various types of symmetry centers in cubic crystals. The value of the Jahn—Teller splitting increases with the increase of ionization E_0 of the impurity center, and for centers with $E_0 \sim 0.05$—0.1 ev, it may be 0.01—0.02 ev. The author thanks G. Ye. Pikus for discussing the article and reviewing the manuscript, and V. L. Gurevich for discussing the paper. Orig. art. has: 69 formulas. [Based on author's abstract]

Card 1/1 SUB CODE: 20/ SUBM DATE: 20Feb66/ORIG REF: 003/OTH REF: 007/

L 29308-66 EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP6012455 SOURCE CODE: UR/0181/66/008/004/1013/1020

AUTHORS: Ansel'm, L. N.; Bir, G. L.; Myl'nikova, I. Ye.; Petrov, M. P.

ORG: Institute of Semiconductors AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

67
65
B

TITLE: Electron paramagnetic resonance of Cr^{3+} ions in lithium-aluminum spinel

27

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1013-1020

TOPIC TAGS: electron paramagnetic resonance, chromium, lithium compound, aluminum compound, epr spectrometry, fine structure

ABSTRACT: The purpose of the investigation was to determine the structure of the crystalline electric fields in the octahedral lattice sites of inverted and intermediate ordered spinel. The single crystals of $LiAl_5O_8$ were grown by spontaneous crystallization from the solution. The solvent was a mixture of PbF_2 and PbO. The EPR spectra were measured at room temperature in the 3-cm band using a standard radiospectroscope (RE-1301). In the main measurements the constant magnetic field was in the (110) plane. When the magnetic field was rotated in this plane, seven lines were observed, and the angular dependence of their positions

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L 29308-66

ACC NR: AP6012455

2

as well as the number point to the existence of a strong crystalline field with rhombic symmetry. The spin Hamiltonian corresponding to the spectrum and the corresponding values of the g factor and the crystal-field constants are determined. The Cr^{3+} ion has twelve magnetically non-equivalent positions, so that in an external magnetic field of arbitrary direction it is possible to observe 12 EPR lines. To determine the correct number of lines it is necessary to take into account the rhombic distortion of the potential, and this is found to be due to the presence of differently-charged ions, Al^{3+} and Li^{+}, in the octahedra. The rhombic distortion decreases linearly with increasing temperature (from 250 Oe at 100K to 120 Oe at 800K). The rhombic distortion also causes the axis of the crystal electric field in the octahedra to deviate somewhat from the crystallographic axes $[111]/\sqrt{3}$, $[112]/\sqrt{6}$, and $[110]/\sqrt{2}$. The larger the difference in the charge between the ions and the octahedra, the greater the deviations of the field axes. The authors thank G. A. Smolenskiy for interest in the work and a discussion of the results and M. F. Bryzhina for x ray investigations of the samples. Orig. art. has: 18 formulas and 2 figures.

SUB CODE: 20/ SUBM DATE: 23Jul65/ ORIG REF: 003/ OTH REF: 007

Card 2/2 BK

BIR, L.I., inzh.

Phototelegraph apparatus of uper-high speed. Vest.sviazi 20 no.1:3 of cover Ja '60. (MIRA 13:5)
(Phototelegraphy)

TAUBE, A.M., prof. [deceased]; BIR, Sh.S.; MIN'YAR-BELORUCHEV, R.K.; OSTAPENKO, V.P.; KOLESNIKOV, P.M., red.; DANILOVA, Z.S., red.-leksikograf; SOLOMONIK, R.L., tekhn.red.

[French-Russian military dictionary] Frantsuzsko-russkii voennyi slovar'. Izd.4., prosmotrennoe i dop. Sh.S.Birom, R.K.Min'iar-Beloruchevym i V.P.Ostapenko. Moskva, Voen. izd-vo M-va obor.SSSR, 1960. 824 p. (MIRA 14:2)

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(Military art and science--Dictionaries)

BIR, Sh.S.; KAPLAN, B.Ya.; KULESHA, V.S.; MARKEVICH, V.G.; ORENSHTEYN, E.I.; RAPPOPORT, T.L.; SMORODSKIY, P.V.; SOKOLOV, D.Yu.; TURETSKAYA, S.S.; PLESHNER, I.K.; ABLOVA, A.A., red.; SMUL'SKAYA, T.K., red.l-leksikograf; LICHACHEVA, L.V., tekhn. red.

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(Polish language--Dictionaries--Russian)
(Technology--Dictionaries)

BIRA, C., ing.; DUMITRASCU, E., ing.

Tubular frontal installation with metallic valve in the main irrigation canals. Hidrotehnica 6 no.11:393-394 N '61.

BIRA, C.,ing.

Aspects of the irrigation of the Braila Plain. Hidrotehnica 7 no. 6:201- 208 Je '62.

BIRA, C., ing.

Considerations on the regime of phreatic waters with reference to irrigation of the lower zone of the Calmatui River. Hidrotehnica 8 no.2:67-71 F '63.

BIRA, Constantin, ing.

Aspects of the prestressed reinforced concrete gutters used in the works carried out in the Stoenesti-Visina irrigation system. Hidroteh apele meteor 10 no.2:57-68 F '65.

BODRYY, M.; GUSEYNOV, M.; AGRETKIN, S.N., red.; ATADZHANOV, A., red.; BIRA, Ya.I., red.; GEL'DYYEV, A., red.; GOLOVKIN, A.V., red.; MAMEDKULIYEV, A., red.; MATALOV, Ch., red.; KHAIMURADOV, B., red.

Sovet Turkmenistany. Soviet Turkmenistan. Ashkhabad, Turkmenskoe izd-vo, 1964. 103 p. [In Turkmen, Russian, English, and Arabic] (MIRA 18:4)

L 10231-63 EPR/EWT(1)/BDS--AFFTC/ASD--Ps-4--WW

ACCESSION NR: AP3000047 S/0056/63/044/005/1544/1551

61
58

AUTHOR: Tamoykin, V. V.; Biragov, S. B.

TITLE: Radiation reaction of sound due to the motion of small bodies in inhomogeneous gaseous media

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 44, no. 5, 1963, 1544-1551

TOPIC TAGS: Radiation reaction of sound, inhomogeneous gas media

ABSTRACT: Radiation of sound due to the motion of a solid in a statistically inhomogeneous gaseous medium is analyzed by using the analogy with Cerenkov radiation. An expression is found, by the method of the radiation reaction of sound, for the intensity of sound waves radiated under conditions where the dimension of the body is much smaller than its mean free path, and much smaller than the wavelength. It is shown that, in contrast with homogeneous media, sound can be radiated in inhomogeneous media at subsonic velocities of the bodies. It is noted that the radiation of a charge can be considered by a similar method, for example in an inhomogeneous magnetoactive plasma and in

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L 10231-63

ACCESSION NR: AP3000047

3

an inhomogeneous medium with spatial dispersion. "The authors express their gratitude to Professor V. L. Ginzburg and N. G. Denisov for valuable discussion of the results of the research." Orig. art. has: 37 formulas.

ASSOCIATION: Radifizicheskiy institut Gor'kovskogo gosudarstvennogo universiteta (Radiophysics Institute, Gor'kiy State University)

SUBMITTED: 26Oct62 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NR REF SOV: 014 OTHER: 002

Card 2/2

ACCESSION NR: AP4024468 S/0141/64/007/001/0059/0066

AUTHOR: Biragov, S. B.

TITLE: On the complex dielectric constant of a magnetoactive plasma at low frequencies

SOURCE: IVUZ. Radiofizika, v. 7, no. 1, 1964, 59-66

TOPIC TAGS: plasma, magnetoactive plasma, plasma dielectric constant, plasma permittivity, complex dielectric constant, quasihydrodynamic calculation, kinetic equations, linear approximation, Sonine polynomial, ion distribution function, electron distribution function, particle collision, fully ionized plasma, weakly ionized plasma, ion ion collision

ABSTRACT: In view of the approximate nature of the results obtained for the complex dielectric constant by quasi-hydrodynamic calculations, the author obtains the complex dielectric constant by solving

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ACCESSION NR: AP4024468

in the linear approximation the kinetic equations for the distribution functions of the electrons and ions, which are represented in the form of expansions in Sonine polynomials. In this case it becomes possible to take into account all types of collisions between particles, and particularly collisions between like particles. The resultant equations are used for two particular cases, fully ionized and weakly ionized plasma. It is shown that for a fully ionized plasma it is possible to neglect ion-ion collisions, owing to the large differences between the masses of the electrons and ions. In the case of weakly ionized plasma, where the molecule mass is comparable with the ion mass and the change in ion momentum is appreciable, the ion-ion collisions become significant for weak attraction between molecules, but such a model is not very probable. The conclusion is that ion-ion collisions can be neglected for both fully ionized and weakly ionized plasmas. "In conclusion I am deeply grateful to B. N. Gershman for suggesting the topic, for interest in the work, and for a discussion of the results." Orig. art. has: 19

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ACCESSION NR: AP4024468

formulas.

ASSOCIATION: Nauchno issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete (Scientific Research Radiophysics Institute at the Gor'kiy University)

SUBMITTED: 26Apr63 DATE ACQ: 15Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 007

Card 3/3

BIRAGOV, S.B.

Complex dielectric permittivity of a magnetoactive plasma at low frequencies. Izv. vys. ucheb. zav.; radiofiz. 7 no.1:59-66 '64. (MIRA 17:3)

1. Nauchno-issledovatel'skiy radiofizicheskiy institut pri Gor'kovskom universitete.

BLYUMIN, A.A.; BIRAGOV, Yu.G.; KALASHNIKOV, A.I.

Automatic pH control in the lead-zinc industry. TSvet. met. 34 no.12:31-35 D '61. (MIRA 14:12)

1. Severo-Kavkazskiy filial konstruktorskogo byuro "TSvetmetavtomatika".
(Zinc--Electrometallurgy)
(Hydrogen-ion concentration--Measurement)

L 23405-66 EWT(1)/T RO/JK

ACC NR: AP6014013 SOURCE CODE: UR/0016/65/000/008/0007/0014

AUTHOR: Sukhova, M. N.; Gvozdeva, I. V.; Misnik, Yu. N.; Teterovskaya, T. O.; Bolotova, T. A.; Kholodova, G. K.; Samsonova, A. N.; Gol'dina, G. S.; Goldina, G. S.; Storozhova, Ye. M.; Storozheva, E. M.; Mosunov, V. B.; Nasolovskaya, V. K.; Serafimova, A. M.; Biralo, T. I.; Vasilenko, L. N.

ORG: Central Scientific Research Disinfection Institute, Moscow (Tsentral'nyy nauchno-issledovatel'skiy dezinfektsionnyy institut); Mytishchi City Sanitary Epidemiological Station, Mytishchi (Mytishchitsskaya gorodskaya sanitarno-epidemiologichoskaya stantsiya); Tashkent City Sanitary Epidemiological Station, Tashkent (Tashkentskaya gorodskaya sanitarno-epidemiologicheskaya stantsiya); Tashkent City Disinfection Station, Tashkent (Tashkentskaya gorodskaya dezinfektsionnaya stantsiya); Minsk City Disinfection Station, Minsk (Minskaya gorodskaya dezinfektsionnaya stantsiya); Brest City Sanitary Epidemiological Station, Brest (Brestskaya gorodskaya sanitarno-epidemiologicheskaya stantsiya); Brest Oblast Sanitary Epidemiological Station (Brestskaya oblastnaya sanitarno-epidemiologicheskaya stantsiya)

TITLE: Sensitivity of the house fly population to chlorophos, trichlorometaphos-3, DDT, hexachlorocyclohexane, and polychloropinene after many years of application of these insecticides

SOURCE: Zhurnal mikrobiologii, epidemiologii i immunobiologii, no. 8, 1965, 7-14

TOPIC TAGS: entomology, insecticide, organic phosphorus compound, chlorinated organic compound

UDC: 614.57:615.777/779]:[576.895.772.095.18

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L 23405-66

ACC NR: AP6014013

ABSTRACT: The sensitivity of flies to insecticides was studied in a number of cities. Tests were carried out on female flies by applying an acetone solution of the insecticide to the back and determining the LD_{50}. At Minsk and Brest, where sprinkling of walls with a 2-3% aqueous solution of chlorophos was applied for 7 and 6 years, respectively, increased tolerance of flies to this insecticide was observed. At Mytishchi, where chlorophos baits were used, particularly in the form of mixtures containing ammonium carbonate, the sensitivity of flies to this insecticide remained undiminished. No increase in the tolerance of southern house flies (Musca domestica vicina Macg.) to chlorophos after application of this insecticide in Tashkent for 4-5 years was observed. Use of trichlorometaphos as a larvicide reduced the sensitivity of flies to this insecticide to a small extent in Mytishchi, Minsk, and Brest, but not to a degree which could be regarded as an increase in tolerance (defined as a decrease of sensitivity by a factor of 2-4). The sensitivity of flies to trichlorophos was unaffected after use of this insecticide in Tashkent. Flies at Minsk and Brest which had developed a tolerance to chlorophos also showed an increased resistance to DDT and hexachlorocyclohexane (this increase in resistance also developed to a minor extent at Mytishchi). However, the increase in the resistance to hexachlorocyclohexane was presumably not related to the use of organophosphorus compounds, but due to the application of polychloropinene in these localities. Existence of a relation between increased resistance to DDT and tolerance to chlorophos was more likely. Southern flies in Tashkent, which retained sensitivity to chlorophos to the full extent, did not exhibit an increase in the resistance to DDT. After a

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ACC NR: AP6014013

6 to 7 year discontinuance of the use of chlorinated hydrocarbons in Tashkent, a moderate tolerance to DDT that was on the initial level remained, while the resistance to hexachlorocyclohexane decreased by a factor of three. The most expedient methods for the extermination of flies are used of chlorophos - ammonium carbonate baits to exterminate imago and application of larvicides, specifically those containing trichlorometaphos - 3 in optimum doses, so that development of tolerance will be prevented. Orig. art. has: 4 figures and 2 tables. [JPRS]

SUB CODE: 06, 07 / SUBM DATE: 24Sep65 / ORIG REF: 004 / OTH REF: 004

Card 3/3

BIRBAIR, M.L.; ZEL'DIN, Ya.M.

Errors of the medical working ability expertise in diseases of the cardiovascular system. Zdrav.Bel. 8 no.11:63-65 N '62. (MIRA 16:5)

1. Vitebskaya oblastnaya vrachebno-trudovaya ekspertnaya komissiya (predsedatel' Ye.A. Khrapunovich) i kafedra fakul'tetskoy terapii Vitebskogo gosudarstvennogo meditsinskogo instituta (zav. - prof. A.M. Davydov).
(CARDIOVASCULAR SYSTEM--DISEASES) (DISABILITY EVALUATION)

SUKHOVA, M.N.; YEROFEYEVA, T.V.; GVOZDEVA, I.V.; NIKIFOROVA, N.F.; DOTSENKO, T.K.; DEM'YANCHENKO, R.P.; BIRALO, T.I.; SERAFIMOVA, A.M.; MOSUNOV, V.B.; SAMSONOVA, A.M.; STOROZHEVA, Ya.M.; SURCHAKOV, A.V.

Methods of applying insecticides to control synanthropic flies. Zhur.mikrobiol., epid.i immun. 33 no.8:15-19 Ag '62. (MIRA 15:10)

1. Iz TSentral'nogo nauchno-issledovatel'skogo dezinfektsionnogo instituta Ministerstva zdravookhraneniya SSSR, Mytishchinskoy gorodskoy sanitarno-epidemiologicheskoy stantsii, Kuybyshevskogo instituta epidemiologii i mikrobiologii, Minskoy gorodskoy dezinfektsionnoy stantsii, Brestskoy sanitarno-epidemiologicheskoy stantsii, Tashkentskoy gorodskoy dezinfektsionnoy stantsii i Tashkentskoy gorodskoy sanitarno-epidemiologicheskoy stantsii.
(INSECTICIDES) (FLIES--EXTERMINATION)

SUKHOVA, M.N.; GVOZDEVA, I.V.; MISNIK, Yu.N.; TETEROVSKAYA, T.O.; BOLOTOVA, T.A.; KHOLODOVA, G.K.; STOROZHEVA, Ye.M.; SAMSONOVA, A.M.; MOSUNOV, V.B.; NESELOVSKAYA, V.K.; GOL'DINA, G.S.; SERAFIMOVA, A.M.; BIRALO, T.I.; VASILENKO, L.N.

Sensitivity to chlorophos, trichlorometaphos, DDT, hexachlorocyclohexane and polychloropinene in housefly populations following the use of these insecticides for several years. Zhur. mikrobiol., epid. i immun. 42 no.8:7-14 Ag '65. (MIRA 18:9)

1. TSentral'nyy nauchno-issledovatel'skiy dezinfetsionnyy institut, Moskva, Mytishchinskaya i Tashkentskaya gorodskiy sanitarno-epidemiologicheskiye stantsii, Tashkentskaya i Minskaya gorodskiye dezinfektsionnyye stantsii i Brestskaya gorodskaya i Brestskaya oblastnaya sanitarno-epidemiologicheskiye stantsii.

BIRANSKIY, P.I.; KURILO, P.M.

Study of the symmetry properties of isoenergetic surfaces in n-germanium by measuring the Hall effect. Fiz. tver. tela 6 no.1:54-57 Ja '64. (MIRA 17:2)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

BIRAR, C.

Electronic apparatus for measurement of distances in geodesy. Rev geodezie 6 no.4:13-18 '62.

1. I.S.P.A.

BIRASHEVICH, V.M., inzh.; VAYNSHTEYN, L. M., inzh.

Economic effectiveness of intersystem couplings. Elek. sta. 35 no. 4:50-54 Ap '64. (MIRA 17:7)

BIRBAUER, J.

"Investigation of lipins in the mammary glands of young and lactating cattle." p. 143.

BIOLOGIAI KOZLEMENYEK. (Magyar Biologiai Tarsasag. Altalanos Biologiai Szakosztaly). Budapest, Hungary, Vol. 6, No. 2, 1959.

Monthly list of East European Accessions (EEAI), LC, Vol. 8, No. 8, August 1959.
Uncla.

BIRBRAIR, B.L., and SLIV, L.A.

"Role of Pairing Interaction in Formation of Deformed Nuclei."

paper submitted at the All-Union Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

Physico-Tech. Inst. Acad. Sci. USSR

BIRBRAIR, B. L.

AUTHOR: Birbrair, B.L. 56-5-25/46

TITLE: Investigation of the Equilibrium Form of Atomic Nuclei (Issledovaniye ravnovesnoy formy atomnykh yader)

PERIODICAL: Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol. 33, Nr 5, pp. 1234-1247 (USSR)

ABSTRACT: Theoretically the following is shown: The part played by the remaining interaction of nucleons is not infinitely small if the spin dependence of nuclear forces is taken into account. The experimentally confirmed abrupt change of the forms of equilibrium of atomic nuclei is due to the influence of pair-energy, which counteracts transition to the deformed form of equilibrium outside the body in the case of a small number of nucleons.
If the difference between the pair energies in deformed and spherical states is to be judged on the basis of experimental data, all three known domains of the "stretched" nucleus are obtained, and the theoretically found limits of the "stretched" nucleus agree well with experimental data. The presence of other domains of "stretched" nuclei is not indicated by theoretical derivation, which is not in agreement with the latest data.

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BIRBRAIR, B.L., Cand Phys Math Sci -- (diss) "Equilibrium form of atomic nuclei." Len, 1958, 6 pp (Min of Education RSFSR. Len State Pedagogical Inst im A.I. Gertsen. Chair of Theoretical Physics and Astronomy) 100 copies (KL, 23-58, 101)

21 (7), 21 (8)

AUTHOR: Rudakov, V. P. SOV/89-7-1-18/26

TITLE: IX All-Union Conference on Nuclear Spectroscopy (IX Vsesoyuznoye soveshchaniye po yadernoy spektroskopii)

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 1, pp 76-78 (USSR)

ABSTRACT: The IX All-Union Conference was held from January 26 to February 2, 1959 at Khar'kov. More than 300 participants heard 100 lectures, the most important of which dealt with the following fields. Nuclear Theory. General problems of β-decay. A. S. Davydov (MGU): Theoretical classification of low-energy excited nuclear states. L. E. Feker: Deformed nuclei. R. I. Birbrair, L. K. Feker, L. A. Sliv (LFTI): Quadrupole oscillations of deformed nuclei. Ye. V. Inozin, V. K. Goncharov, S. P. Tsytko (KhPTI): Calculation of the ft-values with matrix elements for β-transitions by means of the generalized nuclear model. S. T. Belyayev (IAE): Consideration of pair-correlation in nuclei. K. K. Nigmal (IAE): The application of the superconductivity model to nuclei for the purpose of calculating their moments of inertia. P. E. Nemirovskiy (IAE): Problems of the neutron stability of nuclei. G. A. Sherodinskiy (IAE): The present stage in the theory of β-decay. V. V. Vladimirskiy, V. K. Grigor'yev, V. A. Yergakov, Yu. V. Trebukhovskiy (ITEP): Measurement of the angular correlation between electron and neutrino in the decay of the neutron. V. M. Lobashev, Ye. A. Nazarenko, L. I. Rusinov (LFTI): Measurement of the correlation between the transversal electron polarization and circular polarization of γ-quanta occurring in the decay of Sc^{46} and Co^{60}. Decay Schemes. γ-radiation of Nuclei. Ye. M. Amfriyev, A. K. Valter, Yu. V. Gonchar, Ye. G. Kopanets, A. N. L'vov, P. M. Tutskiy, S. P. Tsytko, P. V. Sorokin, A. S. Marnetz, A. Ya. Malakhov, A. Ya. Tarnov (Fiziko-tekhnicheskiy Khar'kovskiy institut (Physico-technical Institute, Khar'kov)): The $Si^{28,29,30}(p,\gamma)$, $Ne^{20}(p,\gamma)$, $S^{32,34}(p,\gamma)$, $Ar^{40}(p,\gamma)$ and $N^{14}(p,\gamma)$ reactions. R. G. Alkhazov, A. P. Grinberg, G. M. Gusinskiy, N. Kh. Lemberg, V. V. Nozhdeynitskiy, K. N. Yershina (Leningradskiy fiziko-tekhnicheskiy institut (Leningrad Physico-technical Institute)): Investigation of the Coulomb excitation of the lower levels of some nuclei during their bombardment by multiply charged ions (C, N, O, and Ne). A. V. Kalyamin, A. N. Murin, V. N. Pokrovskiy, V. A. Yakovlev (RIAN): New isotopes Tu^{161}, Ho^{153}, Ho^{155} and Ho^{157}. B. S. Dzhelepov, V. A. Yerzilyenko (LGU): Decay schemes of some neutron-deficient isotopes, set up on the basis of measurements of the coincidence of the internal conversion electrons. Spectroscopy Engineering. B. S. Dzhelepov, B. P. Ivanov, V. I. Nemirovskiy, V. G. Chumin (RIAN): β-spectrometer with double focusing. S. A. Barnov, V. V. Nemenko, A. G. Zelenkov, A. F. Valov, G. Ye. Shcherbakin (IAE): Improved β-spectrometer. L. F. Barnhuk, Ye. V. Belykh, V. I. Golyshkin, V. A. Tarasov (IFAN UkrSSR): Magnetic spectrograph for heavy charged particles. The representatives of the Ministerstvo radiotekhnicheskoy promyshlennosti (Ministry of the Radio-engineering Industry) gave a report about new multipliers. The Conference was closed by B. S. Dzhelepov, who stressed the fact that nuclear tables and reference works ought to be published much more quickly in order to be of real use to the experimenter.

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21(1)

AUTHORS: Birbrair, B. L., Poker, L. K., Sliv, L. A. SOV/56-36-3-42/71

TITLE: Quadrupole Oscillations of Deformed Nuclei (Kvadrupol'nye kolebaniya deformirovannykh yader)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 809-820 (USSR)

ABSTRACT: By investigating the oscillation levels of deformed nuclei it is possible to obtain new data concerning the properties of these nuclei. The authors of the present paper investigated two types of quadrupole oscillations: 1) β-oscillations along the deformation axis with respect to the equilibrium value of β_0 in the case of an axially symmetric shape of the nucleus ($\gamma = 0$), and 2) γ-oscillations which are vertical to the deformation axis. The paper consists of two parts. In the first part equations are derived for the β- and γ-oscillations on the basis of Bohr's (Bor) hamiltonian (ref 1) for a nucleus consisting of a core and a external nucleon. In part II the authors investigate the problem of averaging Bohr's hamiltonian according to the internal state of the nucleons for the purpose of explaining the connection between the stability parameters

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Quadrupole Oscillations of Deformed Nuclei SOV/56-6-[illegible]/71

C_β and C_γ (with respect to β- and γ-radiation respectively).

In part III the interaction between rotation and oscillations is investigated, and explicit formulas are derived for the corrections to the energy of the rotation-oscillation band ΔE_β (as a result of β oscillations the shape of the nucleus deviates from axial symmetry) and ΔE_γ (γ-oscillations cause variation of the moment of inertia). In part IV the experimental data at present available for nuclei of heavy elements are finally discussed (Tables 1, 2) and the difficulties connected with analyzing them are thoroughly investigated. There are 1 figure, 2 tables, and 4 references, 1 of which is Soviet.

AUTHOR: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physical-Technical Institute of the Academy of Sciences, USSR)

SUBMITTED: July 9, 1958

Card 2/2

BIRBRAIR, B.L.

Effect of superfluidity of atomic nuclei on stripping and pickup reactions. Zhur.eksp.i teor.fiz. 41 no.3:894-897 S '61. (MIRA 14:10)

1. Leningradskiy fiziko-tekhnicheskiy institut AN SSSR.
(Nuclear reactions)

22142

S/056/61/040/003/022/031
B112/B214

24.6520

AUTHOR: Birbrair, B. L.

TITLE: Analysis of the angular distribution of the reaction products in light nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 3, 1961, 895-897

TEXT: The angular distribution of the reaction products in light nuclei is found to be unsymmetric with respect to 90° and has maxima which are characteristic of processes of direct interaction. From these circumstances it may be concluded that the reactions proceed simultaneously by direct, and by resonance mechanism. The interference between these two mechanisms complicates the analysis of an experimental angular distribution very much. It is shown in the present paper that if the energy of the particle current is sufficiently large in comparison with the height of the Coulomb barrier, the contribution of the direct mechanism to the differential reaction cross section may be separated in calculating the angular distribution at energies E_r and $E_r \pm \Gamma_r/2$ (E_r resonance energy,

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22142

S/056/61/040/003/022/031
B112/B214

Analysis of the angular...

Γ_r resonance width). The calculation of the angular distribution is made in the plane wave approximation and expressions are given for the angular distributions $d\sigma_d/d\Omega$, $d\sigma_{int}/d\Omega$, and $d\sigma_r/d\Omega$ of the direct, interference, and resonance parts of the differential reaction cross section. The following result is finally obtained: $d\sigma_d/d\Omega = J(E_r + \frac{1}{2}\Gamma_r;\vartheta) + J(E_r - \frac{1}{2}\Gamma_r;\vartheta) - J(E_r;0)$, where $J(E;\vartheta) = d\sigma_d/d\Omega + d\sigma_{int}/d\Omega + d\sigma_r/d\Omega$, and ϑ is the scattering angle. Experiments on light nuclei at medium energy of the particle current give a resonance width of the order of 10 - 100 kev. In regions distant from the reaction threshold $d\sigma_d/d\Omega$ changes markedly (1 - 2 Mev) while in the resonance region it is practically constant. There are 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Technology, Academy of Sciences, USSR)

SUBMITTED: October 3, 1960

Card 2/2

S/056/62/042/002/027/05
B108/B104

AUTHOR: Birbrair, B. L.

TITLE: Proton-neutron interaction in the pair correlation model

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 479 - 484

TEXT: The difference in the proton and neutron Fermi levels may be compensated by Coulomb interaction. It is therefore necessary to study the effect of p-n interaction upon coupling. It is shown that the proton and neutron amplitudes in the canonical Bogolyubov transformation (N. N. Bogolyubov UFN, 67, 549, 1959) do not interfere with each other, i. e., the coupling of protons and neutrons in a spherical nucleus is independent. The quadrupole excitation of even-even spherical nuclei is discussed with consideration of p-n interaction. The outer protons and neutrons are to have moments of momentum (j) much greater than unity. Two levels with spins 2^+ are found. The probabilities of E2 transitions from these levels to the ground level and of the transition $2'^+ \longrightarrow 2^+$ are determined:

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$$B(E2)_{2+\to 0} = B^{sp}\frac{2E_{j_p}}{\mathscr{E}_{2+}}\frac{u_{j_p}^2 v_{j_p}^2}{1+\delta^2-\delta\sqrt{1+\delta^2}},$$

$$B(E2)_{2'+\to 0} = B^{sp}\frac{2E_{j_p}}{\mathscr{E}_{2'+}}\frac{u_{j_p}^2 v_{j_p}^2}{1+\delta^2+\delta\sqrt{1+\delta^2}}, \qquad (26)$$

$$B(E2)_{2'+\to 2+} = B^{sp}\frac{(\mathscr{E}_{2+}\mathscr{E}_{2'+}+4E_{j_p}^2)^2}{64\mathscr{E}_{2+}\mathscr{E}_{2'+}E_{j_p}^2}\frac{(u_{j_p}^2-v_{j_p}^2)^2}{1+\delta^2},$$

where B^{sp} is the single particle value of the respective probability. $\delta = (\mathscr{E}_n^2 - \mathscr{E}_p^2)/8EV_{pn}$; $E = \sqrt{E_{j_p}E_{j_n}}$; $V_{pn} = u_{j_p}v_{j_p}u_{j_n}v_{j_n}\mathscr{L}(1j_p^2, -1j_n^2)$. $\mathscr{E}_p$ and $\mathscr{E}_n$ are the energies of quadrupole oscillations without p-n interaction. For the limiting case $\delta = 0$, which is rather close to the actual facts, the results are

Proton-neutron interaction...

S/056/62/042/002/027/055
B108/B104

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physicotechnical Institute of the Academy of Sciences USSR)

SUBMITTED: July 28, 1961

CARD 4/4

S/048/63/027/002/001/023
B104/B180

AUTHORS: Birbrair, B. L., Yerokhina, K. I., and Lemberg, I. Kh.

TITLE: The energies of the first 2^+ levels and the reduced probabilities of E2-transitions to those levels in spherical nuclei

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 27, no. 2, 1963, 150-171

TEXT: The aim is to calculate $\mathcal{E}_{2^+}$ energies of the first excited levels and the $B(E2)_{0 \to 2^+}$ reduced probability for spherical nuclei in a wide range of atomic numbers and to compare the results with experimental data. The calculation is carried out on the basis of a simple qualitative model taking account of pairing and quadrupole-quadrupole interaction between the outer nucleons. On the basis of results and symbols defined in previous papers the selection of $\mathcal{E}_{\tau j}$, the calculation of Δ_τ and λ_τ, the mass difference between odd and neighbored even-even nuclei, and the selection of G_τ^{opt}, are studied in detail. By means of the formulas

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$$\frac{\chi}{10\pi}\sum_{\substack{\tau jj'\\ (j>j')}}\frac{(E_{\tau j}+E_{\tau j'})L^2(\tau jj')}{(E_{\tau j}+E_{\tau j'})^2-\omega^2}=1 \qquad (6)$$

and

$$B(E2)_{0\to 2^+}=\frac{1}{4\pi\omega}\left\{\sum_{\substack{\tau jj'\\ |j>j'|}}\frac{(E_{\tau j}+E_{\tau j'})L^2(\tau jj')}{[(E_{\tau j}+E_{\tau j'})^2-\omega^2]^2}\right\}^{-1}\left\{e_p\sum_{\substack{jj'\\ |j>j'|}}\frac{(E_{pj}+E_{pj'})L^2(pjj')}{(E_{pj}+E_{pj'})^2-\omega^2}+\right.$$

$$\left.+e_n\sum_{\substack{jj'\\ |j>j'|}}\frac{(E_{nj}+E_{nj'})L^2(njj')}{(E_{nj}+E_{nj'})^2-\omega^2}\right\}^2 \qquad (7)$$

$$L^2(\tau jj')=\mathcal{L}^2(\tau jj')\frac{E_{\tau j}E_{\tau j'}-(\varepsilon_{\tau j}-\lambda_\tau)(\varepsilon_{\tau j'}-\lambda_\tau)+\Delta_\tau^2}{2E_{\tau j}E_{\tau j'}(1+\delta_{jj'})}\Bigg)$$

the reduced probability of E2-transitions from the ground state to the first 2^+ levels are calculated and the energy of the first excited levels of spherical nuclei. The reduce probabilities are in good agreement with experimental data in many diagrams. The energies agree well with experimental data in the case of Ni, Kr, Sr, Sn, Te, Ba, Ce, and Pb;

agreement is worse in the case of Zn, Zr, Mo and Pt. The theoretical results reflect general tendencies observed experimentally, particularly the increasing ω_{2+} on approaching the outside of the shell with the maximum for neutron-filled shells. There are 12 figures and 2 tables.

BIRBRAIR, B.L.

Superfluidity and excited states of spherical nuclei with odd atomic numbers. Izv. AN SSSR. Ser. fiz. 27 no.10:1329-1337 O '63. (MIRA 16:10)

BIRBRAIR, B. L.

"Concerning the Theories of Superfluidity of Atomic Nuclei."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

FTI (Physico Technical Inst)

ACCESSION NR: AP4042964 S/0048/64/028/007/1185/1187

AUTHOR: Birbrair, B.L.

TITLE: Contribution to the theory of superfluidity of atomic nuclei [Report, 14th Annual Conference on Nuclear Spectroscopy held in Tibilisi 14-21 Feb 1964]

SOURCE: AN SSSR. Izv.Seriya fizicheskaya, v.28, no.7, 1964, 1185-1187

TOPIC TAGS: atomic structure, nuclear structure, nuclear model

ABSTRACT: This paper is concerned with criteria for the occurrence of superfluidity in spherical nuclei in the vicinity of lead. The pairing interactions obtained by V.N.Guman, Yu.I.Kharitonov, L.A.Sliv and G.A.Sogomonova.(Nucl.Phys.28,192,1964) for nucleon states in these nuclei are tabulated and compared with the formula

$$\Gamma_{jj'}^{0} = -\sqrt{(2j+1)(2j'+1)}\,G,$$

commonly employed in theoretical discussions of superfluidity in spherical nuclei. The formula is found to be grossly inadequate; in particular, the off-diagonal interactions obtained by Sliv et al, even between states of nearly the same energy, are much smaller than the diagonal terms, and sometimes even of opposite sign. The

1/2

BIRBRAIR, B.L.

Theory of the superfluidity of atomic nuclei. Izv. AN SSSR. Ser. fiz. 28 no.7:1185-1187 Jl '64 (MIRA 17:8)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.

APPROVED FOR RELEASE: 06/08/2000 CIA-RDP86-00513R000205320011-7"

BIRBRAIR, B.L.; GUMAN, V.N.

Excitation spectra of Tl^{208} and Bi^{208} nuclei. IAd. fiz. 1 no.6: 971-975 Je '65. (MIRA 18:6)

1. Fiziko-tekhnicheskiy institut imeni Ioffe AN SSSR.

BIRBRAIR, B.L.; FEYFRLIK, V.V.

Relation between one-particle states and rotation in deformed nuclei with odd A. Izv. AN SSSR Ser. fiz. 29 no.2:294-301 F '65. (MIRA 18:5)

ANDREYEVA, R.I.; BIRBRAYER, I.Sh.; GAVRISH, V.K.; CHIRVINSKAYA, M.V.

Efficient combined geological-geophysical method for areal prospecting used in the Dnieper-Donets Lowland. Geol.nafti i gaza 3 no.11:24-28 N '59. (MIRA 13:3)

1. Trest Ukrneftegeofizika.
(Dnieper Lowland--Prospecting--Geophysical methods)
(Donets Basin--Prospecting geophysical methods)

SMELYANSKIY, V.M.; BIRBRAYER, I.Sh.

Some data on the relation of structural plans in the northwestern part of the Dnieper-Donets Lowland. Geol. nefti i gaza 9 no.6: 61-3 of cover Je '65. (MIRA 18:8)

1. Kiyevskaya ekspeditsiya Ukrainskogo nauchno-issledovatel'skogo geologorazvedochnogo instituta.

BIRBRAYER, M.L.

BIRBRAYER, M.L., kand.med.nauk

Prothrombinogenic hepatic function in syphilis patients under the effect of specific treatment. Vrach.delo no.12:1353 D '57. (MIRA 11:2)

1. Kafedra koshnykh i venericheskikh bolezney (i.o.zav. - dots. S.I. Matuskov) Odesskogo meditsinskogo instituta.
(SYPHILIS) (LIVER) (BLOOD PLASMA)

BIRBRAYER, M.L.

BIRBRAYER, M.L., kandidat meditsinskikh nauk

Antitoxic function of the liver during specific treatment for syphilis. Vest.derm. i ven. 31 no.3:52 My-Je '57. (MIRA 10:11)

1. Iz kafedry kozhnykh i venericheskikh bolezney Odesskogo gosudarstvennogo meditsinskogo instituta imeni N.I.Pirogova.
(SYPHILIS) (LIVER)

KHALETSKA, N.I.; CHEKHOVSKIY, N.S.; P'YANKOV, P.I.; OSTROVSKIY, N.N. BIRBRAYER, M.L.; ABRAMOVA, N.I.; KOGAN, G.Kh., kand.med.nauk; ANDZHELOV, V.O., kand.med.nauk

Abstracts. Sovet. med. 27 no.9:131-133 S'63 (MIRA 17:2)

1. Iz kafedry gospital'noy terapii Voyenno-meditsinskoy ordena Lenina akademii imeni Kirova (for Khaletskaya, Chekhovskiy). 2. Iz kliniki infektsionnykh bolezney Permskogo meditsinskogo instituta (for P'yankov). 3. Iz kafedry infektsionnykh bolezney Blagoveshchenskogo meditsinskogo instituta (for Ostrovskiy) 4. Iz kafedry kozhnykh i venericheskikh bolezney Odesskogo meditsinskogo instituta imeni Pirogova (for Birbrayer). 5. Iz kafedry kozhnykh bolezney II Moskovskogo meditsinskogo instituta imeni Pirogova (for Abramova). 6. Iz kozhnogo dispansera 24-y gorodskoy bol'nitsy Dnepropetrovska (for Kogan). 7. Iz nauchno-issledovatel'skogo instituta glaznykh bolezney imeni Gel'mgol'tsa (for Andzhelov).

KOSHNITSKIY, I.N., dotsent; KRICHKOVSKIY, G.F.; VERBITSKAYA, L.P., dotsent; LYSENKO, N.I.; BIRBRAYER, M.L.; ALENGOZ, N.G.; LOKHMATOV, D.P.; YAROSHCHUK, A.A.

State of health of workers in the graphite industry. Vrach. delo no.8:134 Ag'63. (MIRA 16:9)

1. Odesskiy meditsinskiy institut.
(NO SUBJECT HEADINGS)

BIRBROVER, V.

Hourly bonus wages for heat-treatment workers. Sots.trud.no.9:78-80 S '56. (MIRA 9:12)

1. Nachal'nik otdela truda i zarabotnoy platy zavoda imeni Sverdlova, Leningrad.

(Machine-tool industry) (Wages)

CAJAL, N.; IANCONESCU, M.; ADERCA, I.; DANIELESCU, G.; BIRCA, A.

Study of the incidence of antipoliomyelitis antibodies of types I, II and III in unvaccinated persons in the rural areas of the R.P.R. Stud. cercet. inframicrobiol., Bucur. 11 no.1: 21-30 '60.

1. Comunicare prezentata la Institutul de inframicrobiologie al Academiei R.P.R. in Sesiunea stiintifica festiva din 17-18 august 1959.

(POLIOMYELITIS, immunology)

ADERCA, I.; IANCONSECU, M.; BIRCA, A.

Herpes virus in tissue culture. I. Herpes virus isolated in human embryo tissue culture. Stud. cercet. inframicrobiol., Bucur. 11 no.2:243-248 '60.
(HERPES virol.)

CAJAL, N.; IANCONESCU, M.; ADERCA, I.; OPRESCU, El.; DANIELESCU, G.; ~~BIRCA, A.~~

Comparative studies of the indidence of antipoliomyelitis antibodies in the vaccinated and unvaccinated children of the Rumanian People's Republic. Stud. cercet. inframicrobiol. Bucur. 11 no.4:549-554 '60.

1. Comunicare prezentata la Institutul de inframicrobiologie al Academiei R.P.R. [redacted]

(POLIOMYELITIS immunology)

CAJAL, N., assist. prof.; ADERCA, I.; IANCONESCU, M.; OPRESCU, E.; DANIELESCU,G.; with technical assistance of BIRCA, A.

The incidence of poliomyelitis antibodies in children in the R.P.R. Rumanian M Rev. no.2:12-14 Ap-Je '60.
(POLIOMYELITIS immunology)

BIRCA, C.

"Pastures and hayfields in Rumania." Edited by E.Puscaru-Soroceanu and others. Reviewed by C.Birca. Anal St Jassy II 10:201-202 '64.

DOBRESCU, C.; BIRCA, C.; LAZAR, Maria

Geobotanical and floristic contributions to the forest massif of Birnova-Repedea, Iasi. Pt.1. Anal St Jassy II 10:147-158 '64.

1. Chair of Botany, Faculty of Natural Sciences and Geography, "Al. I.Cuza" University, Iasi. Submitted October 26-28, 1962.

LABAU, V.; BIRCA, I.

Chemical equilibrium of weak acids in aqueous solutions and in natural water. Studii cerc chim 9 no.4:693-698 '61.

1. Institutul de cercetari pisciocole, Laboratorul de chimie, Bucuresti.

BIRCA-GALATEANU, D.

Study of isomerism of certain aniline compounds with the aid of approximate infrared spectra. Note 1. p. 1271. Academia Republicii Populare Romine. COMUNICARILE. Bucuresti. Vol. 5, no. 6, June 1955.

SOURCE: East European Accessions List (EEAL) Library of Congress, Vol. 5, no. 9, Sept. 1955

BIRCA-GALATEANU, D.

Infrared absorption spectrum of dimethyl tricyclopentyl. p. 339.
ACADEMIA REPUBLICH POPULARE ROMANE. Vol. 5, No. 2, Feb 1955.
Rumania

East European Accessions List (EEAL) Library of Congress
Vol. 5, No. 11, August 1956.

Birca-Galateanu, D.

RUMANIA/Physical Chemistry - Molecule, Chemical Bond. B-4

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3554.

Author : D. Birca-Galateanu.
Inst : Academy of Sciences of Rumania.
Title : Study of Isomerism of Some Aniline Compounds According to Their Spectra in The Next Infrared Range. Report II.

Orig Pub: Comun. Acad. RPR, 1956, 6, No 6, 767-773.

Abstract: In order to clarify the substitute nature and position in the benzene nucleus, the author studied the infrared spectra of o-, m- and n-nitroanilines in the range from 1 to 3.7 μ and compared them with those of chloraniline isomers received by him earlier (Report I, RZhKhim, 1956, 387). It is shown that the spectrum of every isomer differs from the others by absorption bands, viz., the metaisomer differs by the bands at 4070 and 5002 cm^{-1}, the ortoisomer differs by the bands at 3172 and 3346 cm^{-1}, and the paraisomer differs by the bands at 3080 and 3108 cm^{-1}.

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Birca-Galateanu, D.

B-4

RUMANIA/Physical Chemistry - Molecule, Chemical Bond.

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3569.

Author : St. Vencov, D. Birca-Galateanu, C. Gheorghita-Oancea.
Inst : Academy of Sciences of Rumania.
Title : Infrared and Ultraviolet Spectra of Some Vegetable Oils.

Orig Pub: Bul. stiint. Acad. R.P.R. Sec. mat. si fiz., 1956, 8, No 2, 391-404.

Abstract: The infrared and the ultraviolet absorption spectra of ricinus oil (I), sunflower oil (II) and linseed oil (III) in natural state were studied. Only an intensity difference of separate bands was observed in the I to III spectra. The bands 3.5 and 3.42 μ were referred to the valence vibrations of the CH_2 group, 3.32 μ was referred to the harmonic of the CH_2 deformation vibration, 1.9 μ was (C=C) 3ν , 1.72 and 1.75 μ were the symm. and asymm. (CH_2) 2ν, 1.4 μ was (C-C) 3ν . The overtone of (OH)ν was superimposed on the last band in the I spectrum. The bands 5.87 μ of (C=O)ν and 8.1 and 8.6 μ of (C-O)ν were noted in the range from 3.7 to 14 μ.

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BIRCA-GALATEANU, D.

RUMANIA/Physical Chemistry - Molecule, Chemical Bond. B-4

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 122

Author : D. Birca-Galateanu.

Inst : Academy of Sciences of Rumania

Title : Absorption Spectrum of n-Bromaniline in Nearer Infrared Region.

Orig Pub : Bul. stiint. Acad. RPR. Sec. mat. si fiz., 1956, 8, No 2, 405-413

Abstract : The infrared spectrum of n-bromaniline in the region from 1,5 to 10μ was obtained. The frequencies found were refered as follows (in cm^{-1}): 1002, 1042 ν_{14}, δ (CH), 1061, 1101 2 ν'', ν (C-Br), 1167 ν_{17}, δ (CH), 1267 ν, ν, (C-N), 1431 2 ν_4, δ (CH), 1481 ν_{13}, ν (C-C), 1598 ν_3', δ (NH_2), 1839 ν_9, ν (C-C), 1953 $\nu_{11} + \nu_{19}$, δ

Card 1/2

RUMANIA/Physical Chemistry - Molecule, Chemical Bond. B-4

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 122

δ(CH), 2042 2 ν_{14}, same, 2517 2 ν, ν (C-N), 2853 ν_9 + ν_{17}, 2893 ν_{13}, 2997, 3033 ν_{13} + ν_{16}, 3054 ν_2 + ν_{16} + ν_{18}, 3095 ν_{12}, ν (C-H), 3192 2 ν_3', 3365 ν_1', symm. ν(N-H), 3465 ν_2', asymm. ν (N-H), 3661 3 ν, 3876, 4045, 4338, 4522 3 ν_{13}, 4782 4 ν, 5055 3 ν_3', 5973 2 ν_{12}, 6666 2 ν_1'. The band 3422 cm^{-1} was attributed to the val. osc. of the N-H link taking part in the formation of the hydrogen bond.

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BIRCA-GALATEANU, D.

BIRCA-GALATEANU, D. Seignette electricity .p. 623.

Vol. 8, no. 12, Dec. 1956
GAZETA MATEMATICA SI FIZICA. SERIA A.
SCIENCE
RUMANIA

So: East European Accession Vol. 6, No.5, May 1957