

L 25375-65 EWT(d)/T/EMP(1) IJP(c)
ACCESSION NR: AP5004580

S/0020/65/160/002/0259/0262

AUTHOR: Bredikhina, Ye. A.

TITLE: On the convergence of Fourier series of almost-periodic functions

SOURCE: AN SSSR. Doklady, v. 160, no. 2, 1965, 259-262

TOPIC TAGS: Fourier series, almost periodic function, Fourier series uniform convergence, Fourier series absolute convergence, convergence criterion

ABSTRACT: A method for deriving a series of new criteria for uniform and absolute convergence of Fourier series of almost-periodic functions is presented. This method is based on representing the given almost-periodic function as the sum of a finite number or a denumerable set of almost-periodic functions with bounded spectra and is mainly applicable to a class of uniform, almost-periodic functions whose Fourier indices have a finite set of limit points on every finite interval of the real axis. Criteria for uniform and absolute convergence are defined in the form of three lemmas, for the case when the given function is an almost-periodic function, and when it is a uniform, almost-periodic function. Two theorems proved here show that the criteria of uniform and absolute convergence can be extended without any essential difficulties to Fourier series of almost-periodic functions whose

Card 1/2

L 25375-65

ACCESSION NR: AP5004580

Fourier indices have only one finite limit point. It is also noted that a series of criteria for absolute convergence of Fourier-series of almost-periodic functions can be derived when the set of Fourier indices is not everywhere dense. Orig. art. has: 8 formulas. [LK]

ASSOCIATION: Kybyshhevskiy aviatsionnyy institut (Kybyshhev Aviation Institute)

SUBMITTED: 22 May 64

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OTHER: 000

ATD PRESS: 3181

Card 2/2

BREDIKHINA, Ye. A.

Approximation of almost periodic Stepanov functions. Dokl. AN
SSSR 164 no.2:255-258 S '65. (MIRA 18:9)

1. Kuybyshevskiy aviatsionnyy institut. Submitted February 11,
1965.

BREDIKIS, Yu.I., SHUMAKOV, V.I.

Danger zones of the heart. [with summary in English]. Eksper.khir.
1 no.1:47-53 Ja-~~3~~'56 (MIRA 11:10)

1. Iz kafedry operativnoy khirurgii i topograficheskoy anatomii
(zav. - prof. V.V. Kovanov) I Moskovskogo ordena Lenina meditsinskogo
instituta imeni I.M. Sechenova.

(HEART, wounds and injuries
exper. determ. of danger zones (Rus))
(WOUNDS AND INJURIES, exper.
heart, determ. of danger zones. (Rus))

BREDIKIS, Yu. I. Cand Med Sci -- (diss) "~~The~~ ^{of Heart} Anatomic and
Experimental Basis ~~for the~~ Cardiac Puncture." Mos, 1957. 15 pp
21 cm. (First Mos Order of Lenin Medical Inst im I. M. Sechenov),
200 copies (KL, 27-57, 109)

- 65 -

BREDIKIS, Ju. I.

USSR/Human and Animal Physiology (Normal and Pathological).
Blood. Transfusions and Blood Substitutes.

Abs Jour: Ref Zhur-Biol., No 17, 1958, 79442.

Author : Bredikis, J.

Inst

Title : Development of Blood Transfusion in Bourgeois
and Soviet Latvia.

Orig Pub: Kauno med. inst. darbai, Tr. Kaunassk. med. in-ta,
1957, 3, 133-143.

Abstract: No abstract.

Card : 1/1

17

BREDIKIS, Yurgis Iosifovich

[Punctures of the heart] Funktsiia serdtsa. Moskva, Medgiz,
1960. 104 p. (MIRA 14:2)
(PUNCTURES (MEDICINE)) (HEART)

BREDIKIS, Yu.I., kand.med.nauk; KAZAKEVICHUS, P.P., inzhener

Small electrostimulator for the heart. Vest.khir. no.7:110-111
'61. (MIRA 15:1)

1. Iz Kaunasskogo meditsinskogo instituta (dir. - prof. Z.I. Yanushkevichus) i Kaunasskikh elektromekhanicheskikh masterskikh po remonty meditsinskoy apparatury (zav.-A.Ramunas).
(CARDIOLOGY—EQUIPMENT AND SUPPLIES)

BREDIKIS, Yu.I., kand.meditsinskikh nauk

Electricity -- doctor and friend of the heart. Zdorov'e 7 no.11:
14-15 N '61. (MIRA 14:11)
(ELECTRICITY--PHYSIOLOGICAL EFFECT) (HEART)

BREDIKIS, Yu.I., kand.med.nauk

Electrostimulation of the heart. Khirurgiia 37 no.1:53-58
Ja '61. (MIRA 14:2)

1. Iz gospiatal'noy khirurgicheskoy kliniki (zav. - dotsent D.S.
Klebanov) Kaunasskogo meditsinskogo instituta.
(HEART FAILURE)

BREDIKIS, Yu.I., kand.med.nauk

Case of prolonged electrical stimulation of the heart in the Adams-
Morgagni-Stokes syndrome. Kardiologiya 2 no.1:68-73 Ja-F '62.
(MIRA 15° 5)

1. Iz gospital'noy khirurgicheskoy (zav. - dotsent D.S.Klebanov)
i gospital'noy terapevticheskoy (zav. - chlen-korrespondent AMN SSSR
prof. Z.I. Yanushkevichus) klinik Kaunasskogo meditsinskogo instituta.
(HEART BLOCK) (ELECTROCARDIOGRAPHY)

BREDIKIS, Yu.I., kand. med. nauk

Use of external cardiac massage in Morgagni-Adams-Stokes
syndrome. Terap. arkh. 34 no.10:98-104 0'62 (MIRA 17:4)

1. Iz kliniki fakul'tetskoy khirurgii imeni S.I.Spasokukotskogo
(dir. - akademik A.N. Bekulev) II Moskovskogo meditsinskogo in-
stituta imeni N.I. Pirogova i Kaunasskogo meditsinskogo instituta.

BREDIKIS, Yu.I., kand. med. nauk; FRIDZON, M.G. (Moskva)

Use of electrical stimulation of the heart in Morgagni-Adams-Stokes syndrome developing against a background of severe diabetes mellitus. Probl. endok. i gorm. 9 no.5:85-88 S-0'63
(MIRA 16:12)

1. Iz kliniki fakul'tetskoy khirurgii imeni S.I.Spasokuketskogo (dir. - akademik A.N. Bakulev) II Moskovskogo meditsinskogo instituta imeni N.I.Piregova.

ABRIKOSOVA, M.A.; BREDIKIS, Yu.I. /

Hemodynamic effect of electrical stimulation of the heart in
pathologically low rhythms. Ter. arkh. 35 no.7:48-55 J1'63

(MIRA 17:1)

1. Iz kliniki fakul'tetskoy khirurgii imeni S.I.Spasokukots-
kogo (dir. - akademik A.N. Bakulev) II Moskovskogo meditsin-
skogo instituta imeni N.I.Pirogova.

CHAZOV, Ye.I.; ANDREYENKO, G.V.; SPEKTOROVA, Z.G.; RAYEVSKAYA, V.V.;
MOISEYEV, S.G.; BABSKIY, Ye.B.; BREDIKIS, Yu.I.; KUSHKIY, R.O.;
KALITEYEVSKAYA, V.F.; BEREZOV, Ye.; POKROVSKIY, A.V.; MEL'NIK,
I.Z.; AGRANENKO, V.A.; VINOGRADOVA, I.L.; SKACHILOVA, N.N.;
VIKHERT, A.M.; ZAMYSLOVA, K.N., prof.; SOKOLOVSKIY, V.P., prof.;
BEYUL, Ye.A., kand.med.nauk; SOLOV'YEV, V.V.

Minutes of the meetings of the Moscow Society of Therapists.
Terap.arkh. 35 no.1:112-118 Ja'63. (MIRA 16:9)
(THERAPEUTICS--ABSTRACTS)

BREDIKIS, Yu.I.

Electric stimulation of the heart in a closed chest with the
aid of radio waves. Grud. khir. 5 no.2:123-124 Mr-Ap'63
(MIRA 17:2)

1. Iz kliniki fakul'tetskoy khirurgii imeni S.I. Spasokukotskogo
(direktor - akademik A.N.Bakulev) II Moskovskogo meditsinskogo
instituta imeni N.I.Pirogova.

BREDIKIS, Yu.I.; KOSTENKO, I.G.

Auricular rhythm in patients with Morgagni-Adams-Stokes syndrome before and during electrical stimulation of the heart. Biul. eksp. biol. i med. 55 no.4:19-22 Ap '63.

(MIRA 17:10)

1. Iz kliniki fakul'tetskoy khirurgii imeni Spasokukotskogo (dir. - akademik A.N. Bakulev) II Moskovskogo meditsirskogo instituta imeni Pirogova.

BREDIKIS, Yu.I. [Bredikis, J.], dotsent (Kaunas, ul. Kestuchio, d.16, kv.2)

Prolonged electrostimulation of the heart. Vest. Khir. 91
no.12:79-80 D '63. (MIRA 17:9)

1. Iz fakul'tetskoy khirurgicheskoy kliniki imeni S.I.
Spasokukotskogo (dir.- akademik A.N. Bakulev) 2-go Moskovskogo
meditsinskogo instituta imeni Pirogova.

BREDIS, A.A.

PHASE I BOOK EXPLOITATION

SOV/1174

Nauchno-tekhnicheskoye obshchestvo priborostroitel'noy promyshlennosti

Avtomaticheskoye upravleniye i vychislitel'naya tekhnika; trudy soveshchaniya provedennogo v marte 1957 g. (Automatic Control and Computer Technique; Transactions of a Conference Held in March, 1957) Moscow, Mashgiz, 1958. 494 p. 12,000 copies printed.

Ed.: Solodovnikov, V.V. Doctor of Technical Sciences, Professor; Ed. of Publishing House: Konovalov, G.M.; Tech. Ed.: El'kind, V.D.; Managing Ed. for Literature on Machine Building and Instrument Making: (Mashgiz): Pokrovskiy, N.V., Engineer.

PURPOSE: The book is intended for scientific personnel and engineers working with computers and automatic control.

COVERAGE: The book is a collection of 24 articles presented at a conference called by the Scientific and Technical Society of the Instrument Manufacturing Industry in March, 1957. The conference considered problems of the construction and application of computer equipment for the automatic control of industrial processes. The articles discuss problems of analysis

Card 1/6

Automatic Control and Computer (Cont.)

SOV/1174

and synthesis of computers and automatic control systems. They also describe the principles of construction and design of the newest components of these systems. The articles present specific examples of the application of computer technique to the calculation and design of automatic control systems and the automation of industrial processes. M.I. Zborovskiy, Engineer, is mentioned in connection with arranging the conference. Engineers I.M. Rusevich and L.I. Shorol' helped in preparing the collection. References appear after each article.

TABLE OF CONTENTS:

Foreword

3

Solodovnikov, V.V., Professor, Doctor of Technical Sciences, Batkov, A.M., Engineer, Bredis, A.A., Engineer, and Matveyev, P.S., Engineer. Methods of Mathematical Statistics and the Theory of Automatic Control

7

Card 2/6

Automatic Control and Computer (Cont.)	SOV/1174	
Zimin, V.A., Candidate of Technical Sciences. Principles of Constructing Calculating Machines Based on Universal High-speed Digital Computers		29
Kuzin, L.T., Candidate of Technical Sciences. Application of Z-Transformation to the Analysis of Control Systems Using Computers		46
Kazakevich, V.V., Professor, Doctor of Technical Sciences. Optimizing Control Systems and Some Methods for Improving Their Stability		69
Mamonov, Ye.I., Candidate of Technical Sciences. Comparative Characteristics of Automatic Digital Computers		97
Gutenmakher, L.I., Professor, Doctor of Technical Sciences, Avrukh, M.I., Engineer, Vissonova, I.A., Engineer, Mokhel', L.L., Engineer, and Khol'sheva, A.F., Engineer. Contactless Magnetic Devices for Control Systems		113
Korol'kov, N.V., Candidate of Technical Sciences. Magnetic High-speed Pulse Relay Elements		146

Card 3/6

Automatic Control and Computer (Cont.)	SOV/1174	
Mamonov, Ye.I., Candidate of Technical Sciences, and Sharapov, Yu.I., Engineer. Applications of Semiconductor Devices in Computer Technique		175
Zimin, V.A., Candidate of Technical Sciences. Logical Circuits of Calculating Machines Using Semiconductor Devices		204
Trubnikov, N.V., Candidate of Technical Sciences. Data Input and Output in High-speed Digital Computers		223
Ryzhov, V.I. Engineer. Devices for Converting Continuous Quantities Into Codes and Codes Into Continuous Quantities		243
Dikushin, V.I., Academician. Development of Control Systems for Machine Tools		265
Khetagurov, Ya.A., Candidate of Technical Sciences. Coding of Orders in a Digital Programming System for Machine Tool Control		276

Card 4/6

Automatic Control and Computer (Cont.)	SOV/1174	
Kopay-Gora, P.N. Candidate of Technical Sciences. Application of Calculating Machines for Controlling the Basic Processes in Ferrous Metallurgy		296
Kaganov, V.Yu., Candidate of Technical Sciences. Application of Calculating Machines for Automating Blast Furnaces		310
Yefroyimovich, Yu.Ye., Candidate of Technical Sciences. Application of Calculating Machines for Automating Steel Smelting in Arc Furnaces		321
Chelyustkin, A.B., Candidate of Technical Sciences. Automatic Control of Dimensions of Rolled Metal		340
Vasil'yev, D.T., Candidate of Technical Sciences, Fitzner, L.N., Candidate of Technical Sciences. Calculating Device for Determining Optimum Operating Conditions for Cutting		362
Novikov, Yu., V., Candidate of Technical Sciences. Special Continuous Calculating Machines for Statistical Processing of Random Processes		375

Card 5/6

Automatic Control and Computer (Cont.)	SOV/1174	
Val'denberg, Yu.S., Engineer. Principles of Constructing a Continuous Calculating Machine for Solving Integral Equations		399
Vitenberg, I.M., Candidate of Technical Sciences. Electronic Analog Computer for Automatic Selection of the Most Favorable Solution to a Problem with a Given System of Equations		419
Batkov, A.M., Engineer. Analysis and Synthesis of Linear Systems of Automatic Control by Means of Analog Computers		438
Kagan, B.M., Candidate of Technical Sciences. Application of High-speed Computers for Calculating and Analyzing the Performance of Automatic Control Systems		464
Rakov, G.K., Engineer. Deriving a Random Quantity by Means of High-speed Computers		485

JP/lrb
2-24-59

Card 6/6

BREDIS, A.A.; SAVCHENKO, A.M., mladshiy nauchnyy sotrudnik

Reforestation of clearcut areas in pine forests of the Buryat A.S.S.R.;
from practices of the former Zaigrayevo Forest Working Circle. Trudy
VSNIPILesdrev no.5:55-61 '62. (MIRA 16:5)

1. Direktor Zaigrayevskoy lesnoy shkoly Buryatskoy ASSR (for
Bredis).

(Zaigrayevo region--Reforestation)
(Zaigrayevo region--Pine)

BREDIS, A.I.

98-58-6-13/21

AUTHOR: Bredis, A.I., Candidate of Technical Sciences

TITLE: The Simulation of Distorted Models (Modelirovaniye iskazhennykh modeley)

PERIODICAL: Gidrotekhnicheskoye Stroitel'stvo, 1958, Nr 6, pp 43-44 (USSR)

ABSTRACT: The author compares various formulae for the projection of distorted models. He shows that the formula proposed by Professor S.V. Izbash [Ref. 2] for the correlation of speeds of the model and natural speeds is the most correct. It is expressed as follows:

$$v_n = v_n \frac{C_H}{C_n} \frac{\delta_n}{\sqrt{\sigma_1}}$$

The various functions are not explained. There are 4 Soviet references.

AVAILABLE: Library of Congress

Card 1/1 1. Models-USSR 2. Models-Mathematical analysis 3. Models-Simulation

ANTELEVA, N.V.; SHETADZE, D.P.; ~~BREDIS, A.I.~~; LOMTATIDZE, N.F.;
TOTADZE, Ye.L.

Experience in organizing a thoracic surgery department. Khirurgia
36 no.1:117-123 Ja '60. (MIRA 13:10)
(CHEST--SURGERY)

BREDIS, A.I.

Significance of the measurement of venous pressure during surgery of
the thoracic organs. Eksper. khir. 5 no. 2:34-36 Mr-Ap '60.
(MIRA 14:1)

(CHEST--SURGERY) (BLOOD PRESSURE)

BREDIS, A.I., dotsent; KHVICHIIYA, N.V., ordinator

Surgical treatment by the Kukudzhanov method in difficult forms
of inguinal hernia. Khirurgiia no.6:84-88 Je '61. (MIRA 14:11)

1. Iz 1-y khirurgicheskoy kliniki (zav. - chlen-korrespondent
AMN SSSR zasluzhemyy deyatel' nauki prof. N.V. Antelava) Tbilis-
skogo Gosudarstvennogo instituta dlya usovershenstvovaniya vrachey.
(HERNIA)

BREDIS, A.I., dotsent, kand.tekhn.nauk

Evaporation and seepage losses from reservoirs of the trans-Volga
region. Nauch. za.p MIVKH 19:257-267 '57. (MIRA 15:3)
 (Volga Valley--Reservoirs)
 (Seepage)
 (Evaporation)

BREDIS, A.I.

Gases in the blood in heart diseases. Trudy Inst. Klin. i
eksper. kard. AN Gruz. SSR 8:639-643 1963. (MIRA 17:7)

1. 1-ay Khirurgicheskaya kafedra Tbilisskogo gosudarstvennogo
instituta dlya usovershenstvovaniya vrachey.

BREDIS, A.I.; GRUBNIK, N.V.

Attachment for the street rotary railway snow remover for work
in the city. Rats. predl. na gor. elektrotransp. no.9:81-82
'64. (MIRA 18:2)

1. Upravleniye tramvaya Arkhangel'ska.

VLADYCHINA, Ye. N.; BREDIS, E.E.; SHREDER, A.G.

Protection from staining of supporting devices used in
the electrostatic painting of articles. Lakokras. mat.
i ikh prim. no.3:27-33 '61. (MIRA 14:6)
(Painting, Industrial)

TALANOV, P.I., prof.; BREDIS, V.E., inzh.

Dimensional connections and errors in sand molds. Lit. proizv. no.9:
6-7 s '65. (MIRA 18:10)

BREDIS, Z.CH.

Vertical drying machine SKT-48
Leg prom. 12 no.5, 1952

BREDIS, Z.Ch., inzhener.

Let us enlarge the assortment of locknit warp fabrics. Leg.prom.
16 no.4:25-26 Ap '56. (MLRA 9:8)

(Knit goods)

BREDIS, Z.Ch., inzh.

Importance of the filling factor for knit goods. Leg.prom. 18
no.7:22-25 JI '58.

(Knit goods)

(MIRA 11:9)

BREDIS, Z.Ch., inzh.

Knitted fabrics made with elastic threads. Tekst.prom. 21
no.12:51-52 D '61. (MIRA 15:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut trikotazhnoy
promyshlennosti.
(Elastic fabrics)
(Knit goods)

BREDJUK, N.

"Quick threshing." Tr. from the Russian. p. 415. (Termesztet es Technika, Vol. 112,
No. 7, July 1953, Budapest)

SO: Monthly List of East European Accessions, Vol 3 No 2 Library of Congress Feb 54 Uncl

BREDNEV, A.P. --

"Selection of Barley Under the Conditions Existing in the Southeast."
Cand Biol Agr Sci, Saratov Agricultural Inst, Saratov, 1953. (RZhBiol, No 2,
Sep 54)

Survey of Scientific and Technical Dissertations Defended at USSR
Higher Educational Institutions (10)

SO: Sum. No. 481, 5 May 55

BREDNEV, V.I., inzh.

Manual for roadmen ("Road maintenance and repair" by A.S.
Elenorvich, P.I., Nikitin. Reviewed by V.I. Brednev). Avt.dor.
21 no.6:29 Je '58. (MIRA 12:10)
(Roads--Maintenance and repair)
(Elenorvich, A.S.) (Nikitin, P.I.)

BREDNEV, V. M.; NIKOLAYEV, V. S.

"Investigation into the characteristics of a vertical rotor apparatus."

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12
May 1964.

Kazan' Chemical Technological Inst.

BREDNEVA, T.P.
~~BREDNEVA, T.P.~~

Producing round loaves in the ATsKh oven. Khleb. 1 kond. prom. 1
no.9:36-37 S '57. (MIRA 10:11)

1. Khlebozavod "Avtomat" Sverdlovskogo tresta khlebopecheniya.
(Bread) (Ovens)

BREDNYAKOV, A.V., inzh.; EL'MAN, R.I., inzh.

Setup for automatic recording of light-intensity curves.
Svetotekhnika 5 no.6:15-16 Je '59, (MIRA 12:8)
(Lighting—Measurement)

BREKDYAKOV, A.V., inzh.; EL'MAN, E.I., inzh.

Use of electronic models for solving lighting engineering problems.
Svetotekhnika 6 no.6:1-7 Je '60. (MIRA 13:7)
(Lighting--Electromechanical analogies)
(Electronic analog computers)

BREDNYAKOV, A.V., kand. tekhn. nauk; TREMBACH, V.V., kand. tekhn.
nauk; EL'MAN, R.I., kand. tekhn. nauk

Use of electronic analog computers in designing mirror-type
light fixtures. Svetotekhnika 9 no.6:13-18 Je '63.
(MIRA 16:6)

(Electric light fixtures)
(Electronic analog computers)

BREDO, V.A.; LEYBUSH, B.N.

Characteristics of the course of acute pneumonias. Zdrav.
Kazakh. 21 no.11:36-41 '61. (MIRA 15:7)

1. Iz meditsinskoy sanitarnoy chasti Leninogorskogo poli-
metallichesкого kombinata (glavnyy vrach - A.I. Asmolov).
(PNEUMONIA)

BREDO, V.A.

Training of roentgenology specialists at local bases.
Vest. rent. i rad. 39 no.3:70-72 My-Je '64.

(MIRA 18:11)

1. Vostochno-Kazakhstanskaya oblastnaya bol'nitsa.

PROCESSES AND PROPERTIES INDEX

A-1

Radiative stopping (Bremsstrahlung) of fast electrons in thin layers. L. ANTONOVICH and M. RAMBOY. (Comm. Acad. Sci. U.R.S.S., 1939, 25, 600-682).—The effective cross-section of Al, Cu, Sn, and Pb atoms for radiative retardation of electrons of energies 1 Mv. and 2 Mv. is $\propto (at. no.)^2$, and varies with initial electron energy in the manner predicted by Bethe and Heitler. The depth at which retardation radiation has max. intensity increases with initial electron energy and decreases with increasing at. no.

L. J. J.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3

CA

The Bremsstrahlung of fast electrons. L. A. Artsimovich and M. Riegler, *Bull. acad. sci. U.S.S.R., Ser. Phys.* 4, 279-81 (in English, 281) (1940), cf. C. A. 35, 25.

The intensity of Bremsstrahlung originating in thin layers of Al, Cu, Sn and Pb by the electrons of 1 and 2 m. e. v. was studied. The effective Bremsstrahlung cross sections are proportional to the squares of at. nos. within the limit of 10%. The intensity ratios for 1- and 2-m. e. v. electrons are 1.35 for Al and 2.3 for Pb, the accuracy being 15%. This agrees well with Bethe-Heitler's theoretical value 2.05 for both elements. The intensity of radiation reaches the max. value at 227 mg./sq. cm. in Pb and 310 mg./sq. cm. in Cu for 1-m. e. v. electrons and at 620 mg. sq. cm. in Cu for 2-m. e. v. electrons. These results also agree with the theory. Roksolana Gamow

COMMON ELEMENTS

MATERIALS INDEX

ASO-SLA METALLURGICAL LITERATURE CLASSIFICATION

123456789101112131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100

101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150

COMMON ELEMENTS INDEX

BREDOV, M. M.

PA 163T107

USSR/Physics - New Techniques
Ions, Source

Apr 50

"Ion Source of Alkali Metals," M. M. Bredov, Leningrad Physicotech Inst, Acad Sci USSR

"Zhur Tekh Fiz" Vol XX, No 4, pp 476-479

Bredov describes construction, uses, and character of a new source of ions from Li, Na, K, Rb, Cs and their chlorides, which uses well-known phenomenon of ionization of above substances on incandescent surfaces of wolfram and tantalum. Submitted 27 Jun 49.

163T107

(4)

The work of D. I. Simonenko on "A method of production of molecular beams" M. M. Bredov, V. M. Dukelski, and V. M. Tschkewich. ~~Zhur. Teoret. Fiz.~~ *Theoret. Fiz.* 20, 1143(1950); *Chem. Zentr.* 1951, I, 3453. According to the data reported by Simonenko (C. C.A. 44, 7847i), the effective cross section for the recombination of ions with electrons would have to be 10-12 orders of magnitude greater than is actually the case. The effects obtained were probably due to the effect of the space charge on the electron beam. According to B. et al, this kind of "high-energy" mol. beam cannot be used for the purposes proposed by Simonenko. It is further argued that the method reported for their production is not new. M. G. Moore

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

III AND 2ND ORDER) PROCESSES AND PROPERTIES UNDER 1RD AND 4TH ORDER

N

MEASUREMENTS OF EFFECTIVE CROSS SECTIONS FOR CHANGE OF CHARGE IN IONS OF ALKALI METALS.
 M. M. Brodov and N. V. Fedorenko. *Zhur. Tekh. Fiz.* 20, 1047-95(1950) Dec. (In Russian)

The phenomenon of "change of charge," observed in ion beams moving through a gas and consisting of transfer of charge from ions to neutral gas atoms, has been studied by Shervin (*Phys. Rev.* 57, 814(1949)) and by Keene (*Phil. Mag.* 40, 368(1949)). The present authors question the methodology of these works, as ignoring or not adequately evaluating various secondary effects. In their own measurements of cross sections for change of charge in K^+ and Ca^+ beams, in the energy range 6 to 18 kev, moving through H_2 , He, and air, the authors attempted to avoid the alleged sources of error, both by a preliminary study of interfering secondary ionizations and by carefully removing secondary electrons and scattered ions from the measuring organs of the instrument. The numerical results differ notably from those obtained by the workers cited. The dependence of the effect under study on the gas pressure and ion energy was among the problems investigated. It was confirmed rigorously that the effect is produced directly by the ion beam and is due to a single-stage process.

COMMON ELEMENTS
 COMMON VARIANTS INDEX
 OPEN
 MATERIALS INDEX

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

ASPHENOV
 1ST LETTERS
 1ST ORDER

БРЕДОВ, М.М.

U S S R .

637.311.33 : 548.289 : 621.314.632 1401
Investigation of Change of Rectifying Properties
of Metal-Semiconductor Point Contact under the
Influence of Bombardment of Semiconductor by
Alkali Metal Ions.--M. M. Bredov, R. F. Komarova
& A. R. Regel. (C. R. ~~Acad. Sci. USSR~~, 1st Nov. 1951,
Vol. 99, No. 1, pp. 69-72. In Russian.) An experimental
investigation is reported of the effect on an n-type-Ge/
metal contact of bombardment by a monochromatic
beam of K ions with energy in the range 1-4 keV and of
the subsequent treatment of the surface. The observed
decrease of the rectification property depends on the
energy of the ion beam, but no effect was noticed when
this was less than 1 keV. The treatment included
polishing and immersion in a 30% solution of H₂O₂.
Results are presented graphically and discussed.

The possibility of obtaining a $p-n$ transition is realized
by aid of impurity heating. M. M. Jurek
No. 23, 2104-11(1953). The possibility of
producing a $p-n$ transition in Ge of the C17 type
conversion upon transition in Ge of the C17 type
The solution of this problem is indicated by
propagation of a thermal wave in the direction of
estimate is obtained for the correlation between the par-
eters of the electric field and the depth of the transition
layer. The results of these calculations agree qualitatively with
the measurements.
Werner Jurek

BREDOV, M.M.

AUTHOR: BREDOV, M.M., KSHEMYANSKAYA, I.Z. PA - 3542
TITLE: Electrization of Bodies after their Coming into Contact.
(Elektrizatsiya, obnaruzhivayemaya posle soprikosnoveniya dvukh tel, Russian)
PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 5, pp 921 - 928 (U.S.S.R.)
ABSTRACT: The present paper intends to investigate the rules governing the formation of a static load occurring on the occasion of the separation of two bodies which had hitherto been in contact with each other. For this purpose measures were taken in order, if possible, to eliminate all elements of dynamic character. For this purpose a special apparatus was constructed. Summary of results:
1) When breaking contact a transfer of electrons takes place, the basic process being the tunnel effect. The amount of charges remaining on the separating surfaces depends on the velocity of the breaking of contact.
2) The dependence of charges measured on the occasion of the breaking of contact between two metals upon the contact difference of these metals is represented by a straight line.
3) If a semiconductor and a metal serve as a separated pair, the amount of the charge to be measured is a function of the contact difference of the potentials of the investigated substances, of the concentration of the free current carriers of the semiconductor and its dielectric constant. If both of the latter quantities

Card 1/2

PA - 3542

Electrization of Bodies after their Coming into Contact

are constant, the dependence mentioned under 2) is a straight line also in this case.

4) In the case of semiconductors with a relatively low volume concentration of current carriers (germanium, tellurium), it is possible, by utilization of the dependence of the charges (which are measured when contact is broken) on the concentration of the free current carriers to determine a difference between the concentration of the carriers near the surface and those inside the body. The relative change of charge concentration on the surface when passing from one point of the sample to another can be determined. (5 illustrations, 1 table, and 4 Slavic references)

ASSOCIATION: Institute for Semiconductors of the Academy of Science of the U.S.S.R.
PRESENTED BY: -
SUBMITTED: 14.1.1957
AVAILABLE: Library of Congress

Card 2/2

AUTHOR BREDOV M.M., OKUNEVA N.M. PA - 3044

TITLE On the Depth of the Penetration of Ions of Medium Energies into the Material.

PERIODICAL (O glubine promikaoveniya ionov srednykh energii v veshchestvo -Russian) Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 4, pp 795-796 (U.S.S.R.) Received 6/1957 Reviewed 7/1957

ABSTRACT The authors determined the depth of penetration of 4 kV cesium ions into germanium by the method of marked atoms. Radioactive Cs¹³⁷ with the half life of 2,2 years was added to ordinary cesium. Germanium was irradiated with an already previously described mass-spectrometric device. The principal experiments were reduced to measuring the activity of the irradiated samples after they had been irradiated and pickled in a standard hydrogen peroxide solution. The solution used in this case removed a layer of germanium of $2,4 \cdot 10^{-6}$ cm thickness within one minute. The samples were also pickled before irradiation for 20 minutes in the same standard solution in order to remove possible existing microdefects on the surface and in order to eliminate the influence exercised by a possible discontinuity of pickling velocity within the first few minutes. The curves of the dependence of the activity of the irradiated samples on the duration of pickling (which was recorded for a series of samples) had, on the whole, the same character in the case of all samples. Activity decreased, on the average, as follows:

Duration of pickling in minutes	1 min.	2	3	4	5	6
Percentage of initial activity	66%	56%	48%	40%	34%	24%

Card 1/2

On the Depth of the Penetration of Ions of Medium Energies PA - 3044
into the Material.

For purposes of control the same germanium sample was irradiated with a bundle of atomic cesium of the same isotope composition, i.e. the atoms of the radioactive cesium settled on the germanium surface with thermal velocities. There the remanent activity of the sample after 1 and 2 minutes of pickling amounted to 0,07 and 0,03 % respectively of the initial activity.

Thus, the 4 keV cesium ions penetrate into germanium to a depth of about 0,1 micron, and this effect is connected with their kinetic energy. So great a depth of penetration may be due to a diffusion mechanism which is connected by microheating caused by the slowing down of a given particle.
(No illustrations)

ASSOCIATION Institute for Semiconductors of the Academy of Sciences of the USSR
PRESENTED BY IOFFE A.F., Member of the Academy
SUBMITTED 28.6.1956
AVAILABLE Library of Congress
Card 2/2

BREDOV, M.M.

AUTHORS: Balabanova, L. A. and Bredov, M. M.

57-27-7-1/40

TITLE: Thermal Conversion of Germanium on Irradiation by an Electron Beam (Termicheskaya konversiya germaniya pri obluchenii elektronnyy puchkom).

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1957, Vol. 27, Nr 7, pp. 1401-1407 (USSR)

ABSTRACT: Data are given of some experiments on the behavior of electric conductivity, the carrier-concentration and the life of non-equilibrium-carriers in thermal conversion caused by heating the sample by an electron beam in a vacuum. The vacuum conditions and the possibility to regulate the heating sufficiently elastically made it possible to obtain some data with regard to the kinetics of the process. The investigation of the resulting curves for the dependence of the concentration on the time of irradiation shows that the process has a relaxation-character. It is shown that the quantity of concentration in the case of saturation, i.e. the value of the equilibrium concentration, is not determined by the conditions in the experiment but by the initial properties of germanium. This general conclusion is confirmed

Card 1/2

Thermal Conversion of Germanium on Irradiation by an Electron Beam 57-27-7-1/40

by the control-tests given here. It may therefore be assumed that in the case under review the formation of thermal acceptors takes place like a certain spatial relaxation-process whose equilibrium state is at the end determined by the conditions existing in the sample already before the beginning of the process. It is assumed that these acceptors which are contained in the initial sample in a bound form are converted to a state of action only as a consequence of a heat-treatment. The evaluation of the activation-energy yields about 2,45 eV and the evaluation of the recombination-section of the unreal (minor?) carriers on the thermal acceptors about $5 \cdot 10^{-17}$ qcm. There are 5 figures and 10 references, 3 of which are Slavic.

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

SUBMITTED: February 19, 1957

AVAILABLE: Library of Congress

Card 2/2 1. Germanium-Conductivity-Test results 2. Electron beams-Applications
3. Germanium-Properties-Temperature factors

TSUKKERMAN, Il'ya Ioannovich,; BREDOV, M.M.,retsenzent,; KHALFINYM, A.M.,
retsenzent,;BONSHTEDT, B.E.,red.; SOBOLEVA, Ye. M., tekhn. red.

[Electron optics in television] Elektronnaia optika v televidenii.
Moskva, Gos. energ. izd-vo, 1958. 247 p. (MIRA 11:12)
(Electron optics)
(Television--Picture tubes)

BREDOV, M. M

AUTHORS: Bredov, M. M., Lang, I. G., Okuneva, N. E.

57-2-8/32

TITLE: On the Depth of Penetration of Medium-Energy Ions Into a Substance
(K voprosu o glubine proniknoveniya ionov srednikh energiy v veshchestvo).

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 20, Nr 2, pp. 252-253 (USSR).

ABSTRACT: Reference is made to the earlier reports given by the authors (references 1 and 2). An evaluation of the depth of penetration of medium-energy ions in germanium at the direct expense of their kinetic energy is given here. It became evident that when a function of the following shape

$$V = -\frac{Z_1 Z_2 e^2}{r} \exp(-r/a)$$

is assumed as potential of the interaction between the fact ions and the lattice-atoms (as it was assumed in calculations of a similar kind in references 3 and 4) it is possible, with the taking into account of the multiple collisions according to the Monte-Carlo method, to obtain a curve. This curve represents the dependence of the relative number of ions which have attained the respective depth over the depth itself. In contrast to the widely spread opinion it is shown here that the depth of penetration of ions with the energy investigated here (4 keV) possesses an order of

Card 1/2

On the Depth of Penetration of Medium-Energy Ions Into a Substance.

57-2-8/32

magnitude of 1.10^{-5} cm. This is only twice or thrice smaller than the value observed in the test and anyway agrees with it regarding the order of magnitude. Attention is called to the fact that the potential (1) used here which is approximately correct as interaction-potential of free ions does not seem to be sufficiently founded for use in an interaction in a solid body. For in this case the screening constant a may have another value, but the final result is very highly dependent on this constant. The model itself also is much too crude and does not take into account the anisotropy of the electron-cloud in the covalent crystal.

$$a = \frac{a_0}{\sqrt{Z_1^{2/3} + Z_2^{2/3}}}, \text{ where } a_0 \text{ is the Bohr-radius and } Z_1, Z_2 \text{ - the atomic number of the ions and the lattice-atoms.}$$

There are 1 figure, and 4 references, 2 of which are Soviet.

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

SUBMITTED: July 17, 1957.

AVAILABLE: Library of Congress.

Card 2/2

1. Ions-Penetration-Mathematical analysis

86700

247000 2508

S/180/60/000/006/016/030
E201/E391

AUTHOR: Bredov, M.M. (Leningrad)

TITLE: The Use of Neutron Spectroscopy in Studies of the Physical Properties of Substances in Their Solid and Liquid States

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No. 6, pp. 87 - 89

TEXT: To study the structure and kinetics of condensed matter on atomic scale by means of radiation, the radiation wavelength should be of the order of several angstroms and the radiation energy should be about 0.01 eV at room temperature. These conditions are satisfied by neutrons. Neutrons can interact with matter by interactions with either nuclei or with magnetic moments of atoms. Both these interactions are discussed in some detail in the first part of the paper. The second part deals with the possibilities of nuclear spectroscopy in quantitative studies of short-range order in liquids (no experiments of this type have yet been
Card 1/2

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E201/E391

The Use of Neutron Spectroscopy in Studies of the Physical Properties of Substances in Their Solid and Liquid States reported) and in studies of liquids near their critical points. Some experimental work of the latter type has been done by Egelstaff (Ref. 2). There are 2 non-Soviet references.

SUBMITTED: August 26, 1960

Card 2/2

S/181/60/002/011/031/042
B006/B060

AUTHORS: Ageyev, V. N., Balabanova, L. A., and Bredov, M. M.

TITLE: A Study of Plasmon Spectra

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 11, pp. 2899-2905

TEXT: The authors wanted to work out a method of determining the plasmon spectra, when assuming for energy values to be absolutely accurate on three points. In a previous paper (Ref. 7) they had described an electrostatic energy analyzer, which is specially suited for measuring the energy on plasmons. The simplest variant of this instrument (single-stage device with homogeneous field) was made use of here. The plasmon energy was determined in aluminum. Fig. 3 shows the spectrum, taken by oscilloscope, of the characteristic losses in aluminum. The plasmon energy was determined from the line distance; it lies with a probability of 0.9 at $\hbar\omega = 15.18 \pm 0.06$ ev. The values found by other authors range between 14.7 and 15.8 ev (Refs. 10-19) and are compiled in a table. If the value $\hbar\omega$ is theoretically calculated on the basis of the model of free electron gas in aluminum with $a = 4.0496\text{A}$ and $n_0 = 4/a^3$, one obtains $\hbar\omega = 15.78$ ev, Card 1/2

✓
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A Study of Plasmon Spectra

S/181/60/002/011/031/042
B006/B060

whereas, if the oscillations of polarization of ion trunks are considered, one obtains 15.48 ev, which comes very close to the value determined experimentally. The mean free path of a 14.5-kev electron in Al for the production of a plasmon amounts to 200-650 A. A. Ya. Vyatskin is mentioned. There are 3 figures, 2 tables, and 19 references: 8 Soviet, 5 German, 4 US, 1 Japanese, 1 British, and 1 French. ✓

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

SUBMITTED: July 19, 1960

Card 2/2

BREDOV, M.M. (Leningrad)

Use of neutron spectroscopy for the investigation of the physical
properties of matter in solid and liquid states. Izv. AN SSSR. Otd.
tekh. nauk. Ser. 1 topl. no.6:87-89 N-D '60. (MIRA 13:12)
(Neutrons--Spectra) (Matter--Properties)

S/181/61/003/001/037/042
B102/B204

AUTHORS: Bredov, M. M., Lepilin, V. A., Shestakov, I. B., and
Shakh-Budagov, A. L.

TITLE: The effect produced by the type of ions upon the character
of the change in the electrical properties of a semi-
conductor surface during its irradiation by ions of medium
energy

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 267-274

TEXT: The effect produced by ion bombardment upon the surface properties
of semiconductors has hitherto not been sufficiently investigated; above
all, nothing is known about the effect produced by the type of ions, i. e.,
the most contradictory opinions have been expressed (Refs. 2 and 4). A
study of these questions is of both basic and practical value. If, e.g.,
the effect of bombardment does not depend on the type of ions, the effect
would have to be considered to be purely microthermal, and in the
opposite case, to be microchemical. Experiments, described in earlier

Card 1/6

The effect produced by the type of ions...

S/181/61/003/001/037/042
B102/B204

papers uniquely proved that different effects are produced by different ions. The present paper deals with a study of the volt-ampère characteristics of W-Ge and W-Si point contacts in the irradiation with atomic oxygen ions and molecular nitrogen ions of 5 and 10 kev. The experimental conditions were chosen in such a manner that an answer to the especially interesting questions (change in carrier mobility, carrier concentration of the scattering centers) could be expected. Theoretical considerations in this direction are discussed in detail; they led to the conclusion that an investigation of the volt-ampère characteristics of point contacts (investigation of direct and reverse currents and of the rectification constant between semiconductor and metal may supply the required information in a bombardment with ions of 5-10 kev. The radiation dose was varied within the range of from 10^{11} - 10^{15} ions/cm². The experiments were carried out by means of the mass separator described in Ref. 3. The ion source was gaseous (impact ionization); the irradiated specimens were n-type Ge and Si single crystals with a concentration ratio of the carriers of $n/n_0 = 1 \cdot 10^{-9}$ and $7 \cdot 10^{-9}$, respectively. The individual measurements were repeated with due

Card 2/6

The effect produced by the type of ions...

S/181/61/003/001/037/042
B102/B204

frequency in order to keep the statistical error at a minimum. The results were evaluated according to M. O. Kornfel'd. Measurements are illustrated in Figs. 3 and 4. Fig. 3 shows the ratio of the rectification constant after irradiation to its value before irradiation as a function of the radiation dose for 5- and 10-kev ions. The difference between the effect of O and N₂ ions is obvious. Whereas N₂ ions do not change the carrier concentration considerably and increase the defect density only slightly (thus somewhat increasing the ohmic resistance), O ions increase the rectification constant (i.e., by forming a p-n junction in the "active zone" of the specimens, because the penetrating oxygen atoms act as acceptors). The rectification constant has a maximum at a certain dose (which is due either to a removal of the region of defect-carrier equilibrium from the active zone of the probe, or to an increase of the lattice defects, or to both). Fig. 4 shows the dependence of direct and reverse currents and rectification constant on the radiation dose N₀ (irradiation by 10-kev O and N₂ ions). The true value lies in the hatched region. There are 4 figures, 1 table, and 10 references: 5 Soviet-bloc and 5 non-Soviet-bloc.

Card 3/6

The effect produced by the type of ions...

S/181/61/003/001/037/042
B102/B204

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

SUBMITTED: July 19, 1960

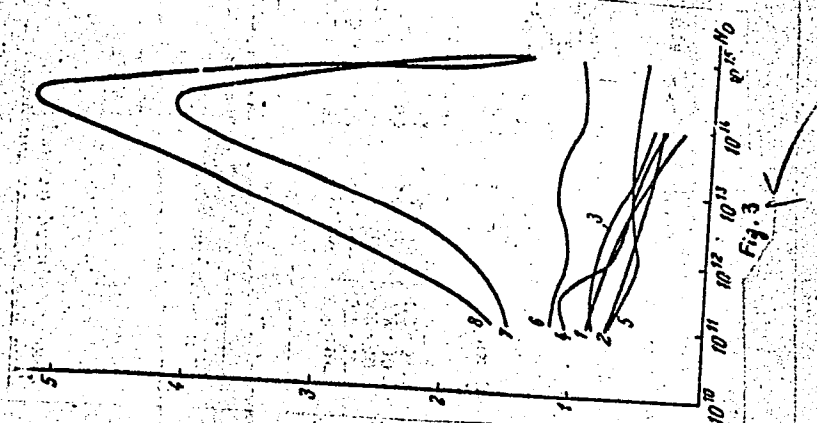


Card 4/6

The effect produced by the type of ions...

S/181/61/003/001/037/042
B102/B204

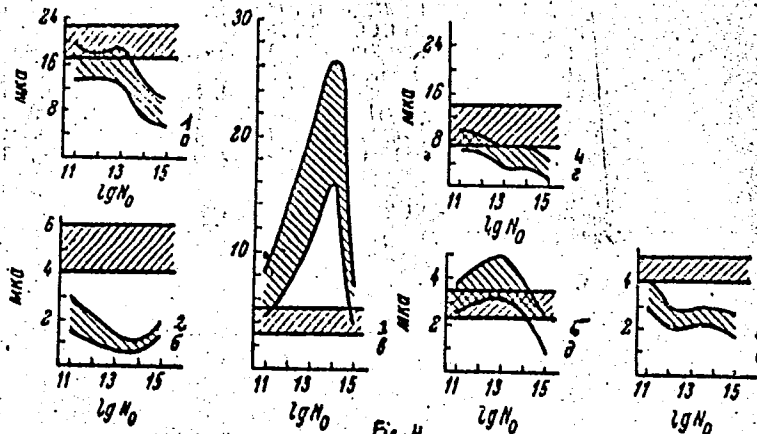
Legend to Fig. 3: 1) 10 kv, N₂ on Ge; 2) 5 kv, N₂ on Ge; 3) 5 kv, 0 on Ge; 4) 10 kv, 0 on Ge; 5) 5 kv, N₂ on Si; 6) 10 kv, N₂ on Si; 7) 5 kv, 0 on Si; 8) 10 kv, 0 on Si.



Card 5/6

S/181/61/003/001/037/042
B102/B204

The effect produced by the type of ions...



Legend to Fig. 4: 1) Direct current, 2) reverse current, 3) rectification constant in bombarding with O; 4)-6) the same in bombarding with N_2 . The horizontal hatched band gives the true value before irradiation.

Card 6/6

33347
S/181/62/004/001/014/052
B125/B104

24,7700 (1035, 1043, 1385, 1144)

AUTHORS: Balabanova, L. A., Bredov, M. M., and Kotov, B. A.

TITLE: Plasmon spectra in In and InSb

PERIODICAL: Fizika tverdogo tela, v. 4, no. 1, 1962, 86 - 89

TEXT: The characteristic energy loss spectra of electrons passing through free thin films of In and InSb were measured using a device and method described by V. M. Ageyev, L. A. Balabanova, and M. M. Bredov (FTT, 2, 11, 1960). The films were vacuum-deposited on rock-salt crystals which were then dissolved. When evaluating such spectra, it should be considered that the electrons can lose energy by successive excitation of one, two, or more plasma vibration quanta, or by pair collisions. If there is a group of valence electrons with sufficiently varying energy, or if the difference between the plasmon energy corresponding to the electron vibrations in this group and the energy characteristic of band-to-band transitions, it will be possible to observe the lines related to the excitation of collective vibrations. If the assumptions made above are correct, the energy losses of electrons due to the excitation of plasma vibrations

Card (1/4)

33347
S/181/62/004/001/014/052
B125/B104

Plasmon spectra in In and InSb

cause narrow lines in the energy spectrum of electrons that have traversed the film. These narrow lines correspond to multiples of $\hbar\omega$, where $\omega^2 = 4\pi e^2 N/m$, N is the concentration of electrons involved in plasma vibrations. The lines that follow correspond to the excitation of one, two, three, and so on plasmons. The plasmon spectrum cannot be observed in practice when the plasmon energy lies in the spectral range corresponding to band-to-band transitions. However, if the lines $n \hbar\omega$ ($n = 2, 3, 4, \dots$) lie in this range, the plasmon spectrum will be observable. Practical observations will only reveal transitions between neighboring bands. Transitions from the valence band to higher bands cannot be observed in practice under real conditions. It is assumed that chiefly transitions from the band below the valence band to the latter and to the conduction band can be observed in practice provided the difference in energy between these two bands is not too large (10 - 20 eV). Curves recorded on InSb show no band-to-band transitions, but furnish two distinct lines corresponding to single and double excitation of a plasmon with the energy $\hbar\omega = 12.65 \pm 0.25$ eV with the probability 0.95. The semiquantitative results of the measurements discussed here might show where investigations of the characteristic energy losses of electrons can be of interest for solid-state physics.

Card 2/3

33347

S/181/62/004/001/014/05

B125/B104

Plasmon spectra in In and InSb

Plasma vibrations can also give information on the number of electrons involved in valence binding. There are 4 figures and 4 references: 2 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: B. Gauthé. Phys. Rev., 114, 1265, 1959.

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

SUBMITTED: July 11, 1961

Fig. 1. Characteristic energy losses in three different In samples. The curve x-x-x- is similar to that for InSb. Ordinate: relative intensity; abscissa: energy losses, ev.

Card 3/43

34252

S/181/62/004/002/048/051
B102/B138

26.2420

AUTHORS: Bredov, M. M., and Nuromskiy, A. B.

TITLE: Variation of the surface properties of p-type silicon under bombardment with lithium ions

PERIODICAL: Fizika tverdogo tela, v. 4, no. 2, 1962, 562 - 564

TEXT: Continuing an earlier paper (Bredov et al. FTT, 3, 267, 1961) an attempt was made to produce donor centers in p-type Si by bombarding it with Li ions. Li impurities in Si have a level which is 0.033 eV below the bottom of conduction band. The irradiation energies and doses were determined, at which the concentration of the penetrated Li ions would be higher than that of the displacement defects due to the irradiation. At a certain depth inversion of the sign of conductivity has then to be expected. The experiments were carried out with an apparatus described earlier (Bredov et al. DAN SSSR, 99, 69, 1954); the ion source was described in Ref. 8 (Bredov, ZhTF, 20, 476, 1950); the ion energy was 5 and 10 keV. The single-crystal samples had a resistivity of 14 and 30 ohm-cm and concentrations of $2 \cdot 10^{15} \text{ cm}^{-3}$ and $7 \cdot 10^{14} \text{ cm}^{-3}$, respectively. ✓
Card 1/3

Variation of the surface...

34252
S/181/62/004/002/048/051
B102/B138

The variations in direct and reverse currents and rectification factor were measured in dependence on the doses. From the graphs it can be seen that at doses of the order of $10^{14} - 10^{15} \text{ cm}^{-2}$ the reverse currents show a sharp rise, and at $10^{15} - 10^{16} \text{ cm}^{-2}$ the rectification factors become broken. It may be assumed that at these doses a new p-n junction is formed which is opposite to that which existed before irradiation. The depth was calculated, at which the concentration of penetrated ions was comparable with that of the carriers; 10^{-4} cm was obtained for a specimen with $2 \cdot 10^{15} \text{ carriers/cm}^3$ bombarded with 10-kev ions with a dose of 10^{16} cm^{-2} . It is assumed that the depth of penetration of Li ions is greater than that of K ions. The formation of displacement defects is accompanied by their partial annihilation. These results mean that an n-layer may be formed in the region of the active zone of the probe. This barrier layer is responsible for the valve-type photoeffect observed. There are 2 figures and 8 references: 6 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: W. S. Cussions. Proc. Phys. Soc. B68, 213, 1955; H. Y. Fan, K. Lark-Horovitz. Fast particle irradiation of germanium semiconductor Report Solids, London, p. 232, 1955.

Card 2/3

Variation of the surface...

34252
S/181/62/004/002/048/051
B102/B138

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

SUBMITTED: October 25, 1961

4

Card 3/3

L 11082-65 EWT(1)/EWG(x)/EPA(sp)-2/EPA(w)-2/EEG(t)/T/EEG(b)-2/ENA(m)-2 P1-4/
Po-4/Pz-6/Pab-10 IJP(c)/ASD(p)-3/ASD(a)-5/BSD/ESD(ga)/ESD(t) AT

ACCESSION NR: AP4046634

S/0181/64/006/010/3141/3147

AUTHORS: Balabanova, L. A.; Bredov, M. M.

TITLE: Plasma oscillations in solids

SOURCE: Fizika tverdogo tela, v. 6, no. 10, 1964, 3141-3147

TOPIC TAGS: electron oscillation, electron spectrum, spectrum line, line shift, electron loss

ABSTRACT: Collective oscillations of electrons in solids were investigated by a method described by the authors earlier (with V. N. Ageyev, FTT v. 4, 2899, 1960; with B. A. Kotov, FTT v. 2, 86, 1962) in which the energy spectra of the electrons were determined by measuring the so-called "characteristic" energy losses experienced by relatively fast electrons passing through thin films of various substances. The experimental investigations were made on Al, In, Sn, Pb, Ge, Sb, Bi, Te, Se, Cr, Cu, Ag, InSb, PbTe, PbSe, Bi₂Te₃.

Card 1/3

L 11082-65

ACCESSION NR: AP4046634

and Sb_2Te_3 . The experimental data make it possible to determine the plasmon energy in the zeroth approximation, and to estimate the line shift relative to the zeroth approximation. The plasma energy calculated in the zeroth approximation agreed well with the experimental data on all the substances. As to the line shifts, the substances fall in three groups, one with relatively small line widths ~ 3 -- 4 eV and a negative small shift (Al, In, Sn, Pb, PbTe, PbSe, InSb), one with long widths 5 -- 9 eV and large and positive shifts (Ge, Sb, Bi, Te, Se, Sb_2Te_3 and Bi_2Te_3) and the third with an anomalously broad line (~ 13 eV) with a clearly pronounced maximum, the position of which gives the plasmon energy in the zeroth approximation. The spectra of this group (Cr, and also Cu and Ag which were not investigated) calls for an investigation of the angular dependences to be able to interpret the spectra of these elements. Negative shifts contain information on the polarizability of the electron shells of the ionic cores. The positive shifts, being the result of the anisotropy of the plasma in the solid, may afford information

Card 2/3

L 11082-65

ACCESSION NR: AP4046634

on the electron density in crystals, provided progress is made in the experimental technology. Orig. art. has: 2 figures, 2 formulas, and 2 tables.

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

SUBMITTED: 19May64

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Card 3/3

1. 65175-65 EWT(m)/EPP(n)-2/T/EWP(t)/EWP(b)/EWA(h)/EWA(c) IJP(c)
 JD/JW

ACCESSION NR: AP5012551

UR/0181/65/007/005/1413/1422

AUTHOR: ^{44.55} Bredov, M. M.; ^{44.55} Kotov, D. A.; ^{44.55} Okuneva, N. N.; ^{44.55} Shakh-Sudagov, A. L.

TITLE: Investigation of phonon spectra in aluminum

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1413-1422

TOPIC TAGS: phonon, aluminum, single crystal, neutron scattering, elastic scattering, beryllium, filter

ABSTRACT: A method based on elastic scattering of slow neutrons ^{19.44.53} is used for an experimental investigation of thermal motion in aluminum. The possibility of the use of such a method is analysed by means of apparatus in which a beryllium filter serves as a neutron monochromator and the neutron energy is determined from the time necessary to traverse a given base. The experimental set-up is illustrated in Fig. 1 of the Enclosure. The sample is single-crystal aluminum 100 mm in diameter and 120 mm long and can be rotated around an axis perpendicular to the scattering plane. The neutrons scattered by the sample travel 5.1 meters in a tube in which a vacuum of 10^{-1} mm Hg is maintained and are then registered with a detector. Some 500 peaks in the spectra of the inelastically scattered neutrons were used to construct the scattering surface in the (011) plane and to determine the frequencies and the wave vectors of the phonons. It is concluded from the results that a beryllium

Card 1/3

L 65175-69

ACCESSION NR: AF5012551

3

filter does not make the primary beam monochromatic enough, and this may lead in many cases to appreciable errors in the interpretation of the spectra. Although the large transmission of the apparatus has made it possible to investigate the scattering surfaces for aluminum in much greater detail than before, it is pointed out that some caution is necessary in the analysis of the results. Possible improvements in the apparatus are considered by the authors in a companion paper in the same source (Accession Nr. AF5012552). Orig. art. has: 7 figures and 3 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors, AN SSSR) 4/1/55

SUBMITTED: 4/1/55

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SEC CODE: 03, 17

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Card 2/3

L 65175-65

ACCESSION NR: AP5012551

ENCLOSURE: 01

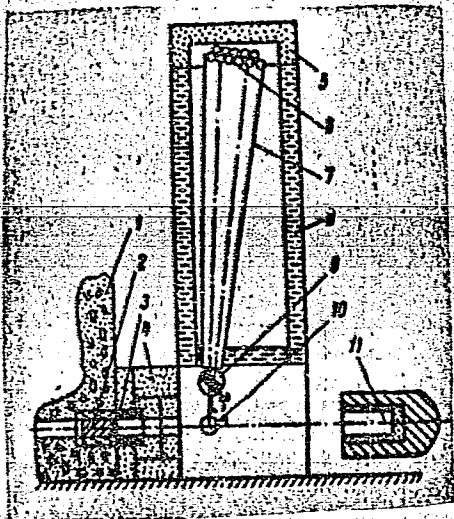


Fig. 1. Diagram of installation.

- 1 - Reactor shield, 2 - beryllium filter, cooled with liquid nitrogen, 3 - lead, 4 - paraffin with borax, 5 - detector shield, 6 - detector, 7 - cadmium collimator, 8 - water, 9 - mechanical chopper, 10 - sample, 11 - trap of direct beam.

Card 313 mlb

L 21506-66 EWT(1)/EWA(d) GW

ACC NR: AP6007736

SOURCE CODE: UR/0293/66/004/001/0066/0073

AUTHOR: Konstantinov, B. P.; Bredov, M. M.; Belyayevskiy, A. I.; Sokolov, I. A.

ORG: none

TITLE: Possible antimatter nature of micrometeors

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 1, 1966, 66-73

TOPIC TAGS: antiparticle, gamma flux, gamma radiation, gamma background, meteor trail, meteor tracking, meteor stream, meteor detection, comet, scintillation counter, radar meteor observation, cosmic radiation, cosmic ray measurement, neutron radiation

ABSTRACT: An experiment was conducted to verify whether meteor showers are the product of cometary disintegration, in which case they would, according to one hypothesis, consist of antimatter dust particles. Theoretically, it appears possible to identify the radiation produced by the disintegration of such antidust particles coming into contact with particles of the earth's atmosphere. It is suggested that the major meteor showers may be formed by the disintegration of comets; the connection between comets and meteor

Card 1/6

UDC: 551.590.25

L 21506-66

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showers, therefore, is directly related to the question of the nature of meteors. At this point it should be noted that the problem under discussion does not involve meteors of noncometary origin reaching the earth, the number of which does not change during periods of meteor showers.

The problem is approached on the assumption that comets are macroscopic bodies consisting of antimatter and coming to us from other solar systems of our galaxy which may consist entirely of antimatter. From this, a plausible theory can be derived to explain the extrasolar-system origin of comets. A comet's capture by the sun could, according to calculations, result from a small change in the comet's total energy, adequate to transfer it from a hyperbolic to an elliptical class, due to the annihilation of protons in the solar wind on the comet's surface.

Of the primary and secondary radiation produced during annihilation, the most satisfactory for detecting the investigated phenomenon are hard gamma rays (with an energy exceeding 70 Mev), which can be recorded at a great distance from the point of annihilation. Due to the radiation length in air of gamma rays at this energy level, measurements of average

Card 2/6

L 21506-66

ACC NR: AP6007736

gamma radiation flux at sufficiently high altitudes permit several maximum values to be derived for the quantity of antimatter which may enter the earth's atmosphere. The intensity of gamma radiation at an altitude having a residual atmospheric density of about $100-10 \text{ g/m}^2$ was found to be approximately $10^{-1} \text{ cm}^{-2} \cdot \text{sec}^{-1} \cdot \text{sterad}^{-1}$. Taking the above maximum antinucleon-flux-intensity value, and considering the earth's orbital velocity to be $\sim 3 \times 10^6 \text{ cm/sec}$, the concentration of antinucleons in space is estimated at about 10^{-7} cm^{-3} .

Measurements of average gamma-radiation intensity at altitudes of 25—30 km during periods of varying meteor activity have shown that variation in the intensity of gamma radiation during a period of maximum meteor shower activity exceeds by not more than 50% the radiation intensity in the absence of a shower. This finding permits maximum values for the mass of antimeteors to be estimated. The number of meteors falling on a given area of earth per unit of time during the heaviest showers is about $10^{-16} - 10^{-15} \text{ cm}^2 \cdot \text{sec}^{-1}$. Taking, as earlier, the maximum gamma-radiation intensity due to annihilation at $10^{-1} \text{ cm}^{-2} \cdot \text{sec}^{-1} \cdot \text{sterad}^{-1}$,

Card 3/6

L 21506-66

ACC NR: AP6007736

with its variation not exceeding this value during a period of meteor-shower activity, a maximum value for the mass of an antimeteor was found to be about 10^{-9} — 10^{-10} g. If such meteors are antiparticles, their mass of 10^{-9} g would release a total energy equivalent to that of a conventional meteor with a mass of 10^{-1} g. The task of registering the annihilation radiation from an individual meteor should be fairly difficult, considering that annihilation would occur at an altitude of about 100 km.

Along with measurements of average intensity at altitudes of 25—30 km, experiments were conducted to detect radiation at altitudes of 13—18 km produced by an individual meteor entering the atmosphere. Gamma rays and neutrons were registered by scintillation counters and proportional gaseous-boron counters; meteors were detected by a radar technique at the 4-m wavelength. The directivity pattern of the radar station, the selection of meteors' radar echoes by distance, and the area in which to expose radiation detectors were coordinated in such a way that it was possible to assume that a given meteor had entered the atmosphere approximately above the detector.

Card 4/6

L 21506-66

ACC NR: AP6007736

A number of control experiments were used to reveal any systematic errors which could possibly have occurred. Despite this, and since the experiments were conducted using only one method, the possibility remains that unaccounted-for systematic errors were made; however, actual reasons for their appearance could not be found at that time. With the formation of meteor trails at an altitude of about 100 km, an increase in the intensity of hard gamma radiation and neutrons, amounting to approximately 2% of the background or ~ 1 impulse per meteor, was noted at altitudes of 13—18 km.

Among the possible physical origins of the observed effect, besides the explanation related to the investigated hypothesis, may be suggested the presence of background modulation of cosmic radiation during the entry of a conventional meteor into the earth's atmosphere. Theoretically, such modulation can take place either because of a change in the density of the upper atmospheric layer or because of the influence of the magnetic pole on primary cosmic radiation arising during the formation of a meteor trail.

Card 5/6

L. 21506-66
ACC NR: AP6007736

12

Analysis showed that qualitatively the above phenomena cannot account for the investigated effect. There are inherent difficulties involved in interpreting findings within the framework of the proposed hypothesis, i. e., the explanation for the relatively low altitude at which the formation of meteor trails was observed, the great magnitude of the light yielded from a small antimeteor mass, etc. It is indicated that although there are several ways of eliminating the above difficulties, this would be premature without conducting the experiment by an essentially different method.

The authors feel that their findings, independent of those of theoretical discussions, can be viewed not as proof of the hypothesis, but as experimental fact testifying to its use and drawing the attention of experimenters to it. The authors thank B.A. Gayev, A.M. Romanov, N.I. Orlov, D.V. Frederikc, L.P. Pakhomov, Yu.A. Gur'yan, L.F. Alekseyev, V.K. Bocharkin, Ye.V. Myakinin, Ye.G. Stepanova, M.P. Konstantinova, and L.V. Chernyshova for assistance in organizing the work, developing the apparatuses, carrying out of the measurements, and the processing of the results. Orig art. has: 3 figures and 3 tables. [ATD PRESS:4195-F]

SUB CODE: 03, 20, 18 / SUBM DATE: 02Sep65 / ORIG REF: 001 / OTH REF: 009

Card 6/6 *dda*

ACC NR: AP7001952

SOURCE CODE: UR/0120/66/000/006/0148/0149

AUTHOR: Bredov, M.M.; Ostroumova, Ye.G.

ORG: Semiconductor Institute, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: New variant of mass spectrometer with double focusing

SOURCE: Pribory i tekhnika eksperimenta, no. 6, 1966, 148-149

TOPIC TAGS: mass spectrometer, mass spectrum, *ELECTROSTATIC FIELD, SPECTRUM ANALYZER*

ABSTRACT: A mass spectrometer is described which uses as the analyzing medium the uniform electrostatic field between plane condenser plates. A shaped beam of charged particles injected at 45° to the field direction will describe a parabolic path as shown in Fig. 1, such that the distance l is a function of particle energy. Refocused with a magnetic field applied to the emerging beam as shown, the beam is collected at element K; energy spectra are then determined from apparatus geometry. Fig. 2

Card 1/3

UDC: 621.384.8

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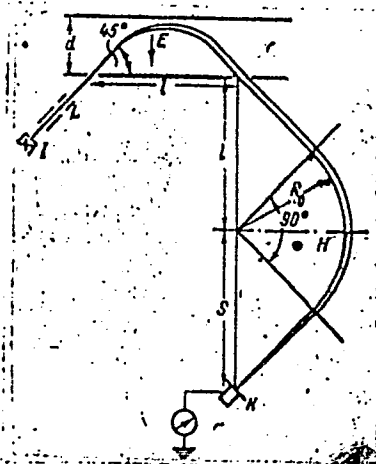


Fig. 1. Plane-condenser mass spectrometer

I - Particle source; L - beam shaping electrodes; K - collector.

is an overall view of a test model designed on the basis of $l = 17$ cm. Tests with an electron beam have verified the design calculations. To check for chromatic aberration, the velocity of the input electron beam

Card 2/3

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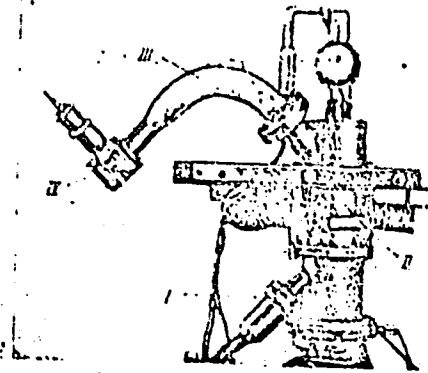


Fig. 2. Spectrometer model

I - Source and input optics, including a quadrupole lens;
II - condenser; III - magnetic analyzer portion, with mean curvature radius of 12.5 cm;
IV - collector.

was a-c modulated. This test showed accuracy was maintained at up to ± 50 v excursions of a nominal 2-kv accelerating voltage. It was therefore concluded that the spectrometer would focus electrons having an initial energy spread of 5%. Orig. art. has: 2 figures. [WA-75]

[SH]

SUB CODE: 20/ SUBM DATE: 20Dec65/ ORIG REF: 002/ OTH REF: 001/
ATD PRESS: 5115

Card 3/3

BREDS, A.

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SO: Monthly Index of European Accession (EEAI) LC, - Vol. 7, No. 1, Jan. 1958

YANITSKIY, G.; KRIMBERG, B.Ya., stekol'shchik; SUKACH, G., inzh.; VOLOVICH,
A., inzh.; BREDUN, I., tekhnolog

Suggested, developed, introduced. Izobr. i rats. no.11:30-31 N
'60. (MIRA 13:10)

1. Berdyanskiy zavod dorozhnykh mashin (for Sukach, Volovich).
2. Dnepropetrovskiy rechnoy port (for Bredun).
(Technological innovations)

BREDUN, I., inzh. po ratsionalizatsii

Warehouse with expanding roof. Rech.transp. 21 no.7:49 J1 '62.
(MIRA 15:8)

1. Dnepropetrovskiy port.
(Warehouses)

BREDUN, I.

Potentials in work. NTO 4 no.11:8-9 N '62. (MIRA 16:1)

1. Uchenyy sekretar' soveta Nauchno-tekhnicheskogo obshchestva
Dnepropetrovskogo rechnogo porta.
(Dnepropetrovsk--Harbors)