KOMAR, A.

THE ANOMALOUS CHANGE OF THE ELECTRIC RESISTIVITY OF THE Ni$_3$Mn ALLOY IN THE MAGNETIC FIELD. A. Komar and I. Portnyagin (S. M. Kirov Ural Indust. Inst., Sverdlovsk). Doklady Akad. Nauk S.S.S.R. 60, 569-70 (1948). -- The relative changes of the elec. resistance r in a longitudinal and in a transverse magnetic field H were detd. for alloys Ni 75.6-Mn 24.3 at . %, quenched after annealing at temps. between 700 and 250°, which corresponds, resp., to completely disordered and to completely ordered condition. Depending on its degree of order, this alloy changes its spontaneous magnetization and its Curie temp. (K. and Volkenshtein, J. Exptl. Theoret. Phys. (U.S.S.R.) 11, 723 (1941)). In the disordered state, the shapes of the curves of $\Delta r_{\parallel}/r$ and $\Delta r_{\perp}/r$ as functions of H, at 293 and at 77°K., are analogous to those of pure Ni in the neighborhood of the Curie point (Englert, C.A. 26, 3153). In the ordered state, at 293°K., both $\Delta r_{\parallel}/r$ and $\Delta r_{\perp}/r$ are neg., have close values throughout, and increase (in abs. value) with increasing H along practically the

(Continued)

(Continued)

same curve. At intermediate degrees of order, $\Delta r_{\parallel}/r$ changes its sign at a definite H, depending on the degree of order.

N. Thon

Immediate source clipping

(Continued)

autoelectronic emission masks the photoelec. emission; at about E = 10^5, the dark current is about 10^{-10} amp./sq. cm.; from there on, the autoelectronic current i_a rises steeply with E, increasing 10^7 times with E increasing 4 times. Expts. confirm the relation $i_a = AE^2 e^{-a/E}$. The cathode could be observed visually by coating the anode with willemite; while in photoelec. emission the whole surface of the cathode is seen to emit uniformly, autoelectronic emission in strong fields is confined to discrete points, visible as bright spots, and evidently corresponding to edges with a high potential gradient; the over-all exponential relation between i_a and E holds also for individual spots. From the diam. D of the spots, the tangential component V_o of the initial energy of the electrons can be detd. by

(Continued)

(Continued)

the temp., namely $R_T - R_\theta = c(J_T^2 - J_\theta^2)$ (where θ is a temp. close to the Curie point). This type of relation should hold for all ferromagnetics for which the elec. cond. at temps. close to the Curie point depends on the spontaneous magnetization.

N. Thon

Immediate source clipping

KOMAR, A.

32452. Grabarev, L. Primeneniye obyazatel'nykh tekhnologicheskikh pravil na zhilstroitel'stve tresta-Dneprovskpromstroy-Stroit. prom-st', 1949, No. 10, s. 9-12.

SO: Letopis' Zhurnal'nykh Statey Vol. 44

Primary application of technical [illegible] in construction by Dneprovskpromstroy Trust.

KOMAR, A. P.

35812. Ferromagnitnye svoystva splavov i dal'niy poryadok stomov (Doklad na vsesoyuz. Konferentsii po fizike magnitnykh yavleniy. Sverdlovsk dok. 1947G.) Trudy In-Ta fiziki metallov, VYP. 12, 1949, S. 50- 1--Bibliogr: 33 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 49, Moskva, 1949

KOMAR, A. P.

USSR/Physics - Semiconductors, Ferromagnetic — 1 Nov 53

"Thermal Behavior of Magnetization of Nickel-Zinc Ferrites in Weak Fields," A. P. Komar and N. M. Reynov

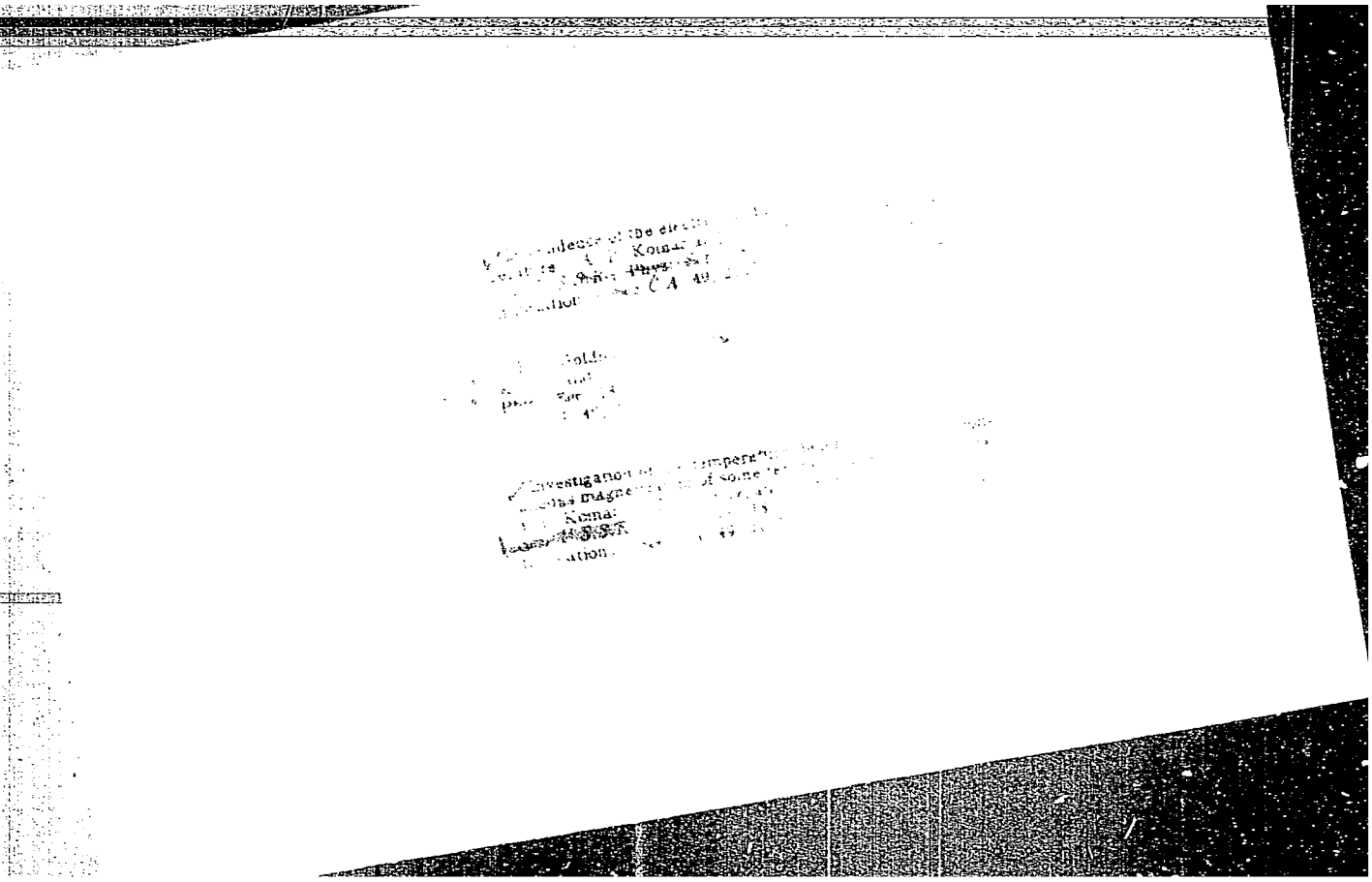
DAN SSSR, Vol 93, No 1, pp 19-20

Present curves of magnetization of nicket-zinc alloy for room temp, liquid Ni, liquid H and liquid He temps in fields up to 600 oerst. Presented by Acad M. A. Leontovich 7 Sep 53.

275T88

Physics of the ionosphere and the propagation of radiowaves [translations and surveys of foreign periodical literature]. Probl.sovr.fiz. 6 no.4: 3-212 '54. (MLRA 7:6)

1. Deystvitel'nyy chlen Akademii nauk USSR.
(Ionosphere) (Radio waves)



USSR/Physics

Card 1/1 Pub. 43 - 11/15

Authors : Komar, A. P., and Klyushin, V. V.

Title : Dependence of the electrical resistance of ferrites upon temperature

Periodical : Izv. AN SSSR. Ser. fiz. 18/3, 400-402, May-Jun 1954

Abstract : Experiments were conducted to determine the dependence of the electrical resistance of ferrites upon temperature at the point of ferromagnetic conversion. Data regarding this dependence may be useful in estimating the type of ferromagnetic conversions and in determining the mechanism of origination of spontaneous magnetization in ferrites. The noticeable change in temperature gradient of the electrical resistance during passing through the zone close to the Curie point indicates a change in the condition favorable for the appearance of conductivity electrons as well as in the conditions favorable for their continuous existence. Five references: 4 French and 1 USSR (1950-1952). Graphs.

Institution : Academy of Sciences USSR, Physico-Technical Institute

Submitted : May 3, 1954

USSR/Physics

Card 1/1 Pub. 43 - 12/15

Authors : Komar, A. P., and Klyushin, V. V.

Title : The Goldhammer-Thomson effect in ferrites

Periodical : Izv. AN SSSR. Ser. fiz. 18/3, 403-405, May-Jun 1954

Abstract : The Goldhammer-Thomson effect in ferrites was investigated to establish whether there is any connection between the change in electrical resistance in the magnetic field and magnetization. It was found that the longitudinal [illegible] G-T-effects in ferrites [illegible] positive sign. The deviation from the second law of Akulov's even-effects in ferrites is explained by the insignificant role of the para-process and by the volumetric magnetostriction effect. The [illegible] in this case was found to have a complex bond with the magnitude of the [illegible] magnetization. Five [illegible] French [illegible].

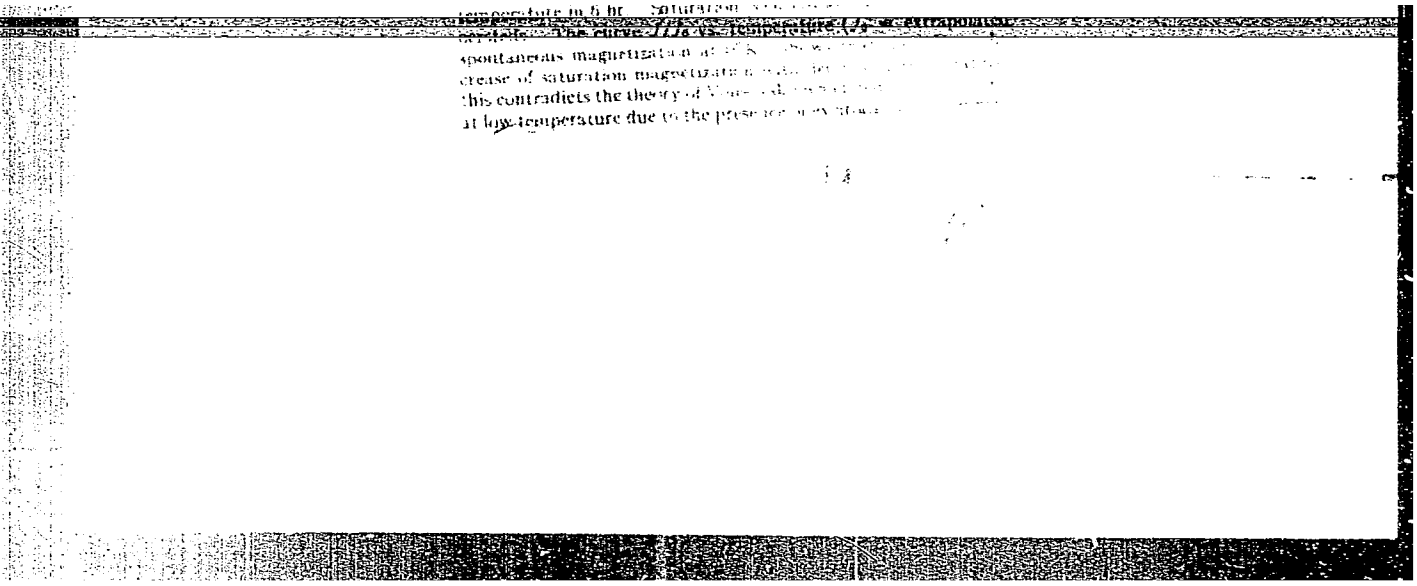
Institution : Academy of Sciences USSR, Physico-Technical Institute

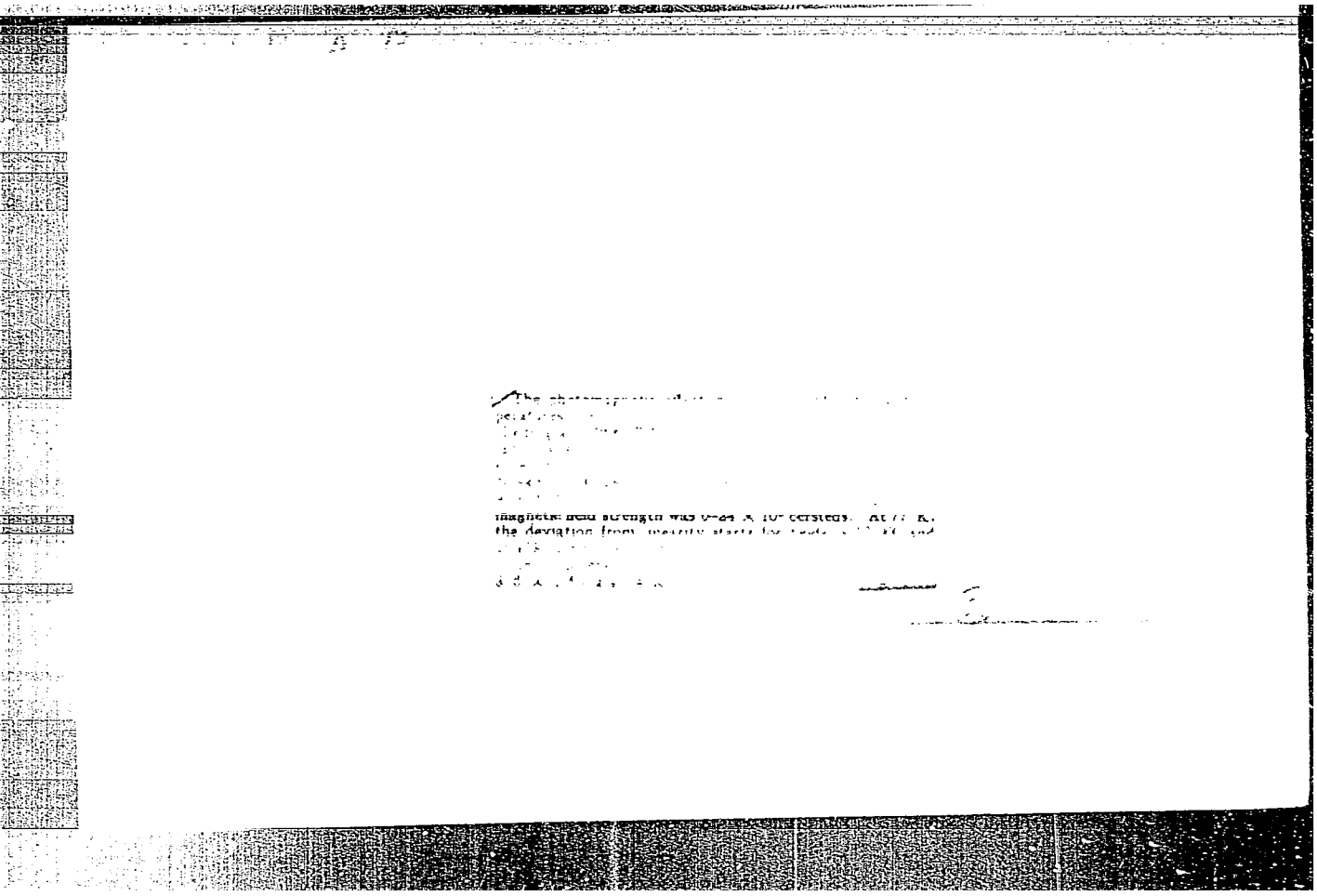
Submitted : May 3, 1954

KOMAR, A. P.

5
19E14

Investigation of the temperature dependence of ... spontaneous magnetization of some ferrites at low temperatures. A. P. Komar, N. M. Reinov, and ... S. Shal... Izv. Akad. Nauk S.S.S.R., Ser. Fiz. 18, ... 10 (4) 2137g (1955). — An apparatus is described ... spontaneous magnetization, ... (Curie point) of a ferrite material ... The sample was annealed at 1350 ... temperature in 6 hr. Saturation ... oersteds. The curve J/J_0 vs. temperature ...





KOMAR, A. P.

USSR/[illegible]

Card : 1/1

Authors : Komar, A. P., and Selitskiy, Yu. A.

Title : Experiments with an ion projector

Periodical : Dokl. AN SSSR, 96, Ed. 5, 957 - 958, June 1954

Abstract : It was suggested that a proton (ion) projector be used for studying structural changes in the surfaces of Al, Ni, Fe and other monocrystals instead of an electron projector, because the resolving power of the former is much higher. Pictures taken with the help of proton and electron projectors are given for comparison. Four references. Photos.

[illegible] : Acad. of Sc. USSR. Physico-Technical Institute, Leningrad

[illegible] : Academician, P. I. Lukirskiy, March 15, 1954

KOMAR, A.P.; REYKOV, N.M.; SHALYT, S.S.

Investigation of photomagnetoelectric effect in cuprous oxide at low temperatures. Izv.AN SSSR.Ser.fiz. 19 no.4:444-446 Jl-Ag '55. (MLRA 9:1)

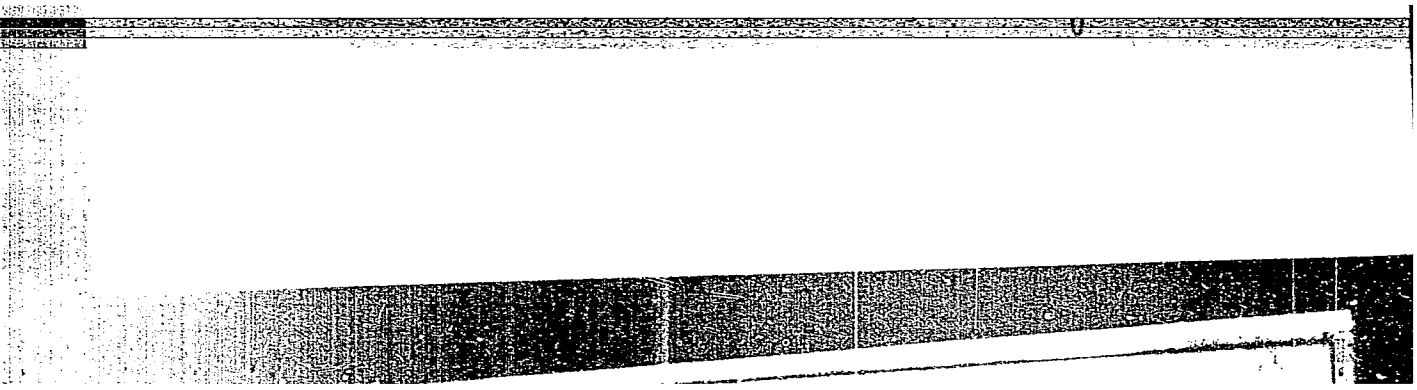
1.Fiziko-tekhnicheskiy institut Akademii nauk SSSR.
(Copper oxide--Electric properties) (Photoelectricity) (Low temperature research)

KOMAR, A.P.

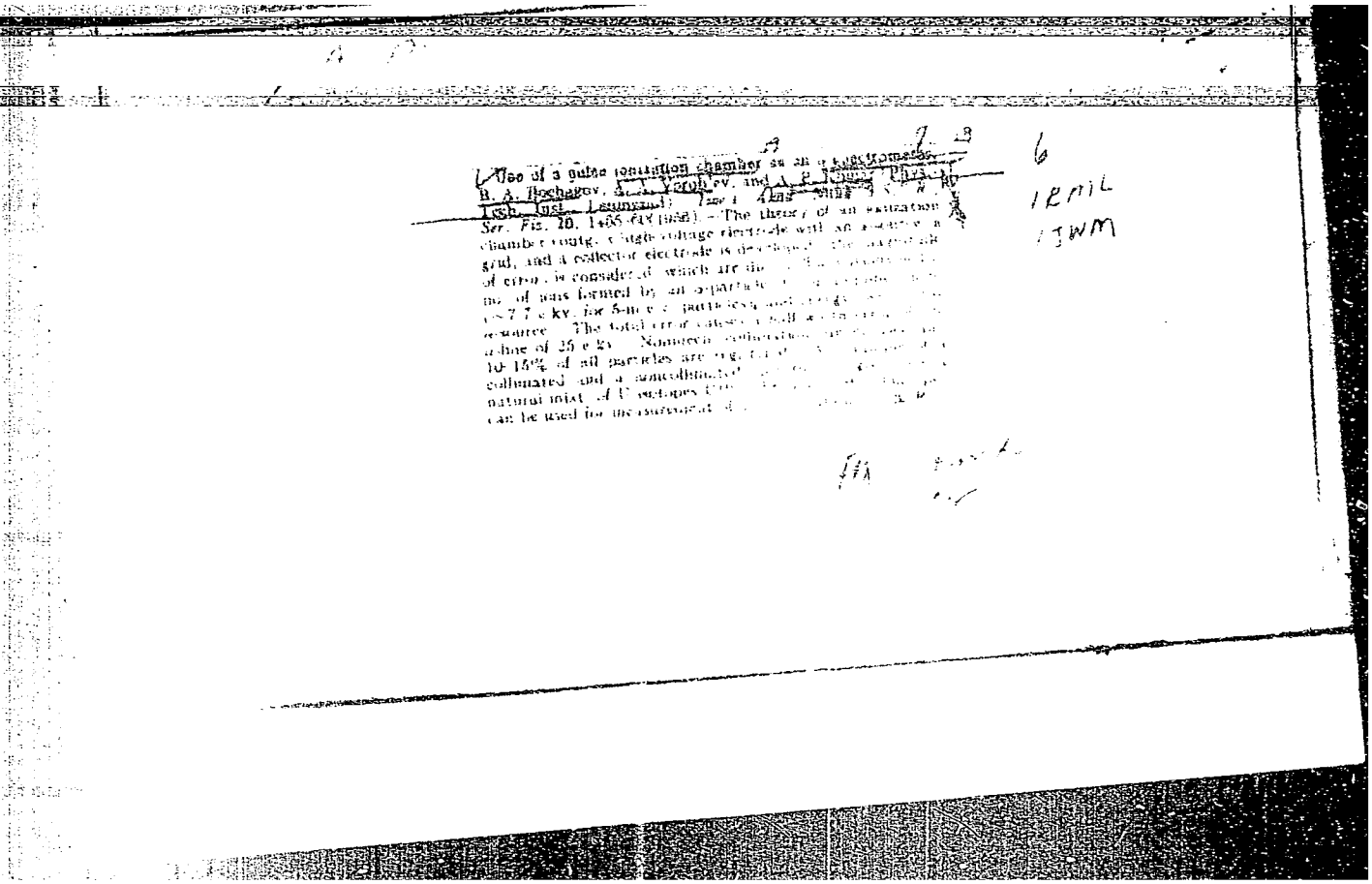
GRIBOVA, M.P., tekhnicheskiy redaktor; YAPPA, Yu.A., redaktor; KOMAR, A.P., otvetstvennyy redaktor, professor; POPOV, R.Yu, redaktor.

Classification of elementary particles [translations and surveys of foreign periodical literature]. Problemy sovremennoi fiziki 8 no.11:1-173 '56. (MLRA 10:1)
(Particles, Elementary)

Experiments with an electron emission microscope. A. F. Komar and Yu. N. Tolmin (Leningrad Phys.-Tech. Inst., Acad. Sci., U.S.S.R.). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 20, 1137–41(1956).—A continuously evacuated electron projector had a W point emitter. Some observations can be made in spite of relatively bad (10^{-7}–10^{-8} mm.) vacuum conditions. A model and photographs are given for the most frequent crystal orientation in the W point. This form is close to the rhombododecahedral (011) cut by the planes (001), (111), and (112). This form is close to the



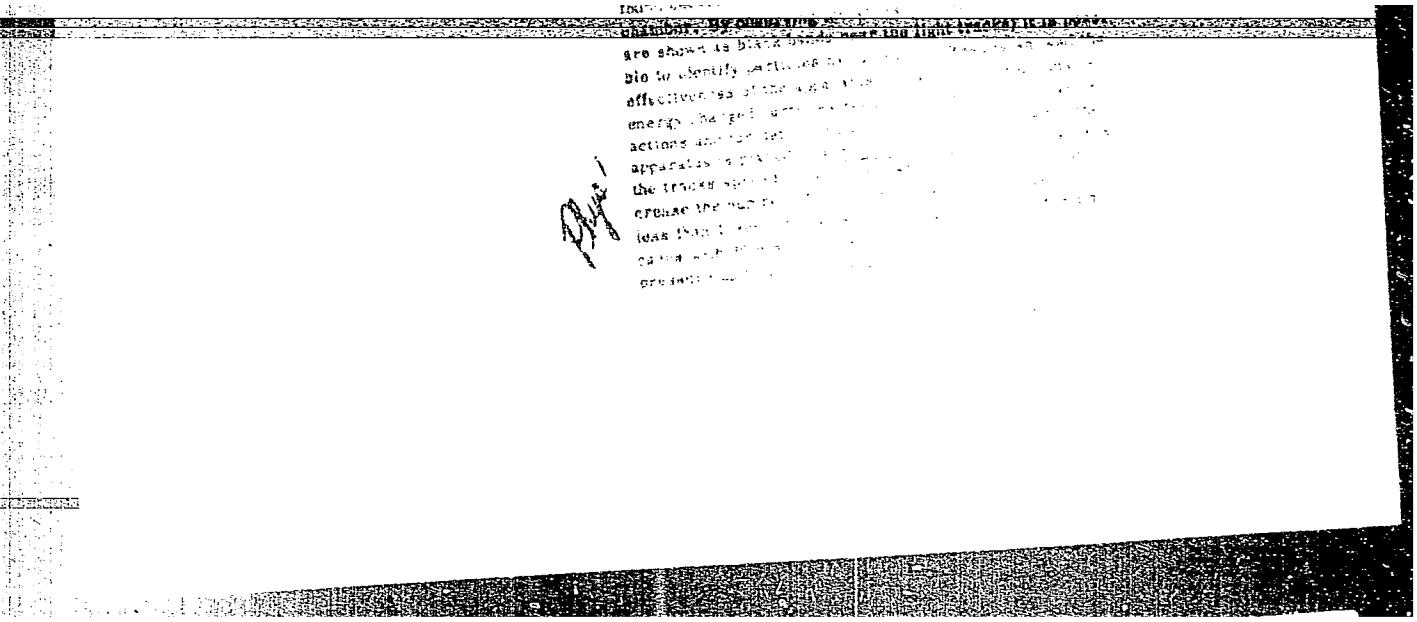
APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000824020008-7"



Use of a pulse ionization chamber as an electrometer.
B. A. Bochagov, [illegible] and A. P. [illegible]
Instr. Exp. Technique
Ser. Fiz. 20, 1435-6 (1956). — The theory of an ionization chamber consisting of a high-voltage electrode with an emitter, a grid, and a collector electrode is developed. The [illegible] of circuit is considered which are the [illegible] of ions formed by an α-particle [illegible] 7.7 × kv. for 5-mc. α particles and [illegible] α-source. The total error [illegible] α-line of 25 × kv. Nonuseful [illegible] 10–15% of all particles are [illegible] collimated and a nondistinctive [illegible] natural mixt. of U isotopes [illegible] can be used for the measurement [illegible]

SUBJECT USSR / PHYSICS
AUTHOR KOMAR, A.P., JAVOR, I.P.
TITLE The Photoprotons from A^{40}
PERIODICAL Žurn.eksp.i teor.fis, 31, fasc.3, 531 - 531 (1956)
Issued: 12 / 1956

The angular distribution of the photoprotons from A^{40} which was irradiated with the γ-bundle of a synchroton with the maximum energy of 90 MeV, was investigated. The photoprotons with an energy of from 2 to 10 MeV were registered by means of a WILSON chamber which was filled at a pressure of 1,4 atm with argon and with the vapors of a mixture of ethyl alcohol and water. The Wilson chamber, which has a diameter of 30 cm and a depth of 7 cm, works in a cycle with overpressure with a period of from 10 to 15 sec. The argon contained by the Wilson chamber was irradiated with a collimated γ-bundle of 1,8 cm diameter, which incides into the chamber trough an aluminium window (100 μ) in its lateral wall. The proton traces formed as a result of the reaction (γ,p) were photographed stereoscopically.
302 traces were dealt with. Angles were measured by the reprojection method and with an accuracy of from 1 to 2°. The histogram contained in the attached drawing was drawn by joining the traces with intervals of 20°. Directivity in a forward direction with a maximum at the angle of 70° is distinctly discernible. The course taken by the curve obtained here for the angular distribution of the photoprotons from argon agrees sufficiently well with the course of angular distribution obtained by B.M. SPICER, Phys.Rev., 100, 791 (1955) by the method of nuclear emulsions and with a maximum energy of the γ-bundle of 22,5 MeV.



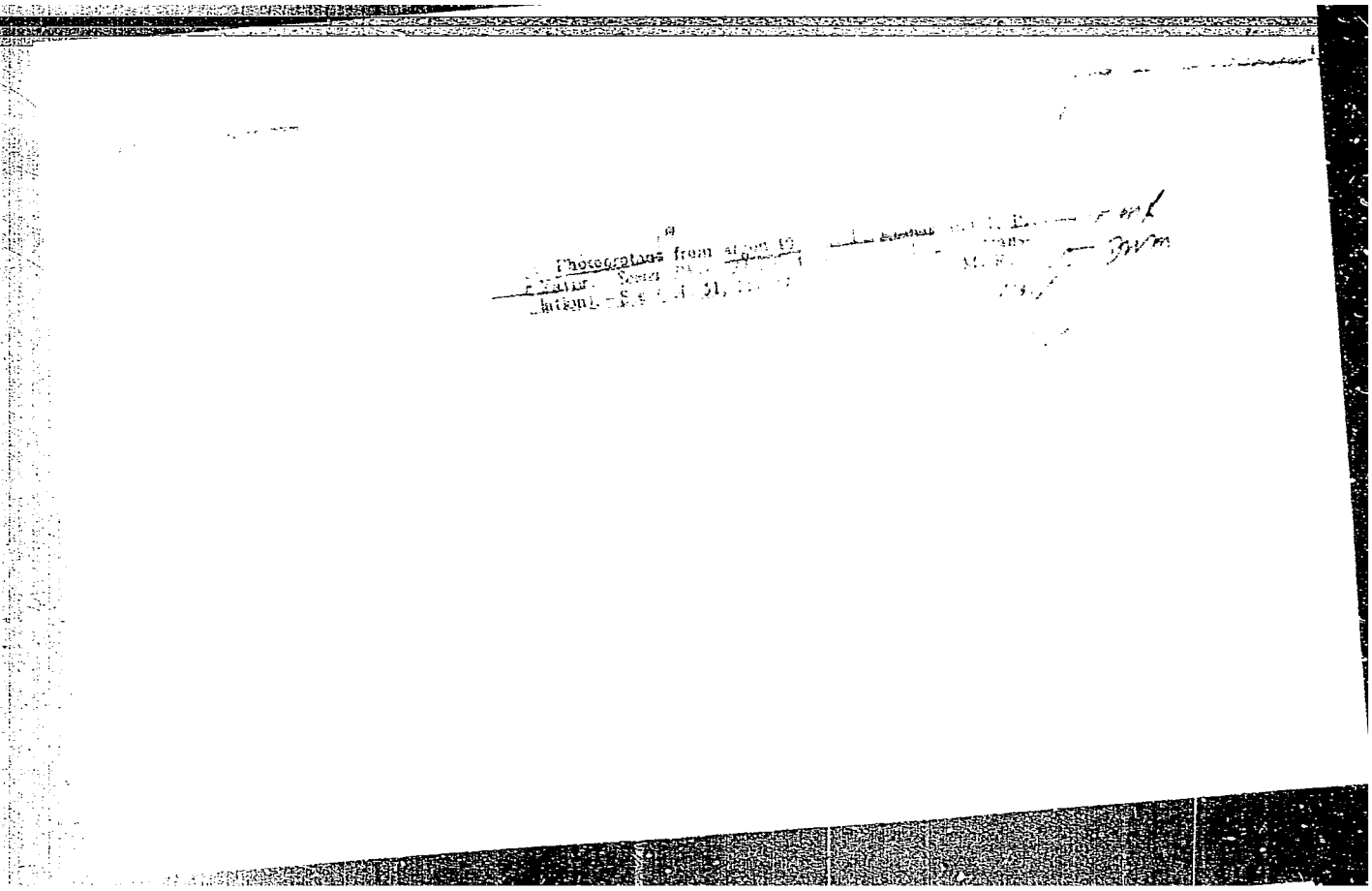
KOMAR, A.P.

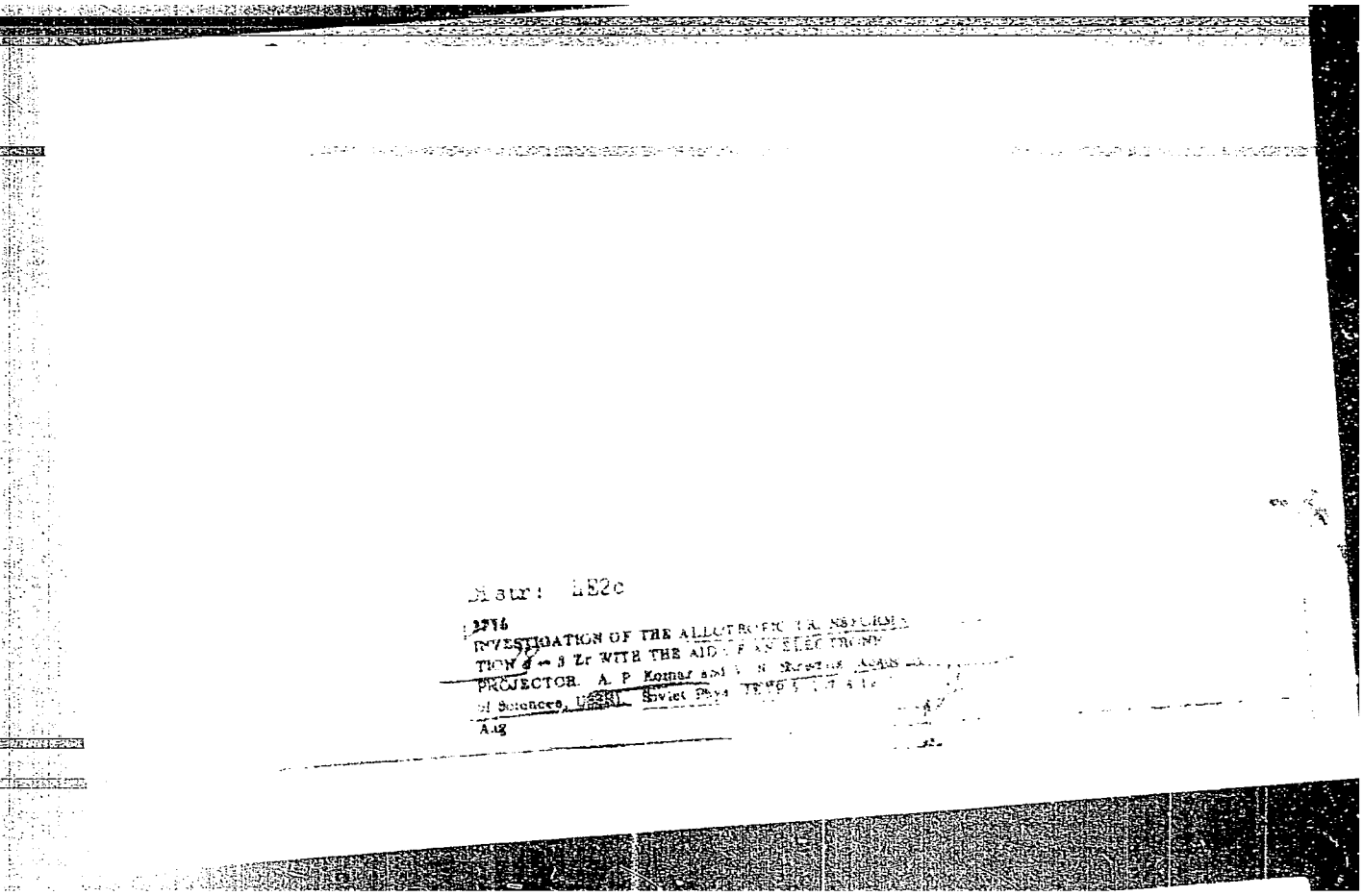
BAZHANOV, Ye.B., CHIZHOV, V.P., KOMAR, A.P., KUL'CHITSKIY, L.A.
VOLKOV, Yu.M., and YAVOR, I.P.

"Photodisintegration of Nuclei by Gamma-Radiation from Leningrad Synchrotron at 60-90 Mev."

Physics Inst. im Lebedev, Acad. Sci. USSR

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





Aug

126-5-3-11/31

AUTHORS: Komar, A.P. and Shrednik, V. N.

TITLE: $\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector (Prevrashcheniya $\alpha \rightleftarrows \beta$ tsirkoniya po nablyudeniyam s pomoshch'yu elektronnogo proyektora)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol V, Nr 3, pp 452-464 + 1 plate (USSR)

ABSTRACT: The aim of the work described in this paper, which was started before the publication of the paper by E.G.Brock (Phys. Rev., 1955, Vol 100, p 1619), was to evaluate the potentialities of the electron projector method for studying phase transformations; to verify by means of this method the crystallographic relations between the lattices of α and β zirconium obtained by Burgers by means of the X-ray method on macroscopic specimens; to elucidate the role of the size and shape of the crystal on the type of mutual orientation of the lattices of the α and β phases. The authors took into consideration the fact that study of zirconium by means of an electron projector is of great interest also from the experimentation point of view, Muller (Ref.6). So far no regular pictures of auto-electron emission of zirconium has been obtained proving symmetry of the crystal. Even in the

Card 1/6

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

best vacuum only irregular spots of auto-electron emission are obtained which are due apparently to various contaminations of the crystal surface. In their experiments, the authors used an ordinary electron projector as described by Muller (Ref.6). The anode consisted of a layer of "conducting glass" (Ref.8) on the inside of a spherical glass flask, the surface of which was coated by villemite. The work was carried out with projectors which were continuously evacuated as well as sealed projectors containing tantalum getters. The $\alpha \rightleftarrows \beta$ phase transformation is investigated for zirconium single crystals of sizes of the order of one micron. By using the electron projector method it is possible to observe visually the transforming crystal at a magnification of 100 000 times. Emission pictures were obtained of crystals of the cubic (β zirconium) as well as the hexagonal (α zirconium) symmetry. The results confirmed the relations published by Burgers, W.G., (Physica, 1934, Vol 7, p 561). Usually during transformation only one of the

Card 2/6 possible orientations of the new phase relative to the

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

initial phase manifests itself, which is attributed to the considerable role of the surface energy in the case of crystals of small dimensions. Signs of dislocation have been detected in zirconium crystals, which are attributed to a diffusionless mechanism of transformation. The method of identification and of indication of the emission pictures of the faces of the zirconium crystal is explained in para.3. Since in the first approximation the shape of the end of the projector point can be assumed as being semi-spherical and since the dimensions of the radius of the point are considerably smaller than the radius of the sphere of the projector, the electric field between the point and the sphere of the projector can,in the given approximation,be considered as the field of a spherical condenser in which the electrons will move along radii of the projector sphere. On hitting the villemite screen, the electrons will produce light on the screen and will produce on the sphere of the projector an orthogonal projection of the faces and edges of the crystal. On this projection it is easy to designate the

Card 3/6 centres of the faces which can be considered as being

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

spherical projections of the normals to the edges. Obviously, this spherical projection of the normals can easily be inter-related with the gnomo-stereographic projection of the crystal which also enables deciphering the auto-emission picture, which is described. The results of the experiments are described in para.4,which deals with the structure of the face surface and auto-emission as well as with the picture of auto-emission and of $\alpha \rightleftarrows \beta$ transformation of zirconium. The results are evaluated in para.5. The following conclusions are arrived at:

1. By means of the electron projector it is possible to determine from the nature of the faces of a crystal point, the mutual orientation of the lattices of the individual phases during polymorphous transformations. For the case of zirconium, the mutual orientation of the lattices of the α and the β phases, earlier determined by Burgers by means of the X-ray method, was confirmed.
2. The polymorphous transformation of zirconium in the case of crystals with linear dimensions of the order of a

Card 4/6

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

micron takes place according to the non-diffusional method throughout the entire volume of the crystals.
3. The non-equilibrium pseudo-morphous crystal of the accompanying phase becomes transformed into the equilibrium state in the case of high surface mobility of the atoms so that the faces with low indices of the basic and the accompanying crystals remain strictly or approximately parallel.
4. In the case of the studied zirconium crystals, with linear dimensions of about 1μ, those possible orientations become materialised during transformations which involve a minimum change of the surface energy.
5. The temperature of the polymorphous transformation of the zirconium depends strongly on the quantity of the nitrogen and oxygen absorbed by the zirconium, increasing with increasing concentration.
6. The observed faces of the zirconium crystals with cubic symmetry are not equilibrium faces of pure zirconium but equilibrium faces of crystals of the solid solution of nitrogen and zirconium in presence of a strong electric

126-5-3-11/31

$\alpha \rightleftarrows \beta$ Transformation of Zirconium as Observed by Means of an Electronic Projector

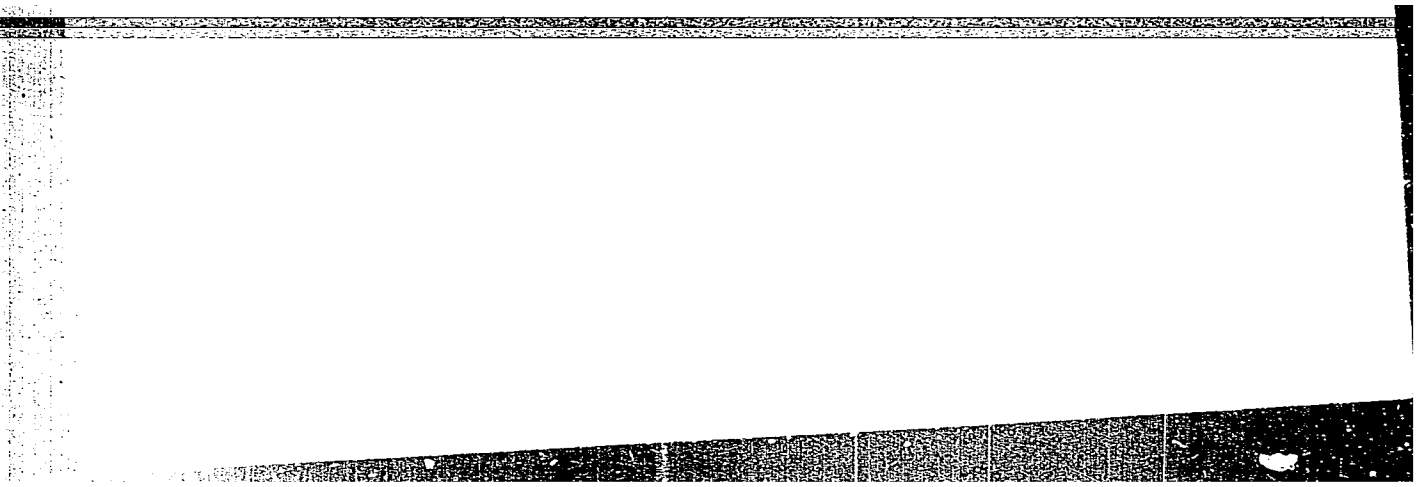
field and a high temperature.
7. The layer by layer spiral destruction of crystals of hexagonal symmetry in a reverse electric field begins from the centres of the faces (11$\bar{2}$0), (10$\bar{1}$2), (10$\bar{1}\bar{2}$) and (2$\bar{1}\bar{1}$0) and this is possibly due to the presence of spiral dislocations, the axes of which are normal to the respective atomic planes of the hexagonal lattice.
There are 8 figures and 23 references, 7 of which are Soviet, 7 German, 9 English.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physico-Technical Institute, Ac.Sc., USSR)

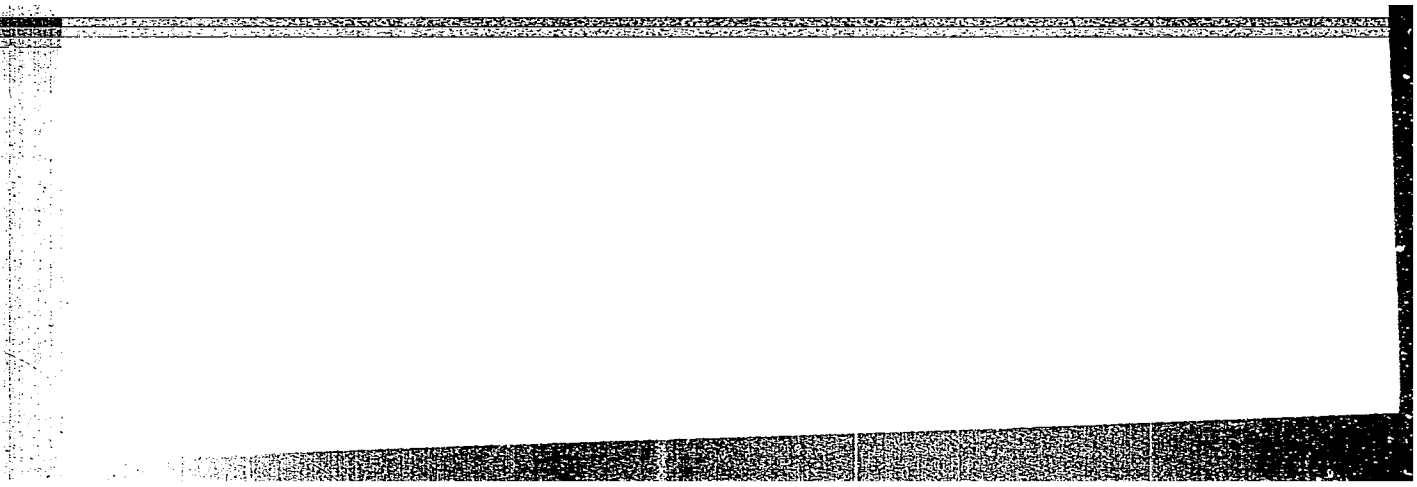
SUBMITTED: November 9, 1956

1. Zirconium--Transformations 2. Zirconium crystals--Lattices
3. Single crystals--Physical properties 4. Electron microscopy

Card 6/6



APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000824020008-7"



APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000824020008-7"

Komar, A.P.

120-6-17/36

AUTHORS: Komar, A.P., and Yashukov, V.P.

TITLE: Instrument for Automatic Determination of Small Non-uniformities of Variable Magnetic Fields (Pribor dlya avtomaticheskogo opredeleniya malykh neodnorodnostey peremennykh magnitnykh poley)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.6, pp. 75 - 78 (USSR).

ABSTRACT: An instrument is described which permits observing on the screen of an oscillograph the curve of the non-uniformity of a magnetic field caused by slight differences in the amplitude or phases at various points of the gap of an electromagnet. Since in modern betatrons and synchrotrons the injection takes place at a low magnetic field potential in the gap of a magnet, the occurring deviations of the magnetic field potential are commensurate with the magnitude of the field potential at the instant of injection. Such non-uniformity of the magnetic field along the azimuth and the radius at the instant of injection leads to an increase in the amplitude of oscillations of the electrons and to falling of the electrons onto the walls of the chamber. In betatrons, non-uniformities in the magnetic field potential occur in the gap of the magnet and the accelerator at the instant of injection of electrons. The

Cardl/2

[illegible] congress.

Card 2/2

KOMAR, A.P.

PA - 2815

AUTHOR: YAVOR, I.P., KOMAR, A.P.

TITLE: High-Speed Cloud Chamber Synchronized with Synchrotron. (Bystrodeystvuyushchaya kamera Vil'sona sinkhronizovannaya s sinkhrotronom, Russian)

PERIODICAL: Zhurnal Tekhn.Fiz. 1957, Vol 27, Nr 4, pp 868-874 (U.S.S.R.)
Received: 5 / 1957 Reviewed: 7 / 1957

ABSTRACT: The construction and the method of operation of the WILSON chamber is described. The WILSON chamber works according to a cycle with overpressure and 10-15 sec periods. The control scheme with pressure modification in the chamber and some details on the method of operation are described. In the second part the synchronization scheme of the work of the chamber and its control elements as well as those of the synchrotron are given. The scheme worked out in the laboratory of the institute satisfies the requirements for the investigation of photonucleus reactions and elasticity is such that it may be used also for complicated working conditions. The basic elements are: an impulse generator which determines the working period of the chamber (T = 5 ÷ 60 sec) and the scheme of coincidence which gives the performing schemes (vibrators with delays and amplifications) its impulses. The direct control of the output of γ-ray impulses of the synchrotron is accomplished by means of two types of impulses. The synchronization takes place for 100 MeV. The scheme works reliably and needs no subsequent regulation.

Card 1/2.

Association: Academy of Sciences, USSR

KOMAR, A.P.

57-27-7-20/40

AUTHORS: Bochagov, B. A., Vorob'yev, R. A.

TITLE: An Impulse Ionization Chamber as a Device for the Simultaneous Investigation of the Energetic and Angular Distributions of Charged Particles (Impul'snaya ionizatsionnaya kamera kak pribor dlya odnovremennogo izucheniya energeticheskikh i uglovykh raspredeleniy zaryazhennykh chastits).

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1957, Vol. 27, Nr 7, pp. 1575-1577 (USSR)

ABSTRACT: It is shown that the energy E (half width of the lines of α-spectra) and the angle of flight φ (between the normal to the electrodes and the direction of flight of the charged particle) of the particle concerned can be determined beginning from the source, when the quantity of the impulse V_1 (the voltage at the collecting electrode) and the quantity of one of theimpulses V_2 (the voltage at the high-voltage electrode), V_3 (the voltage at the power supply or V_4 (the voltage at the moment where all electrons have reached the collecting electrode) is simultaneously measured. The accuracy of measurement of cos φ in this connection is about 3% and can be improved. At present a mechanical collimator is often used in measurements of the energy of α-particles may also be brought to collimation without a mechanical collimator due to the fact that the ionization chamber permits a simultaneous measurement of E and

Card 1/2

An Impulse Ionization Chamber as a Device for the Simultaneous Investigation of the Energetic and Angular Distributions of Charged Particles. 57-27-7-20/40

φ. The method suggested here can also be employed for the solution of problems of α-spectroscopy, for theinvestigation of the α- - correlation, the neutron-spectrum according to the protons given off and for the investigation of the angular distribution of heavy products of nuclear reactions. There are 3 figures.

ASSOCIATION: Leningrad Polytechnic Institute imeni M. I. Kalinin (Leningradskiy politekhnicheskiy institut im. M. I. Kalinina)

SUBMITTED: January 27, 1956

AVAILABLE: Library of Congress

1. Ionization chambers-Applications 2. Particles-Energy-Measurement
3. Particles-Transmission-Analysis

Card 2/2

PA - 2089

AUTHOR: KOMAR,A.P., SHREDNIK,V.N.

TITLE: Investigation of the Allotropic Transformation $\alpha \rightleftarrows \beta$ Zr with the Aid of an Electronic Projector. (Izucenie allotropicesskogo prevraščenija $\alpha \rightleftarrows \beta$ Zr pri pomoščі elektronnogo projektora, Russian).

PERIODICAL: Zhurnal Eksperimental'noi i Teoret.Fiziki, 1957, Vol 32, Nr 1, pp 184-184 (U.S.S.R.)

Received: 3 / 1957 Reviewed: 4 / 1957

ABSTRACT: The use of an electron projector permits the visual measuring of phase transformations on small crystals of the order of from 10^{-4} to 10^{-5} cm in the case of a resolving power of 100 - 20 Å. The investigation of the transformation in such small crystals is in itself interesting because with these dimensions the surface energy must exercise growing influence on transformations. The present work makes use of the usual electron projector developed by MUELLER, which has a zirconium point the monocrystalline end of which served as a test object. The quality of the vacuum was of particular importance because the oxides, nitrides, or carbides which possibly form with heating, are presenting difficulties with regard to melting and volatility, and therefore do not leave the point in the vacuum.

Card 1/3

PA - 2089

Investigation of the Allotropic Transformation $\alpha \rightleftarrows \beta$ Zr with the Aid of an Electronic Projector.

Although the pressure of the remaining gases in the piston was less than 10^{-8} torr, it was not possible to form an impression (similar to the well-known one of a pure wolfram point) of the autoelectronic emission of a smoothed crystal.

The small crystals of the α-Zr (hexagonally tightly packed lattice) were ribbed. The ribbing and the clearly marked granulation of the crystal can be brought into connection in a natural manner with the well-known effect produced on the crystal by an electric field as a result of heating. The graininess of the crystal is apparently connected with the penetration of nitrogen atoms from the residual gases into the surface layer.

For the "purification" of the surface the following measures were taken: 1) A certain destruction of the surface on the occasion of the destruction of the point by the application of a high positive potential. Here the gradient on the surface amounts to up to $1{,}4 \cdot 10^{8}$ V/cm.

Card 2/3

KOMAR, A.P.

AUTHOR KOMAR, A.P., Member of the Academy of Science of the Ukrainian SSR, and N.I.KRIVKO 20-1-16/64

TITLE The Temperature Dependence of the g-Factor and of the Relaxation Time in the Ferromagnetic Resonance for Some Ferrites. (Temperaturnaya zavisimost' g-faktora i vremeni relaksatsii pri ferromagnitnom rezonanse dlya nekotorykh ferritov-Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 1, pp 64-66 (U.S.S.R.)

ABSTRACT First of all the paper under review refers to some relevent previously published papers. Then the authors compute the factor of the spectroscopic decomposition g and the relaxation time T with the aid of known formulae which were adapted to the conditions prevailing in the experiment described in the paper under review. g and T are determined in this paper for two groups of technological ferrites with the compositions $NiO.ZnO.Fe_2O_3$ and $Li_2O.ZnO.Fe_2O_3$. These ferrites were produced by roasting and they contained, at the boundaries of their grains, rests of oxides. The measurements were conducted at temperatures of 290 and 4.2°K and at a frequency of 9.4.10⁹ hertz. The authors of this paper determined the magnetization curves and the saturation magnetization for all ferrites investigated by them. The saturation magnetization was achieved at relatively low field intensities (H < 1400 oersted). The ferromagnetic resonance was investigated with the aid of rectangular and coaxial wave guides. The ferrite discs were arranged in the wave guide at right angles to the direction of the magnetic alternating field. The dimensions of the ferrite discs a-

Card 1/2

re listed in the paper under review. Each disc had a [illegible] laxation Time in the Ferro[illegible] showed that

diameter of 2mm. The computations and the measurements ents of demagnetization N_x and N_y, if the discs are thin. It was possible to vary the field intensity of the constant magnetising field from 0 to 26,000 oersted. For the generation and measurement of the electromagnetic field, a standard apparatus for the frequency 9600-9600 megahertz was used. The characteristic curves of absorption and dispersion are pictured in diagrams contained in the paper under review. The data obtained in this context show the following: In a part of the ferrites investigated, the g-factor changes-if the temperature is reduced-by an amount which is larger than the accidental error of measurement of 4 %. As far as the change in the relaxation time is concerned no general tendency was observed. It is not possible to explain on basis of the existing microscopic theories the change of the g-factor at reduction of the temperature.

(3 reproductions, 2 charts).

ASSOCIATION Physical-Technological Institute of the Academy of Sciences of the USSR

PRESENTED BY

SUBMITTED 24.12.1956

AVAILABLE Library of Congress.

Card 2/2

KOMAR, A. P.

KOMAR, A. and SCHREDNIK, V.

"The Investigation of Phase Transformation"

[illegible] Fourth Int'l Conference on Electron

KOMAR, A. P. and TAIANINK, G.

"The Formation of Carbides on the Surface of W and Mo Single Crystals."

paper submitted for predentation at Fourth Int'l Conference on Electron Microscopy, Berlin, GFR, 10-17 Sep 58.

Phyical Technical Institute, USSR Academy of Sciences, ~~X~~Leningrad.

C-3,800,829, 25 Jul 58.

SOV-120-58-1-20/43

AUTHORS: Komar, A. P. and Chernov, N. N.

TITLE: A High Voltage Multipulse Voltage Generator (Vysokovol'tnyy mnogoimpul'snyy generator napryazheniya)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1958, Nr 1, pp 82-84 (USSR)

ABSTRACT: The generator was designed to produce short high voltage pulses. The generator may be successfully used in electron microscopy, in semiconductor studies and in work on conductivity. The main requirements were as follows: (1) the generator should give a series of short pulses of 10 - 50 kV; (2) the duration of each pulse should be easily adjustable and lie in the range 0.5 to 3 μs; (3) the maximum number of pulses in series should be not less than 10; (4) the time interval between the pulses should be easily controlled and lie within the range 3 to 5 μs; (5) the repetition frequency should be 50 cps; (6) the envelope of the pulses must be of a given form; (7) the form of each pulse in a series should be sinusoidal or approximately sinusoidal; (8) the

Card 1/5

A High Voltage Multipulse Voltage Generator.

current in each pulse through a load should be of the order of 1 A. The circuit of the generator is a development of a well-known discharge circuit and is shown in Fig.1. The capacitor C charges up to a potential E_A and then discharges with the help of the thyratron T through the inductance L_1 which is the primary of an ironless transformer. The potential difference across a resistance R in the secondary is applied to the load with the anode earthed. A detailed circuit of the multipulse generator is shown in Fig.2. The series of pulses is produced as follows: the capacitors C_6 are charged from a regulated DC power supply at the output of the rectifiers Π_1 (Fig.2). These voltages are up 10 - 15 kV. If the thyratrons T_2 fire one after another, then the capacitors C_6 will discharge through the primary of the pulse transformer L_1 . The secondary of this transformer is connected so that the first peak of the voltage has a negative polarity while the second positive peak is cut off by the valves Π_5 . The successive

A High Voltage Multipulse Voltage Generator.

firing of the thyratrons T_2 is ensured by a delay line, shown in Fig.2 (1-10). The signals for the grids of the thyratrons T_2 are tapped off the line at the points 1-10 and are applied to the grids through amplifiers with cathode loads. Experiment has shown that a single cathode repeater does not ensure the firing of the thyratrons. It was found that the signal propagated along the line was considerably disturbed and its amplitude was lowered. This effect was compensated by means of the second cathode repeater Π_3 .

In the absence of the delay pulse the current in the anode circuit of the thyratrons is zero. The thyratrons fire when a positive pulse with a fast rise time is applied to the delay line from the generator T_1 . In order to prevent the firing of all the thyratrons when the first thyratron fires (when a negative impulse appears on L_1 and therefore on the anodes of all the thyratrons), the capacitor C_5 is

SOV-120-58-1-20/43

A High Voltage Multipulse Voltage Generator.

of the delay line. The pulse generator was used over a number of months and was quite stable. There are 2 figures, no tables and no references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: June 14, 1957.

1. Pulse generators--Design 2. Pulse generators--Applications
3. Pulse generators--Performance 4. Pulse generators--Equipment

Card 5/5

SOV/120-58-5-3/32

AUTHORS: Komar, A. P. and Stabnikov, M. V.

TITLE: An Investigation of the Effect of Plates on the Sensitive Layer of a Diffusion Chamber (Issledovaniye vliyaniya plastin na chuvstvitel'nyy sloy diffuzionnoy kamery)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 5, pp 21-25 (USSR)

ABSTRACT: To study nuclear reactions in diffusion chambers it is necessary to insert into them partitions of different materials. When these partitions are introduced into the sensitive layer of a diffusion chamber, intensive condensation takes place on them. This reduces supersaturation and leads to the formation of a non-sensitive gap near the partitions. At the same time the temperature difference between the plate and the surrounding gas leads to the appearance of convective currents. All this leads to a distortion of the sensitive layer so that the chamber cannot be used successfully. Regozinski (Ref.3) has reported an attempt at the solution of this problem but his method cannot be considered successful. In the present paper a new method

Card 1/3

SOV/120-58-5-3/32

An Investigation of the Effect of Plates on the Sensitive Layer of a Diffusion Chamber

is described whereby lead plates have a negligible effect upon the sensitive layer. It was found that if a lead plate is covered with a metal jacket which is thermally insulated from the plate, then the work of a diffusion chamber is unaffected and the sensitive layer in its upper part approaches the plate (Fig.6a). A similar picture is obtained if the lead plate is cut in two, as was suggested in Ref.3. In this case the non-sensitive zone covers only the lower part of the plate (up to 3 cm). However, the authors have found that the most successful form of a partition wall is the one shown in Fig.3c. Here, 1 is the lead plate, 2 is a textolite screen on either side of the plate with 5 mm holes drilled in it. The two plates are thermally insulated from the lead plate by means of separators, 3. Fig.8 shows the distribution of the sensitive layer near such a plate. As can be seen, in spite of the

Card 2/3

48-22-5-14/22

AUTHORS: Komar, A. P., Talanin, Yu. N.

TITLE: Pictures of Autoelectronic Emission of Crystals of Tungsten Carbide and Molybdenum Carbide (Kartiny avtoelektronnoy emissii kristallov karbidov vol'frama i molibdena)Data on the VIII All Union Conference on Cathode Electronics (Materialy VIII Vsesoyuznogo soveshchaniya po katodnoy elektronike, Leningrad, 17-24 oktyabrya 1957 g.)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 5, pp. 58o - 593 (USSR)

ABSTRACT: The authors repeatedly observed in the projector of a field electron microscope (Reference 1-3) a hexagonal-symmetrical picture originating (rarely) from a tungsten tip or (repeatedly) a molybdenum tip. This seemed peculiar as both metals have a body-centered (cubic) lattice. Considering the not very good quality of the vacuum and the possible carbon-containing contamination, the authors expressed the assumption that the picture in question originates from the carbides W_2C and Mo_2C which are formed on the tungsten-and molybdenum-monocrystals and are of a hexagonal structure (Reference 6). As it was not

Card 1/3

possible to confirm this latter assumption, the investigations on the carbides mentioned were continued. The photographs taken earlier by the authors and by A. P. Kuritsyna were analysed more carefully. The insufficiencies mentioned above were removed and another projector (figure 1) was used. The results leave no doubt that the observed hexagonal crystal presents a carbide of the described metals. It is now to be determined which carbide it is. Structure and position of the metal and the carbon atom is shown in figure 6. Therefrom the angles were calculated, which are formed by the axis "c" with the verticals to the most probable facets of both the lattice planes $(11\bar{2}0)$ and $(1\bar{1}00)$. Figure 7 shows the calculation results in diagrams. From the results the authors assume that the carbides are W_2C and Mo_2C. This is being confirmed in reference 13. The authors cannot understand the absence of the carbides WC and MoC, which should be present at the formation of W_2C and Mo_2C. The nature of the cubic, "rib-bearing" crystal is not clear either, which often preceded the hexagonal crystal. I. L. Sokol'skaya, B. G.

Card 2/3

Smirnov, N. A. Gorbatyy, G. N. Shuppe and the two authors took part in the discussion of this paper. There are 11 figures, 1 figure and 2o references, 12 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physical-Technical Institute AS USSR)

1. Single crystals--Analysis 2. Crystals--Lattices--Analysis 3. Tungsten carbide crystals--Analysis 4. Molybdenum carbide crystals --Analysis 5. Electron microscopes--Applications 6. Secondary emission

Card 3/3

SOV/20-123-4-10/53

9(3)
AUTHORS: Komar, A. P., Academician of the AS UkrSSR, Korobochko, Yu. S.

TITLE: On Two Processes Favoring the Capture of Electrons Under Betatron Conditions of Acceleration (O dvukh protsessakh, sposobstvuyushchikh zakhvatu elektronov v betatronnyy rezhim uskoreniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 4, pp 643-644 (USSR)

ABSTRACT: Various authors have already suggested mechanisms for the capture of electrons in a betatron (Refs 1-4). However, according to the opinion of the authors of the present paper, two more effects must be considered which may vary the amplitudes of the radial oscillations of the electrons considerably by the capture of part of these electrons. The first effect is shown by a diagram, which represents the orbit of the electron beam in the chamber during a period of the radial oscillations. In this case the orbit around which the radial oscillations happen to develop has the shape of a periodic curve, and its period is equal to that of the radial oscillations. The orbit of the electron is distorted under these conditions. The amplitude of the radial oscilla-

Card 1/3

66364

SOV/120-59-5-7/46

21,5300

AUTHORS: Komar, A.P., Stabnikov, M. V. and Yashin, D. A.

TITLE: A Controlled Diffusion Chamber

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5, pp 36-40 + 1 plate (USSR)

ABSTRACT: A description is given of the construction and the working properties of a diffusion chamber controlled by an ionization chamber. The ionization chamber is placed in the sensitive layer of the diffusion chamber and its action depends on the collection of electronic charges. A similar chamber has been briefly described by Block et al. (Ref 3). The diffusion chamber may be used in cosmic ray studies and in accelerator work. When ionizing particles pass through the ionization chamber and the sensitive layer of the diffusion chamber, electrical pulses appear at the output of the amplifier connected to the ionization chamber. The magnitude of each pulse depends on the energy lost by the particle in the gas and also on the working conditions and the construction of the ionization chamber. It is possible to choose pulses of given amplitude and use them to

Card1/2

SOV/48-23-7-15/31

24(7)

AUTHORS: Kocharov, G. Ye., Komar, A. P., Korolev, G. A., Marov, I. N., Surkov, Yu. A.

TITLE: The Fine Structure of the α-Spectrum of Th^{229} (Tonkaya struktura α-spektra Th^{229})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 855-858 (USSR)

ABSTRACT: The radioactive isotope Th^{229} is obtained by the α-decay of U^{233}; as the half-life of the latter is $1.62 \cdot 10^5$, that of Th^{229}, however, only 7,000 years, a large quantity of U^{233} is necessary for the exact determination of the activity of the isotope Th^{229}. A paper (Ref 1) is mentioned in which the α-decay of this isotope was investigated, but it did not deliver satisfactory results due to a poor resolving power. The present investigation was carried out with an ionization-α-spectrometer of high resolving power, and the chemical production of the isotope from oxides of the isotope U^{233} is described in detail. The isotope U^{233} investigated by the authors contains -

Card 1/2

Investigation of the Non-Steady-State Current in a Betatron

75331
SOV/57-29-10-8/18

current change. Measurements of this current show it to equal 50 to 60% of the maximum possible value of the orbital current. In the experiments described, no captured current was observed: not because it does not exist but because it was too small to be recorded by the measurement method used. Teumin, M. I., Oks, I.O., Kiselev, R. A., and Glushanok, Yu. B., helped in the study. There is 1 table, 6 figures, and 10 references, 5 Soviet, 4 U.S., and 1 British. The U.S. references are: Kerst, Rev. Sci. Inst., 21, 462, 1950; Widerøe, 74, [illegible] Kerst, Rev.Sci. Inst., 22, 762, 1951; Pease, Rev. Sci. Inst., 19, 133, J.Appl.Phys., 22, 362, 1951; Pease, Rev. Sci. Inst., 19, 133, 1948. The British reference is: Bowden, Proc. Phys. Soc., 63, 89, 1951.

ASSOCIATION: Leningrad Polytechnic Institute im. Kalinin (Leningradskiy politekhnicheskiy institut im. Kalinina)

SUBMITTED: August 20, 1958

Card 4/4

75333
SOV/57-29-10-10/18

9.3000

AUTHORS: Vorob'yev, A. A., Ivanov, B. A., Komar, A. P., Korolev, V. A.

TITLE: Influence of Ramsauer-Townsend Effect on the Mobility of Electrons in Spectroscopically Pure Argon

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1959, Vol 29, Nr 10, pp 1252-1258 (USSR)

ABSTRACT: The purpose of the paper is to verify the influence of Ramsauer-Townsend effect on the mobility of electrons in spectroscopically pure argon. The study is experimental in nature. The drift of electrons is measured as a function of E/p, where E is intensity of the electric field and p is barometric pressure of argon in the experimental chamber. The experiments were carried out for values of E/p between 0.001 and 1.5. At small values of E/p a maximum was observed similar to that obtained by other investigators. This maximum could be explained as the result of the Ramsauer-Townsend effect, or it might have been caused by the excitation of molecular levels owing to the presence of impurities in argon. For this reason industrial argon of 99.6% was also used. The ionization chamber was filled with argon at

Card 1/3

Inst. Acad. Sci USSR

SOV/56-36-1-11/62

21(8)
AUTHOR: Kocharov, G. Ye., Komar, A. P., Korolev, G. A.

TITLE: Energy Spectra of α-Particles of Long-Life Th^{232} and U^{238} Isotopes (Energeticheskiye spektry α-chastits dolgozhivushchikh izotopov Th^{232} i U^{238})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 68-75 (USSR)

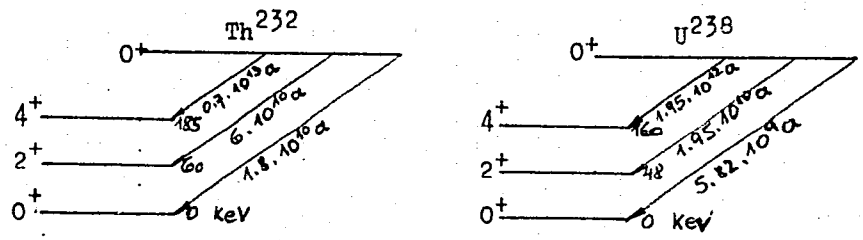
ABSTRACT: Investigation of α-spectra fine structure makes it possible to investigate the weakly excited states of heavy nuclei as well as the determination of several parameters of nuclear structure. As the magnetic spectrometers otherwise used are not suited for fine-structure investigations of α-spectra of long-life isotopes because of their low light intensity, and as the usual ionization chambers furnish a half-width of lines of only ~50 keV, the authors endeavored to produce a device having a better resolving power. In 1955 and 1956 they developed an ionization chamber in their laboratory, which had a grid for an α-line half-width of 30 keV (Refs 1-4), with the help of which it was possible to carry out an investigation of the fine structure of the α-spectra of Th^{232} and U^{238}. The present

Card 1/4

paper gives a very detailed description of the device and of its mode of operation. The following was investigated:
1) The α-transition to the first excited level of the daughter-nuclei of Ra^{228} and Th^{234}. Figure 4 shows the α-spectrum of Th^{232} (measuring time 25 hours), and figure 5 shows that of U^{238} (1.5 hours). For the former an α_1-intensity of (23±3) % is given, as well as an energy of the first level of (60±5) keV, for U^{238} an α_1-intensity of (23±4) % and an energy of the corresponding level of (48±5) keV.
2) Transition to the second level of the daughter nuclei of Ra^{228} and Th^{234}. Figure 6 shows N(E) for Th^{232} (measuring time 90 hours). Owing to the great light intensity and the good resolving power of the ionization chamber, the spectrum shows distinct peaks for $\alpha_1(2^+)$ and $\alpha_2(4^+)$. Figure 7 shows a similar spectrum for U^{238} (30 h). The following data are given: Energy of the second level (185±5) keV, intensity (0.2±0.08) % and (160±5) keV intensity (0.23±0.07) % respectively.
A comparison between experimental data and those calculated by Nosov (Ref 17) and Komar et al (Ref18) shows good agreement

Card 2/4

(see table). In conclusion, the following decay schemes are suggested for Th^{232} and U^{238}:



In conclusion, the authors thank Yu. A. Surkov for placing the thorium sources at their disposal, V. G. Nosov for discussions and for placing the manuscript of his paper at their disposal, and they further express their gratitude to

Ye. A. Damaskinskiy for his assistance and to V. A. Kireyev and S. N. Nikolayev for their advice. There are 8 figures, 1 table, and 21 references, 10 of which are Soviet.

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

SUBMITTED: August 8, 1958

24(7)
AUTHORS: Vorob'yev, A. A., Komar, A. P., Korolev, V. A., SOV/56-37-2-32/56
Solyakin, G. Ye.

TITLE: The α-Spectrum of the Natural Mixture of Isotopic Samarium

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 2(8), pp 546 - 548 (USSR)

ABSTRACT: In the present "Letter to the Editor" the authors report on investigations of the α-spectrum of Sm^{147} and the isotopic mixture by means of a pulse ionization chamber; the chamber was filled with chemically pure argon (99.9% Ar, $+O_2$, N_2, ...). The measured α-spectrum of Sm^{147} is shown by figure 1; it had a half width of 43 kev (when intensive α-emitters, as e.g. U^{234}, were used, the half width amounted to 30 kev). The energy of the α-particles of Sm^{147} was determined as amounting to (2.19 ± 0.01) Mev, which agrees well with the value mentioned in reference 6. Figure 2 shows the spectrum of the α-particles of the natural isotopic mixture (without collimation) with-

Card 1/2

The α-Spectrum of the Natural Mixture of Isotopic Samarium SOV/56-37-2-32/56

the energy interval of 2.0 - 2.8 Mev. The energy of the α-particles of Sm^{146} is (according to reference 7) equal to $\sim$ 2.55 Mev; knowledge of this fact and of the entire background (within the range of 1.5 - 2.5 Mev - 1 pulse/hour) makes it possible to evaluate the upper limit of the Sm^{146}-content in the natural isotopic mixture and thus to determine the half lives: $T(Sm^{147}) = 10^{12}$a and $T(Sm^{146}) = 5.10^{7}$a. The Sm^{146}-concentration in the natural isotopic mixture is not greater than $2.5.10^{-6}$ % (the number of α-particles originating from Sm^{146}-decay does not exceed the background). According to a mass-spectrometric analysis the content would amount to 8.10^{-5} % (Ref 8). There are 2 figures and 8 references, 1 of which is Soviet.

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

SUBMITTED: March 26, 1959

Card 2/2

-24 (3), 18 (7)

AUTHORS: Komar, A. P., Academician, AS UkrSSR, SOV/20-125-3-17/63
Volkenshteyn, N. V., Fedorov, G. V.

TITLE: The Change of the Sign of the Constant of Hall in the Ordering of Atoms in an Alloy (Izmeneniye znaka postoyannoy Kholla pri uporyadochenii atomov v splave)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 3, pp 530-531 (USSR)

ABSTRACT: The authors first mention some previous papers on this subject. The alloy Ni_3Mn is characterized by a dependence of its electric and galvano-magnetic properties on the spontaneous magnetization I_s and on the degree of the long-range order η. This dependence discerns this alloy from pure ferromagnetic metals and also from binary alloys of similar structure and composition. The Hall electromotive force E_H of the alloys Ni_3Mn was investigated for the cases of different heat treatment of the used samples in a wide temperature range down to the temperature of liquid helium. According to these investigations, E_H strongly depends

Card 1/3

on the manner of fixing the investigated state of the alloy. Even in the case of fixing the non-ordered state (hardening from high temperatures), the different rate of hardening exerts a great influence. If the alloy is quickly cooled from 800° to room temperature, the alloy is paramagnetic at this temperature. The Hall constant of this sample was positive and equal to $R_o = +0.09.10^{-12}$ v. cm/a. gauss. In the case of ferromagnetics, v_y (it seems to denote the Hall potential) is calculated according to the formula $v_H = \frac{R_o Bi}{d} + \frac{R_s \cdot 4\pi I_s i}{d}$. R_o denotes the ordinary Hall constant and R_s the Hall constant connected with the spontaneous magnetization I_s. R_o has an unusual, non-classical, positive sign. This fact agrees also with the results of American authors (Ref 7). The Hall electromotive force, which is due to the existence of I_s, was found only at low temperatures.

Card 2/3

The Change of the Sign of the Constant of Hall in the Ordering of Atoms in an Alloy

SOV/20-125-3-17/63

A diagram shows the curves for the dependence of E_H on B for a sample of Ni_3Mn of ordered grouping ($\eta \sim 1$) of the atoms. In this case, R_s is equal to $-0.637 \cdot 10^{-12}$ v.cm/a.gauss. The diagram contains also the similar curves for the sample if the degree of the long-range order is lower than 1. All the curves plotted for such a treatment of the alloy show a noticeable decrease of E_H if B increases. E_H passes through the value zero at the temperatures of liquid nitrogen and liquid helium. In the case of partially ordered states or of a mixture of ordered and non-ordered phases, E_H and v_H may be determined according to the above-mentioned formula. In the way discussed in the present paper, the shape of all the curves shown in the diagram may be qualitatively explained. There are 1 figure and 10 references, 6 of which are Soviet.

Card 3/3 Inst. Physics of Metals AS USSR,
Physics-Tech Inst AS USSR

21(7)

AUTHORS: Komar, A. P., Academician, Dragnev, T. N. SOV/20-126-6-23/67

TITLE: The Fine-structure of the Energy Spectrum of Photoprotons From Ca^{40} (Tonkaya struktura energeticheskogo spektra fotoprotonov iz Ca^{40})

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 6, pp 1234-1235 (USSR)

ABSTRACT: The energy- and angular distribution of photoprotons were investigated by the aid of photoemulsions NIKFI-22 (200μ) which were irradiated by γ-rays of the synchrotrone of the Fiziko-tekhnicheskiy institut AN SSSR (Physico-technical Institute of the AS USSR), the maximum γ-energy amounting to 85 Mev. The energy distribution shown in figure 1 was worked out according to the method by Ye. P. Ferreyra and P. Ya. Valoshek. The form of energy distribution, especially the peaks in the range of 9.5 to 12 Mev, are explained by the assumption that absorption of γ-quanta leads to the production of intermediate nuclei. The "plateau" in the range of from 7.5 to 9.5 Mev is explained by the appearance of photoprotons which correspond to the transitions of excited Ca^{40} levels to the first excited levels

Card 1/2

The Fine-structure of the Energy Spectrum of Photoprotons From Ca^{40}

SOV/20-126-6-23/67

of K^{39}. The functions developed by the method of the least squares for the angular distribution of photoprotons in various energy ranges between 3.4 and 10.8 Mev are specified, and by way of a conclusion it is stated that the considerable differences in the anisotropy of the angular distribution of the protons in the energy ranges (3.4 - 9.5 Mev) and (9.5 - 15 Mev) agree with the suggested explanation of the fine-structure. There are 1 figure and 2 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Physico-technical Institute of the Academy of Sciences, USSR)
Leningradskiy politekhnicheskiy institut im. M. I. Kalinina
(Leningrad Polytechnic Institute imeni M. I. Kalinin)

SUBMITTED: April 18, 1959

Card 2/2

~~18 (7), 24 (2)~~ 18.9100

AUTHORS: Komar, A. P., Academician, Academy of Sciences, Ukrainskaya SSR, Savchenko, V. P., Shrednik, V. N.

66450
SOV/20-129-3-18/70

TITLE: The Electron Autoemission Images of Crystals of Orderable Alloys

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 3, pp 540-543 (USSR)

ABSTRACT: New methods ought to be developed for the production of electron-autoemission images of metals with a melting point of less than 1500°. The method suggested by A. J. Melmed and R. Gomer (Ref 1) is suited only for pure metals. The authors developed a simpler and more universal method for the production of electronic autoemitters, which are suited for various single-phase metallic systems with a melting point of less than 1500°. By means of the usual production process using a vacuum breakdown the authors obtained projections on the surface of the tip on which autoelectronic emission occurs. The projections having a height of some hundreds Å have good contact with the tip and are therefore easily heated. In metals or alloys which have a higher vapor pressure ($p > p_{Ni}$) at room temperature, breakdown in the vacuum is easily produced.

Card 1/3

4

The Electron Autoemission Images of Crystals of Orderable Alloys

66450
SOV/20-129-3-18/70

Several figures show typical electron images recorded immediately after breakdown in the vaccum. The emission of electrons is the same for nearly all parts of the "pimples". In addition to the roughness of the surface, deep holes in the layers of the "pimples" occur on the surface. In the figures round, black spots correspond to these holes, which are displaced with the entire figure under the influence of a magnetic field. The homogeneity of the emission and the holes in the surface of the "pimples" show that the structure of the "pimples" within the limits of the resolving power of the electron projector is amorphous. Heating the points consisting of Ni_3Mn and $AuCu_3$ alloys to 40 to 60°, signs of a crystallographical limitation of the "pimples" occur. The equilibrium images resulting from an intense heating of the alloys Ni_3Mn, $AuCu_3$, $PtCu_3$ and the pure metals Ni and Au indicate that the "pimples" are well-bounded crystals. For the definite and final determination of the structure of the initial surface the authors intend carrying out investigations by means of an ion projector. In the alloy Ni_3Mn the diffusion

Card 2/3

4

21.5200
~~21 (3)~~

67259
SOV/20-129-4-21/68

AUTHORS: Komar, A. P., Academician of the Academy of Sciences, Ukrainskaya SSR, Stabnikov, M. V.

TITLE: The Variation of Pressure in a Diffusion Chamber Due to the Occurrence of Tracks, and the Possibilities of Its Utilization

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 4, pp 793 - 794 (USSR)

ABSTRACT: The sensitive volume of a diffusion chamber is usually filled with an oversaturated mixture of oversaturated vapors of the operational liquids and a gas. The operational liquids used are, above all, ethyl- or methyl alcohol, and according to the purpose for which the experiment is carried out any type of gas may be used. The partial gas pressure in the chamber is considerably higher than the partial pressure of the vapors of the operational liquid. In the course of the condensation of part of the vapor during production of the track in the sensitive layer, the latent condensation heat is emitted, the gas will become heated and pressure will increase. The "lifetime" of the increased pressure depends upon the rate of heat emission from the interior of the chamber. When using a microphone transmitter,

Card 1/3

The Variation of Pressure in a Diffusion Chamber Due to the Occurrence of Tracks, and the Possibilities of Its Utilization

SOV/20-129-4-21/68

the variation of pressure with respect to time may be recorded. The corresponding curve is illustrated in a diagram. Pressure variation in the chamber during production of a track of α-particles with an energy of 8 Mev is of the order of 10^{-6} mm Hg. This pressure variation may serve for the control of photographing the tracks with a previously determined ionization. The corresponding wiring diagram is shown in a figure. The position of the drop was recorded by means of a photoelectric resistor of the type FS-K1. The variations of temperature and gas pressure in the chamber are proportional to the particle energy if the entire track is located within the chamber. Thus, the particle tracks of a certain energy or nature, stars etc., may be selectively photographed by means of a device shown in a figure even in the presence of a background of α-radiation or of electrons. As the primary element for the pressure pulse is considerably more simple than e.g. an ionization chamber, the method suggested in this paper may be employed for the discrimination of

67259

The Variation of Pressure in a Diffusion Chamber Due to the Occurrence of Tracks, and the Possibilities of Its Utilization SOV/20-129-4-21/68

tracks in any laboratory. There are 2 figures and 1 Soviet reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences, USSR)

SUBMITTED: July 16, 1959

Card 3/3

67259

The Variation of Pressure in a Diffusion Chamber Due to the Occurrence of Tracks, and the Possibilities of Its Utilization SOV/20-129-4-21/68

tracks in any laboratory. There are 2 figures and 1 Soviet reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences, USSR)

SUBMITTED: July 16, 1959

Card 3/3

26.2312
9.3120 (1003, 1137, 1140)

S/109/60/005/008/003/024
E140/E555

AUTHORS: Komar, A.P., Savchenko, V.P. and Shrednik, V.N.

TITLE: Adsorption, Migration and Evaporation of Be Deposited on W monocrystal

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.8, pp.1211-1217

TEXT: The system Be-W is of interest for several reasons. Be is an alkali-earth metal and Be films should reduce the W work function; published measurements of Be work function date back 20 years; and the study of Be on W monocrystal would permit verification of Drechsler's calculations (Ref.7) concerning migration and evaporation of atoms on W monocrystals for the region of small adsorbate atomic radii. A study was accordingly carried out, using a Müller projector (Ref.8). Emission patterns were obtained showing the migration of beryllium over a tungsten monocrystal (Fig.1), the behaviour of thick films (Fig.2) and evaporation (Fig.3). It was found that Be work function is higher than that of W. (Preliminary results give $\varphi_{Be} = 5$ eV). It was further found that the work function of W is either increased or decreased by a beryllium monolayer, in dependence on crystallographic direction.

Card 1/2

S/109/60/005/008/021/024
E140/E355

9,3120 (1003, 1137, 1140)

AUTHORS: Komar, A.P., Savchenko, V.P. and Shrednik, V.N.

TITLE: A New Method of Preparing Field Emitters From Low-melting Point Metals and Alloys

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5, No. 8, pp. 1342 - 1346

TEXT: Field emitters of Ni_3Mn and similar materials have been prepared by the use of vacuum breakdown in a projector tube between a point of the investigated material (negative electrode) and the screen (positive electrode). A resistive or inductive element is used to restrict the breakdown to a local breakdown. This resulted in the formation of protuberances. A number of field emission patterns obtained in the projector tube are reproduced.
There are 3 figures and 7 references: 2 Soviet and 5 non-Soviet.

Card 1/2

Card 2/2

83673

S/048/60/024/009/006/015
B003/B063

24.6810

AUTHORS: Vorob'yev, A. A., Komar, A. P., Korolev, V. A.

TITLE: Investigation of the Alpha Decay of U^{235} by Means of an Ionization Alpha Spectrometer

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 9, pp. 1092-1098

TEXT: The present paper contains the results of an investigation of the α-decay of U^{235}, which was carried out by means of an ionization α-spectrometer. The spectrometer was tuned to a γ-spectrometer. The authors studied a spectrum without coincidence with γ-quanta (Figs. 1 and 2) and a series of γ-spectra coinciding with different groups of alpha particles (Figs. 3 and 4). A source enriched in U^{235} was used for the measurement. The spectral line of U^{234}(98%) showed, however, the highest intensity. It was used to stabilize the amplification factor of the amplifying part of the α-spectrometer. Besides, this line served as a standard for the

Card 1/2

83673

Investigation of the Alpha Decay of U^{235} by Means of an Ionization Alpha Spectrometer

S/048/60/024/009/006/015
B003/B063

measurement of the energies of U^{235} alphas. The energies, intensities, and forbiddances of the alpha groups are given in Table 1. The results of the analysis of the U^{235} α-spectrum agree with the results of Ghiorso although the latter are only of a qualitative character. The α-spectrum of U^{235} has been recently studied by S. A. Baranov and A. G. Zelenkov by means of a spectrometer of high luminous power. The energies of the lines they found are fairly consistent with the data obtained by the present authors. Table 2 gives the results of the determination of multipole or γ-transitions. On the basis of measurements of α- and γ-spectra, the authors suggest a possible α-decay scheme of U^{235} (Fig. 5). The levels were identified with the help of Nilsson's scheme. Though this identification cannot make a claim to finality, it does not contradict the experimental data available at present. The authors thank S. A. Baranov and A. G. Zelenkov for discussions and information, as well as M. F. Sobolevskaya for her assistance in the measurements. There are 5 figures, 2 tables, and 9 references: 3 Soviet, 3 US, and 1 Danish.

Card 2/2

21.2000

77325
SOV/57-30-1-4/18

AUTHORS: Denisov, S. G., Ivanov, D. P. , Komar, A. P., Korobochko, Yu. S.

TITLE: Investigation of Electron Distribution in a Batatron Vacuum Chamber

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 1, pp 31-36 (USSR)

ABSTRACT: The authors devised experiments to investigate the space charge distribution over the cross section of the chamber. During the injection time the electron distribution was studied with a fixed magnetic field while the distribution of the trapped electrons was studied during the work of the betatron and in the presence of γ-rays. All measurements were done on the betatron of the Leningrad Politechnic Institute (Leningradskiy politekhnicheskiy institut), with a maximum γ-ray energy of 15 mev. (1) Investigations of electron distribution over the chamber cross section at injection time: The block diagram is on Fig. 1. The probe is a molybdenum wire

Card 1/9

Investigation of Electron Distribution in a Batatron Vacuum Chamber

77325
SOV/57-30-1-4/18

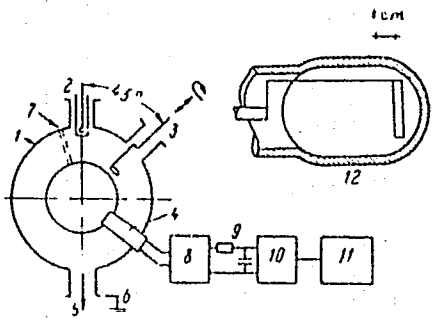


Fig. 1. (1) vacuum chamber; (2) injector; (3) probe; (4) coil; (5) pump connections; (6) grounding of the conducting coating of the chamber; (7) slit in the conducting coating; (8) and (10) preamplifier and amplifier; (9) integrating circuit; (11) oscillograph; (12) diagram of the probe position in the chamber.

Card 2/9

1.2 mm in diameter, with a 5 x 25 mm^2 stainless steel plate at the end. The current in the chamber is reduced by the amount of the charge caught by the probe, and this quantity is proportional to the density of electrons at the position of the probe. The size of the current is measured by means of a coil, wound around the chamber, whose signal after amplification and time integration is fed to the input of an oscillograph with slave scanning. The input signal is, at every moment, proportional to the instantaneous magnitude of the nonstationary current in the chamber. The apparatus registers the current distribution at the moment when the radius of the injected electrons is near the geometrical center of the cross section of the chamber. The injection impulse was nearly equal to a half-wave of a sinusoid of approximately 40 μ sec duration and of an amplitude 4 to 8 kv. Prior to measurements the injector is always adjusted to yield a maximum value of the nonstationary current for the given emission from the injector. Figures 2a and 2b represent the decrease in the nonstationary current, I,

as a function of the position of the probe. Curves are obtained for emission currents varying between 7 and 30% of the calculated limiting current. The authors explain that the variation in I/I_{max} with the injection current intensity, is due to the registration procedure they have chosen and not due to processes occurring in the camera. Figure 2b shows two clear minimums corresponding to the first and second electron revolution in the chamber. From the position of these and the position of the filament, the authors obtain 0.69 for the effective value of n over the gap width, and for the angle between the circle tangent to the filament and the direction of the beam axis, a value $\theta = -2.2^{\circ}$. This yields the beam regions for the first five turns plotted at the top of Fig. 2b., where the trapping angle for the beam is limited by the width of the chamber to 8.8°. Compared to this, the width of the minimum shows that the actual trapping width corresponds to a $\theta' = 4.5^{\circ}$. These regions are shown by thick lines on Fig. 2b.

Investigation of Electron Distribution in a Batatron Vacuum Chamber

77325
SOV/57-30-1-4/18

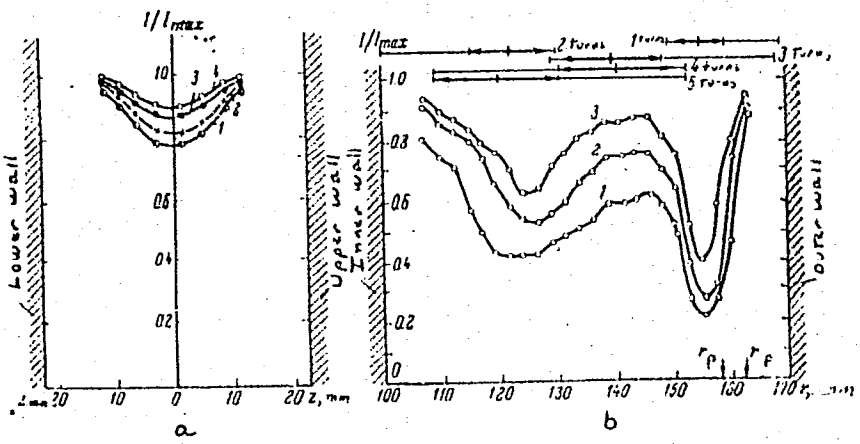


Fig. 2. (a): (1) $I_{em} = 0.07\ I_{lim}$; (2) $I_{em} = 0.16\ I_{lim}$; (3) $I_{em} = 0.25\ I_{lim}$; (4) $I_{em} = 0.3\ I_{lim}$ (b): (1) $I_{em} = 0.07\ I_{lim}$; (2) $I_{em} = 0.16\ I_{lim}$; (3) $I_{em} = 0.3\ I_{lim}$. r_f and r_p are radial coordinates of the injector filament and injector point nearest the orbit (similar in Fig. 4b).

Card 5/9

Investigation of Electron Distribution in a Batatron Vacuum Chamber

77325
SOV/57-30-1-4/18

Attempts to measure the probe current fail, mostly because of secondary electron emissions. (II) Distribution of trapped electrons: While the probe in the stationary magnetic field is almost completely transparent to electrons, which made some 10 turns, during the working cycle of the betatron the probe becomes completely opaque when at the place of the equilibrium radius, as seen in Fig. 4a and 4b. Figure 4b shows that electrons occupy practically the entire width of the chamber, and the largest electron current density is in the equilibrium region. This takes place also during the accelerating cycle. Detecting the γ -rays generated by means of a scintillation detector, the authors found rays of 4-5 mev energy hitting the probe during the acceleration process. The authors do not know the exact cause of the step to the left of the minimum of the equilibrium radius. They speculate that there may be two trapping orbits, or that for some values of the instantaneous radius and radial oscillation amplitudes, there may be a resonance value of 0.75

Card 6/9

Investigation of Electron Distribution in a Batatron Vacuum Chamber

77325
SOV/57-30-1-4/18

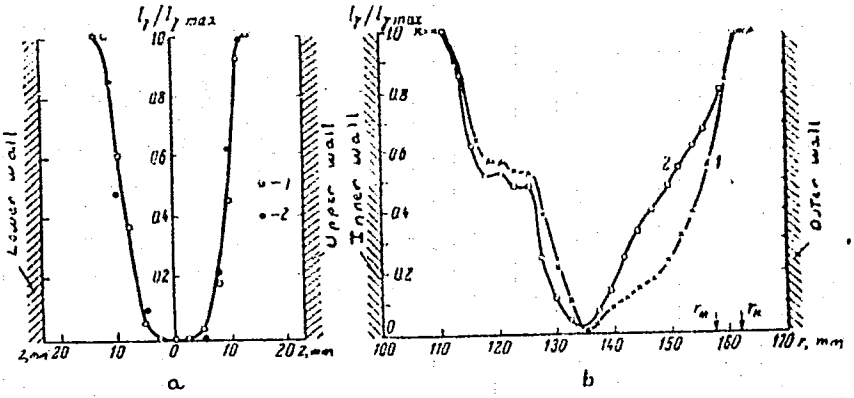


Fig. 4. (a): (1) energy of accelerated electrons, 5 mev; (2) energy of accelerated electrons, 15 mev; (b): (1) electron throw-off on external target; energy of accelerated electrons, 5 mev; (2) electron throw-off on inner wall of the chamber; energy of accelerated electrons, 5 mev.

Card 7/9

for the effective value of n. The difference in shape of curves 1 and 2, Fig. 4b, is due only to the fact that when the back side of the injector is used as the target, the γ -rays from the probe (which is also a target for electrons, see Fig. 3) miss the ionization chamber. There are 4 figures; and 3 Soviet references.

ASSOCIATION: Physico-Technical Institute AS USSR, Leningrad C. (Fiziko-tekhnicheskiy institut AN SSSR, g. Leningrad)

SUBMITTED: July 20, 1959

KOMAR, A.P., MIKHAYEV, G.F., FOMINENKO, V.P., CHERNOV, N.N.

New methods for investigating the process of injection of electrons into the betatron. Zhur. tekh. fiz. 30 no.7:855-859 Jl '60.
(MIRA 13:8)

1. Fiziko-tekhnicheskiy institut AN SSSR, Leningrad.
(Betatron)

84564

S/057/60/030/011/009/009
B006/B054

9,6150
21.5300 (1033, 1518)

AUTHORS: Komar, A. P. and Kruglov, S. P.

TITLE: A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons, and Its Investigation at $E_{\gamma max} < 100$ Mev

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 11, pp. 1369-1380

TEXT: The demands made on an instrument for measuring bremsstrahlung energy flux are theoretically met by the new quantum meter developed by Wilson (Ref. 7). Wilson tested the instrument in the $E_{\gamma max}$ range from 300 to 800 Mev. The present paper gives the results of quantum meter tests in the range $E_{\gamma max} < 100$ Mev, in which the independence of the instrumental factor on $E_{\gamma max}$ and on the diameter of the gamma beam at the input of the instrument is not so clear as at high energies. The authors also give a mathematically accurate theory for the quantum meter which was missing

Card 1/4

A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons, and Its Investigation at $E_{\gamma max} < 100$ Mev

S/057/60/030/011/009/009
B006/B054

in Ref. 7. In chapter I, they describe the operation of the quantum meter and the theory of transition curves, and discuss its use for energy flux measurement. The design of the quantum meter is illustrated in Fig. 2, and the instrumental factor (for argon, CO_2, and air filling) is thoroughly calculated. Table 3 compares the theoretical and experimental instrumental factors (for argon and air) in 10^{18} Mev/coulomb units. Chapter II describes the methods and results of the authors' experiments. Fig. 6 shows the experimental arrangement. First, the authors studied the dependence of the sensitivity of the quantum meter on a parallel shift of its axis with respect to the beam axis (Curve 1, Fig. 7). The curve obtained is symmetrical, and shows a minimum when displaced by about 7 cm. For comparison, the authors give the curve measured by Wilson at $E_{\gamma max} = 800$ Mev (Curve 3), as well as the curve obtained from an improved quantum meter; this curve (2) shows no minimum. The diagram of Fig. 8 illustrates the sensitivity of the instrument as a function of the angle of rotation round the beam axis. Fig. 9 shows $I_K/I_C = B(E_{\gamma max})/A$, where I_K/I_C is the ratio of the currents of the quantum meter and of the stand-

84564

A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons, and Its Investigation at $E_{\gamma max} < 100$ Mev

S/057/60/030/011/009/009
B006/B054

ard; $B(E_{\gamma max})$ is the constant of the standard for a given $E_{\gamma max}$, and A is the instrumental factor of the quantum meter (Table 3). Finally, the results are discussed in chapter III. The most important result of experiments made in the range $E_{\gamma max} = 53 \div 85$ Mev was that A showed a very small energy dependence, even at lower energies. At $E_{\gamma max} = 300$ Mev, for example, A is only 4.5% smaller than at $E_{\gamma max} = 85$ Mev. Some explanations are offered for the increase of A with decreasing $E_{\gamma max}$. I. Tamm and S. Z. Belen'kiy are mentioned. There are 9 figures, 3 tables, and 20 references: 5 Soviet and 15 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: March 25, 1960

Card 3/4

83570

S/056/60/038/005/003/050
B006/B070

24.6600
26.2211

AUTHORS: Bochagov, B. A., Komar, A. P., Solyakin, G. Ye.

TITLE: The Kinetic Energy of the Photofission Fragments of U^{238} 19

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1374-1380

TEXT: The authors report on investigations of the photofission of heavy nuclei, particularly U^{238}, carried out with the help of two pulsed ionization chambers. A block diagram of the experimental arrangement is shown in Fig. 1. The synchrotron of the FTI AN SSSR (Institute of Physics and Technology of the AS USSR) supplied 70 Mev gamma radiation. Uranyl nitrate in the natural isotopic composition in the form of a deposit on a cellulose film served as the target. The film was covered on both sides by thin sheets of aluminum. The thickness of the film together with that of the aluminum was 30 $\mu g/cm^2$. The thickness and the homogeneity of the uranyl-nitrate film were determined from the alpha spectrum of the natural uranium. Fig. 2 shows this spectrum taken from the side of uranyl nitrate. The thickness of the uranyl-nitrate film was 320 $\mu g/cm^2$. According to

Card 1/4

The Kinetic Energy of the Photofission Fragments of U^{238}

S/056/60/038/005/003/050
B006/B070

I. V. Chuvilo (Ref. 9), the fragment yield is due to U^{238} fission with an accuracy of 1% when uranium targets of natural isotopic mixture are used. In the experiments, every fission event is characterized by the energies E_1 and E_2 (corresponding to whether it was recorded in the first or in the second chamber). The distribution of the individual events in (E_1, E_2) is shown in Fig. 3 (contour diagram) as "horizontal" surfaces $W_{ik}(E_1,E_2)$, where $W_{ik} = n_{ik}/n_{ik\ max}$, and n is the number of events. The remarkable thing about the surfaces $W_{ik}(E_1,E_2)$ is their symmetry for reflection at the vertical plane containing the principal diagonal $(E_1=E_2)$. This symmetry shows the same emission probability of light and heavy fragments for a given direction. It follows from Fig. 3 that the most probable values of the energies of the fragments are 87 and 61 Mev. Fig. 4 which shows the fragment yield as a function of the masses $m_2/m_1 = E_1/E_2$, gives the value of the most probable mass ratio as 1.36. It is seen, therefore, that the ratio of the most probable masses (1.43) is not equal to the

The Kinetic Energy of the Photofission Fragments of U^{238}

S/056/60/038/005/003/050
B006/B070

most probable mass ratio. (The same is true also of the neutron-induced fission of U^{235} and U^{233}.) The W_{ik} surfaces are further characterized by the two symmetrically lying "hillocks" with "ridges" parallel to the coordinate axes. These diagrams have analogous forms for the neutron-induced fissions of other heavy nuclei. Fig. 5 shows the spectra of the total (kinetic) energy $\Sigma E = E_1 + E_2$ for different E_1/E_2; Fig. 6 shows the spectrum $\Sigma E = f(N)$. The peculiarities of the curves are discussed. Fig. 7 shows the fragment distribution $N = f(E_1)$; Fig. 8 shows the same for three different ranges of ΣE. These distributions have always two maxima of nearly the same height. The most probable value of ΣE is 150±2 Mev, the half widths of the high and low energy peaks are 17 and 19 Mev, respectively. The measured values and also those obtained after correction for the source thickness and ionization defects are collected in a table. Yu. Morozov and B. K. Gormin are thanked for technical assistance. There are 8 figures, 1 table, and 13 references: 6 Soviet, 4 US, 2 Canadian, and 1 German.

Card ~~3/4~~

Leningrad Phys.-Tech. Inst. AS USSR

24.6800
26.2222

S/056/60/038/005/052/057/XX
B006/B070

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye.

TITLE: Study of the Alpha Decay of U^{236} 19

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1436 - 1438

TEXT: The alpha spectrum of U^{236} was studied by means of a high resolution ionization chamber with grid. This chamber permits to determine the number of ion pairs formed by the alpha particles in the chamber. The ion pair number N and the alpha particle energy E are related by the equation $E = Nw$, where w is the energy required for the formation of an ion pair. w depends on the gas filling of the chamber and on the energy of the alpha particles. To separate the two effects, E is set equal to $Nw_o + \varepsilon_o$, where w_o is the mean pair formation energy for $E > 4$ Mev, and ε_o is a parameter depending on the nature of the gas. (ε_o = 83 kev for a mixture of argon and methane). The energy of alpha particles was determined from the

Card 1/3

84974

S/056/60/038/005/052/057/XX
B006/B070

Study of the Alpha Decay of U^{236}

relation $E_{236} = aE_{234} + \varepsilon_0'(1-a)$, where a is the pulse-height ratio of the alpha particles of U^{236} and U^{234}. Thus, E = (4.488 ± 0.003)Mev is obtained. Fig. 1 shows the spectrum of alpha particles for a channel width of 5 kev; the broken curves give the result of an analysis in which account was taken of the distortion of the spectrum due to the conversion electrons. The corresponding level scheme is shown in Fig. 3.

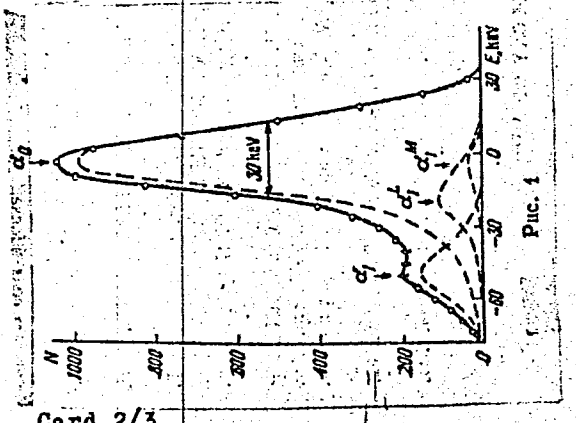


Рис. 1

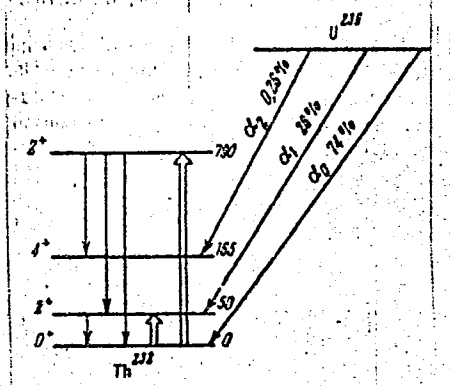


Рис. 3

Card 2/3

84914

Study of the Alpha Decay of U^{236}

S/056/60/038/005/052/057/XX
B006/B070

Fig. 2 shows the alpha spectrum taken for a channel width of 13.9 kev. The three alpha groups correspond to the transitions to 0^+, 2^+, and 4^+ level, respectively, of the Th^{232} nucleus. The distance of the α_2 group from the ground level is 160 kev; the intensity of this group is (0.26 ± 0.1)%. Professor S. A. Baranov is thanked for having supplied the U^{236} samples. There are 3 figures and 8 references: 2 Soviet and 6 US.

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

SUBMITTED: December 15, 1959

X

Card 3/3

KOMAR, A.P.

82602

S/056/60/039/01/11/029
B006/B070

24.6520

AUTHORS: Vorob'yev, A. A., Komar, A. P., Korolev, V. A.

TITLE: Measurement of the Energy of the α-Particles of an Emitter

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 1 (7), pp. 70-72

TEXT: The authors measured the α particle energies with the help of an α-spectrometer. The ionization was determined by comparing the pulse heights of the α particles with those of the generated pulses whose amplitude could be measured to an accuracy of ~ 0.01%. The chamber used was filled with 97% Ar and 3% CH_4. The width of the α line was 35 kev. Table 1 collects a number of relevant data. Th^{228} was chosen as a standard. In the first column of this table the energy values deduced by a magnetic analysis are given, the second column gives ionization I, and the third the energy calculated according to the formula (1) $(E_{st} - 84)/(E_{\alpha} - 84) = I_{st}/I_{\alpha}$, where E_{st} and E_{α} denote the α energies of the standard and the emitter under investigation. There is good

Card 1/3

Measurement of the Energy of the α-Particles of an Emitter

S/056/60/039/01/11/029
B006/B070

agreement between the first and the third columns, from which the conclusion is drawn that the method of energy determination from the ionization in the α spectrometer is suitable. The following results are obtained:

At^{217}: 7.064 ± 0.005 Fr^{221}: 6.336 ± 0.005

Po^{213}: 8.368 ± 0.010 U_{I}^{235} : 4.396 ± 0.003

U_{II}^{235} : 4.211 ± 0.003 U^{238} : 4.190 ± 0.005

These values are compared with the results obtained by other authors. Agreement is good in some cases and not so good in others. Some particular cases in this connection are discussed. Thus, for example, the values obtained for the two intensive U^{235} lines (I and II) diverge considerably from those obtained by magnetic spectrometer (Ref. 6). In connection with this, it is pointed out that the measurements lately made by S. A. Baranov, A. G. Zelenkov et al. (Ref. 8) of the α spectrum of U^{235} with a new magnetic spectrometer led to the following values:

82602

Measurement of the Energy of the α-Particles of an Emitter

S/056/60/039/01/11/029
B006/B070

E_I = 4.394 ± 0.002 and E_{II} = (4.213 ± 0.002) Mev, and these agree very well with those obtained in the present work. There are 2 tables and 9 references: 1 Soviet, 1 South African, 2 Canadian, and 5 American.

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

SUBMITTED: March 22, 1960

Card 3/3

24.6810

68980

AUTHORS: Komar, A. P., Academician of the AS UkrSSR, S/020/60/131/02/018/071
Krzhemenek, Ya., Yavor, I. P. B013/B011

TITLE: Photodisintegration of N^{14} Nuclei

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 131, Nr 2, pp 283 - 285 (USSR)

ABSTRACT: Certain facts concerning the photodisintegration of N^{14} nuclei had hitherto been unexplained. The present paper clarifies certain details of photodisintegration, especially the mechanism of the (γnp) reaction, which has a large yield. This photodisintegration was investigated here by means of a cloud chamber in a constant magnetic field (H = 6700 oersteds). These experiments were made with maximum γ- bremsstrahlung energy of 90 Mev. The photodisintegration were identified by comparing certain factors (as e.g. range, density of ionization, direction of the tracks, etc.). Moreover, the proton energy (determined from the curvature of the proton track in the magnetic field) was compared with the energy determined from the range of the recoil nucleus. In the (γnp) reaction these energies can differ greatly from one another. It is possible by this method to make a reliable distinction between the reactions (γp) and (γnp). Furthermore, it was possible to determine accurately the departure angles of the neutrons of the reaction (γnp). Table 1 contains the

Card 1/3

Photodisintegration of N^{14} Nuclei

68980
S/020/60/131/02/018/071
B013/B011

relative yields of the photonuclear reactions on nitrogen. These data were determined from 2633 photodisintegrations. The total absorption cross section of γ-quanta amounted to 9.8 ± 0.8 mb/Q. The total integral absorption cross section of γ-quanta on N^{14} (0.3 Mev.barn) determined by the authors in the experimental way is in good agreement with the corresponding theoretical value (0.29 Mev.barn). The proton yield at relatively high energies is very considerable. The dependence of the cross section of the reaction (γp) on the energy of the γ-quanta was determined from the energy spectrum of the photoprotons of the reaction (γp). The maximum of the cross section is found at the energy $\sim$ 23 Mev of the γ-quanta. The integral cross section of the reaction (γp) amounts to 0.07 Mev.barn. Figure 2 shows the angular distribution of the protons of the reaction (γp). For E_p from 0.4 to 50 Mev it can be described by the expression $1 + 1.3 \sin^2\theta + 0.16 \cos\theta$, and for $E_p > 10$ Mev $1 + 2\sin^2\theta + 0.25\cos\theta$ holds. The major part of the reactions (γp) on nitrogen is caused by a direct resonance process. All 12-Mev protons stem from the $p_{3/2} \rightarrow d_{5/2}$ transitions. Figure 1 shows the energy spectrum of the protons emitted in the reaction

Card 2/3

Photodisintegration of N^{14} Nuclei

S/020/60/131/02/018/071
68980
B013/B011

(γnp). The maximum of the proton-energy spectrum is found at proton energies of ~ 1.5 Mev. The neutrons are probably emitted with greater energies as compared with the protons. These and other results can be explained by the assumption that in most cases (~2/3) the reaction (γnp) proceeds as follows: A neutron is first emitted with relatively great energies, and thereupon a proton from the excited nucleus N^{13}. On the strength of data found here it is possible to estimate the contribution of the protons that depend on the "quasi-deuteron" mechanism of the interaction of γ-quanta with the nitrogen nuclei, and also the yield of protons with energies of more than 18 Mev can thus be estimated. This contribution is of the order of ~ 1%. Further data concerning other photodisintegrations of nitrogen are being worked out. There are 2 figures, 1 table, and 12 references, 3 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences of the USSR)

SUBMITTED: December 16, 1959

Card 3/3

S/020/60/133/04/12/031
B019/B060

AUTHORS: Komar, A. P., Academician of the AS UkrSSR, Makhnovskiy, Ye. D., Poddubnov, V. P.

TITLE: The Relative Yield and the Energy Distribution of Photodeuterons From Copper

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 4, pp. 797-799

TEXT: The authors measured the ratio between the photodeuteron yield and the photoproton yield from copper and the energy distribution of these particles at the maximum energy of the bremsspectrum of the 70 Mev gamma radiation. Basing on Fig. 1, the authors discuss details of the experimental setup. A special pulse method was developed for the identification of the particles, and formulas (1) and (2) are given for the calculation of the radius of curvature of the particle path in the magnetic field (11,500 oe) toward the emulsion. The authors worked with an НИКФИ-Я 2 (NIKFI-Ya2) 400 μ thick nuclear emulsion. Fig. 2 shows the radii of curvature as a function of the particle ranges in the emulsion and the

Card 1/2

The Relative Yield and the Energy Distribution of Photodeuterons From Copper

S/020/60/133/04/12/031
B019/B060

"error zone". The energy distribution of the identified protons that was obtained, is in good agreement with the results obtained by other authors. Fig. 3 shows the energy distribution of photodeuterons. In agreement with Byerly and Stephens (Ref. 1) the conclusion is drawn that the maximum of the energy distribution is below 4 Mev. The ratio of the deuteron yield with energies of 4 - 10 Mev and the proton yield of the same energy is found to be $0.07_8 \pm 0.04_1$. In the energy range of 3 - 10 Mev it is found to be $0.08_6 \pm 0.04_5$. There are 3 figures and 3 non-Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR
(Physicotechnical Institute of the Academy of Sciences, USSR)

SUBMITTED: May 3, 1960

Card 2/2

S/020/60/135/001/013/030
B006/B056

AUTHORS: Komar, A. P., Academician of the AS UkrSSR and
Makhnovskiy, Ye. D.

TITLE: The Fine Structure of the Energy Spectrum of Photoprotons and the Levels of the Li^6-Nucleus

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 1, pp. 52-54

TEXT: Following an earlier paper (Ref. 1), the authors report on measurements of the energy distribution of protons from Li^6 irradiated with gamma rays of the bremsstrahlung spectrum with $E_{\gamma max}$ = 28 Mev. The target, enriched in Li^6 to 90% was 8.6 mg/cm^2 thick. The protons were recorded by means of НИКФИ-Я2 (NIKFI-Ya2) nuclear emulsions (400 μ); the plates were orientated at an angle of 60° to the proton beam axis. Measurements were made on all tracks with a length of ≥ 4 μ, which began on the emulsion surface and satisfied the geometrical criteria. The plates were evaluated in 1350-fold enlargement. The background, due to $Li^6(\gamma,d)He^4$

Card 1/3

The Fine Structure of the Energy Spectrum of Photoprotons and the Levels of the Li^6-Nucleus

S/020/60/135/001/013/030
B006/B056

reactions, was about 1% less than 10% of the measured tracks due to photodisintegrations of the Li^7 admixture. The background due to the apparatus (scattered radiation) was $< 3\%$. The proton spectrum measured is shown in Fig. 1. The proton energy (Mev) was measured in the laboratory system. According to Refs. 2-4, the reactions (γ,n) and (γ,p) on Li^6 developed under formation of the non-stable nuclei Li^5 and He^6 especially in the ground state. The question is now discussed what E_p-peaks in the decay of these nuclei may occur in $\alpha+p$, also in the case of the formation of Li^5 and He^5 in excited states. The following E_p-peaks were measured: 4.1, 4.5, 5.5, and 11.6 Mev; determined levels: 11.2 and 18.3 Mev; proposed levels: 9.5 and 10.0 Mev. (According to Ref. 5 there exists a level with 9.3 ± 0.2 Mev and according to a paper by Ye. A. Al'bitskaya et al. one at 10 Mev). There are 1 figure, 1 table, and 5 references: 2 Soviet, 2 US, and 1 British.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: July 13, 1960

~~Card 2/3~~

S/020/60/135/002/011/036
B019/B077

AUTHORS: Komar, A. P., Academician of the AS UkrSSR, Krzhemenek, Ya., and Yavor, I. P.

TITLE: Photodisintegration of Ne^{22}

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 2, pp. 291 - 293

TEXT: The investigations of Ne^{22} photodisintegration were done in a cloud chamber which was placed in a magnetic field of 6700 oersteds. The isotopic mixture was composed of 89% Ne^{22}, 10% Ne^{20}, and 1% Ne^{21}. The maximum energy of the γ-beam was 90 Mev. Table 1 gives several relative outputs of the recorded photodisintegrations. The energy distribution of the photoprotons of the (γ, p) and (γ, pn) reactions are given along with their angular distribution. A short discussion of the results follows. There are 4 figures, 1 table, and 4 references: 3 Soviet and 1 US.

SUBMITTED: July 15, 1960

Card 1/2

Kinetic energy of Th^{232}...

The contour diagram for the fragment energy distribution shows that asymmetric, as well as symmetric fragmentations occur, and that the mass ratio m_2/m_1 diminishes as the mass of the disintegrating nucleus increases. For Th^{232}, U^{238} and Cf^{252}, m_2/m_1 is 1.56, 1.36, and 1.31, respectively. The figure 1.56 was determined from the fragment mass distribution. From the total energy distribution it can be seen that the most probable total energy $E = E_1 + E_2$ is lower and the half-width of the peak (45 Mev) higher, than the respective values for U^{238} photofission. The following numerical values for most probable fragment energy (Mev) were determined:

Heavy fragments: $52 + 2 + 6.8 = 61 \pm 2$
Light fragments: $89 + 2 + 5.6 = 97 \pm 2$
heavy + light f.: $143 + 2 + 12 = 157 \pm 3$

The authors thank the proton-synchrotron team of the FTI AN SSSR, and G. N. Nikolayev and K. Shvets for assistance. There are 4 figures, 1 table, and 4 references: 2 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: D. Hiller, D. Martin. Phys. Rev., 90, 581 (1953); R. Jensen, A. Fairhall. Phys. Rev., 109, 942 (1958).

Card 2/12

VOLKOV, Yu.M.; KOMAR, A.P.; KOROLEV, G.A.; KOCHAROV, G.Ye.

Application of an ionization γ-spectrometer with a time analyzer for half-life determinations. Izv. AN SSSR. Ser. fiz. 25 no.9:1188-1196 '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.
(Spectrometry)
(Radioactive substances--Decay)

S/057/61/031/001/016/017
B104/B204

21,2000

AUTHORS: Komar, A. P., Mikheyev, G. F., and Chernov, N. N.

TITLE: A System for the extremum control of the intensity of gamma radiation of a synchrotron

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 109-115

TEXT: The authors describe an extremum control system which had been constructed for the synchrotron of the institute mentioned under Association and which controls simultaneously two parameters which, essentially, determine the stability of the intensity of gamma radiation. In the first part of this paper, an extremum controller with one input parameter is studied. The so-called step modulation of the input parameter is mentioned as the most favorable control method. The injection time T is considered to be the input parameter. This injection time changes with a constant frequency and the amplitude δT. Thus, the initial quantity, i.e., the intensity of gamma radiation assumes the values I' according to the injection time T, and I" according to the injection time T + δT. The sign of the difference (I" - I') is determined from these values.

Card 1/ 7

A system for the extremum control...

S/057/61/031/001/016/017
B104/B204

If $(I'' - I') < 0$, the operating point is to the left of the extremum, and if it is > 0, it is to the right of it. Thus, $T = k\,\mathrm{sign}(\bar{I}'' - \bar{I}')$ (1), where T is the increment of the injection time, $\bar{I}''$ and $\bar{I}'$ are the mean values of the intensities corresponding to the injection times T and $T + \delta T$. For improving the quick response, the authors, in the scheme developed by them, used not only the sign of $(I'' - I')$ according to (1), but also the amount of this difference according to the relation $T = \frac{1}{k}(\bar{I}'' - \bar{I}')$ (2), where k is the negative feedback factor. In order that the quantity $\delta(\Delta T)$ be as small as possible, a high amplification factor is necessary for the feedback. A scheme based on this principle is shown in Fig. 1 as a block diagram, whereas in Fig. 2 it is shown as a circuit diagram. A parameter which just as important for a synchrotron, is the instant T_{hf} where the high-frequency voltage is connected to the resonator of the synchrotron. It is shown that for normal operation of a system of several extremum controllers the demand that the extremum controllers do not act upon one another need not necessarily be fulfilled.

Card 2/ 7

This demand may be satisfied if the extremum controllers operate alternatively. In this way, however, a reduction of the quick response is caused, and the question is examined how far an incomplete decoupling of the two extremum controllers is permissible. For this purpose, it is sufficient to modulate the two input parameters by means of another frequency. Fig. 3 shows a system of two extremum controllers which operate according to this principle. Blocks (1) and (2) correspond to blocks (1) and (2) in Fig. 1, the dashed blocks correspond to the dashed block in Fig. 1. By means of this extremum controller, T and T_{hf} are controlled, and the good results obtained from this controller are discussed. Scientific collaborator A. V. Kulikov is thanked for interest and advice. There are 4 figures and 5 Soviet-bloc references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad
(Institute of Physics and Technology AS USSR, Leningrad)

SUBMITTED: June 15, 1960