POZDNEYEV, Mark L'vovich; FLEROV, D.I., red.; KIMMEL', L.S., red. izd-va; GRECHISHCHEVA, V.I., tekhn. red.

[Using plastic and synthetic materials for repairing timber skidding tractors and logging motor vehicles]Primenenie plasticheskikh mass i sinteticheskikh materialov pri remonte trelevochnykh traktorov i lesovoznykh avtomobilei. Moskva, Goslesbumizdat, 1962. 122 p. (MIRA 16:3)
(Tractors--Maintenance and repair)
(Motor vehicles--Maintenance and repair)

RAYKHLIN, alman Tanfilovich, dots.[deceased];GOKHMAN,Shlem Moiseyevich, dots.; ZAYTSEV, Pavel Alekseyevich, nauchn. rab., inzn.; FLEROV, D.I., red.

[Basic ways of improving the maintenance and repair of lumbering machines] Osnovnye puti sovershenstvovaniia remonta i tekhnicheskogo obsluzhivaniia lesozagotovitel'nykh mashin. Moskva, Izd-vo "Lesnaia promyshlennost'," 1964. 132 p. (MIRA 17:7)

1. Kafedra ekonomiki i organizatsii proizvodstva Ural'skogo lesotekhnicheskogo instituta (for Raykhlin). 2. Zaveduyushchiy kafedroy tyagovykh mashin Ural'kogo lesotekhnicheskogo instituta (for Gokhman). 3. Ural'skiy lesotekhnicheskiy institut (for Zaytsev).

VOLYNETS, O.N.; KOLOSKOV, A.V.; FLEROV, G.B.; FRIKH-KHAR, D.I.; SHILIN, N.L.

Formational delineation of Tertiary plutonic and volcanic-plutonic formations in central Kamchatka. Dokl. AN SSSR 165 no.1:153-155 N '65. (MIRA 18:10)

1. Institut vulkanologii Sibirskogo otdeleniya AN SSSR. Submitted March 10, 1965.

VOLYNETS, O.N.; FLEROV, G.B.; FRIKH-KHAR, D.I.; SHILIN, N.L.

Evolution of the Tertiary igneous activity in the central range of Kamchatka. Geol. i geofiz. no.5:103-107 '63. (MIRA 16:8)

1. Kamchatskaya geologo-geofizicheskaya laboratoriya Sibirskogo otdeleniya AN SSSR.
(Kamchatka—Geology, Structural)
(Kamchatka—Rocks, Igneous)

FLEROV, G.B.; KOLOSKOV, A.V.

Potassium metasomatites in the ultrabasic rocks of the central range of Kamchatka. Izv. AN SSSR. Ser.Geol. 30 no.4:35-41 Ap '65. (MIRA 18:4)

1. Institut vulkanologii Sibirskogo otdeleniya AN SSSR, Petropavlovsk-Kamchatskiy.

FLEROV, G.M.; kand.tekhn.nauk

Investigating a plane with merging traces. Trudy GPI 14 no.7:7-12 '58. (MIRA 14:3)

(Geometry, Descriptive)

L 13219-65 EWT(m)/EWP(t)/EWP(b) DIAAP/IJP(c)/AFWL [illegible]

ACCESSION NR: AP4047420 S/0089/64/017/004/0310/0312 B

AUTHORS: Flerov, G. N.; Oganesyan, Yu. Ts.; Lobanov, Yu. V.; Kuz-[illegible], V. I.; Druin, V. A.; Perely*gin, V. P.; Gavrilov, K. A.; [illegible]yakova, S. P.; Plotko, V. M.

TITLE: Synthesis and physical identification of the isotope of the 104th element with mass number 260

SOURCE: Atomnaya energiya, v. 17, no. 4, 1964, 310-312

TOPIC TAGS: transuranium element, half life, spontaneous fission

ABSTRACT: In view of the fact that earlier estimates yielded a wide range of values for the half-life of the isotope 104^{260}, whereas experiments have shown that the element 102^{256} experiences spontaneous fission with a half-life of 1500 seconds, the authors developed a procedure for indicating the spontaneous fission, for use in searches

Card 1/3

for the 104th elements. The experiments were made with the internal beam of a 300-cm heavy-ion cyclotron. The target was Pu^{242} and Ne^{22} ions were used for bombardment, so that the investigated reaction was $Pu^{242}(Ne^{22}, 4n)104^{260}$. The equipment consisted essentially of a variable-speed belt conveyor to transport the reaction products from the target to the detectors. The fragment detectors were silicate and phosphate glasses. The distribution of the tracks over the detectors yields information on the lifetime of the nuclei synthesized in the reactions. The results of the experiments yielded a half-life of 0.3 ± 0.1 sec for the 104 element with mass number 260 under spontaneous fission. The correctness of the results was checked by studying the form of the excitation function, the cross sections at the maximum, and the lack of an effect in control experiments with other particles and other targets. The authors thank A. F. Linev, A. N. Filipson, I. A. Shelayev, and the cyclotron crew for reliable operation of the cyclotron, S. M. Polikanov and Ye. D.

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ACCESSION NR: AP4047420

4

Donets for a discussion of the experimental results, and OyYaI director Professor D. I. Blokhintsev and the State Committee on the Use of Atomic Energy in the USSR for support of the work." Orig. art. has: 3 figures.

ASSOCIATION: None

SUBMITTED: 29Aug64 ENCL: 00

SUB CODE: NP, IC NR REF SOV: 008 OTHER: 005

Card 3/3

FLEROV, K., prof.

Stone hieroglyphics of the history of the world. IUn.tekh. 5 no.7:46-48 Jl '61. (MIRA 15:1)
(Paleonthology--Juvenile literature)

ORLOV, Yu.A., otv. red.; GABUNIYA, L.K., red.; TROFIMOV, B.A., red.; FLEROV, K.K., red.; YANOVSKAYA, N.M., red.

[Tertiary mammals] Tretichnye mlekopitaiushchie. Moskva, Izd-vo "Nauka," 1964. 57 p. (Its Doklady sovetskikh paleontologov. Problema 8) (MIRA 17:6)

1. International Geological Congress, 22d, 1964.

FLEROV, G.N.

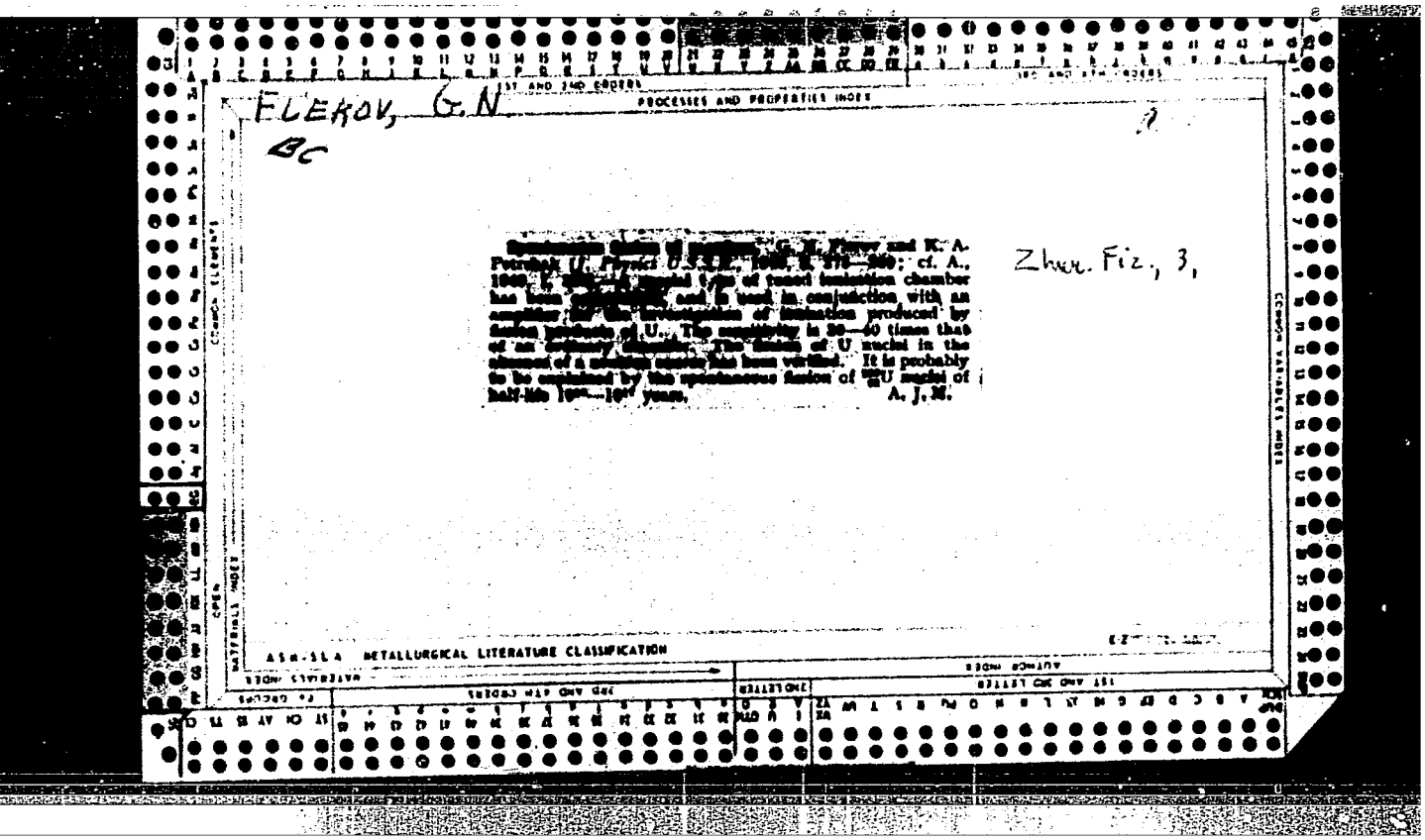
SA

A 53

Zhur. Eksper. i Teor. Fiz.,
2,

3787. Absorption of Slow Neutrons in Cd and Hg. G. Flerov. *J. of Exp. and Theor. Physics, U.S.S.R.* 9. 2. *pp.* 143-150, 1939. *In Russian.*—With the help of a special Li counter of which the construction and development are described, the absorption of thermal neutrons corresponding to 290° K. and 500° K. in B, Cd and Hg was investigated. The energy dependence of the absorption cross-section was found to correspond best to a breadth of the resonance energy level in Cd of $\sqrt{2}$ times the energy of the level. In Hg the results require at least two resonance capture levels, and the author finds that Bethe's calculation of the position of the resonance level is incorrect. D. S

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



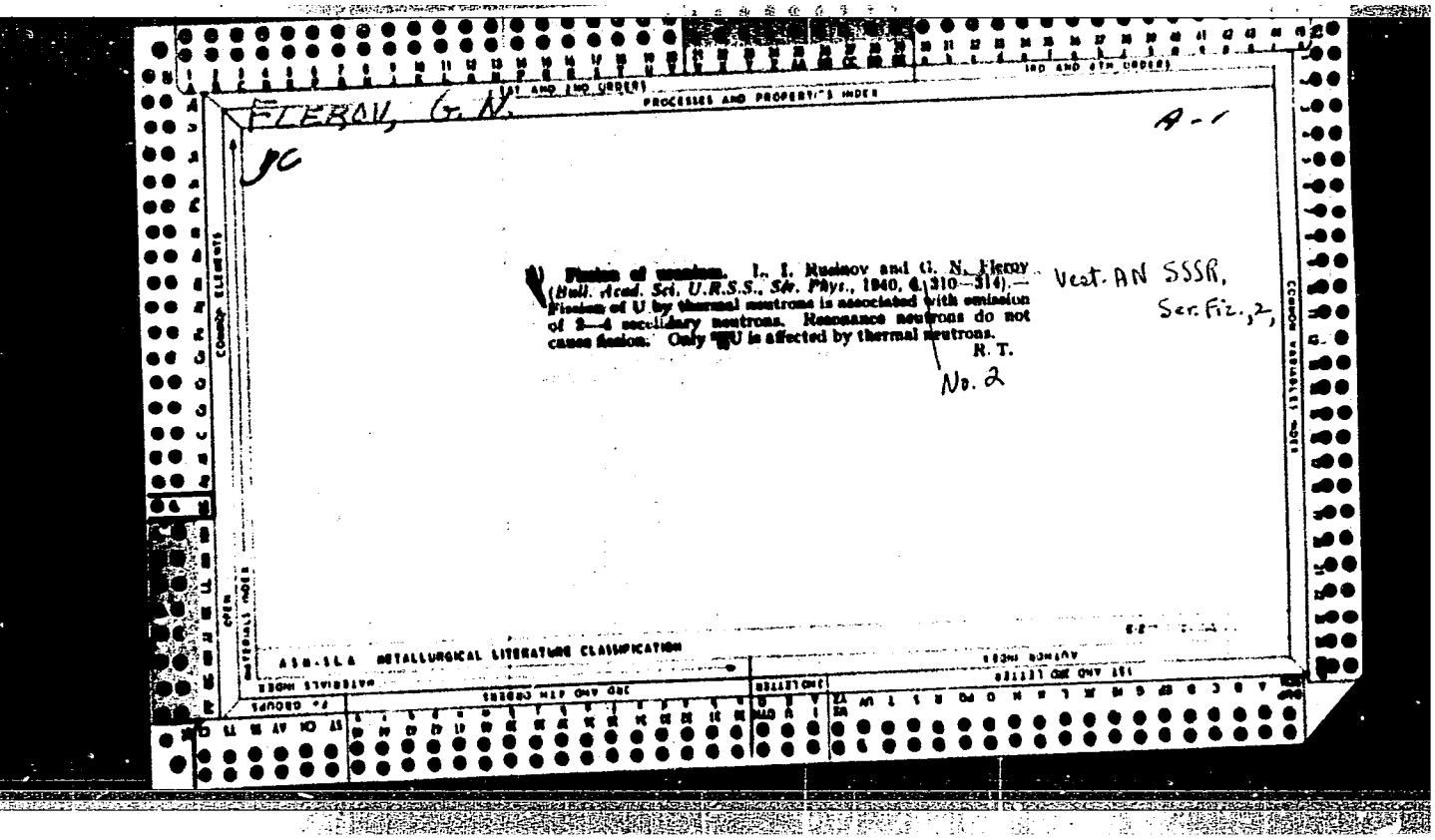
FLEROV, G.N

BC

PROCESSES AND PROPERTIES INDEX

Zhur. Fiz., 3,

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



FLEROV, G. N.

JC

A-1

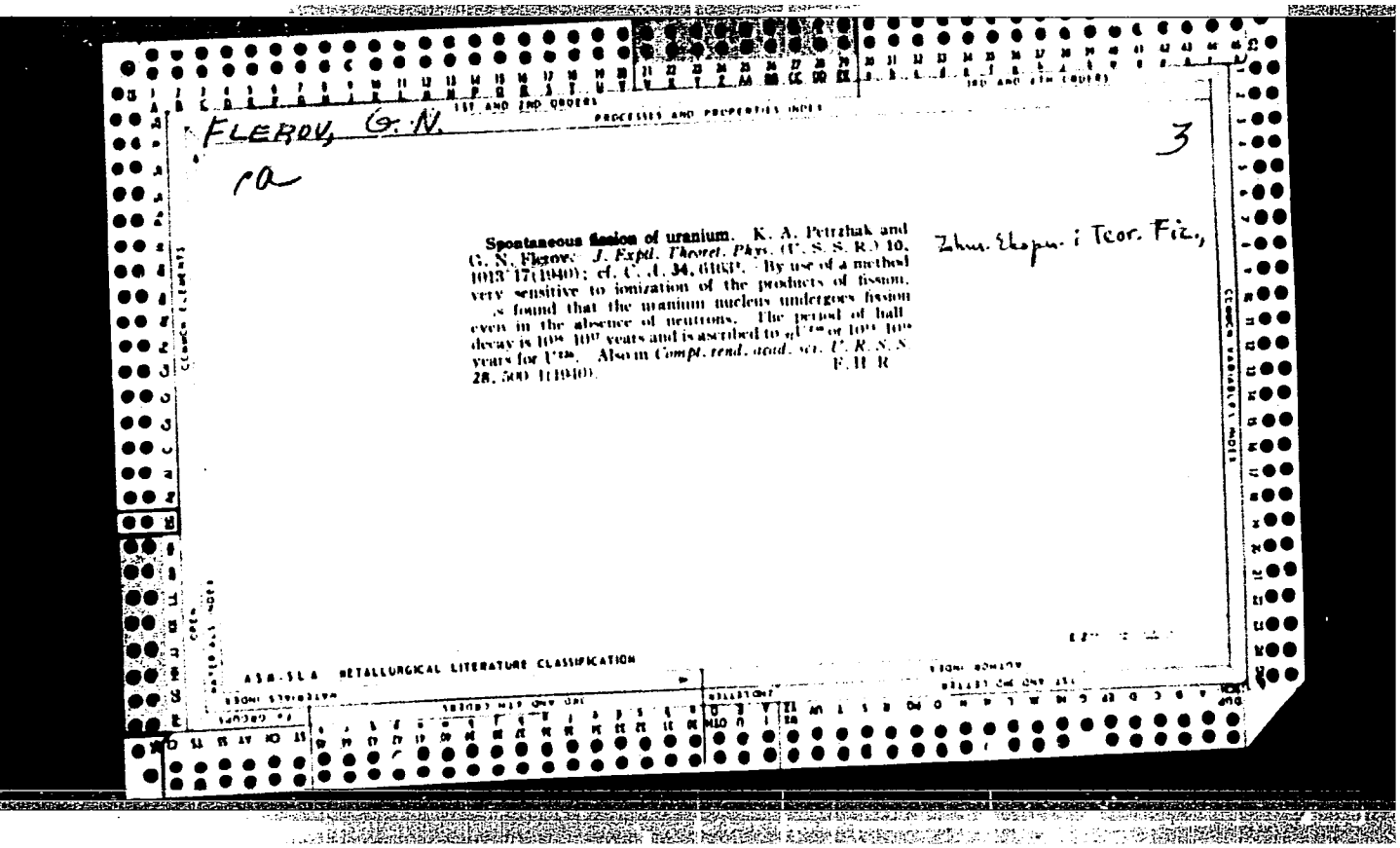
Fission of uranium. I. I. Guseinov and G. N. Flerov (*Bull. Acad. Sci. U.R.S.S., Sér. Phys.*, 1940, 4, 310–314).— Fission of U by thermal neutrons is associated with emission of 3—4 secondary neutrons. Resonance neutrons do not cause fission. Only ^{235}U is affected by thermal neutrons.

R. T.

Vest. AN SSSR, Ser. Fiz., 2,

No. 2

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



FLEROV, G.N.

ra

3

Spontaneous fission of uranium. K. A. Petrzhak and G. N. Flerov: *J. Expl. Theoret. Phys.* (U. S. S. R.) 10, 1013-17(1940); cf. C. A. 34, 6183⁸. By use of a method very sensitive to ionization of the products of fission, it is found that the uranium nucleus undergoes fission even in the absence of neutrons. The period of half decay is 10^{18}-10^{19} years and is ascribed to $_{92}U^{238}$ or 10^{15}-10^{16} years for U^{235}. Also in *Compt. rend. acad. sci. U. R. S. S.* 28, 500 (1940). F. H. R

Zhur. Eksper. i Teor. Fiz.,

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

FLEROV, G. N.

"On the Spontaneous Separation of Uranium," Dok, AN, 28, No. 6, 1940(Inst. for Research in Radium of the USSR Acad. of Scholars, member of)

SSSR,

pp. 500-501.

FLEROV, G. N.

"Absorption of Slow Neutrons by Cadmium and Mercury," Uspekhi Fiz. ⁊ Nauk, 1941.

FLEROV, G.N.

BC

A-1

Spontaneous division in thorium. I. S. Panasiuk and G. N. Flerov. (*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, **30**, 704—705).—Two large ionisation chambers with electrodes of area 5000 sq. cm. were used, and the relation no./magnitude of impulses was determined for both U and Th during neutron bombardment and without. It is concluded that the half-life of spontaneous fission is ~5×10^{16} years for U and $>10^{19}$ years for Th.

H. V. S.-H.

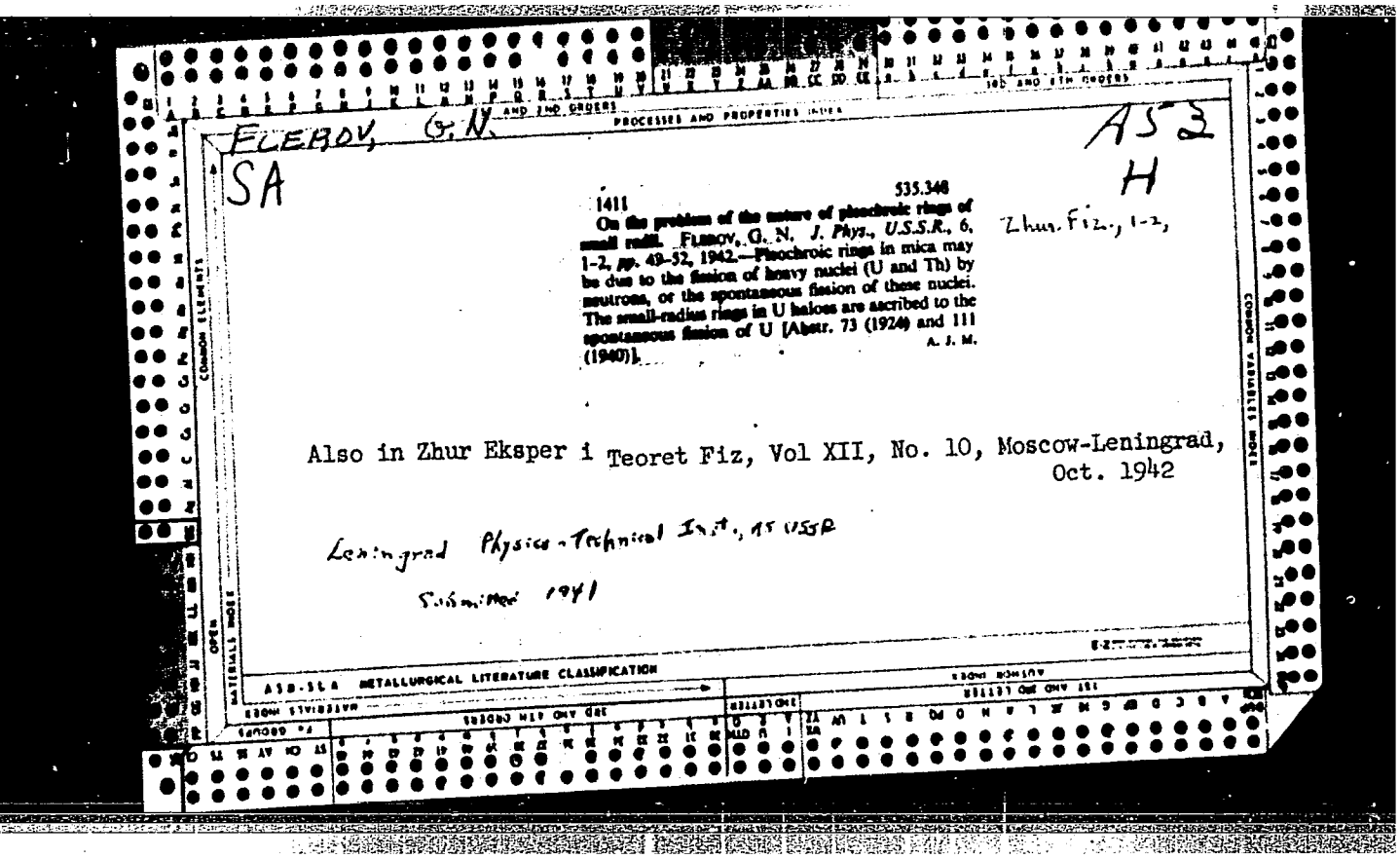
Dokl. AN SSSR, 30, 8,

No. 8

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

FLEROV, G. N.

"Spontaneous Fission of Uranium," Zhur. Fiz. 6, No. 1-2, 1942.



FLEROV, G.N.

AS2

H

SA

1411 535.348

On the problem of the nature of pleochroic rings of small radii. Flerov, G. N. *J. Phys., U.S.S.R.*, 6, 1-2, pp. 49-52, 1942.—Pleochroic rings in mica may be due to the fission of heavy nuclei (U and Th) by neutrons, or the spontaneous fission of these nuclei. The small-radius rings in U haloes are ascribed to the spontaneous fission of U [Abstr. 73 (1924) and 111 (1940)]. A. J. M.

Zhur. Fiz., 1-2,

Also in Zhur Eksper i Teoret Fiz, Vol XII, No. 10, Moscow-Leningrad, Oct. 1942

Leningrad Physico-Technical Inst., AS USSR

Submitted 1941

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

FLEROV, G.N.

BC

A1

Dokl. AN SSSR,

Spontaneous fission of uranium and thorium. G. N. Flerov (*Compt. rend. Acad. Sci. U.R.S.S.*, 1942, 37, 58; cf. A., 1941, I, 287; 1942, I, 5).—The possibility of a difference between the spectra of fragments produced by spontaneous fission and by induced fission is postulated and an explanation proposed. N. M. B.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Flerov, G.N.

2 Work of the Academy of Science of the U.S.S.R. on reactors with uranium-235 and plutonium-239 with hydrogen moderators. G. N. Flerov. *Conf. Acad. Sci. U.S.S.R. on Peaceful Uses of Atomic Energy, Session Div. Phys. Math. Sci.* 1955, 133–40(Pub. 1956)(Engl. translation).—See C.A. 50, 3098f.

1

FLEROV, G. N. and ALEKSEYEV, F. A.

"Possibilities for Extending the Use of Radioactive Radiations in Oil Prospecting and Oil-Field Development".

Report appearing in 1st Volume of "Session of The Academy of Sciences USSR on the Peaceful Use of Atomic Energy, 1-5 July 1955", Publishing House of Academy of Sciences USSR, 1955. p. 173-8

SO: Sum 728, 28 Nov 1955.

FLEROV, G. N.

62

The spontaneous decay of thorium. A. V. Podgurskaya, V. I. Kalashnikova, G. A. Stolyarov, E. D. Vorob'ev, and G. N. Flerov. *Zhur. Eksptl. i Teoret. Fiz.* 28, 603–5(1955).—The results of measuring the half-life of Th by using a multiple-layered variation of the ionization chamber (*C.A.* 35, 4677[1]) are given. These data are compared with data published earlier by Segrè (*C.A.* 40, 6000a). J. Rovtar Leach

(4)

FLEROV, G. N.

15-57-7-9952

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 7, pp 176-177 (USSR)

AUTHORS: Flerov, G. N., Alekseyev, F. A.

TITLE: Use of Radioactive Radiation in Exploration and Exploitation of Petroleum Deposits in the USSR (Ispol'zovaniye radioaktivnykh izlucheniy pri razvedke i razrabotke neftyanykh mestorozhdeniy v SSSR)

PERIODICAL: 4-y Mezhdunar. neft. kongress. Vol 2, Moscow, Gostoptekhizdat, 1956, pp 24-36

ABSTRACT: The advantages of radioactive electrical logging are examined by the authors. The use of radiometry for determining the position of the water-petroleum contact in strata intersected by a cased well is described. The problem is solved by methods of neutron gamma electrical logging and of induced activity. In both cases the water-bearing stratum is distinguished

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Use of Radioactive Radiation (Cont.)

from the petroleum-bearing stratum by the different NaCl content of the strata. The contacts can therefore be distinguished only where the formation waters are sufficiently mineralized. The water-bearing parts of the strata are marked by higher values on the curves of neutron γ-logging. The reason for this phenomenon lies in the fact that the Cl readily traps the fast neutrons and gives off a stable γ-radiation in the process. Na^{24}, which had a half-life of 15, is the index element for the method of induced activity. The activation of the Al of rock and cement and of the Mn contained in the casing pipes make the utilization of the Cl activation impossible. The use of radioactive isotopes for study of the state of wells (quality of cementing, inflows of liquids and movement of the liquid outside the case) and for showing permeable zones in the wells is considered. The radiometric instrument used in this work is described. The instrument, which has discharge indicators, is to be replaced by a more perfect one with luminescent indicators. The results of the first tests in the use of radiometric survey for

Use of Radioactive Radiation (Cont.)

petroleum prospecting are set forth. A minimum of intensity of γ-radiation, surrounded by an aureola of increased values of intensity, was obtained on the petroleum field of the investigated deposit.

M. V. Zaporozhets

Card 3/3

FLEROV, G. N. (Acad. Sci. USSR)

with KARMAUKHOV, V. A., "Interaction of Accelerated Nitrogen Ions with Bismuth Nuclei,"

with PARFANOVICH, D. M. and SEMCHINOVA, A. M., "Interaction of Accelerated Nitrogen Ions with Bismuth Nuclei,"

with BARABOSHKIN, S. A., DRUIN, V. A., KARAMYAN, A. S., and POLIKANOV, S. M. "Interaction between Nitrogen Nuclei and Heavy Elements Nuclei,"

with Basyuk, A. S., and Volkov, V. V., "Stripping Reaction Produced by the Accelerated Nitrogen Ions on Some Nuclei,"

with FILIPPOVA, K. V., GERLIT, Yu. B., GUSEVA, L. I., MYASOYEDOV, B. F., and TARANTIN, N. I., "Mass Distribution of Fission Fragments Formated by Nitrogen Ions on Gold and Uranium Nuclei,"

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

FLEROV, G. V., KLOCHKOV, D. S., SKOBKIN, V. S., TERENT'YEV, V. V.
(probably G. N.)

(Acad. Sci. USSR)

"On the Stability of Proton,"

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

FLEROV, G.N.

AUTHOR BARABOSHKIN, S.A., KARAMYAN, A.S., FLEROV, G.N. 56-6-4/56

TITLE Interaction Between Nitrogen and Gold Nuclei.- (Vzaimodeystviye yader azota s yadrami zolota -Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki,1957,Vol 32,Nr 6,pp 1294-1297 (U.S.S.R.)

ABSTRACT By using the source of multiply charged ions developed by Morozov (Atomnaia energiia,Vol 3,p 272(1957)) the authors obtained by means of the 150 cm cyclotron of the Academy of Science an intense bundle of monoenergetic ions of five-fold charged N^{14} with the energy of 115 MeV.This bundle was used for the following purposes: 1) Investigations of the dependences of the cross sections of the reactions Au(N,4n), Au(N,5n) and Au(N.6n) on the energy of the nitrogen ions. 2) Determination of the absolute cross sections of these reactions. 3) Determination of the principal mechanism of the interaction of heavy ions with gold nuclei.On the occasion of these experiments stacks of from 10 to 15 nickel foils with a thin coating of gold were irradiated.After irradiation the α-activity of the foil was determined by means of a photomultiplier with ZnS crystal and by means of an amplitude discriminator.The reactions were determined according to the half-value periods of the α-active isotopes concerned.

The thus obtained dependences of the cross sections of the above mentioned reactions on the energies of the nitrogen ions are illustrated by a diagram.The characteristic course taken by the curves with the maxima is due to the presence of competing reactions (with

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56-6-4/56

Interaction Between Nitrogen and Gold Nuclei.

emission of a different number of neutrons) and also to the fission of the composed nucleus.The sharp decrease of the cross section of the reaction (N,4n) at energies of more than 9o MeV is explained by the fact that within this energy domain the reactions with an emission of 5 neutrons predominate.In a similar manner also the decrease of the cross section of the reaction (N,5n) and (N,6n) at energies of more than 1oo and 11o MeV reppectively bay be explained. The curve for the dependence of the sum of the cross sections of all reactions (with emission of neutrons) upon the energy of the nitrogen ions has also a characteristic maximum.
(3 illustrations)

ASSOCIATION Not Given.
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SUBMITTED 21.1.1957
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Card 2/2

FLEROV, G.N.

AUTHOR DRUIN, V.A., POLIKANOV, S.M., FLEROV, G.N.

TITLE Nuclear Fission Induced by Accelerated Nitrogen Ions. 56-6-5/56
(Deleniye yader pod deystviyem uskorennykh ionov azota -Russian)

PERIODICAL Zhurnal Eksperim.i Teoret.Fiziki, 1957, Vol 32, Nr 6, pp 1298-1304
(U.S.S.R.)

ABSTRACT The introduction contains a short report on the stage to which the problem has hitherto developed. The present paper deals with the determination of the fission cross section of U^{235}, U^{238}, Bi, Au, Re and Yb under the influence of accelerated nitrogen ions in dependence on the energy of the nitrogen nuclei.
Experimental technology: The nitrogen ions were accelerated by means of a cyclotron with a pole diameter of 150 cm. The fission fragments were observed by means of an ionization chamber. Also the recording of nitrogen ions and the experiments on the exterior bundle are discussed. The targets consisted of aluminum disks of 14 μ thickness upon which the layers of the substance to be investigated are applied.
Experimental results: The here obtained data concerning the fission cross sections of U^{235}, U^{238}, Bi, Au, Re and Yb at different energies of the nitrogen nuclei are illustrated in form of diagrams. Also the statistical measuring errors are shown in these diagrams.
Discussion of results: When analyzing their experimental results, the authors based upon the fact that before the process of fissioning a highly excited nucleus with known values of the excitation energy and of the parameter Z^2/A are formed. Experimental investi-

Card 1/2

Nuclear Fission Induced by Accelerated Nitrogen Ions. [redacted] 56-6-5/56

gations of the interaction between the accelerated nitrogen ions and U^{235} and U^{238} nuclei showed that the products of those reactions at which there is no fission are created with a probability that is considerably lower (by about 100 times) than fission. The data obtained here make it possible to estimate the upper limit of the fission cross section of the uranium nuclei in consideration of their Coulomb excitation on the occasion of interaction with the accelerated nitrogen ions. Several special results are then dealt with.
(5 illustrations)

ASSOCIATION Not Given.
PRESENTED BY
SUBMITTED 12.1.1957
AVAILABLE Library of Congress.
Card 2/2

FLEROV, G.N.

56-2-4/47

AUTHOR: GERLIT, Yu.B., GUSEVA, L.I., MYASOYEDOV, B.F., TARANTIN, N.I., FILIPPOVA, K.V., FLEROV, G.N.

TITLE: Yield of Californium Isotopes Produced in the Interaction between Carbon Isotopes and Uranium Nuclei (Vykhody izotopov kaliforniya v reaktsiyakh vzaimodeystviya ionov ugleroda s yadrami urana. Russian)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 33, Nr 2 (8), pp 339 - 342 (U.S.S.R.)

ABSTRACT: In a 67 cm cyclotron four-fold charged carbon ions are accelerated up to 90 MeV. With this energy they impinge upon a thick uranium target and cause the reaction U(C, n)Cf. The absolute yields per impinging carbon ion and the following reactions are:

$U^{239}(C^{12}, 4n)\ Cf^{246}$ $1{,}5 \cdot 10^{-9}$

$U^{239}(C^{12}, 5n)\ Cf^{245}$ $\sim 3{,}0 \cdot 10^{-9}$

$U^{239}(C^{12}, 6n)\ Cf^{244}$ $\leqslant 9 \cdot 10^{-11}$

The fissioning of uranium bombarded with carbon was found to be $3{,}8 \cdot 10^{3}$ times more probable than the evaporation process of neutrons from the intermediary nucleus Cf^{250}.

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56-2-4/47

Yield of Californium Isotopes Produced in the Interaction between Carbon Isotopes and Uranium Nuclei

(With 1 table and 4 illustrations).

ASSOCIATION Academy of Sciences of the USSR (Akademiya nauk SSSR)

PRESENTED BY
SUBMITTED 5.3.1957
AVAILABLE Library of Congress

Card 2/2

FLEROV, G.N.

AUTHOR: PARFANOVICH,D.M., SEMCHINOVA,A.M., FLEROV,G.N. 56-2-5/47

TITLE: Determination of the Range-Energy Relation for Nitrogen and Oxygen Ions in Photographic Emulsions. (Opredeleniye zavisimosti probeg-energiya dlya ionov azota i kisloroda v fotoemulsii, Russian)

PERIODICAL: Zhurnal Eksperim.i Teoret.Fiziki, 1957, Vol 33, Nr 2, pp 343-345 (U.S.S.R.)

ABSTRACT: In a 150 cm cyclotron ions are first accelerated as doubly-charged ions, and they leave the cyclotron as six-fold charged ions. For monochromatization and after traversing an Al-filter of 5 μ thickness, they pass through a magnetic analyzer in the focus of which the photoplates are located. By means of this arrangement the range energy curve for nitrogen and oxygen was recorded within the energy range of from 3 to 120 MeV on Ilford E-1 plates. The accuracy with which each point on the curve was determined for ions with an energy exceeding 30 MeV amounts to 5%, and for ions with a lower energy it amounts to 10%. (With 1 Illustration).

ASSOCIATION: Academy of Sciences of the U.S.S.R. (Akademiya nauk SSSR)

PRESENTED BY:

SUBMITTED: 8.3.1957

AVAILABLE: Library of Congress

Card 1/1

FLEROV, G.N.

AUTHORS: Volkov, V.V., Pasyuk, A.S., Flerov, G.N. 56-3-7/59

TITLE: Evaporation Reaction in the Interaction of Accelerated Nitrogen Ions N^{14} with the Nuclei of Some Elements. (Reaktsiya "sryva" pri vzaimodeystvii uskorennykh ionov azota N^{14} s yadrami nekotorykh elementov)

PERIODICAL: Zhurnal Eksperim. I.Teoret.Fiziki, 1957, Vol. 33, Nr 3, pp. 595-601 (USSR)

ABSTRACT: N^{14}- ions are accelerated in the cyclotron up to ~100 MeV, after which they penetrate through Al., Ni, Cu, Ag, Cd, Sn- foils, on which occasion radioactive N^{13} was found. Measuring of angular distribution showed that N^{13} emerges only within a very narrow angular range. For Al $23^{o} \pm 8^{o}$ was measured as the most probable angle, where N^{14}- energy amounted to 67 MeV. The cross section for the evaporation reaction in the case of a N^{14} -energy of ~ 85 MeV amounted to 30 mb for Ni and 12 mb for Al. There are 5 figures and 2 Slavic references.

ASSOCIATION: AN USSR (Akademiya nauk SSSR)

SUBMITTED: March 19, 1957

AVAILABLE: Library of Congress.

Card 1/1

FLEROV, G. N. and POLIKHANOV, S. M.

"Nuclear Reactions Induced by Heavy Ions."

paper to be presented at 2nd UN Intl.' Conf. on the peaceful uses of Atomic Energy, Geneva, 1 - 13 Sept 58.

Flerov G. N.

AUTHORS: Tarantin, N. I., Gerlit, Yu. B., Guseva, L. I., 56-2-7/51
Myasoyedov, B. F., Filippova, K. V., Flerov, G. N.

TITLE: The Mass Distribution of Fission Products Produced by the Irradiation of Gold and Uranium by Nitrogen Ions (Raspredeleniye po massam produktov deleniya, obrazuyushchikhsya pri obluchenii zolota i urana ionami azota)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol 34, Nr 2, pp 316-321 (USSR)

ABSTRACT: The present work investigates the mass spectrum of the fission fragments of radon and einsteinium which are formed in the irradiation of gold and uranium with nitrogen ions. First the experimental method is discussed. Gold- and uranium plates of a thickness of 30 μ were irradiated with five-times charged nitrogen ions from a slit source at the inner ray of an 150 cm cyclotron. The energy of the nitrogen ions was 115 MeV. After the dissolution of the irradiated target the different radioactive elements on the corresponding carriers were dissolved. The radioactive

Card 1/3

isotopes were identified according to their half life. The relative yields of the nuclei identified this way are listed in a table. A diagram shows the yields of the nuclei given in this table as a function of the mass number A. The main part of the yield of fission products is concentrated within a comparatively narrow interval of mass numbers. The yield of fission fragments increases rather greatly with an increase of the mass number from 7o to 1oo, and with still greater mass numbers it decreases to the same extent. From the experimental values of the yields of single nuclei the total yields of the corresponding mass series (massovaya tsepochka) were computed. The additional taking into account of the yields of nuclei not identified in these experiments changes only little the character of the distribution of experimental points. The curve of the distribution of fission fragments in relation to the mass with the values A = 85 to 115 has the shape of a narrow peak with a half width of about 2o mass units. The yields of $Ga^{72,73}$, Se^{123}, Sb^{122} and the yields of the series of decays corresponding to these nuclei do not coincide with the monotonous course of the curve and are a little greater as normal. About 2o

The Mass Distribution of Fission Products Produced by the Irradiation of Gold and Uranium by Nitrogen Ions 56-2-7/51

different isotopes were identified among the fission products forming in the irradiation of uranium with nitrogen ions. The yields of the accumulated nuclei are collected in a table. The fission of nuclei under the action of heavy particles can be represented by the following scheme: Formation of a compound nucleus, emission of neutrons and fission. The half width of the curve of the distribution of fission fragments on the mass is considerably smaller in the fission of radon than in the fission of einsteinium. There are 2 figures, 2 tables, and 1o references, 4 of which are Slavic.

SUBMITTED: August 2o, 1957

AVAILABLE: Library of Congress

1. Gold-Irradiation 2. Uranium-Irradiation 3. Nitrogen ions-Applications 4. Isotopes-Determination

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20-1-19/58

AUTHORS: Flërov, G. N., Corresponding Member AN USSR, Klochkov, D. S., Skobkin, V. S., Terent'yev, V. V.

TITLE: The Spontaneous Fission of Th^{232} and the Stability of Nucleons (Spontannoye deleniye Th^{232} i stabil'nost' nuklonov)

PERIODICAL: Doklady AN SSSR, 1958, Vol. 118, Nr 1, pp. 69-71 (USSR)

ABSTRACT: First the authors shortly report on respective earlier works. Many a thing spoke in favor of the determination of the half-life period of the spontaneous fission of Th^{232} by means of an essential increase of the sensitiveness of the method. Such an increase of the sensitiveness can be reached by an increase of the total quantity of experimental material as well as by a decrease of the background. The advantages of proportional counters are mentioned. The counters used here were produced of thin aluminum tubes. Thorium was deposited in form of ThO_2 with bakelite lacquer on inner surface of the semi-cylindrical grooves in the cathode of the counter. As anode served Nichronium wires with a diameter of 50 μ. The counters were filled with methane and had a wide proportionality range. For the increase of the total quantity of the experimental material some counters of the same type were used. Special attention was paid to the decrease of the

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background. Possible reasons for errors e. g. neutrons, are pointed out. From the measurements discussed here the following results: the half-life period of Th^{232} is (if thorium suffers a spontaneous fission at all) more than 10^{21} years. If we accept the condition that thorium nuclei, because of the decay of a nucleon, are divided into lighter particles the life of the compound nucleon is more than 10^{23} years. By means of the here discussed method for the registration of rare fission acts the authors also searched for transuranium elements in monazite minerals. For this purpose monazites from different deposits of an age of more than 10^9 years were investigated. For the plutonium content a value of $< 10^{-10}$% was obtained. There are 5 references, 1 of which is Slavic.

SUBMITTED: October 4, 1957

AVAILABLE: Library of Congress

AUTHORS: Flerov, G. N., Corresponding Member, SOV/20-120-1-18/63
Academy of Sciences, USSR, Polikanov, S. M., Karamyan, A. S., Pasyuk, A. S., Parfanovich, D. M., Tarantin, N. I., Karnaukhov, V. A., Druin, V. A., Volkov, V. V., Semchinova, A. M., Oganesyan, Yu. Ts., Khalizev, V. I., Khlebnikov, G. I.

TITLE: Experiments on the Production of the 102-nd Element (Opyty po polucheniyu 102-go elementa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 1, pp. 73 - 75 (USSR)

ABSTRACT: The present paper describes the experiments carried out at the Institute of Atomic Energy, AS USSR (Institut atomnoy energii AN SSSR) for finding the new element with the atomic number 102; these experiments were carried out in autumn 1957. First the authors refer to the experiments carried out in the first half of 1957 at the Swedish Nobel Institute (Ref 1). In the experiments of the authors the plutonium isotopes Pu^{239} and Pu^{241} were irradiated with accelerated oxygen ions. Five times charged oxygen ions were by the 150-cm-cyclotron accelerated to 102 MeV. In most cases the ions with the maximum energy were used. The

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targets consisted of Pu^{239} or Pu^{241} layers which were 300 or 100 $\mu g/cm^2$ thick. The method used made possible the registration of an α-decay taking place within some seconds. At the collision of an oxygen ion with the energy of about 100 MeV with a plutonium nucleus such a great momentum is transferred to the intermediate nucleus that its range is greater than the thickness of the plutonium layer and of the protective copper layer. The nuclei formed in the irradiation of plutonium with a O^{16} beam were freely emitted from the target and fell on a collector where they came to a standstill at a certain depth. This collector was periodically applied to a thick-layered photoplate which was at a distance of 2 m from the target and which served for the registration of the α-particles resulting from the radioactive decay of the formed isotopes. The performance of the experiments is described in short. The method used in the present paper is suited for the registration of short-living α-active products of reactions with very small yields (up to cross sections of from 10^{-32} to 10^{-33} cm^2). Based on the analysis of the possible causes for the background and based on some control experiments the authors arrived at the following conclusion: the α-particles with an energy of $> 8,5$ MeV observed in the irradiation of

. Experiments on the Production of the 102-nd Element SOV/20-120-1-18/63

plutonium with oxygen ions most probably are connected with the decay of the isotopes of the 102-th element. Further control experiments with an improved method are planned. The authors thank I.V.Kurchatov, Member, Academy of Sciences, USSR, for his constant interest in this work. They also thank the collaborators under the supervision of Pustovoyt for the perfect operation of the cyclotron. There are 2 figures and 2 references, 1 of which is Soviet.

SUBMITTED: February 28, 1958

1. Plutonium isotopes (Radioactive)--Preparation 2. Plutonium isotopes (Radioactive)--Test results 3. Oxygen ions--Applications

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FLEROV, G. N.

21(0) PHASE I BOOK EXPLOITATION SOV/2081

International Conference on the Peaceful Uses of Atomic Energy, 2d., Geneva, 1958

Doklady sovetskikh uchenykh; yadernaya fizika (Reports of Soviet Scientists; Nuclear Physics) Moscow, Atomizdat, 1959. 552 p. (Series: Its: Trudy, Vol. 1) 8,000 copies printed.

Eds. (Title page): A.I. Alikhanov, Academician; V.I. Veksler, Academician; and N.A. Vlasov, Candidate of Physical and Mathematical Sciences; Ed. of this volume: S.I. Drozdov and B.P. Zaretskiy, Candidates of Physical and Mathematical Sciences; Ed. (Inside book): G.L. Smolyan; Tech. Ed.: Ye.I. Mazel'.

PURPOSE: This collection of articles is intended for scientific research workers and other persons interested in nuclear physics. The volume contains 43 papers presented by Soviet Scientists at the Second Conference on Peaceful Uses of Atomic Energy, held in Geneva in September 1958.

COVERAGE: It is divided into two parts. Part I contains 17 papers dealing with plasma physics and controlled thermonuclear Reactions, and Part II contains 26 papers on nuclear physics, including problems of particle acceleration and of cosmic ray physics. The first paper by L.A. Artsimovich presents a review of Soviet work on controlled thermonuclear reactions. The remaining papers in Part I deal with particular problems in this field. The papers in Part II deal in detail with various problems in nuclear physics, such as the fission of heavy atoms and their isotopes, and with the study of cosmic radiation by means of artificial earth satellites and rockets, described in a paper by S.N. Vernov. The Russian-language edition of the proceedings of the conference is published in 16 volumes. The first 6 volumes contain all the papers presented by Soviet scientists as follows: Volume (1), Yadernaya fizika (Nuclear Physics); Volume (2), Yadernyye reaktory i yadernaya energetika (Nuclear Reactor and Nuclear Power); Volume (3), Yadernoye goryucheye i reaktornyye metally (Nuclear Fuel and Reactor Metals), Volume (4), Khimiya radioelementov i radiatsionnykh prevrashcheniy (Chemistry of Radioelements and of Radiation Transformations); Volume 5, Radiobiologiya i radiatsionnaya meditsina (Radiobiology and Radiation Medicine); Volume (6) Polucheniye i primeneniye izotopov (Production and Use of Isotopes). The other 10 volumes contain selected papers presented at the Conference by non-Soviet scientists. In the present volume discrepancies between the English and Russian language edition of the proceedings have been noted in three articles where the texts are not identical; viz; Andrianov, et al, "High Current Pulsed Discharge"; Akhiyezer, et al, "High Frequency Plasma Oscillation"; and Bogolyubov, "Investigations of the Many-body Problem". The serial numbers of reports 2302 and 2504 are reversed in the English edition. Report 2211, by Sinel'nikov, et al, is numbered 2536 in the English edition.

TABLE OF CONTENTS:

Reports of Soviet Scientists; Nuclear (Cont.) SOV/2081

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FLEROV, G. N., ALEKSEYEV, F. A., DAKHNOV, V. N., GULIN, Y. A., SHIMKEVICH, Y. S.

"Using the Method of Atomic Physics in Oil Prospecting and Production."

Report to be submitted for the Fifth World Petroleum Congress, 30 May-5 June 1959. New York.

21(4), 7(5) SOV/89-6-3-10/29

AUTHORS: Leypunskaya, D. I., Gauer, Z. Ye., Flerov, G. N.

TITLE: Neutron Activation Analysis of Samples of Rock and Ore Concentrates (Neytronnyy aktivatsionnyy analiz obraztsov gornykh porod i rudnykh kontsentratov)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 3, pp 315-320 (USSR)

ABSTRACT: The rock samples are examined in a paraffin block which contains a Po+Be-neutron source and an irradiation duct. The neutron source emits $\sim 10^7$ n/sec. The material to be investigated is introduced into the duct and irradiated, according to what element is to be detected, approximately for 20 minutes. The forming activities are due to (nγ)- and (np)-reactions. The formed radioactivity is investigated as to its β- and γ-radiation. In order to be able to carry out better measurements of the β-energies the radioactive samples are powderized and filled into a cylindrical canning with double walls consisting of material which cannot be activated. The inner wall of the canning is produced from a thin foil. The thickness of the layer of the sample in the canning is greater than the maximum range of the β-rays. The length of the canning

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is ~8 cm. During the measurement the canning is moved over a thin-walled β-counter. The γ-radiation was measured by means of a scintillation counter combined with a one-channel amplitude-analyzer. The processes of measurement are described for the determination of aluminum, manganese, vanadium, silicon, and indium in rocks of complex composition. In this connection the concentration of these elements in the rock samples must be relatively high. The analysis can be carried out very rapidly since the most short-lived isotope of the element to be determined can be used as an indicator. The effect of interference activities is taken into account in every element to be determined and it is pointed out how this interference activity can be detected. The sensitivity of the developed method to the individual elements is the following: Al ~5%, Si 7 - 10%, V 10^{-1}%, In 10^{-2}% and Mn 10^{-2}%. By using the portable neutron multiplier described in reference 6 it is possible to increase the sensitivity of this activation method by 1 1/2 to 2 orders of magnitude, and thus also small concentrations of elements to be investigated can be detected. F. A. Alekseyev showed interest in this paper. There are 2 figures, 1 table, and 6 references, 3 of which are Soviet.

SOV/89-6-4-16/27

21(0)
AUTHOR: Parkhil'ko, V.

TITLE: The Fifth Session of the Scientific Council of the Joint Institute of Nuclear Research (Pyataya sessiya Uchenogo soveta Ob"yedinennogo Instituta yadernykh issledovaniy)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 4, p 479 (USSR)

ABSTRACT: The fifth session of the Scientific Council of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) was held from January 14 to 17, 1959. Lectures were held on the following important papers, which were also discussed: Professor V. P. Dzhelepov spoke about the results obtained by the work carried out by the Laboratoriya yadernykh problem (Laboratory of Nuclear Research). Investigations were carried out of: the elastic and inelastic scattering of nucleons on polarized and non-polarized particles, scattering of π-mesons on nucleons, processes of weak interaction in the presence of π-mesons, and the properties of π-mesons. The Director of the Laboratoriya teoreticheskoy fiziki (Laboratory for Theoretical Physics) Academician N. N. Bogolyubov, reported that the following subjects were investigated: general scattering theory, field theory, theory of elementary particles, nucleon structure, dispersion relations, use of the theory of superconductivity in investigations of nuclear matter. Academician V. I. Veksler reported on the work carried out by the Laboratory for High Particle Energies. A considerable amount of work was carried out for the purpose of fixing the normal operational conditions for the 10 bev synchrophasotron in order to be able, above all, to work day and night with this device. Moreover, a number of new physical devices was developed. The Scientific Council praised the work performed by work carried out by these 3 laboratories were outlined at the 2. Geneva Atomic Conference. I. M. Frank, Corresponding Member, AS USSR and Holder of the Nobel Prize, spoke about the progress achieved in building the impulse reactor at the Laboratoriya neytronnoy fiziki (Neutron-Physics Laboratory). This reactor differs essentially from a normal reactor and is especially well suited for work to be carried out in the field of neutron physics.

D. K. Fleyrov, Corresponding Member, AS USSR, gave a report about nuclear reactions with highly ionized particles. Work was carried out jointly by the USSR and the participating countries in the Laboratory of Nuclear Physics. The Scientific Council approved and confirmed the scientific building plans for 1959. The management of the Institute submitted a plan for the improvement of collaboration among the participants. The Scientific Council expressed its gratitude especially to the following persons: D. I. Blokhintsev, Director of the Institute, Corresponding Member, AS USSR; Vaclav Votruba, Deputy Director and Corresponding Member of the Czechoslovakian Academy of Sciences, and Professor Marian Danysz (Poland), Deputy Director.

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21(7)

AUTHORS: Flerov, G. N., Kalashnikova, V. I., Podgurskaya, A. V., Vorob'yev, Ye. D., Stolyarov, G. A.

SOV/56-36-3-11/71

TITLE: Neutrons of High Energies in Cosmic Rays (Neytrony bol'shikh energiy v kosmicheskikh luchakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 727-734 (USSR)

ABSTRACT: In 1945 Flerov and Stolyarov discovered that by cosmic radiation nuclear fission may be caused in the case of uranium and thorium. In the meantime, a number of experimental investigations was carried out for the purpose of determining that cosmic radiation component which is responsible for fission on heavy nuclei. This was also the task to be performed by the present paper. The authors used multi-layer ionization chambers to detect the effect of heavy nuclei fission in cosmic rays. They investigated the altitude dependence of fission in altitudes of 4700, 3860 and 2200 m above sea level (Pamirs, $\lambda = 28^{\circ}$) and 120 m above sea level ($\lambda = 52^{\circ}$). Figure 1 shows the calculated and measured dependence of the intensity of the fissioning component on altitude. The curves show a practically linear decrease of fission frequency with

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increasing atmospheric density, i.e. fission frequency increases linearly with altitude. Actually, fissions occur rarely, 1 - 2 fissions per 1 g of thorium within 24 hours. Further investigations deal with the angular distribution of the fissioning component. These investigations were carried out at 3860 m above sea level (Pamirs). Measuring results are shown in form of a diagram (Fig 2) where they are compared with the calculated curve. The two curves differ essentially from each other. Further investigations concern the energy- and momentum determination of the fissioning component. Results:

Absorber	thickness of absorber g/cm^2	range of fissioning component in g/cm^2 in consideration of the atomic weight of the absorber	
		experimental result	calculated result
Graphite	119 (126)	410±120	130
"	136 (144)	550±100	130
"	177 (188)	340± 90	130
"	195 (207)	410± 80	130
Aluminum	150 (120)	340±110	170
"	300 (240)	330± 85	170

The values in brackets are obtained if the atomic weight of the absorber is taken into account. In most cases of heavy nuclei fission, the latter is found to be caused by the nucleon component of cosmic radiation. The authors finally thank the staff of the Fizicheskiy institut AN SSSR im. P. N. Lebedeva (Physics Institute AS USSR imeni P. N. Lebedev), with whose assistance the majority of experiments in high altitudes was carried out, and they further thank Academician I. V. Kurchatov for his interest in this work. There are 3 figures, 1 table, and 7 references, 3 of which are Soviet.

SUBMITTED: September 2, 1958

21(7)

AUTHORS: Korneyev, Ye. I., Skobkin, V. S., Flerov, G. N. SOV/56-37-1-7/64

TITLE: Fission of Th^{232} by Thermal Neutrons (Deleniye Th^{232} teplovymi neytronami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 41-45 (USSR)

ABSTRACT: Thorium fission, induced by slow neutrons, has already been experimentally investigated by a number of papers, but no exact data have hitherto been obtained; for the Th^{232} fission induced by thermal neutrons the upper limit of the cross section is given as $2 \cdot 10^{-28}$ cm^2 (Ref 1). It was the aim of this paper to obtain more exact data. The authors succeeded in showing that the fission effect which occurs when thorium is irradiated with slow neutrons is in fact due to the fission of Th^{232} by thermal neutrons, which has already been pointed out by Flerov et al in a previous paper (Ref 4). The experimental arrangement is schematically shown by figure 1. As a neutron source, a beryllium cylinder (diameter 90 mm, height 80 mm) was used. A hole in the cylinder axis contained the γ-source (Sb^{124}-sphere of 19 mm diameter, activity 6 C).

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Fission of Th^{232} by Thermal Neutrons

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The intensity of the photoneutron source is given as amounting to 10^8/sec. A multilayer ionization chamber was used for recording (diameter 18 cm, height 15 cm). The thorium (as ThO_2) was applied to aluminum plates (total surface 2,300 cm^2). The total quantity of the active matter amounted to 2.5 g. The chamber itself was filled with technically pure argon (1 at). The neutron flux was determined by means of a similar chamber containing 2.4 g natural uranium. The results obtained by the experiments are given by a table. For the evaluation of the fissions induced by thermal neutrons a cadmium absorber was first used, which, however, proved to be less effective than boron, so that boron absorbers were used for the following experiments. For the fission cross section (0.06 ± 0.02) mb was obtained. The results obtained by the authors are compared with other available experimental data concerning the fission of even-even nuclei in thermal neutrons. Figure 2 for such fissions shows the ratio between fission cross section and compound nucleus formation cross section σ_f/σ_c in dependence on the difference $B_n - E_a$ (B_n - neutron binding energy, E_a -

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activation energy). For thermal neutrons, σ_c is near the radiation capture cross section. The results are finally briefly discussed. There are 2 figures, 1 table, and 7 references, 2 of which are Soviet.

SUBMITTED: February 9, 1959

21 (7)

AUTHORS: Mikheyev, V. L., Skobelev, N. K., Druin, V. A., Flerov, G. N. SOV/56-37-3-45/62

TITLE: On the Spontaneous Fission of Am^{241}

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 859 - 861 (USSR)

ABSTRACT: A number of heavy odd nuclei showing spontaneous fission has already been investigated by American authors. A short report is given on these investigations in the introduction. In the following, investigations carried out by the authors themselves are described. A gas scintillation counter was used as a detector for the fission fragments. The counter consisted essentially of a hermetically closed chamber filled with xenon, the glass window of which was connected to a photomultiplier; the inside of the window was covered by a layer of quaterphenyl ($\sim$50 $\mu g/cm^2$), which caused ultraviolet radiation to be transformed into visible light. The chamber was evacuated to $5 \cdot 10^{-6}$ Hg and then filled with Xe (2 atm). The FEU-33-type photomultiplier had a time resolution of $\sim 3 \cdot 10^{-9}$ sec. Recording of the

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fission fragments in the case of the strong α-background was carried out by means of a fast discriminator; a DGTs-7 diode served as nonlinear element in the circuit. The entire device was first tested by means of a Pu^{240} target and was calibrated with U^{235}(200 μg). The Pu^{240}-half life was determined as amounting to $1.2 \cdot 10^{11}$a, which agrees well with other measurements. For the purpose of determining the counting characteristic all counters were surrounded by paraffin, and Po+Be was used as a neutron source (cf. figure). It was found that in the transition from Pu^{240} to Am^{241} the characteristic practically did not change. Measurements on ~60 μg Am^{241} were carried out during 160 hours with a discrimination threshold of 4v. During this time 26 pulses were recorded; as shown by control tests, at least 18 of them originated from the background. Thus, the lower limit of the half-life of the spontaneous fission of Am^{241} is about $2 \cdot 10^{14}$a. The Cm^{242} impurity is estimated

at 10^{-10}%. In conclusion, the results are compared with those obtained by Segre; the authors thank V. F. Gerasimov for his advice in constructing the counters. There are 1 figure and 6 references, 1 of which is Soviet.

SUBMITTED: May 26, 1959

24.6520,24.6600,24.6500,
16.8100,16.8300,24.6720

76968
SOV/56-37-6-8/55

AUTHORS: Perelygin, V. P., Donets, E. D., and Flerov, G. N.

TITLE: Experiments in the Production of a New Fermium Isotope

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1558-1563 (USSR)

ABSTRACT: An investigation was made of the α -active products interaction between accelerated oxygen O^{16} ions and uranium U^{238} nuclei. The energy of accelerated oxygen ions was 84 - 98 mev, and the beam was monochromatic. The U^{238} targets were prepared by sublimation under vacuum and by precipitation with tetraethyleneglycol on an Ni holder. Targets had a thickness from 200 μ g/cm^2 to 800 μ g/cm^2 U^{238} atoms. The registration of α -decay was carried out by means of a fast and highly sensitive method, which was originally developed by G. N. Flerov, S. M. Polikanov, A. S. Karamyan, A. S. Pasyuk, D. M. Parfanovich, N. I. Tarantin, V. A. Karanaukhov,

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Experiments in the Production of a New Fermium Isotope

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V. A. Druin, V. V. Volkov, A. M. Semchinova, Yu. Ts. Oganesyan, V. I. Khalizev, and G. I. Khlebnikov (cf. Doklady Akad. nauk SSSR, 120, 73, 1958). The measurements gave some proof of the existence of a new fermium isotope Fm^{249} which possesses a half-life of about 150 sec and an α-particle energy of (7.9 ± 0.3) mev. The procedure for the identification of transuranium isotopes was based on the registration in photographic emulsions of their successive α-decays. V. V. Volkov, D. M. Parfanovich, S. M. Polikanov, A. M. Semchinova, and N. I. Tarantin participated in the discussion of the work. Three excitation curves are presented for reactions involving the emission of four and five neutrons. The paper contained 15 references, 4 Soviet, 1 Canadian, 1 U.K., 9 U.S. The 5 most recent U.S. references are: A. M. Friedman, J. E. Gindler, R. F. Barnes, R. Sjoblom, P. R. Fields. Phys. Rev., 102, 585, 1956; S. Amiel, A. Chetam-Strode, G. R. Choppin, A. Ghiorso, B. G. Harvey, L. M. Holm, S. G. Thompson. Phys. Rev., 106, 553, 1957; R. A. Glass, S. G. Thompson, . . .

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Experiments in the Production of a New Fermium Isotope

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SOV/56-37-6-8/55

G. T. Seaborg. J. Inorg. Nucl. Chem., 1, 3, 1955; A. Ghlorso, Proc. Conf. on React. Betw. Complex Nucl, Gatlinburg, Tennessee, 1958; T. D. Jackson. Can. J. Phys. 34, 767, 1956.

SUBMITTED: July 4, 1959

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FLEROV, G.N.; POLIKANOV, S.M.; KARAMYAN, A.S. [deceased]; PASYUK, A.S.; PARFANOVICH, D.M.; TARANTIN, N.I.; KARNAUKHOV, V.A.; DRUIN, V.A.; VOLKOV, V.V.; SEMCHINOVA, A.M.; OGANESYAN, Yu.TS.; KHALIZEV, V.I.; KHLEBNIKOV, G.I.; MYASOYEDOV, B.F.; GAVRILOV, K.A.

Experiments to produce element No. 102. Zhur. eksp. i teor. fiz. 38 no.1:82-94 Jan '60. (MIRA 14:9)

1. Sotrudniki Ob"edinennogo instituta yadernykh issledovaniy (for Polikanov, Oganesyan, Gavrilov). 2. Sotrudnik Instituta geokhimii i analiticheskoy khimii AN SSSR (for Myasoyedov).
(Transuranium elements)

OGANESYAN, Yu.TS.; LOBANOV, Yu.V.; MARKOV, B.N.; FLEROV, G.N.

[γ-Spektra in reactions with heavy ions] γ-spektry v reaktsiiakh s tiazhelymi ionami. Dubna, Ob"edinennyi institut iadernykh reaktsii, 1961. 16 p. (MIRA 14:11)

(Gamma rays—Spectra) (Nuclear reactions)

FLEROV, G.N

PHASE I BOOK EXPLOITATION SOV/5592

Vsesoyuznoye soveshchaniye po vnedreniyu radioaktivnykh izotopov i yadernykh izlucheniy v narodnom khozyaystve SSSR. Riga, 1960.

Radioaktivnyye izotopy i yadernyye izlucheniya v narodnom khozyaystve SSSR; trudy Vsesoyuznogo soveshchaniya 12 - 16 aprelya 1960 g. g. Riga, v 4 tomakh. t. 4: Poiski, razvedka i razrabotka poleznykh iskopayemykh (Radioactive Isotopes and Nuclear Radiation in the National Economy of the USSR; Transactions on the Symposium Held in Riga, April 12 - 16, 1960, in 4 volumes. v. 4: Prospecting, Surveying, and Mining of Mineral Deposits) Moscow, Gostoptekhizdat, 1961. 284 p. 3,640 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta Ministrov SSSR. Gosudarstvennyy komitet Soveta Ministrov SSSR po ispol'zovaniyu atomnoy energii

Eds. (Title page): N. A. Petrov, L. I. Petrenko, and P. S. Savitskiy; ed. of this volume: M. A. Speranskiy; Scientific ed.: M. A. Speranskiy; Executive Eds.: N. N. Kuz'mina and A. G. Ionel';

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Radioactive Isotopes and Nuclear (Cont.) SOV/5592

Tech. Ed.: A. S. Polosina.

PURPOSE : The book is intended for engineers and technicians dealing with the problems involved in the application of radioactive isotopes and nuclear radiation.

COVERAGE: This collection of 39 articles is Vol. 4 of the Transactions of the All-Union Conference of the Introduction of Radioactive Isotopes and Nuclear Reactions in the National Economy of the USSR. The Conference was called by the Gosudarstvennyy nauchno-tekhnicheskiy komitet Sovet Ministrov SSSR (State Scientific-Technical Committee of the Council of Ministers of the USSR), Academy of Sciences USSR, Gosplan SSSR (State Planning Committee of the Council of Ministers of the USSR), Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu (State Committee of the Council of Ministers of the USSR for Automation and Machine Building), and the Council of Ministers of the Latvian SSR. The reports summarized in this publication deal with the advantages, prospects, and

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development of radioactive methods used in prospecting, surveying, and mining of ores. Individual reports present the results of the latest scientific research on the development and improvement of the theory, methodology, and technology of radiometric investigations. Application of radioactive methods in the field of engineering geology, hydrology, and the control of ore enrichment processes is analyzed. No personalities are mentiond. There are no references.

TABLE OF CONTENTS:

FLEROV, G.N.

S/169/62/000/005/041/093
D228/D307

AUTHORS: Alekseyev, F. A., Gulin, Yu. A., Dakhnov, V. N., Flerov, G. N. and Shimelevich, Yu. S.

TITLE: Use of methods of atomic physics in seeking and exploiting oil and gas

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 5, 1962, 39, abstract 5A294 (V. sb. 5-y Mezhdunar. neft. kongress, v.I, M., Gostoptekhizdat, 1961, 325-338)

TEXT: The results of the application of radioactive methods in the oil and gas industry are reviewed. The accuracy of estimating the rock porosity from radioactivity logging data depends on a number of causes of a geologic and a tectonic character: The salinity of the stratal waters and the drilling solution, the chemical composition of the rocks, borehole-design, the position of the instrument in it, etc. The depth potential of all radioactivity logging methods is very small: In neutron-gamma logging it comprises 10 - 30 cm, while in gamma-gamma logging it is 5 - 8 cm. It is noted

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Use of methods ...

that in porosity measurements the gamma-gamma logging and the neutron-neutron logging methods are more sensitive than neutron-gamma logging, especially in the region of high porosity values. Side by side with the advantages of the methods of neutron-neutron logging and gamma-gamma logging against neutron-gamma logging (the absence of any influence of the mineralization of stratal waters and drilling solutions on the readings, the high sensitivity) they have an essential defect -- to wit, the strong influence of the borehole design on the measurements results. The reliability of the results of porosity determinations rises considerably if a complex, consisting of neutron-neutron and gamma-gamma logging, is used. A complex device, whose design is given and which ensures the simultaneous recording of neutron-neutron and gamma-gamma logging diagrams, has recently been developed; it is intended for obtaining data about the rock porosity in unstrengthened wells. The movement of the oil-water and the gas-liquid contact zone during the exploitation of oil and gas fields can be successfully followed by means of radiometric methods. The most sensitive method of separating sand and carbonate beds into the oil- and water-bearing parts at

S/169/62/000/005/041/093
D228/D307

the present time is the induced activity technique, whose survey depth amounts to 15 - 20 cm. The methods of neutron-gamma logging and neutron-neutron logging are less sensitive; they are being used in fields with sandy collectors, saturated with highly mineralized stratal waters containing more than 150 g/l of NaCl. At the present time it has become possible to determine quite rapidly and accurately the content of Al, Na, Cl, Si, Ca, Mg, Fe, Cu, Br, I, Dy, Eu, V, and other elements in rock samples by radioactive methods, using powerful neutron sources. Radioactive isotopes are being applied in oil-industrial practice to control a well's technical state, to fracture beds hydraulically, and to solve other geologico-technical problems in petroleum extraction. Research into the possibility of applying radiometry for direct oil and gas searches is cited. It is established that in the vicinity of oil fields radiometric anomalies are a particular case of the general geochemical anomaly indigenous to the latter. Hence the radiometric method should be considered as a composite part of the radio-geochemical procedure for seeking oil and gas fields. [Abstracter's note: Complete translation.]

Card 3/3

FLEROV, G.N.; VOLKOV, V.V.; POMORSKIY, L.; TYS, Ya.

Production of N^{17} nuclei by irradiation of some elements with heavy ions. Zhur. eksp. i teor. fiz. 41 no.5:1365-1369 N '61. (MIRA 14:12)

1. Ob"yedinennyy institut yadernykh issledovaniy. 2. Sotrudnik TSentral yadernykh issledovaniy v Krakove, Pol'sha (for Pomorskiy). 3. Sotrudnik Instituta yadernykh issledovaniy v Varshave, Pol'sha (for Tys).

(Nitrogen--Isotopes)
(Ion beams)

PETRZHAK, K.A.; FLEROV, G.N.

Spontaneous fission of atomic relief nuclei. Usp. fiz. nauk 73 no.4:655-683 Ap '61. (MIRA 14:4)
(Nuclear fission)

OGANESYAN, Yu.TS.; LOBANOV, Yu.V.; MARKOV, B.N.; FLEROV, G.N.

[Gamma radiation of high-spin nuclei] γ-izluchenie iader s vysokim spinom. Dubna, 1962. 13 p. (MIRA 16:10)
(Nuclear spin) (Gamma rays)

FLEROV, G.N.; KARNAUKHOV, V.A.

[Effect of large angular momenta in nuclear reactions with heavy ions]Effekt bol'shikh uglovykh momentov v iadernykh reaktsiiakh s tiazhelymi ionami; doklad, predstavlennyi na Mezhdunarodnyi simpozium po priamym vzaimodeistviiam i mekhanizmam iadernykh reaktsii (Padua). Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1962. 14 p. (MIRA 16:10)
(Nuclear reactions)

VOLKOV, V.V.; POMORSKIY, L.; TYS, Ya.; FLEROV, G.N.; SARANTSEVA, V.R., tekhn. red.

[Transfer reactions of 2n and 3n by irradiation of Al, Cu, and Ta with N^{15} and N^{14} ions] Reaktsii peredachi 2n i 3n pri obluchenii Al, Cu, Ta ionami N^{15} i N^{14}. Dubna, Ob"edinennyi in-t iadernykh issl., 1962. 17 p. (MIRA 15:6)

1. Institut yadernoy fiziki, Krakov, Pol'sha (for Pomorskiy).
2. Institut yadernykh issledovaniy, Varshava, Pol'sha (for Tys).
(Nuclear reactions) (Neutrons) (Ions)

S/029/62/000/005/002/003
D045/D114

AUTHOR: Flerov, Georgiy Nikolayevich, Physicist, Corresponding Member (see Association)

TITLE: Neutrons sound the Earth's interior

PERIODICAL: Tekhnika molodezhi, no. 5, 1962, 8-10

TEXT: Neutron pulse logging, devised by the author, is described. Compared to conventional neutron logging, it is safer, more accurate and can be used in exploring any type of well. Based on the intermittent emission of neutrons from the source, the method permits distinguishing between petroleum and water and, to a lesser extent, between water occurring in and below the petroleum layer. A neutron detector picks up the echoes from neutrons falling into the water or oil, the difference in the resonance of the echoes being more marked when there is a longer pause between the emission of batches of neutrons. For obtaining

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Neutrons sound...

instantaneous neutron pulses, a miniature accelerator has been developed, which can be lowered into the well. The device has already been manufactured and tested at the Institut geologii i razrabotki goryuchikh iskopayemykh Akademii nauk SSSR (Institute of Geology and Production of Mineral Fuels, Academy of Sciences USSR) together with the Institut yadernoy fiziki Sibirskogo otdeleniya Akademii nauk SSSR (Institute of Nuclear Physics, Siberian Department of the Academy of Sciences USSR). The heart of the device is a fitting resembling a TV tube, in which a pulsing voltage of 100,000 V can be created. The electric field accelerates the charged particles, forcing them to liberate the neutrons from the target. By changing the voltage, the intensity of an intermittent beam of neutrons bombarding the rock strata can be regulated. Using the accelerator, practically any required neutron beam intensity can be obtained, and very deep layers can be sounded. Some figures on the application of neutron logging in the USSR are given. There are 3 figures.

ASSOCIATION: AN SSSR

Card 2/2

FLEROV, G. N., and ALEKSEYEV, F. A.

"Present state and trends of further development of nuclear geophysics."

report to be submitted for the Conference on Nuclear Geophysics, Krakow, Poland, 24-30 Sept 1962.

34655
S/056/62/042/002/050/055
B108/B138

24.6500

AUTHORS: Volkov, V. V., Pomorskiy, L., Tys, Ya., Flerov, G. N.

TITLE: Observation of capture of three neutrons and stripping of three protons in the interaction of N^{14} and Ne^{20} ions with C, Al, Cu, and Ta nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 635-637

TEXT: The authors studied nucleon transfer processes which occur in the interaction of heavy ions with nuclei without formation of a compound nucleus. The experiments are based on recording the lagging neutron activity of the N^{17} nuclei. Bombarding a target with N^{14} or Ne^{20} ions may lead to the reactions

$$ {}_{Z}X^{A} + N^{14} \rightarrow {}_{Z}X^{A-3} + N^{17} \quad (1) $$

$$ {}_{Z}X^{A} + Ne^{20} \rightarrow {}_{Z+3}Y^{A+3} + N^{17} \quad (2). $$

However, the departure of free nucleons is not impossible. C, Al, Cu, and Ta targets were exposed to an ion beam of several microamperes. A detailed

Observation of capture of three ...

description of the experimental arrangement is given in ZhETF, 41, 1365, 1961 (G. N. Flerov et al.). The background caused by ions scattered from the cyclotron dees has to be considered only in the case of very low energies. Fig. 2 shows the yield in N^{17} (a), and the effective reaction cross section (b) for N^{14} ions. Results for Ne^{20} are qualitatively the same. The good agreement of the experimental values with data from publications (Ref. 11, see below) indicates that the observed reactions are nucleon transfer processes as described by Eqs. (1) and (2). There are 3 figures and 13 references: 3 Soviet and 10 non-Soviet. The four most recent references to English-language publications read as follows: J. A. McIntyre et al. Phys. Rev., 119, 1331, 1960; K. S. Toth. Phys. Rev., 121, 1190, 1961; Ref. 11: R. Kaufmann, R. Wolfgang, Phys. Rev. Lett., 3, 232, 1957; Phys. Rev., 121, 192, 1961; L. C. Northcliffe. Phys. Rev., 120, 1744, 1960.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research). Institut yadernoy fiziki, Krakov, Pol'sha (Institute of Nuclear Physics, Cracow, Poland) (L. Pomorskiy). Institut yadernykh issledovaniy, Varshava, Pol'sha (Institute of Nuclear Research, Warsaw, Poland) (Ya. Tys)

S/056/62/042/002/050/055
B108/B138

Observation of capture of three ...

SUBMITTED: December 9, 1961

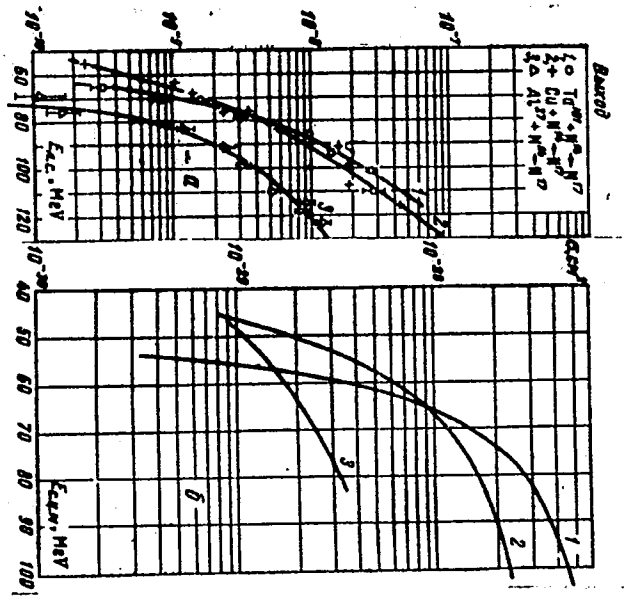

Fig. 2

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S/056/62/043/003/021/063
B102/B104

AUTHORS: Volkov, V. V., Pomorskiy, L., Tys, Ya., Flerov, G. N.

TITLE: 2n and 3n transfer reaction in the bombardment of Al, Cu and Ta by N^{15} and N^{14} ions

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v.43, no. 3(9), 1962, 865-872

TEXT: The authors studied the transfer of two and three neutrons from the target nuclei (Al, Cu, Ta) to the bombarding ions. The experiments were carried out at the cyclotron of the Laboratoriya yadernykh reaktsii OIYaI (Laboratory of Nuclear Reactions of the OIYaI) which was set in pulsed operation. The bombardment period was 30 sec, since the N^{17} half-life is 4.15 sec. The ion energies were between ~50 and 140 Mev. The time dependence of the N^{17} neutron activity and the dependence of the N^{17} yield on the energy of the bombarding ions was measured with an apparatus described in detail in ZhETF, 41, 1365, 1961. The results obtained for the reaction cross sections were compared with those of transfer reactions of one neutron from the bombarding particle to the target (ZhETF, 33, 595, 1957;

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2n and 3n transfer reaction in...

Phys. Rev. 119, 1331, 1960). The cross sections were found to increase when changing over Al to Cu and to Ta. The same sequence was observed for the Q-value of the reaction and for the height of the Coulomb barrier in the c.m.s. The fact that the 2n cross section is higher than the 3n cross section by about one order of magnitude is attributed to a reduction in probability. There are 8 figures and 1 table.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: April 23, 1962

Card 2/2

S/089/63/014/001/002/013
B102/B186

AUTHORS: Flerov, G. N., Donets, Ye. D., Druin, V. A.

TITLE: Spontaneous fission and synthesis of far transuranium elements

PERIODICAL: Atomnaya energiya, v. 14, no. 1, 1963, 18-26

TEXT: Beginning from the first experiment on the spontaneous fission of U^{238} carried out at the Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physicotechnical Institute AS USSR) in the laboratory of Professor I. V. Kurchatov in cooperation with K. A. Petrzhak and G. N. Flerov, a review is given of the most important results of the fundamental investigations in the field of spontaneous fission and synthesis of transuranic elements. The known regularities of the spontaneous fission made apparent from the $T_{sf}(Z^2/A)$ and $T_{sf}(N)$ diagrams are discussed in detail. The name of I. V. Kurchatov also is intimately associated with the synthesis of transuranic elements. Not only the first reactor but also the first ion cyclotron and the great heavy-ion

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Spontaneous fission and synthesis ...

accelerator in Dubna were built as his suggestion and under his direction. The synthesis of transuranium elements by the bombardment of uranium with multiply charged ions is considered in full detail and the most important methods and results are discussed. The nucleon evaporation resulting from the use of fission products as the bombarding particles is also discussed. The future researches will be devoted, among other questions, to a study of the transuranium isomers, the relationship between the spontaneous fission probability and the nuclear energy levels, and the spontaneous fission of the transfermium isotopes. There are 5 figures.

SUBMITTED: August 30, 1962

Card 2/2

S/056/63/044/004/010/044
B102/B186

AUTHORS: Oganesyan, Yu. Ts., Lobanov, Yu. V., Markov, B. N., Flerov, G. N.

TITLE: Gamma radiation from nuclei with high spins

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 4, 1963, 1171 - 1179

TEXT: The authors measured the γ-ray spectra emitted on bombardment of Cu, Ta, W, and U targets with O^{16} and Ne^{22} ions accelerated to energies between 74 and 145 Mev, by means of a single-crystal scintillation spectrometer. For the reactions $Cu+Ne^{22}$ and $Ta+O^{16}$ the upper limits of the cascade γ-transition times were also determined. The projectile ions were accelerated in the 300-cm cyclotron of the Laboratoriya yadernykh reaktsiy OIYaI (Nuclear Reactions Laboratory of the OIYaI). The targets had natural isotope composition and were, at thicknesses of from 25 to 100μ, deposited on copper backings. The spectrometer consisted mainly of a NaI(Tl) crystal and a photomultiplier whose pulses were fed to a AИ-100/1 (AI-100/1) 100-channel pulse height analyzer. In some experiments the

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B102/B186

Gamma radiation from nuclei with high spins

neutron yield was also measured by means of a stilbene crystal with an ФЭУ-33 (FEU-33) multiplier. The γ-counting rate was 100-300 pulses/sec for a flux of $\sim 10^{12}$ ions/sec. The spectrometer was positioned at an angle of 115° with respect to the ion beam. In all cases a prompt gamma radiation ($< 10^{-9}$ sec) was observed with mean energies between 0.7 and 1.1 Mev. The upper limit of the cascade emission time was $(2-3) \cdot 10^{-9}$ sec. Up to 13 gamma quanta were emitted per compound nucleus decay. The spin effect on the decay mechanism is discussed separately for the various reactions. There are 6 figures and 1 table.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: November 16, 1962

Card 2/2

FLEROV, G.N.; POLIKANOV, S.M.; GAVRILOV, K.A.; MIKHEYEV, V.L.; PERELYGIN, V.P.; PLEVE, A.A.

Formation of spontaneously fissioning isomers in reactions involving α-particles and deuterons. Zhur. eksp. i teor. fiz. 45 no.5:1396-1398 N '63. (MIRA 17:1)

1. Ob"yedinennyy institut yadernykh issledovaniy.

FLEROV, G.N.; KARNAUKHOV, V.A.; TER-AKOPYAN, G.M.; PETROV, L.A.; SUBBOTIN, V.G.; KULIKOVA, L.V.[translator]

On the proton decay of radioactive nuclei. Dubna, Ob"edinennyi in-t iadernykh issledovanii, 1964. 24 p.

FLEROV, G. N.; KARNAUKHOV, V. A.; TER-AKOPYAN, G. M.; PETROV, L. A.; SUBBOTIN, V. G.,
Dubna

"On the proton decay of radioactive nuclei."

report submitted for Intl Conf on Low & Medium Energies Nuclear Physics, Paris, 2-8 Jul 64.

FLEROV, G. N.; KARNAUKHOV, V. A.

"I.-Mechanism and Products of Heavy Ion Reactions. II.-Fission Physics."

report submitted for Intl Conf on Low & Medium Energies, Nuclear Physics, Paris, 2-8 Jul 64.

FLEROV, G.N.; OGANESYAN, Yu.TS.; LOBANOV, Yu.V.; KUZNETSOV, V.I.; DRUIN, V.A.; PELEKHIN, V.P.; GAVRILOV, K.A.; TRET'YAKOVA, S.P.; PLOTKO, V.M.

Synthesis and physical identification of an isotope of the 104th element with mass number 260. Atom. energ. 17 no.4:310-312 O '64. (MIRA 17:10)

ACCESSION NR: AP4043611 S/0056/64/047/002/0419/0432

AUTHORS: Flerov, G. N.; Karnaukhov, V.A.; Ter-Akop'yan, G. M.; Petrov, L. A.; Subbotin, V. G.

TITLE: On proton decay of radioactive nuclei

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 419-432

TOPIC TAGS: radioactive decay, proton decay, proton radiation, heavy particle, Coulomb repulsion force, alpha particle reaction

ABSTRACT: This paper is an elaboration of a previous report (ZhETF v. 45, 1280, 1963) and contains additional new data on observed proton emitters. Experiments on proton decay of radioactive nuclei, using the internal beam of the heavy-ion cyclotron of OIYaI, are described and data are presented on two types of proton emitters obtained by bombarding nickel with beams of Ne^{20} and O^{16}. The first (one of the light isotopes of neon or magnesium) has a half-life

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ACCESSION NR: AP4043611

$(85 \pm 15) \times 10^{-3}$ sec and emits protons with energy 5 ± 0.2 MeV. The second has a half-life 23 ± 4 sec and emits protons with energy 2.5 ± 0.2 MeV. It is concluded on the basis of several experiments that the second emitter is one of the light isotopes of Kr or Br, so that sub-barrier protons are emitted (height of the Coulomb barrier is ~8.5 MeV). It is most probable that the protons are emitted from the daughter nucleus following the positron transition with which the measured half-life is connected. The emission of ≈5 MeV protons is similar to the emission of delayed neutrons. The emission of 2.5-MeV sub-barrier protons is analogous to the emission of long-range alpha particles by heavy nuclei. It is also shown that in the case of the ≈2.5-MeV proton emitter another possible mechanism is proton decay of configuration isomers. Further work is planned for an experimental determination of the mechanism of the observed proton decay and for a more exact identification of the obtained protons. "The authors are grateful to E. Z. Ry*ndina and her co-workers for much preparing the silicon detectors, which were

Card 2/5

ACCESSION NR: AP4043611

essentially in the present work. The authors thank V. Titov and V. Chugreyev for construction work, Ye. A. Minin, N. Danilov, and B. Bichev for help in preparation for the experiments, and the cyclotron crew headed by A. N. Filipson for the irradiation." Orig. art. has: 11 figures and 2 tables.

ASSOCIATION: Ob"yedinenny*y institut yaderny*kh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: 26Feb64 ENCL: 02

SUB CODE: NP NR REF SOV: 013 OTHER: 013

Card 3/5

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ACCESSION NR: AP4043611

ENCLOSURE: 01

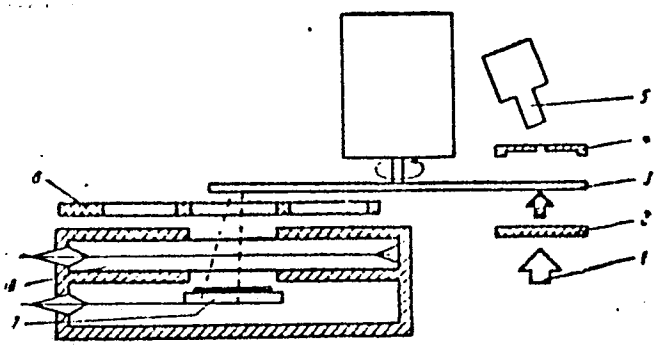

Diagram of experimental set-up
1 - ion beam, 2 - target, 3 - collector, for reaction products, 4 - ion collector, 5 - detector, 6 - proportional counter, 7 - surface barrier detector, 8 - moving frame

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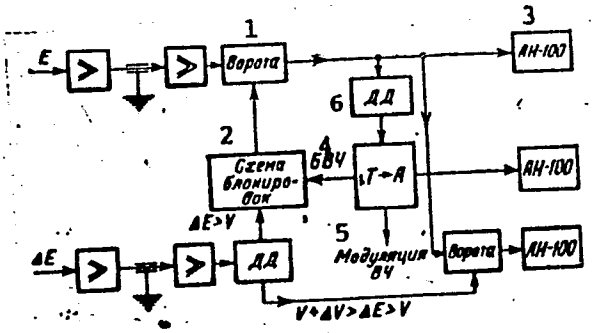
ACCESSION NR: AP4043611

ENCLOSURE: 02



Block diagram of electronic apparatus
1 - gates, 2 - blocking circuits 3 - pulse analyzer 4 - high frequency block,
5 - high frequency modulation, 6 - discriminator (differential)

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FLEROV, G.N.; DRUIN, V.A., kand. fiz.-mat. nauk; OGANESYAN, Yu.Ts., kand. fiz.-mat. nauk; POLIKANOV, S.M., kand. fiz.-mat. nauk; DONETS, Ye.D., nauchn. sotr.; ZVARA, Ivo, nauchn. sotr.; CHERNOV, A.G.; FAYNBOYM, I.B., red.

[Prospects for the synthesis of transuranium elements. Ninth discussion. Participants in the discussion: Flerov, G.N. and others] Perspektivy sinteza transuranovykh elementov. V besede uchastvuiut: G.N.Flerov i dr. Moskva, Znanie, 1965. 39 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia: Fizika, matematika, astronomiia, no.10) (MIRA 18:5)