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observed. The smaller number of such cases observed in aluminium appears to be of a somewhat peculiar significance. The curve of the angular distribution for helium is wider than that for hydrogen, which fact is connected with the higher velocity of the electrons in helium. The experimental curves of angular distribution of γ-quanta differ from those computed by Chzhan Li (Ref 5), (Figs 3,4). The spectrum of the center-of-mass energy of the annihilating pairs can be constructed from the curve of the angular distribution of the γ-quanta. As a result of the computations energy spectra of the positron annihilation in liquid hydrogen and helium were obtained (Figure 7). As regards the spectrum for aluminium, which is also given in figure 7, no judgment can be passed on it, as the curve was constructed from six points only. The authors express their gratitude to the Director of the Institute of Physical Problems, AS USSR, imeni S.I. Vavilov, P.L. Kapitsa and A.A. Shal'nikov. There are 7 figures, 1 table, and 11 references, of which are Soviet.

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Investigation of the Angular Distribution of γ-Quanta in the Annihilation of Positrons in Liquid Hydrogen and Helium SOV/48-22-8-11/28

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos universiteta im. A.A. Zhdanova (Scientific Research Institute of Physics at the Leningrad State University imeni A.A. Zhdanov)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

20-119-2-12/60

AUTHORS: Anton'yeva, M. N., Bashilov, A. A., Dzhelepov, B. S., Corresponding Member of the AS USSR, Preobrazhenskiy, B. K.

TITLE: Conversion Spectra of Some Neutron-Deficient Terbium Isotopes (Konversionnyye spektry nekotorykh neytronodefitsitnykh izotopov Tb)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol 119, Nr 2, pp 241-243 (USSR)

ABSTRACT: The present paper investigates the conversion spectra of the neutron-deficient Tb-isotopes resulting in the reaction Ta + P (660 MeV). The preparations and the conditions of experiments are similar to those in 2 previous works (references 1, 2). The decay curves determined from the change of the conversion peaks with progressing time showed that the Tb-preparation contains several isotopes. The present paper gives the results obtained for each of the observed activities: 1) $T_{1/2} = 8 \pm 1$ hours.

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Conversion Spectra of Some Neutron-Deficient Terbium Isotopes 20-119-2-12/60

Only the conversion electrons of the two transitions E_γ =123 and 977 keV were observed. One of the isomers of Tb^{154} shows $T_{1/2}$ =7,5 hours. Furthermore the level 123 keV is known for Gd^{154}. Therefore the given activity was attributed to Tb^{154}. The other transitions known from the decay of Eu^{154} were, however, not observed in Gd^{154}. 2) $T_{1/2}$ = 18 $\pm$ 1 hours. Within the energy interval of from 109 to1050 keV 16 nuclear transitions as well as a composed β^+-spectrum with E_{limit} = 2,8 MeV were observed. The values of E_γ of the here discussed transitions differ from the corresponding values known from the decay of Eu^{154}. The 18-hour activity observed here can be attributed to Tb^{154} or to Tb^{151} partly or completely.

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3) $T_{1/2}$ = 2,3 ± 0,3 days. Within the interval of about 100 to 250 keV 8 nuclear transitions were observed. Until now no isotopes have been known which decay with such a half life. The newly discovered activity obviously belongs to Tb^{153}. The authors observed in fact Gd^{153} in the secondary products of its preparation.
4) $T_{1/2}$ = 5 ± 1 days. The transitions attributed to the half life of 5 days obviously belong to the isotopes Tb^{155} and Tb^{156}. The authors attribute 14 transitions to Tb^{155}, with respect to their energy they partly correspond to the 19 known transitions. The transition with E_γ = 89 and 199 keV were attributed to Tb^{156}. 5) $T_{1/2}$ = 10; 120 or 200 days respectively. The activities with these half lives also belong to the secondary products of Gd^{149}, Gd^{151} and Gd^{153}. The authors express their thanks to the Team

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Conversion Spectra of Some Neutron-Deficient Terbium Isotopes 20-119-2-12/60

of the Synchrocyclotron of the United Institute for Nuclear Research (Ob"yedinennyy institut yadernykh issledovaniy) for the irradiation of the tantalum samples; they also thank L. Soyenko and E. Pania for their collaboration in the measurements. There are 2 figures, 2 tables, and 8 references, 2 of which are Soviet.

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

SUBMITTED: December 25, 1957

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

21(7) SOV/20-121-6-11/45

AUTHORS: Dzhelepov, B. S., Corresponding Member, Academy of Sciences, USSR, Prikhodtseva, V. P., Khol'nov, Yu. V.

TITLE: The $0^+ \rightarrow 0^+$-Transition in Ce^{140} ($0^+ \rightarrow 0^+$-perekhod v Ce^{140})

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 6, pp 995-997 (USSR)

ABSTRACT: By some authors the following problem was raised: Do the conversion electrons K-1909 (~1909 keV) correspond to the transition between the excited state (1909 keV, quantum characteristics 0^+) and the ground state (also 0^+) ? In order to solve this problem, the authors carefully investigated the γ-spectrum of La^{140} in the energy region of ~1900 keV. Lanthanum oxide irradiated by thermal neutrons was used as a source. The original activity of the preparation was 2,8 Cu. The results of the measurements are given in a diagram. No γ-line is observed in the energy region 1800-2000 keV. The intensity of the γ-rays ~1900 keV (if they exist at all) is less than 4.10^{-4} quanta per disintegration. These data (together with the data of two previous papers (Refs 1, 2)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

concerning the intensity of the conversion line 1909 keV) enable us to conclude that there is a $0^+ \rightarrow 0^+$-transition. In order to confirm the existence of the line K-1909, and for a more accurate determination of its intensity, the authors investigated the hard part of the spectrum of the conversion electrons of La^{140} by means of 2 spectrometers of the ketron type. These spectrometers were placed at the authors' disposal by A. A. Bashilov, Leningradskiy universitet(Leningrad University) and K. Ya. Gromov, Radiyevyy institut AN SSSR (Radium Institute AS USSR). La^{140} was used as a source in both of these cases. According to the results given in a diagram, the existence of the lines K- and L-1909 is beyond any doubt. The transition has the average energy 1902 keV, and the ratio of the intensities K_{1902}/K_{1596} is equal to 0,220,(i.e. the average value of all the measurement series). For the lower limit of the conversion coefficient of the transition 1902 keV the value $\alpha_{K-1902} > 0,38$ was found.

This leads to the conclusion that the transition with the energy 1902 keV in Ce^{140} is the hitherto unknown transition $0^+ \rightarrow 0^+$. Besides, the authors sought and found the K- and L-conversion lines which correspond to the γ-lines 2543 and

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2390 keV and to the γ-line 2515 keV. A table gives the experimental and the theoretical conversion coefficients on the K-shell for the transitions discussed in this paper. The authors thank A. A. Bashilov and K. Ya. Gromov (who made it possible to carry out the control experiments by means of their spectrometers), N. D. Novosil'tseva for the chemical separation of La^{140} from a barium solution, and also A. G. Dmitriyev and Yu. A. Gur'yan for their help in carrying out measurements. There are 3 figures, 1 table, and 6 references, 5 of which are Soviet.

ASSOCIATION: Radiyevyy institut im. V. G. Khlopina Akademii nauk SSSR (Radium Institute imeni V. G. Khlopin, AS USSR)

SUBMITTED: June 30, 1958

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24(7) PHASE I BOOK EXPLOITATION SOV/3228

Dzhelepov, B. S.

Izobarnyye yadra s massovym chislom A=74 (Isobaric Nuclei With Mass Number A=74) Moscow, Izd-vo AN SSSR, 1959. 39 p. (Series: Svoystva atomnykh yader, vyp. 1) Errata slip inserted. 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Radiyevyy institut.

Ed.: Yu. V. Khol'nov, Candidate of Physical and Mathematical Sciences; Ed. of Publishing House: Ye. A. Semenova; Tech. Ed.: A. V. Smirnova.

PURPOSE: This book is intended for scientists engaged in nuclear physics, and particularly for scientists working in the field of nuclear spectroscopy.

COVERAGE: This is the first of a series of monographs on properties of atomic nuclei. It includes all atomic nuclei having a mass number of 74 and all the data on these isotopes. The author critically analyzes the experimental data and summarizes

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Isobaric Nuclei (Cont.) SOV/3228

the reliable data on the energies of radioactive radiations, modes of decay, half-lives, and quantum characteristics of excitation levels for all nuclei with a mass number of 74. He also points out the characteristics of nuclei which have been determined with sufficient reliability, as well as the characteristics which require further study. The other monographs of this series will present summaries of all physical characteristics of certain nuclear groups, as well as systematized determined properties of all known nuclei. No personalities are mentioned. References follow each chapter.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

BONCH-OSMOLOVSKAYA, Natal'ya Aleksandrovna; DZHELEPOV, B.S., red.; SEMENOVA, Ye.A., red.izd-va; BOCHEVER, V.T., tekhn.red.

[Atomic photoeffect in the field of gamma rays] Atomnyi fotoeffekt v oblasti γ-luchei. Pod red. B.S.Dzhelepova. Moskva, Izd-vo Akad.nauk SSSR, 1959. 48 p. (MIRA 12:8)

1. Chlen-korrespondent AN SSSR (for Dzhelepov).
(Photoelectricity) (Nuclear reactions)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2"

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DZHELEPOV, B. S.

SOV/2021

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

Atomnaya energetika; doklady sovetskikh uchenykh (Reports of Soviet Scientists) Nuclear Physics) Moscow, Atomizdat, 1959. 558 p. (Series: Its: Trudy, Vol. 1) 8,000 copies printed.

Eds. (Title page): A.I. Alikhanov, Academician; V.I. Veksler, Academician; and L.A. Tikhonov, Candidate of Physical and Mathematical Sciences; Ed. of this Volume: B.S. Dzhelepov and B.F. Zavoyskiy, Candidates of Physical and Mathematical Sciences; Tech. Ed.: G.I. Kuznetsova; Tech. Ed.: T.P. Puzyr'.

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 nuclear 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.

[illegible] papers in Part II deal in detail with various problems in nuclear physics, such as the studies 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 K.D. Tsynov. The Russian-language edition of the proceedings of the conference is published in 15 volumes. The first 6 volumes contain all the papers presented by Soviet scientists as follows: Volume (1), Reactors; Volume (2), Reactors Auxiliary Equipment and Materials; Volume (3), Reactors, Atomic Power Stations and Nuclear Power; Volume (4), Cosmic Radiation; Volume 5, Elementary Particles and Nuclear Reactions; Volume 6, Theoretical and Mathematical Physics). The other 10 volumes contain related papers presented at the Conference by non-Soviet scientists. In the present volume are now presented in three articles there the texts are not identical. The Russian and English language editions of the proceedings have been published by Atomizdat, Moscow, and by the Pergamon Press, Inc., New York, N.Y., respectively.

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D z Нсlepou, B.S.

21 (7), 21 (8) SOV/89-7-4-8/26
AUTHOR: Rudakov, V. P.

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

PERIODICAL: Atomnaya energiya, 1959, Vol 7, Nr 4, pp 374-378 (USSR)

ABSTRACT: The II All-Union Conference was held from January 26 to February 2, 1959 at Kharkov. More than 300 participants heard 100 lectures, the most important of which dealt with the following fields: Nuclear Theory (General problems of β-decay, A. S. Davydov (MGU); Theoretical classification of low-energy excited nuclear states, L. K. Peker; Reference material, Bibrzak, L. K. Peker, L. A. Slav (KhPI); Calculation of the β-related with matrix oscillations of deformed nuclei, Yu. T. Grin', V. M. Sinchuk, S. P. Tayts (KhPI); Calculation of the β-related with matrix element for β-transitions by means of the generalized nuclear model, S. T. Belyayev (IAE); Consideration of pair-correlation in nuclei, S. T. Belyayev (IAE); The application of the superconductivity model to nuclei for the purpose of calculating their moments of inertia, I. N. Mikhaylov (FIAN); Problems of the recent stability of nuclei, V. G. Solov'yev (JINR); The present stage in the theory of β-decay, V. A. Krasnov, V. A. Petrov, V. A. Tolokonnikov (IAE); Measurement of the angular correlation between electrons and neutrino in the decay of the neutron, Yu. G. Abov, P. A. Krupchitskiy, Yu. A. Mamayev (IAE); Measurement of the correlation between the transversal electron polarization and circular polarization of γ-quants occurring in the decay of ^{46}Sc and ^{60}Co, Denis Schoen, γ-radiation of Nickel, Yu. V. Grigor'yev, V. I. Fallov, Yu. V. Gaponov, A. V. Ivov, P. M. Rubtsov, S. P. Tayts, S. V. Starodubtsev, A. Ye. Tolmachev, A. Ye. Kuznetsov (Physico-technical Institute, Gor'kiy); Gor'kovskiy Institut (Physico-technical Institute, Gor'kiy)); The ^{31}P(p,γ), ^{32}S(p,γ), ^{39}K(p,γ), ^{40}Ca(p,γ) and ^{44}Ca(p,γ) reactions, O. A. Nikitin, V. V. Orlov, G. K. Gaganskiy, N. Ch. Lebedev, V. V. Rezchikov, L. L. Gervits (Leningrad Physico-Technical Institute); Investigation of the (p,γ) excitation function of the lower levels of the nuclei during their bombardment by multiply charged ions (C, N, O, and Ne), A. A. Kalinkin, A. I. Kutsa, P. M. Pekarskiy, V. I. Petrov (IAE); New isotopes ^{51}Fe, ^{53}Co and ^{55}Ni, B. S. Dzhelepov, L. A. Sergiyenko (LGU); Beta spectrometer with double focusing, Ye. P. Grigor'yev, A. G. Zelenkov, A. F. Kuzmenkov, V. I. Shcherbinin (IAE); Improved spectrometer, I. F. Vorob'yev, A. I. Belyayev, V. I. Gerasimov, L. I. Rusinov (IFAN Ukrain. SSR); Magnetic spectrograph for heavy charged particles. The representatives of the Gosstandarta Politekhnicheskiy preparations (Ministry of the Radio-engineering Industry) gave a report about new multipliers. The Conference was closed by B. S. Dzhelepov who stressed the fact that nuclear tables and reference works ought to be published much more quickly in order to be of real use to the experimenter.

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DZHELEPOV, B. S., KHOLNOV, Yu. V., PRIKHODTSEVA, V. P.

"A $0^+ \rightarrow 0^+$ Transition in Ce^{140}.", Nuclear Physics, vol. 9, 4, 1959, pp.665-669 (No. Holland Publ. Co., Amsterdam)

Radium Inst, im V. G. Khlopin, Acad. Sci. USSR, Leningrad.

A search has been made for gamma-quanta of energy $\approx$1900 keV in the spectrum of La^{140} by means of a gamma-spectrometer by analysis of recoil electrons. It is shown that is such exist, their intensity is $< 0.4 \times 10^{-3}$ quantum per disintegration. It is simultaneously confirmed that the spectrum of conversion electrons contains intense conversion lines corresponding to a transition energy of 1902 keV.

The lower limit of the conversion coefficient of this transition proved equal to 0.38. Such a large value of this limit indicates that it is either a transition of high multipole order ($l > 10$), or a $0^+ \rightarrow 0^+$ transition in which gamma quanta of the given energy are entirely absent. The first assumption may be discarded since in this case the lifetime of the 1900 keV state should be very great ($> 10^{10}$ years), whereas the intensity of the corresponding conversion line falls off with a halflife of $\approx$ 40 hours. We are thus dealing here with a ner $0^+ \rightarrow 0^+$ transition.

The paper also discusses the characteristics of several other transitions in Ce^{140}.

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21(7) SOV/48-23-2-3/20

AUTHORS: Voinova, N. A., Dzhelepov, B. S., Zhukovskiy, N. N.

TITLE: Investigation of the γ-Spectrum of Se^{75} Within the Range 200 + 900 kev (Issledovaniye γ-spektra Se^{75} v oblasti 200 + 900keV)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 2, pp 185-187 (USSR)

ABSTRACT: The investigations were carried out by means of the magnetic spectrometers "Rytron" and "Elotron" by use of recoil electrons. Two experimental curves are given in figure 1, which correspond to the γ-spectrum of Se^{75} and were obtained 1) by means of "Rytron" with cellophane target with a surface density of 6.15 mg/cm^2 and 2) by means of "Elotron" with polystyrene target with a surface density of 2.34 mg/cm^2. By analysis of the curves 5 components with the energies 207, 259, 278, 305 and 402 kev were separated from 2). The weaker range of the spectrum was investigated by means of "Rytron", and the 475 and 570 kev lines were found in addition (Fig 2). For a comparison, the energies and intensities of the γ-lines of Se^{75} obtained from data of other authors are listed in a table (Refs 1, 2, 3, 4, 5). Besides the authors of this

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Investigation of the γ-Spectrum of Se^{75} Within the Range 200 ÷ 900 kev

paper, only Zolotavin (Ref 3) found the 475 kev line. The line 570 kev was found also by Van den Bold (Ref 2), Zolotavin (Ref 3) and Langevin-Joliot (Ref 4). There are 2 figures, 1 table, and 5 references, 1 of which is Soviet.

ASSOCIATION: Radiyevyy institut im. V. G. Khlopina Akademii nauk SSSR (Radium Institute imeni V. G. Khlopin of the Academy of Sciences, USSR)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

21(7) SOV/48-23-2-4/20

AUTHORS: Grigor'yev, Ye. P., Dzhelepov, B. S., Zolotavin, A. V.

TITLE: Decay of $Yb^{166} \rightarrow Tu^{166} \rightarrow Er^{166}$ (Raspad $Yb^{166} \rightarrow Tu^{166} \rightarrow Er^{166}$)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 2, pp 188-190 (USSR)

ABSTRACT: An error occurred in the spectral analysis of this reaction since the energies of the most intense transitions in Tu^{166} produced by decay of Yb^{166} and in Er^{166} produced by Tu^{166} were near 80 kev in both cases. For the purpose of explaining and determining the levels the authors studied the conversion spectra by means of the β-spectrometer with double focusing and a half width of lines of 0.3%. The resolving power permitted the separation of $L_I + L_{II}$, L_{III} and M and N lines. Table 1 shows the corresponding lines of transitions 81.0 kev in Tu^{166} and 79.4 kev in Er^{166}. Transition 79.4 in Er^{166} agrees well with the theoretical transition type E2. M1 represents the transition type at 81.0 kev in Tu^{166}. A distinctly marked difference results from a comparison of the relative intensities of conversion lines of Tu^{166} and Er^{166} in

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equilibrium state with values obtained by other authors (Ref 3) (Table 2). The conversion coefficient for Er^{166} with $\alpha_K = 1.8$ for E2 transition and Tu^{166} for transition M1 amounts to 3 ± 1 and 4, respectively. The ratio of intensities of the individual transitions in Tu^{166} and $Er^{166} = 0.75 \pm 0.3$. The authors thank the researchers of the OIYaI and RIAN for radioactive sources, O. V. Larionov, M. K. Nikitin,, researchers of the LGU for separation of the Yt- and Tu fraction, as well as L. K. Peker for discussions. There are 3 figures, 4 tables and 5 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova
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21(7) SOV/48-23-2-6/20

AUTHORS: Anton'yeva, N. A., Bashilov, A. A., Dzhelepov, B. S., Il'in, V. V., Preobrazhenskiy, B. K.

TITLE: Conversion Electrons of Eu^{149} (Konversionnyye elektrony Eu^{149})

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1959, Vol 23, Nr 2, pp 204-205 (USSR)

ABSTRACT: In investigating the electron spectra of Eu and Gd fractions the authors determined some lines with equal energy among the conversion lines of both fractions. The energy difference of the K - L and K - M lines indicates that the corresponding nuclear transitions take place in the samarium nucleus. The respective energies amount to 256, 279 and 330 kev. From the half-life periods determined by the lines K-279 and K-330 the authors concluded that they had found a long-lived Eu isotope which decays to the samarium nucleus. According to a comparison with data published on Eu isotopes also Eu^{149} is considered to be responsible for the above-mentioned phenomenon. The authors concluded that the transitions with the energies 256-330 kev belong to the types E2 or M1, yet no definite conclusion can be drawn from the results obtained.

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There are 2 figures, 2 tables and 3 Soviet references.

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21(7) SOV/48-23-2-7/20

AUTHORS: Dzhelepov, B. S., Prikhodtseva, V. P., Khol'nov, Yu. V.

TITLE: γ-Spectrum of J^{131} (γ-Spektr J^{131})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 2, p 206 (USSR)

ABSTRACT: The authors investigated the γ-spectrum of J^{131} within the range of 200-800 kev, determined the intensities of well known γ-lines and the γ-line with 514 kev, of which mention is made in paper (Ref 2). The results of these investigations are contained in a figure. For the intensities of γ-lines the following values were obtained:

E_γ kev:	278	362	514	633.5	722
I_γ % :	5.7	100	< 0.4	8.9	1.9

In addition, a special investigation has shown that the intensity of the γ-line with 514 kev never exceeds 0.4% of the intensity of the γ-line with 362 kev. The authors thank V. A. Yeliseyev for help in the measurements. There are 11 figures and 2 references, 1 of which is Soviet.

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21(7) SOV/48-23-2-8/20

AUTHORS: Dzhelepov, B. S., Yeliseyev, V. A., Prikhodtseva, V. P., Khol'nov, Yu. V.

TITLE: γ-Radiation of Br^{82} (γ-Izlucheniye Br^{82})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 2, pp 207-210 (USSR)

ABSTRACT: The γ-spectrum was studied by means of the "Rytron" spectrometer. It is given in figure 1. 10 lines were detected. The energies and relative intensities obtained in this and another paper are listed in a table for comparison. The best accordance resulted from reference 8, both for energies and intensities. Within the range 1700-2000kev a weak line at 1780 kev and only one elevation of a point above the background at 1910 kev were found. Within the range 2000-2700 kev no lines with an intensity above 0.2% were found. The conversion coefficient of the main transitions in Br^{82} was determined by means of the intensities obtained. The initial value of α_K for the transition type E2 of transition 777 kev in Kr^{82} was adopted from tables published by Sliv and Band (Ref 13) with an amount of $8.22.10^{-4}$. A decay scheme of $Br^{82} \longrightarrow Kr^{82}$ is given in figure 2. The transition types of the individual transitions

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of Kr^{82} were determined according to a comparison of the theoretical α_K values with the experimental ones (Table 2). The lines 1648 and 1780 kev detected for the first time as levels are not given in the decay scheme. There are 2 figures, 2 tables, and 13 references, 3 of which are Soviet.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

21(7) SOV/48-23-2-9/20

AUTHORS: Dzhelepov, B. S., Sergiyenko. V. A.

TITLE: Coincidences Between Conversion Electrons in the Gd^{146} and Gd^{151} Decay (Sovpadeniya mezhdu konversionnymi elektronami pri raspade Gd^{146} i Gd^{151})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 2, pp 211-218 (USSR)

ABSTRACT: The authors investigated the $Gd^{146} \rightarrow Eu^{146}$ and $Gd^{151} \rightarrow Eu^{151}$ decay, that is to say, they measured the intensity of coincidence between conversion electrons of the most intense lines. The results are listed in table 1 and illustrated in figures (Figs 2, 3). The coincidence of transitions 114.8 and 115.5 kev (coincidence AA) was found. It is unambiguous and is regarded as a "self-coincidence" of the electrons of line K(114.8+115.5). If both lines were separated, there would be only half the intensity. The authors proved the coincidence of the lines (K-114.8+K-115.5) and(LM-155+LM149.8Gd^{146}) on the basis of the coincidence of transition 155 kev with the transitions 114.8 and 115.5 (coincidence AC). Furthermore, the authors determined the coincidence of the lines LM(114.8+115.5)+K-115 and the

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Auger electrons (K series) (coincidence BA). The components of the A, B and C lines are given (Fig 1). The determination of intensities of the individual components is only outlined. The scheme of decay from Gd^{146} to Eu^{146} is given. All transitions belong to the type M1. The sequences are 1^-, 2^-, 3^-, 4^-. In the $Gd^{151} \longrightarrow Eu^{151}$ decay coincidence (L-21.7)(K-175) may be regarded as proved. The authors thank A. A. Bashilov and B.K. Preobrazhenskiy for the source, A. A. Bashilov also for communication of his results. A. Andriyanova, Kh. Nasyrova, Students of Alma Atinskiy gos. universitet (Alma Ata State University) assisted in the coincidence measurements of Gd^{146}, and A. V. Kudryavtseva in that of Gd^{151}. There are 6 figures, 2 tables and 9 Soviet references.

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21(7) SOV/48-23-2-1c/2o

AUTHORS: Dzhelepov, B. S., Preobrazhenskiy, B. K., Sergiyenko, V. A.

TITLE: Coincidences of Conversion Electrons in the Decay of Gd^{147} and Gd^{149} (Sovpadeniya mezhdu konversionnymi elektronami pri raspade Gd^{147} i Gd^{149})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 2, pp 219-222 (USSR)

ABSTRACT: The spectra of conversion electrons of a Gd fraction were recorded by means of a two-lens spectrometer up to electron energies of 350 kev (Fig 1). The results of investigation of the coincidence of conversion electrons produced in the decay of Gd^{147} and Gd^{149} are contained in a table and shown in figures 2 and 3. The scheme of $Gd^{147} \longrightarrow Eu^{147}$ decay was determined from the coincidences of the lines K(396+370) and LM(396+370) with the K line (229 kev) and the scheme of $Gd^{149} \longrightarrow Eu^{149}$ decay in Gd^{149} from the coincidences (K-149.8)(K-346) and (K-149.8)(LM-346) (Fig 1). The authors thank N. M. Anton'yeva and A. A. Bashilov for interest in the

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SOV/48-23-2-1o/2o

Coincidences of Conversion Electrons in the Decay of Gd^{147} and Gd^{149}

paper. A. Andriyanova and Kh. Nasyrova, Students of the Alma-Ata University, and V. Bunakov and I. Myznikov, Students of the LGU, assisted in the measurements. There are 3 figures, 1 table, and 5 references, 4 of which are Soviet.

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7 (4), 7 (5), 21 (9)

AUTHORS: Dzhelepov, B. S., Ivanov, P. B., Nedovesov, V. G., Chumin, V. G.

SOV/48-23-7-1/31

TITLE: Magnetic α-Spectrometer (Magnitnyy α-spektrometr)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 782-787 (USSR)

ABSTRACT: In the introduction of this paper, it is pointed out that most α-spectrometers work with inhomogeneous magnetic fields, and that their resolving power is different (half-width of the lines 0.05 to 0.08 %) and their light intensity is low (aperture ratio 0.01 to 0.08 % of 4π). The purpose of the present paper is to develop an α-spectrometer with a resolving power of 0.10 % at an aperture ratio of 0.3 % of 4π. In the first part of the paper, the experimental arrangement (electromagnet with its screening and current supply, evacuation plant, accomodation of the radioactive sources, as well as the geometrical control of the α-ray) is described in detail, and supplemented by figure 1 (pole shoes) and figure 2 (chamber). The second part deals with the measurement of the axial-symmetric magnetic field. The focusing angle is indicated with $\pi\sqrt{2}$, and three papers are mentioned showing that

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spectrometers of this type have the most favorable relation between resolution and light intensity. For the axial component, an equation is given in which the coefficient β determines the focusing properties of the field. The influence of the magnitude of β on the width is discussed, and the measurement of the topography of the magnetic field by means of a rotatable coil is dealt with. These measurement results are shown in a diagram (Fig 3). Another diagram shows the topography of the magnetic field in dependence on the position of the screening rings on the pole shoes (Fig 4). The α-particles are recorded by thick nuclear photoemulsions. The last part deals with the determination of the characteristic of the spectrometer. It was carried out with a Po^{210}-source, and the half-width of the lines amounted to 0.1 %. A variation of the solid angle did not show any influence, and the variation of the half-width of the line caused by a change in width and height of the source followed theoretical formulas of a previous paper (Ref 10). A diagram shows the dependence of the resolving power on the aperture ratio of the spectrograph (Fig 5). B. P. Shishin took part in the adjustment and calibration of the instrument. The

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authors thank the collaborator K. I. Yakovlev for the building of an instrument for the measurement of the magnetic field by the method of proton resonance, D. M. Ziv and V. V. Fedorov for the preparation of the polonium sources, and also A. P. Zhdanov for his help in the preparation of the photoemulsions. There are 5 figures and 10 references, 2 of which are Soviet.

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7(4),7(5),24(7)

AUTHORS: Dzhelepov, B. S., Ivanov, R. B., Nedovesov, V. G., Shishin, B. P.

SOV/48-23-7-2/31

TITLE: The α-Spectrum of U^{233} (α-spektr U^{233})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 788-791 (USSR)

ABSTRACT: The introduction mentions a paper by F. Asaro who detected three α-groups of U^{233} by means of a magnetic α-spectrometer of the sector type. In the following L. L. Gol'din et al. showed in an exact investigation of the α-spectrum of U^{233} that it is composed of five lines. These lines are indicated, and it is ascertained that the last three of these lines cannot be calculated by the known formulas for the intensity of the α-transitions. In 1958, the authors carried out investigations of the α-spectrum of U^{233} by means of the α-spectrometer described in the first paper of this issue; these investigations permitted a more accurate determination of the intensity of these three weak lines. Electrochemically plated U^{233} on platinum was used as a source. The measured

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values are compiled in two diagrams (Figs 1 and 2); tables 1 and 2 compare the values with those obtained by other authors. The results show that if there is an α_4-line this is very weak. The α_5-line is formed by a transition to the 316 kev level, and its intensity shows that this is a transition of a single-particle excited level. The quantum numbers of these transitions are dealt with in detail, and finally a scheme of the decay of U^{233} and of the levels Th^{229} is given (Fig 3).
The authors thank Yu. T. Puzynovich and V. N. Delayev for their help in the measurements, and L. K. Peker for the discussion of the results of their work. There are 3 figures, 2 tables, and 9 references, 6 of which are Soviet.

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24(5),21(7)

AUTHORS: Brabets, V., Gromov, K. Ya., Dzhelepov, B. S., Dmitriyev, A. G., Morozov, V. A.

SOV/48-23-7-4/31

TITLE: Conversion Electrons of Yb^{166} and Tu^{166} (Konversionnyye elektrony Yb^{166} i Tu^{166})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 812-818 (USSR)

ABSTRACT: The spectrum of the conversion electrons of the decay $Yb^{166} \xrightarrow[60 d]{K} Tu^{166} \xrightarrow[7,7 h]{K} Er^{166}$ (stable) was investigated by an improved magnetic β-spectrometer. The obtaining of the isotopes Yb^{166} and Tu^{166} carried out in Leningrad is described in short. The first part of this paper deals with the conversion electrons of Tu^{166}. As Tu^{166} has the daughter isotope Yb^{166}, three types of preparations were investigated: 1) The thulium fraction obtained by means of chromatographic separation from the rare earths. 2) The ytterbium fraction obtained by means of chromatographic separation from rare earth elements. 3) A thulium preparation separated from the ytterbium fraction

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20 hours after the chromatographic separation. The results of the measurements are compiled in table 1, and it becomes clear that the spectrum of the conversion electrons of Tu^{166} in most cases agrees with the ytterbium fraction. It is pointed out that the value of these results depends on the evaluation of the limiting intensity of the β-rays. Figure 1 shows the spectrum of the conversion electrons of the isotope Tu^{166} in the range of 10-185 kev of the thulium preparation separated from the ytterbium fraction. All intensities have a half-life of eight hours. Table 1 compares the experimentally determined ratios of the intensities of the K- and L-conversion lines with the theoretical ratios. The second part investigates the conversion electrons of the isotope Yb^{166}, and it is ascertained that the ratios of the intensities of the K- and L-conversion lines of the γ-transition of 80 kev strongly differ. The papers by V. N. Pokrovskiy (Ref 8) and Ye. P. Grigor'yev are mentioned here. Further it was ascertained that a γ-transition with the energy of 81.0 kev takes place in the decay $Yb^{166} \longrightarrow Tu^{166}$, and one with

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79.4 kev in the decay $Tu^{166} \longrightarrow Er^{166}$. Finally, the intensity of the K-2L-Auger-electrons is investigated with the aid of the diagrams (Figs 1 and 4), and it is ascertained that the data obtained are in good agreement with the data known from publications. There are 4 figures, 3 tables, and 12 references, 5 of which are Soviet.

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24(5),21(7)

AUTHORS: Gromov, K. Ya., Dzhelepov, B. S., Pokrovskiy, V. N.

SOV/48-23-7-6/31

TITLE: On the Scheme of the Decay of Tu^{166} (O skheme raspada Tu^{166})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 821-825 (USSR)

ABSTRACT: The first part of the present paper deals with the multipole transitions in Er^{166}, and discusses at first the experimental data of the emission accompanying the decay of Tu^{166}, which were obtained in the preceding papers of this issue. The identification of the energy of the α-transitions, and the relative intensity of the K-conversion electrons, are considered. The multipole transitions E1, E2, (M1 + E2), and M2 are then investigated, and the results are compiled in table 1. The second part investigates the absolute intensity of the γ- and conversion-lines, and calculates the number of captures of orbital electrons. The third part deals with two rotational bands of Er^{166}, the authors referring to previous papers. At first, the levels of the rotational band of the ground state, then the levels of the second rotational band, are investigated

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On the Scheme of the Decay of Tu^{166}

and explained with the help of a figure. The theory developed by A. S. Davydov on the rotational states of non-axial nuclei is mentioned which permits the energy of the rotational levels to be calculated. The intensity of the transitions in the bands studied here is then investigated, and the results are compiled in table 1. The fourth part investigates some other levels of the excitation of Er^{166}, and it is ascertained that for a clarification of these excited states of Er^{166} and their quantum characteristic, accurate measurements of the energy of the conversion electrons will have to be carried out. There are 1 figure, 3 tables, and 7 references, 5 of which are Soviet.

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24(5),24(7)

AUTHORS: Dzhelepov, B. S., Prikhodtseva, V. P., Khol'nov, Yu. V.

SOV/48-23-7-7/31

TITLE: The γ-Emission of Cs^{134} (γ-izlucheniye Cs^{134})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 826-827 (USSR)

ABSTRACT: The object of the measurements carried out by a magnetic spectrometer was the determination of the relative intensity of the γ-lines. The measurement results are shown in two diagrams, the half-width of the lines in the range of 1 Mev is indicated with 3.3 %, and the intensities of the lines are compared. The half-width of the lines could be reduced by a better focusing to 1.6 %. The results of this investigation, the energy and the relative intensity of the γ-lines of Cs^{134} are finally compiled. The authors thank V. A. Yeliseyev and A. Ushakova for the execution of the measurements, and N. N. Zhukovskiy for making possible the measurements by the elotron. There are 1 figure, 1 table, and 11 references, 4 of which are Soviet.

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

The γ-Emission of Cs^{134}

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

24(5),24(7)

AUTHORS: Voinova, N. A., Dzhelepov, B. S., Zhukovskiy, N. N.

SOV/48-23-7-8/31

TITLE: The γ-Emission of Ta^{182} in the Energy Range of 300-1,500 kev (γ-izlucheniye Ta^{182} v oblasti energiy 300-1500 kev)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 828-830 (USSR)

ABSTRACT: The introduction of the present paper mentions in short the results of many investigations of the rotational band of the ground state of W^{182}; then it is stated that the experiments described were carried out by an elotron with the purpose of determining the relative intensity of the γ-lines, at the same time looking for new lines in the range of energy indicated. The measured values are compiled in a diagram (Fig 1), and it is shown that there are practically no lines in the range $h\nu$ = 300-850 kev, and that there are 7 lines of different intensities in the range $h\nu$ = 850-1,350 kev. Finally, some known lines of low intensity in this range are mentioned. There are 2 figures, 1 table, and 5 references, 2 of which are Soviet.

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The γ-Emission of Ta^{182} in the Energy Range of 300-1,500 kev SOV/48-23-7-8/31

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24(5),24(7)

AUTHORS: Dzhelepov, B. S., Yemel'yanov, B. A., SOV/48-23-7-10/31
Podkopayev, Yu. N., Podymakhin, V. N., Uchevatkin, I. F.,
Shestopalova, S. A.

TITLE: On the Hard Part of the γ-Spectrum of Radium Found in the Equilibrium With the Products of the Decay ($h\nu$=3100÷5600 kev) (O zhestkoy chasti γ-spektra radiya, nakhodyashchegosya v ravnovesii s produktami raspada ($h\nu$=3100÷5600 keV))

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 832-834 (USSR)

ABSTRACT: At the beginning, the transition RaC ⟶ RaC', and further the transition RaC" ⟶ RaD, are indicated as the fundamental cause of the hard γ-radiation, and figure 1 shows a branching of the radioactive series of the radium family. The energy levels of these transitions are investigated, and a number of previous papers is indicated. In the present paper, a γ-hodoscope of the NIFI LGU was used for investigating the hard γ-rays. Two series of measurements were carried out. In the first series, the range of from 3,070 kev to 5,600 kev was investigated. The results of these measurements are shown in diagram (Fig 2). In the second series, the range of from

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On the Hard Part of the γ-Spectrum of Radium Found in the Equilibrium With the Products of the Decay (hγ=3,100÷5,600 kev)

SOV/48-23-7-10/31

3,200 kev to 5,600 kev was investigated, and the results were compiled in a diagram (Fig 3). The line with hγ = 3,070 kev was practically not measured in the first series, and was absolutely not measured in the second series. The diagrams show the existence of γ-lines with the energy of 3,100-3,200 kev. The second diagram also shows an increase in the electron output in the range of 3,500-3,800 kev, and this is attributed to the transition RaC" ⟶ RaD according to figure 1. The transitions RaC ⟶ RaC' and RaC" ⟶ RaD are indicated for the γ-lines with the energy of about 3,200 kev, and finally it is ascertained that lines with an energy of more than 3,900 kev could not be detected. The authors thank O. V. Chubinskiy for the supply of experimental data. There are 3 figures and 9 references, 5 of which are Soviet.

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On the Hard Part of the γ-Spectrum of Radium Found in the Equilibrium With the Products of the Decay (hν=3,100÷5,600 kev). SOV/48-23-7-10/31

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. D. I. Mendeleyeva (All-Union Scientific Research Institute of Metrology imeni D. I. Mendeleyev). Leningradskiy gos. universitet im. A. A. Zhdanova (Leningrad State University imeni A. A. Zhdanov)

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21(7) SOV/48-23-7-16/31

AUTHORS: Bunakov, V. Ye., Dzhelepov, B. S., Zvol'skiy, I., Sergiyenko, V.A.

TITLE: The Coincidences of the Conversion Electrons in the Decay $Se^{75} \longrightarrow As^{75}$ (Sovpadeniya konversionnykh elektronov pri raspade $Se^{75} \longrightarrow As^{75}$)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 859-863 (USSR)

ABSTRACT: The authors investigated, by means of a lens-β-spectrometer, the coincidences of the conversion electrons of the above-mentioned decay, the isotope S^{75} being obtained by a (n,γ)-reaction in the irradiation of the enriched isotope Se^{74}. The decay of Se^{75} was investigated in a number of papers; the lines of the γ-spectrum and the coincidences are indicated. The spectrum, recorded by the spectrometer, of the conversion electrons of this decay is shown in figure 1, and is supplemented by the level scheme. The observed coincidences of conversion electrons are indicated, and it is ascertained that their relative number lies between 0.5 and 3. The coincidences of various lines recorded by the spectrometer are shown in

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The Coincidences of the Conversion Electrons in the Decay $Se^{75} \longrightarrow As^{75}$

SOV/48-23-7-16/31

several diagrams, and the results are discussed in detail. Finally, it is stated that the results obtained improve the data of previous papers (Refs 3-5). The authors thank A. V. Zolotavin for placing at their disposal the isotope Se^{75}, and mention L. Gorzhak, student of the LGU, who participated in the measurements. There are 5 figures, 1 table, and 6 references, 3 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova (Scientific Research Institute of Physics of the Leningrad State University imeni A. A. Zhdanov)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

21(7) SOV/48-23-7-17/31

AUTHORS: Grigor'yev, Ye. P., Dzhelepov, B. S., Zolotavin, A. V.

TITLE: On the Transitions $Er^{160} \rightarrow Ho^{160}$ and $Yb^{166} \rightarrow Tu^{166}$ (O perekhodakh $Er^{160} \rightarrow Ho^{160}$ i $Yb^{166} \rightarrow Tu^{166}$)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 864-867 (USSR)

ABSTRACT: In the introduction, it is ascertained that in a number of papers the decays $Er^{160} \rightarrow Ho^{160} \rightarrow Dy^{160}$ and $Yb^{166} \rightarrow Tu^{166} \rightarrow Er^{166}$ have been investigated, and that the authors in the present paper are concerned with some peculiarities of the first transitions of these chains. It is pointed out that two isomeric states of the isotope Ho^{160} are known, which have different half-lives and the quantum characteristic of which is not known. By theoretical investigations, it was found out that the lower excited states of the odd-odd nuclei must necessarily have two levels which have the same parity. The types of the states of the isotope Er^{160} are investigated. Allowed and first forbidden decays take place in the isotope

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Er^{160}, and it is concluded that the energies of the transitions $Er^{160} \longrightarrow Ho^{160}$ do not exceed 1 Mev. The authors further assert that the Er^{160}-decays passing the so-called five-hour isomer do not take place on the levels $5^+, 2^-$ and 2^+ but on any other higher level . In the investigation of the decay $Yb^{166} \longrightarrow Tu^{166}$ it is first ascertained that the odd-odd nuclei of the isotope Tu^{166} have an excited level with the energy of 81 kev, and they are assigned to the type M1. Further it is stated that other levels of the isotope Tu^{166} are not known, and that a positron spectrum corresponding to the transition $Yb^{166} \longrightarrow Tu^{166}$ was not found. The mass defect of the Yb^{166}- and Tu^{166}-nuclei is indicated with 117 kev (according to Cameron) and with 436 kev (according to Riddel), and the decay energy of Yb^{166} is evaluated with not over 1,000 kev. The authors thank

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L. N. Zyryanova for contributing her knowledge on the β-systematics, and L. K. Peker for the discussion of the results. There are 3 figures and 19 references, 8 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova
(Scientific Research Institute of Physics of the Leningrad State University imeni A. A. Zhdanov)

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21(7) SOV/48-23-7-18/31

AUTHORS: Grigor'yev, Ye. P., Dzhelepov, B. S., Zolotavin, A. V., Kratsik, B., Bitterlikh, G.

TITLE: The Decay of Ho^{160} and the Level Scheme of Dy^{160} ($Raspad\ Ho^{160}$ i skhema urovney Dy^{160})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 868-874 (USSR)

ABSTRACT: In a previous paper (Ref 1), the authors had already determined the level scheme of Dy^{160}, but in considering all factors they come to the result that the upper level does not amount to 1718 kev , but that in the decay of the isotope Ho^{160} excited states with energies up to 2900 kev occur. In the present paper, results of an investigation of the transitions with high levels of the isotope Dy^{160} are put forward. The spectra of the positrons and of the electrons of the internal conversion were recorded by a β-spectrometer. The obtaining of the radioactive sources is dealt with, and the investigation of the β^+-spectrum in the range of weak energies is described. In the range under

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160 kev, a positron excess is observed which is connected with a soft component. The components of the spectrum are shown in a diagram (Fig 1). The balance of the intensities for the transitions in the isotope Ho^{160} shows that the transition with 60 kev amounts to 60% of the decay. It is further concluded that the number of positrons in the decay is equal to 0.36%. The authors found 55 new conversion lines which are compiled in table 2 together with the known lines. The experimental results were compared with the theoretical results, and it became clear that some L-lines are superimposed by K-lines of other transitions. Figures 2 and 3 show two ranges of the spectrum of the conversion electrons, the half-width of these lines is indicated, and it is ascertained that in figure 2 there is a group of lines the identification of which is very difficult. From the results obtained hitherto in this

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paper, and in other papers, the extensive level scheme of the isotope Dy^{160} is set up, and the balance of the intensities in Ho^{160} is evaluated. There are 4 figures, 3 tables, and 4 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova
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ANTON'YEVA, N.M.; BASHILOV, A.A.; DZHELEPOV, B.S.; PREOBRAZHENSKIY, B.K.

Conversion electron spectra of Gd^{146} and Eu^{146} [with summary in English]. Zhur.eksp. i teor.fiz. 36 no.1:28-31 Ja '59. (MIRA 12:2)

1. Leningradskiy gosudarstvennyy universitet.
(Gadolinium---Isotopes) (Europium---Isotopes) (Electrons)

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21 (8)

AUTHORS: Dzhelepov, B. S., Ushevatkin, I. F., Shestopalova, S. A.

SOV/56-37-3-44/62

TITLE: $0^+ - 0^+$-Transition in the Decay $Pr^{140} \rightarrow Ce^{140}$

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 857 - 859 (USSR)

ABSTRACT: In an earlier paper it has already been stated that the Ce^{140}-nucleus has an excited state of the type 0^+ with an excitation energy of 1902 kev. This state occurs in La^{140}-decay. The ground state and the excited states of Ce^{140} may occur also in electron capture and in the β^+- decay of Pr^{140}. Figure 1 shows the scheme of the possible transitions to the lower excited states of Ce^{140}. In the present "Letter to the Editor" the authors endeavor to show that the 1902 kev level of Ce^{140} is not excited by the decay of Pr^{140}; as the ground state of Pr^{140} is of the type 1^+, it may be expected that this state occurs in the case of permitted β-decays and in electron cap-

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ture. For this purpose, an $Nd^{140} + Pr^{140}$ preparation in equilibrium was investigated in a β-spectrometer with triple focusing. The counters were filled with argon + 15% alcohol (pressure 100 torr). Figure 2a shows the K conversion line (1902 kev) and figure 2b - the Curie diagram for the end of the β-spectrum of Pr^{140}. The results obtained are supplemented by those obtained by other authors (Refs 4-7). The ratio e^-/β^+ was determined as being 0.2%. The number of e^-(1902) is determined in consideration of the fact that K- and L-captures in the case of the permitted decay to the ground state amount to about 47%. Herefrom the number of conversion electrons is determined as amounting to 0.1% per decay. Thus, the $Ce^{140}(0^+)$ 1902 kev level is far more frequently excited in the decay of Pr^{140} than in the decay of La^{140} (according to references 1,7: 0.013%). Actually, the Ce^{140} 1902 kev level occurs both in e^--capture and in the β^+-decay of Pr^{140}. ft = ?:10^6 is found

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$0^+ - 0^+$-Transition in the Decay $Pr^{140} \rightarrow Ce^{140}$ SOV/56-37-3-44/62

for permitted transitions. There are 2 figures and 7 references, 6 of which are Soviet.

ASSOCIATION: Vsesoyuznyy institut metrologii (All-Union Metrology Institute)

SUBMITTED: May 16, 1959

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DZHIBLADZE, I.Ye.

Terraces of the Kura River in the Tiflis vicinity. Trudy Geog. ob-va Gruz. SSR 5:105-117 '59. (MIRA 13:11)
(Kura Valley--Geology, Structural)

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"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

PHASE I BOOK EXPLOITATION SOV/4394

Dzhelepov, B. S., and G. F. Dranitsyna

Sistematika energiy β-raspada (Energy Patterns of β-Decay) Moscow, Izd-vo AN SSSR, 1960. 57 p. (Series: Svoystva atomnykh yader, vyp. 3) 4,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Radiyevyy institut.

Ed.: Yu. V. Khol'nov, Candidate of Physical and Mathematical Sciences; Ed. of Publishing House: Ye. A. Semenova; Tech. Ed.: R. A. Zamarayeva.

PURPOSE: This book is intended for scientific workers, aspirants, and advanced students of higher educational institutions working in the field of nuclear spectroscopy.

COVERAGE: The booklet is a critical review of the literature on semiempirical and empirical atomic mass formulas. It includes calculated and experimental data on energies of beta decay shown in charts and tables of energy values

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published up to March 1, 1959. No personalities are mentioned. There are 32 references: 3 Soviet, 24 English, 3 Dutch, 1 German, and 1 Swedish.

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ZYRYANOVA, L.N.; DZHELEPOV, B.S., otv.red.; TSVETKOV, M.V., red.izd-va; BOCHEVER, V.T., tekhn.red.

[Unique beta-transitions] Unikal'nye beta-perekhody. Moskva, Izd-vo Akad.nauk SSSR, 1960. 96 p. (Svoistva atomnykh iader, no.2). (MIRA 13:9)

1.Chlen-korrespondent AN SSSR (for Dzhelepov).
(Nuclei, Atomic--Spectra)

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DZHELEPOV, B.S.; ZHUKOVSKIY, N.N.; KHOL'NOV, Yu.V., kand.fiz.-mat.nauk; ovt.red.; KAL', M.M., red.izd-va; ZAMARAYEVA, R.A., tekhn.red.

[Isobaric nuclei with an atomic number of 110] Izobarnye iadra s massovym chislom A = 110. Moskva, Izd-vo Akad.nauk SSSR, 1960. 72 p. (Svoistva atomnykh iader, no.4). (MIRA 13:11)
(Isobars, Nuclear)

APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2"

"APPROVED FOR RELEASE: 03/13/2001 CIA-RDP86-00513R000411910003-2

DZHELEPOV, B.S.; PRIKHODTSEVA, V.P.; KHOL'NOV, Yu.V.; BARKOVSKIY, I.V., red.izd-va; BOCHEVER, V.T., tekhn.red.

[Isobaric nuclei with a mass number of 140] Izobarnye iadra s massovym chislom A=140. Moskva, Izd-vo Akad. nauk SSSR, 1960. 97 p. (Svoistva atomnykh iader, no. 5.) (MIRA 14:2)
(Isobars, Nuclear)

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AUTHORS: Gromov, K. Ya., Dzhelepov, B. S., Dmitriyev, A. G., Morozov, V. A., Yakovlev, K. I.

TITLE: Conversion Electrons and Gamma Rays of Tu^{165}

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 272-277

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The authors studied the spectrum of the conversion electrons of Tu^{165} by means of a magnetic spectrometer of the type "Ketron". The relative half-width of the lines was 0.4 per cent, the light intensity of the instrument was 0.4 per cent. The γ-ray spectrum was taken by means of a γ-scintillation spectrometer. The half-width of the 661-kev Cs^{137} line was 12 per cent. In order to obtain Tu^{165} tantalum was bombarded with 660-Mev protons for 4 hours on the synchrocyclotron of the Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research) at Dubna. Then, the

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resulting elements were separated chromatographically. The conversion-electron spectrum was studied in the range 85 - 1,200 kev. The spectra obtained are illustrated in Figs. 1 - 3. Each spectral region was taken three times every 25 - 35 hours. Thus, it was possible to distinguish the lines of Tu^{165} from the lines of other isotopes. The intensity of the lines was measured relative to the K-243 intensity. The resulting data permitted the identification of the following new γ-transitions: 279.0, 312.1, 366.0, (378.4), 389.4, 457.2, 460.4, 471.6, 488.2, (543.5), 566.0, 807.1, 1,133, 1,179, and 1,187 kev. Table 1 lists all data on the conversion-electron spectrum (E_e, $H\rho$, relative intensity, identification, E_γ). The γ-spectrum obtained is shown in Fig. 4. The following γ-lines were recorded: (219÷240), 296, 350, 450, 540, 810, and 1,170 kev. The relative intensities of these lines are compiled in Table 2. There are 4 figures, 2 tables, and 12 references, 6 of which are Soviet.

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AUTHORS: Abdurazakov, A. A., Gromov, K. Ya., Dzhelepov, B. S., Norseyev, Yu. V., Umarov, G. Ya., Chumin, V. G.

TITLE: The 75-minute Activity of Yb 79

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 278-282

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The authors analyzed the spectra of electrons and positrons arising in the decay of the 75-minute Yb isotope by means of a magnetic β-spectrometer with a homogeneous magnetic field. The half-width of the Cs^{137} K-line amounted to 0.8%. Electrons were recorded by an electron counter of the type MST-17. An analysis of the positron spectrum (Fig. 1) revealed that it corresponded to a half-life of 75 ± 2 min as to intensity in all its parts. Fig. 3 shows one of the decay curves of the positron spectrum; its analysis by means of the Fermi method (Fig. 2) showed that in the range

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of 1,300 - 2,340 kev there occurred no deviations from the shape which is characteristic of allowed β-transitions. The energy limit of the β-spectrum is found at 2,940±20 kev. A deviation of the spectrum from the Fermi shape was observed at energies below 1,300 kev. If this deviation is assumed to be related to a second component of the β-spectrum, its energy limit should then be at 1300±100 kev. L- and M-lines of the 91.5-kev transition and K- and L-lines of the 211-kev transition were found in the spectrum of conversion electrons. Data on conversion lines are compiled in Table 1. The mass number of this 75-min isotope has not yet been safely ascertained, but a number of authors believe it to be 167. The opinions of various authors are cited in this connection, among them B. S. Dzhelepov and L. K. Peker, A. V. Kalyamin and A. Abdurazakov. To conclude from the investigation results obtained by the authors of the present paper (Table 2) it does not seem possible to ascribe the mass numbers 167 and 165 to the 75-minute isotope. Results likewise exclude 163 and 161. The only possible numbers left are 162 and 164. Considerations indicate 164 as the most probable mass number. Fig. 4 shows the possible decay scheme. To check this assumption, the authors analyzed

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the conversion electron spectrum with a view to determining the Z of that nucleus in which the 91.5-kev transition, excited in the decay of 75-min Yb, occurs. Respective data are given in Table 3. It was thus proven that the 75-min activity is actually to be ascribed to the mass number 164. There are 4 figures, 3 tables, and 12 references, 7 of which are Soviet.

ASSOCIATION: Laboratoriya yadernykh problem Ob"yedinennogo instituta yadernykh issledovaniy (Laboratory of Nuclear Problems of the Joint Institute of Nuclear Research) Sredneaziatskiy politekhnicheskiy institut ((Soviet) Central Asia Polytechnic Institute)

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24.6720

AUTHORS: Bonch-Osmolovskaya, N. A., Dzhelepov, B. S., Kraft, O. Ye.

TITLE: Study of Positron Spectra of Neutron-deficient Isotopes

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 283-287

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The authors studied the positron spectra of some neutron-deficient isotopes obtained by bombarding a tantalum target with 680-Mev protons. The authors used a β-spectrometer with triple beam focusing. Results are given according to elements. Lutetium: The hardest component recorded had an energy limit of about 2,800 kev. All spectral regions with an energy exceeding 1,500 kev corresponded to one and the same half-life of 85±18 min (Fig. 1). Thus, it may be seen from the Curie curve shown in Fig. 2 that the energy limit of the β^+-spectrum was 2,800±200 kev, corresponding to a half-life of 56±12 min. The above component can, therefore, be ascribed to Lu^{167}

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Study of Positron Spectra of Neutron-deficient Isotopes

(55 min). The Curie curve of this isotope is shown in Fig. 3. The problem of the β^+-spectrum with the energy limit of 2,800 kev and T = 85 min has not yet been solved. Such an isotope is unknown. Two explanations are possible: 1) Such an Lu isotope as, e.g., Lu^{168} actually exists. In this case also a γ-radiation would have to exist for this half-life, which has not yet been observed. 2) It is the radiation of the 75-minute Yb isotope (β^+-energy limit 2.95 Mev); the presence of such an impurity is not impossible. Thulium: The authors recorded a β^+-spectrum with an energy limit of 2.1 Mev (7.3 hours - Tu^{166}) and one with 137 min (Tu^{163}). As shown in Fig. 4, the spectrum consists of two components with the energy limits 1,050±80 and 400±50 kev with an intensity ratio of 1 : 0.7. The Tu^{163} - Er^{163} mass difference was ≅ 2,070 kev. Other authors found 2.1 and 2.24 Mev. Erbium: Intense positron emission with an energy limit of 1,300 kev (~2.5 hours) was found, further one with 115±15 min. This spectrum also consisted of two components with the energy limits 1,900±100 and 2,980±100 kev, and an intensity ratio of 5 : 1. Also the electron-conversion line with 900 kev (2 hours), which was observed for the first time by I. A. Dneprovskiy, was detected. Dysprosium: The

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B006/B014

24.6520

AUTHORS: Dzhelepov, B. S., Yemel'yanov, B. A., Kupriyanova, K. P., Podkopayev, Yu. N.

TITLE: The β^--Decay of La^{140}

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 288-290

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The data available on La^{140} decay do not permit a definite determination of the ground-state spin of this isotope. Therefore, the authors of this article studied the β-transition from the ground state of La^{140} to the ground state of Ce^{140}. Measurements were carried out in the range 1,800 - 4,000 kev by means of a new β-spectrometer (a β-hodoscope) by NIFI LGU. This instrument differs from the β-hodoscope described in Ref. 1 only in it uses a β-active preparation as electron source, instead of a target. Altogether, seven series of measurements were made

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with different magnetic field strengths and different sources. Each series covered an energy range of $\Delta E \approx 1{,}000$ kev. The results obtained were composed in such a manner that the range 1,800 - 4,000 kev was continuously covered (Fig. 1). The left-hand diagram of Fig. 1 illustrates the β-spectrum of La^{140} with the energy limit $E_{lim} \approx 2200$ kev. The electron distribution found between 2,200 and 3,850 kev was identified as a continuous spectrum of the β-transition between the ground states of La^{140} and Ce^{140} and as conversion lines of the γ-transitions of Ce^{140}. Fig. 2 shows the determination of energy limits by means of Curie curves. The authors found that the most probable spin value of the La^{140} ground state is 3. Further, they detected conversion lines having electron energies of (2,490±30) and (2,880±30) kev. These lines had been detected already earlier. A line of (3,100±50) kev was found for the first time. The energies of the corresponding γ-transitions and the intensities of the conversion lines are listed in a table. The conversion coefficients of the transitions were $\alpha_{K\text{-}2,530} = 3.4 \cdot 10^{-4}$ and $\alpha_{K\text{-}2,920} = 3.1 \cdot 10^{-4}$. A comparison with theoretical results indicated

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The β^--Decay of La^{140}

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that the 2,530-kev γ-transition is an M1 transition. The existence of such an excited level is indicated by the line corresponding to the nuclear transition of 3,140 kev. Finally, the authors thank N. D. Novosil'tseva and L. V. Gustova for their assistance. There are 2 figures, 1 table, and 8 references, 7 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova (Scientific Research Institute of Physics of Leningrad State University imeni A. A. Zhdanov)

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B006/B014

AUTHORS: Voinova, N. A., Dzhelepov, B. S., Zhukovskiy, N. N.

TITLE: Investigation of the Gamma Radiation of Ag^{110m} in the Energy Range 0.2 ÷ 2.0 Mev

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 291 - 299

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). In recent years data on the γ-emission of Ag^{110m} appeared in various papers, inter alia by L. Gustova et al. (Ref. 3) and by the authors of this article (energy range 650 - 1,600 kev). The energies of the γ-lines detected by the various authors in the various energy ranges under consideration are given in the introduction. The authors analyzed again the γ-spectrum of Ag^{110m} in the range 0.2 - 2.0 Mev by means of an elotron. A neutron-activated sample of approximately 11 g served as source. The initial activity of the source was about 0.9 curies. Experimental results are

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compiled in diagrams and tables. The 656-kev lines were used as reference lines. In the range 440 - 1,600 kev 14 lines could be recorded separately. Their intensity exceeded 1 per cent of that of the 656-kev line. An analysis of the experimental curves made on the elotron showed that the ranges 300 - 430 kev and 450 - 600 kev contained no lines with intensities greater than 1 per cent and/or 0.8 per cent of that of the 656-kev line. There was no sign of existence of a 723-kev line in the γ-spectrum of Ag^{110m} (as described by Cork et al.), provided its intensity be greater than 1 per cent of that of the 656-kev line. No γ-lines with intensities exceeding 0.3 per cent were found in the range 950 - 1,350 kev. Next, a great number of further details are discussed, such as intensities (Table 1), lifetimes, and multipole types of the various transitions. Further, the results of numerous papers dealing with decay schemes of isobaric nuclei with A = 110 are discussed (Fig. 2). The following is dealt with in detail: the quantum characteristics of the excited levels of Cd^{110} and the pertinent intensity equilibrium, the isomeric transitions in Ag^{110} and In^{110} (Table 2 lists the theoretical K/L values and $T_{1/2}$ of the 120-kev transition in In^{110} for various multipole types). Finally,

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Investigation of the Gamma Radiation of Ag^{110*} in the Energy Range 0.2 ÷ 2.0 Mev

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B006/B014

the actual possibilities of β^+-decay and of the capture of orbital electrons in Ag^{110*} and Ag^{110} are discussed. Mention is made of N. Anton'yeva. In conclusion, the authors thank V. P. Prikhodtseva and Yu. V. Khol'nov for putting the rytron at their disposal. There are 2 figures, 2 tables, and 34 references, 7 of which are Soviet.

ASSOCIATION: Radiyevyy institut im. V. G. Khlopina Akademii nauk SSSR (Radium Institute imeni V. G. Khlopin of the Academy of Sciences, USSR)

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24.6720
24.6810

AUTHORS: Dzhelepov, B. S., Khol'nov, Yu. V.

TITLE: The Gamma Spectrum of $Eu^{152,154}$ in the Energy Range 245 ÷ 500 and 1,450 ÷ 2,000 kev

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 300 - 303

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The authors studied the γ-spectrum by means of a magnetic γ-spectrometer (rytron). A mixture of Eu^{152} and Eu^{154}, whose total activity amounted to about 800 millicuries, served as source. The activity ratio between E^{154} and E^{152} was estimated as being 0.21±0.03. The results obtained are reproduced in two diagrams and a table. The following lines were detected (the first figure denotes the respective energy of the line, while the following figure in parentheses denotes the relative intensity referred to the 344-kev line): 245 kev (35 ± 4); it consists of two lines which were

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The Gamma Spectrum of $Eu^{152,154}$ in the Energy Range 245 ± 500 and 1,450 ± 2,000 kev

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inseparable in these investigations: 244.7 kev (Eu^{152}) and 248 kev (Eu^{154}). B. V. Bobykin and K. M. Novik showed that the intensity ratio of these two lines equals 21.1 : 5.9. Hence, the Eu^{152} line yields the largest fraction. 344 kev (100). 440 kev (detected by N. N. Zhukovskiy). It corresponds to the conversion lines 411.23 and 444.23 (Ref. 6). The authors of this article recorded 415±4 kev (10.1±2) and 450±4 (11.4±2). The intensity sums of these two lines are in good agreement with that calculated by Zhukovskiy for the 440-kev line. 496±10 kev (2.6±1): This line was observed by the authors for the first time. It corresponds to a transition between the levels 1,577 and 1,088 kev (489-kev transition) or between 1,533 and 1,050 kev (483-kev transition) of Eu^{152}. Also 1,526 ± 15 kev (1.2±0.3) was observed for the first time. It may be assumed that it results from a direct transition from the 1,533-kev level (2^-) to the ground level (0^+). 1,600 kev (described in Ref. 7). 1,610 ± 7 kev (1.6±0.2): no further details available on this line. Besides the spectrum of recoil electrons, Fig. 2 also contains the decay schemes for Eu^{152} and Eu^{154} as published by Zhukovskiy. No lines with relative intensities >0.1 could be found in the range 1,670 - 2,000 kev. Finally,

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The Gamma Spectrum of $Eu^{152,154}$ in the Energy Range 245 ÷ 500 and 1,450 ÷ 2,000 kev

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the authors thank A. Ushakova and V. Rumyantsev for their assistance rendered in measurements. There are 2 figures, 1 table, and 7 references, 4 of which are Soviet.

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24.6810

AUTHORS: Dzhelepov, B. S., Dolgoborodova, M. A.

TITLE: Resonance Scattering of La^{140} Gamma Rays

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 304 - 310

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The authors studied the scattering of gamma rays of La^{140} by Ce^{140}. The La^{140} preparation was used as gamma source in the form of a nitric acid $La(NO_3)_3$-solution. The experimental arrangement is schematically shown in Fig. 1. CeO_2- and La_2O_3 cylinders weighing about 3 kg served as scatterers. The mean scattering angle was 81°. A cylindrical NaI(Tl) crystal with an FEU-24 photomultiplier was used as detector. The half-width of the total absorption peak of the 1,597-kev line was 13 per cent. The counter system was prevented from being charged by a 12 mm thick lead shield which was inserted between the crystal and the scatterer. Eleven series of

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measurements were carried out, in which CeO_2 and La_2O_3 were alternately used as scatterers. Fig. 2 shows some scattering curves as measured in one series. The peaks at 1,597 kev (the first excited level of Ce^{140}) are distinctly marked. The resonance scattering curves of all eleven series of measurements are shown in Fig. 3. The width of the level which was excited in the scattering could be determined by measuring the intensity of resonance scattering. For this purpose the formula

$$\bar{\sigma} = \frac{(2I^*+1)\lambda^2}{(2I_0+1)4}\, m\Gamma_\gamma$$ was used ($\bar{\sigma}$ - resonance scattering cross section averaged over the microspectrum, I_0 and I^* - spins of the ground- and excited level, λ - wavelength of the scattered ray, m - fraction of the microspectrum corresponding to a 1 ev broad band in the resonance range, Γ_γ - desired radiation width of the level). For the case under consideration it holds that $I_0 = 0$, $I^* = 2$, $\lambda = 7.8 \cdot 10^{-11}$cm. For determining Γ_γ it is necessary to know $\bar{\sigma}$ and m. The determination of $\bar{\sigma}$, which is described in great detail, yielded $\bar{\sigma} = (8.4 \pm 1.0)$ mb. In the following, the determination of m from the microspectrum (Fig. 7) of gamma rays

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Resonance Scattering of La^{140} Gamma Rays

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is described. The authors obtained m = 0.008 ± 0.003, wherefrom it followed that $\Gamma_\gamma = 1.4 \cdot 10^{-4}$ ev and $T_{1/2}(1{,}597 \text{ kev}) = (3.3 \pm 1.3) \cdot 10^{-12}$ sec. The data obtained are finally discussed and compared with the results furnished by other authors. Mention is made of A. A. Tkachenko, who calculated the shape of the microspectrum. The decay scheme of La^{140} is shown in Fig. 6. There are 7 figures, 1 table, and 3 non-Soviet references.

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B006/B014

24.6720

AUTHORS: Dzhelepov, B. S., Rumyantsev, V. L., Khol'nov, Yu. V. Shchukin, G. Ye.

TITLE: The Gamma Spectrum of W^{187}

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 311-312

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The authors studied the γ-emission of W^{187} by means of a magnetic γ-spectrometer (rytron); three series of measurements were made with a source of about 1,000 millicuries. The total spectrum of recoil electrons is illustrated. The measured energies and the relative intensities referred to the intensity of the 488-kev line are compiled in a table. The following lines (in kev) - the respective intensities are given in parentheses - were detected: 488 (100), 558 (22.5±1.7), 622 (31.2±2.5), 691 (119±7), 778 (22.2±1.5), 864 ± 9 (1.4 ± 0.3), 891 ± 9 (1.1 ± 0.3).

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The Gamma Spectrum of W^{187}

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These results are compared with those obtained by Mueller et al. and Dubey et al.No γ-lines with intensities >0.3 per cent of that of the 488-kev line could be observed in the range 950 ÷ 1,350 kev. There are 1 table and 6 references, 1 of which is Soviet.

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DZHELEPOV, B.S.; UCHEVATKIN, I.F.; SHESTOPALOVA, S.A.

Spectrum of conversion electrons of neutron deficient isotopes of lutetium in the energy region of 1000-3500 kev. Izv.AN SSSR Ser. fiz. 24 no.7:802-806 Jl '60. (MIRA 13:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii imeni D.I.Mendeleyeva.
(Lutecium--Isotopes)

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ABDURAZAKOV, A. A.; GROMOV, K.Ya.; DZHELEPOV, B.S.; UMAROV, G.Ya.

Spectrum of conversion electrons of a dysprosium fraction.
Izv.AN SSSR.Ser.fiz. 24 no.9:1126-1134 S '60. (MIRA 13:9)

1. Sredne-Aziatskiy politekhnicheskiy institut i Ob"yedinennyy institut yadernykh issledovaniy.
(Dysprosium--Isotopes) (Electrons--Spectra)

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24.6720

AUTHORS: Basina, A. S., Dzhelepov, B. S., and Chikhladze, V. A.

TITLE: The Lu^{167} + Yb^{167} Conversion Electron Spectrum

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 7, pp. 807-810

IX

TEXT: This paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which took place in Moscow from January 19 to 27, 1960. The lutecium fraction, which had been obtained by chromatographic separation of rare earths, was investigated with a lens spectrometer having a resolution of 2%. The rare earths were spallation products of Ta. The source was produced by the evaporation of lutecium lactate on an Al backing; its diameter was not greater than 4 mm. The Ta targets were bombarded with fast protons on the proton-synchrotron of OIYaI for 15 to 30 minutes. The fraction was separated 1 hour and 50 minutes after exposure. 50 minutes later, the conversion spectrum was studied. It was the purpose of the present work to investigate the conversion electron spectrum of

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The Lu^{167} + Yb^{167} Conversion Electron Spectrum

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Lu^{167} + Yb^{167} within the energy range from 30 to 340 kev. Within this energy range there are lines that are formed by the decay of $Lu^{167} \longrightarrow Yb^{167} \longrightarrow Tu^{167} \longrightarrow Er^{167}$. The experimental spectrum of Lu^{167}+Yb^{167}, recorded one hour after separation, is shown in Fig. 1. In the conversion electron spectrum, a number of very bright lines having the half-life of 55±5 minutes were found to exist 1 to 6 hours after separation. After these lines had vanished, 208 kev γ-transition lines could be observed, which are formed in the decay of Tu^{167}. The energies and the relative intensities of the conversion lines for $Lu^{167} \longrightarrow Yb^{167}$ and $Yb^{167} \longrightarrow Tu^{167}$ decays are given in Tables 1 and 2. The intensity of the Lu^{167} K-239 line is 35-55% of that of the Yb^{167} L-106 line. In Table 3, unidentified conversion lines of (Lu^{167} + Yb^{167}) are given, which did not appear in the paper by Mihelich et al. (Ref. 7). P. M. Aron, A. V. Kalyamin et al. (Ref. 4), K. Ya. Gromov and I. S. Dneprovskiy (Ref. 8) are mentioned. There are 1 figure, 3 tables, and 8 references: 6 Soviet and 2 US-

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The Lu^{167} + Yb^{167} Conversion Electron Spectrum

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ASSOCIATION: Nauchno-issledovatel'skiy fizicheskiy institut Leningradskogo gos. universiteta im. A. A. Zhdanova (Scientific Research Institute of Physics of Leningrad State University imeni A. A. Zhdanov). Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

Таблица 3

Неидентифицированные конверсионные электроны (Lu^{167} + Yb^{167}), отсутствующие в работе [7]

E_{e^-}, keV	T, мин	Интенсивность по нашим данным
68,9	56±15	50±10
76,0	100±40	30±15
169,0	60±15	30±15

Таблица 1

Конверсионные электроны, возникающие при распаде $Lu^{167} \rightarrow Yb^{167}$

E_{e^-}, keV	E_γ, keV	T, мин	Интенсивность		Идентификация
			по нашим данным	по [7]	
151,6	212,9	58±5	42±6	46	K-213
176,6	238	56±5	100	100	K-239
216,4	277.7	65±15	19±5	16	K-278
228	238	65±15	17±4	19	L-239
339,5	400,8	59±5	10±2	10	K-401

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Таблица 2

Конверсионные электроны, возникающие при распаде $Yb^{167} \rightarrow Tu^{167}$

E_{e^-}, keV	E_γ, keV	T, мин	Интенсивность		Идентификация
			по нашим данным	по [7]	
46,7	106,0	56±5	340±70	370	K-106
53,5	112,8	55±5	190±40	155	K-113
57,6	116,9	—	25±5	22	K-116
60,8	63	—	19±6	24	M-62*
95,7	105,8	55±5	100	100	L-106
103,6	105,9	56±5	58±9	50	M-106 и L-113
108	117	—	16±7	23	L-116
116,5	175,6	53±5	16±5	11	K-176
122,3	131,4	55±5	14±5	13	L-132

* Здесь также K-122 Lu^{167}.

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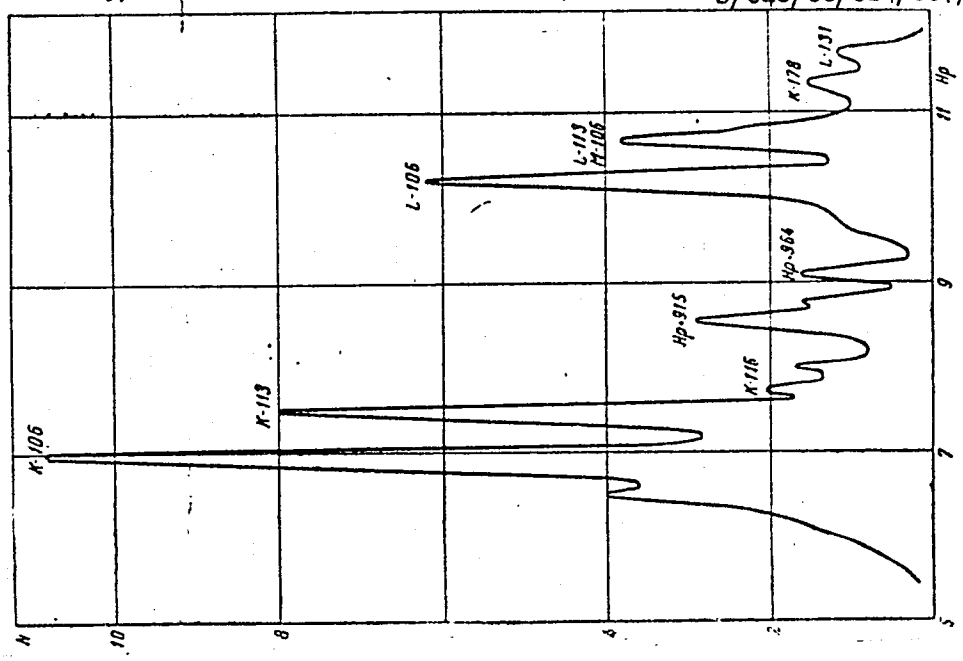

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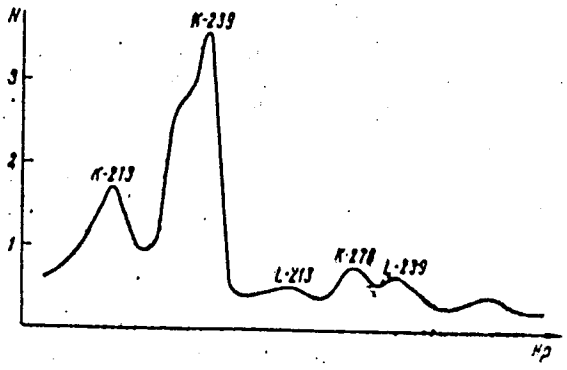

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Рис. 1

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24.6720

AUTHORS: Basina, A. S., Gromov, K. Ya., and Dzhelepov, B. S.

TITLE: The Conversion Electron Spectrum of the Dysprosium Fraction

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 7, pp. 811-816

TEXT: This paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which took place from January 19 to January 27, 1960 at Moscow. The investigations described here were carried out by means of a β-spectrometer having a resolution of roughly 1.9%. The dysprosium fraction was chromatographically separated from rare earths. The rare earths had been obtained by irradiation of a Ta-target (15-20 minutes) with fast protons. Separation of the dysprosium fraction took place 2 hours after the irradiation of the target. Measurements began roughly 1 hour after the fraction separation. The preparation was produced by previous evaporation of dysprosium lactate and following transfer of the activity by means of a weak acetic solution upon an Al foil. The source had a diameter of 3 mm.

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The Conversion Electron Spectrum of the Dysprosium Fraction

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The emission of the following isotopes was observed: Dy^{152}, Dy^{153}, Dy^{155}, and Dy^{157}. Dy^{154} and Dy^{159} were not observed. During the first 30 hours, the conversion electron spectrum was measured continuously, and in the course of the following days it was measured once in each case. In this spectrum lines having the halflife of 6, 8 - 11, and roughly 20 hours, as well as several days were observed. Besides it was found that the intensity of a number of lines at first grew with a period of 2.5 hours, after which it decreased within a period of roughly 20 hours. The known data make it possible to assign the halflife of 8-11 hours to the Dy^{155}- and Dy^{157}- isotopes, and the longer periods to the Tb-daughter activities. The assignment of the halflives of roughly 6, 2.5, and 20 hours is further discussed. On the basis of known data, the spectra of Dy^{157} and Dy^{155} are discussed, and it was found that the L-82 and M-82-lines do not belong to Dy^{157}, and that no lines could be observed that might be assigned to Dy^{154} or Tb^{154}. Furthermore, the authors were able to prove that Dy^{153} was present in the preparation under investigation. In Table 1 the values for the conversion electrons of Dy^{153} are given. In the first column,

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the energy of the conversion electrons, in the second the energies of the γ-transitions, in the third the periods, in the fourth the relative intensities, and in the fifth column the identifications are given. From those lines whose intensity at first grows with a period of 2.5 hours, after which it falls, the authors conclude that the following decay exists: $Dy^{152} \xrightarrow{2.5\ h} Tb^{152} \xrightarrow{20\ h} Gd^{152}$. Thus, the three Tb^{151}, Tb^{152}, and Tb^{154} probably exist with a halflife of 18 hours. In Table 2, the values of the conversion electrons of Tb^{152} are given together. In the first column, the energies of the conversion electrons, in the second the energy of the γ-transitions, in the third the relative intensities, and in column four the identifications are given. The results obtained indicate the $Tb^{152} \rightarrow Gd^{152}$ decay scheme shown in Fig. 3. N. M. Anton'yeva, A. A. Bashilov, A. N. Dobronravova, I. N. Rogachev, and I. Zvol'skiy are mentioned. The authors thank V. A. Morozov and G. A. Mironov for their help in measurements, and also I. A. Yutlandov and V. A. Khalkin for carrying out chemical work. There are 3 figures, 2 tables, and 15 references: 9 Soviet, and 6 US.

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