ment and angle of polarization plane turn φ in the Faraday effect decrease by the radiation effect, and the curve of φ dependence on field H shifts to the left. Coercive force and parameter of spinel lattice are independent of irradiation, within the range of measurement errors.

N. Smol'kov

[Abstracter's note: Complete translation]

LOBANOV, Ye. M., NOVIKOV, A. P.

"Activation Methods for Determining Copper in Rocks"

paper presented at the All-Union Seminar on the Application of Radioactive Isotopes in Measurements and Instrument Building, Frunze (Kirgiz SSR), June 1961)

So: Atomnaya Energiya, Vol 11, No 5, Nov 61, pp 468-470

LUBANOV, Ye. M., ABDULAYEV, D.

"On the Question of Determining the Composition of 2- and 3-Component Mixtures by Scattering of Beta-Rays"

paper presented at the All-Union Seminar of the Application of Radioactive Isotopes in Measurements and Instrument Building, Frunze (Kirgiz SSR), June 1961)

So: Atomnaya Energiya, Vol 11, No 5, Nov 61, pp 468-470

35603

S/166/62/000/001/005/009
B125/B104

24.2200

AUTHORS: Nizametdinova, M. A., Lobanov, Ye. M.

TITLE: The influence of nuclear radiations on ferrites

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1962, 44 - 48

TEXT: The influence of protons and gamma rays on the magnetic permeability $\mu = \mu_1 - j\mu_2$ and the dielectric constant $\varepsilon = \varepsilon_1 - j\varepsilon_2$ has been determined for a cobalt-barium system which filled out the cross section of a coaxial line. The measurements were made with the input impedance Z_{sh} at short-circuit and Z_{idle} at idle run at 300, 500 and 800 ~~мгц~~ Mc. One of the first investigations of this type was made by N. V. Vol'kenshteyn and A. I. Orlov (Izv. AN SSSR, ser. fizicheskaya, vol. 18, 1954, no. 4, 494). The influence of rays on the magnetic properties of ferrites has been found by N. M. Omel'yanovskaya (Atomnaya energiya, v. 7, no. 1, 1959). The following expressions are found $\mu = \gamma' Z_c$ and $\varepsilon = \gamma'/Z_c$ with $Z'_k = Z'_c \operatorname{th}\gamma l$ and

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$Z'_x = Z'_c/\text{th}\gamma l$, $Z'_c = \sqrt{\mu/\varepsilon} = \sqrt{Z'_k Z'_x}$, $\sqrt{\mu\varepsilon} = \gamma' = (\beta + j\alpha)/j\alpha_0$. The primed letters denote the input resistance divided by the characteristic line resistance without introduced substance. The table contains the changes of the magnetic permeability and the dielectric constant of type Φ-63 (F-62) ferrites under the influence of radiation. μ and $\mu_1 - j\mu_2$ are hardly changed by the influence of protons and gamma rays. Radiation increases ε by increasing the content of bivalent iron. A change of ε is partly explained by formation of hole-vacancy pairs. There are 1 figure, 1 table, and 13 references: 6 Soviet and 7 non-Soviet. The four most recent references to English-language publications read as follows: E. I. Salkovitz, C. C. Bailey, A. I. Schindler, J. of Appl. Phys., 1958. N 12, 429; E. I. Salkovitz, A. I. Schindler, An Sell Bull., Am. Phys. Soc., ser. 1, 1958, N 3, 117; N. G. Sakiots, E. I. Salkovitz, A. I. Schindler, Solid State Phys. Electron and Telecommuns, v. 4, London-New York, Acad. Press., 1960, 816; R. E. Alley, J. Appl. Phys., 30, 28, 1959, N 4.

ASSOCIATION: Akademiya nauk UzSSR (Academy of Sciences Uzbekskaya SSR)

SUBMITTED: August 15, 1961

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S/166/62/000/001/009/009
B125/B104

AUTHORS: Kist, A. A., Lobanov, Ye. M., Zvyagin, V. I., Bartnitskiy, I. N.

TITLE: Effect of gamma irradiation upon oxide films of germanium

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fizi.o-matematicheskikh nauk, no. 1, 1962, 88-90

TEXT: The effect of gamma rays on germanium monoxide and germanium dioxide films produced by etching was quantitatively measured with a Geirovskiy micropolarograph. The monoxide - dioxide mixture produced by etching germanium powder in standard etching agent did not change under gamma irradiation in air, carbon dioxide, and in vacuum (10^{-4} torr) with 20, 60, 100, 150, and 200 million r. In the subsequent irradiation of the weighed portion of germanium etched in a standard reagent with 20, 30, 50, and 100 million r, the amount of germanium dioxide increases at doses of up to 40-50 million r, and then decreases again. The oxide film produced in etching agent no. 5 contains monoxide and dioxide in a ~1 : 1 ratio. While etching agent no. 5 gives rise to germanium monoxide,

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germanium dioxide is contained in the film in an equal amount. The anomalous current and the photocurrent are not exclusively due to the germanium monoxide. Similar phenomena are also observed when exposing the diodes to gamma irradiation (doses above 10^6 r). These anomalies disappear either entirely or partially at doses of more than 10^8 r. The irradiated photodiodes yield a photocurrent at such doses if the amount of germanium dioxide on the surface increases. The upper limit of the anomalous photocurrent shifts toward the visible region when etching agent no. 5 is used. Gamma irradiation first causes the oxide film to grow more considerably, but the secondary fast electrons then again partly destroy the oxide film. As a result, the oxide film becomes eventually thinner. If present considerations are correct, germanium diodes are made insensitive also to intense radiations in that the oxide film is prevented from growing all throughout the dose range. There are 1 figure, 1 table, and 8 references: 2 Soviet and 6 non-Soviet. The four references to English-language publications read as follows: S. I. Ellis, Appl. Phys. 1957, 11, 1262, 28; I. Everest, J. Chem. Soc., Febr. 1953, 660; I. Bardet, Tchakarian A. C. R., 1928, 637, 186; L. Dennis, Xules R. J. Am. Soc., 1930, 3554, 52.

Effect of gamma irradiation ... S/166/62/000/001/009/009
B125/B104

ASSOCIATION: Akademiya nauk UzSSR (Academy of Sciences of the Uzbekskaya SSR)

SUBMITTED: August 25, 1961

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KIST, A.A.; LOBANOV, Ye.M.; ZVYAGIN, V.I.; BARTNITSKIY, I.N.

Effect of gamma radiation on a germanium oxide film. Izv.AN Uz. SSR.Ser.fiz.-mat.nauk 6 no.1:88-90 '62. (MIRA 15:4)

1. Akademiya nauk UzSSR.
(Semiconductors--Effect of radiation on) (Gamma rays)

NIZAMETDINOVA, M.A.; LOBANOV, Ye.M.

Effect of nuclear radiation on ferrates. Izv.AN Uz.SSR.Ser.fiz.-mat.nauk 6 no.1:45-48 '62. (MIRA 15:4)

1. Akademiya nauk UzSSR.
(Metals, Effect of radiation on) (Ferrates)

ABDULLAYEV, A.A.; BIBINOV, S.A.; LOBANOV, Ye.M.; KHAITOV, B.K.; KHAYDAROV, A.A.

Using radioactive isotopes as indicators for studying the dynamics of underground waters. Uzb.geol.zhur. 6 no.1:57-61 '62. (MIRA 15:4)

1. Akademiya nauk UzSSR.
(Water, Underground) (Radioisotopes)

ABDULLAYEV, A.A.; KHAITOV, B.K.; LOBANOV, Ye.M.; KHAYDAROV, A.A.

Measurement of the activity of tritium in water samples.
Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.5:40-44 '62.
(MIRA 15:11)

1. Institut yadernoy fiziki AN UzSSR.
(Tritium)

PARFENOV, V. V.; LOBANOV, Yu. A.; SHIMOLIN, L. V.

Investigating the law of magnetization approaching saturation in specimens made of fine ferromagnetic powders. Fiz. met. i metalloved. 14 no.4:503-511 O '62. (MIRA 15:10)

1. Ural'skiy gosudarstvennyy universitet imeni A. M. Gor'kogo.

(Magnetization) (Metal powders—Magnetic properties)

LOBANOV, Ye.M.; NOVIKOV, A.P.; KHAYDAROV, A.A.; GUREVICH, L.G., otv. red.; KISELEVA, V.N., red.; KARABAYEVA, Kh.U., tekhn. red.

[Activation analysis in conditions of geological boreholes] Aktivatsionnyi analiz v usloviiakh geologicheskikh skvazhin. Tashkent, Izd-vo AN Uzb.SSR, 1963. 66 p. (MIRA 17:2)

ACCESSION NR: AT3007254 S/2952/63/000/000/0056/0067

AUTHORS: Zvyagin, V. I.; Lobanov, Ye. M.; Zverev, B. P.; Lenchenko, V. M.

TITLE: Employment of the reaction B-super-10 (n, alpha) Li-super-7 for the determination of boron and silicon

SOURCE: Radiatsion. effekty* v tverd. telakh. Tashkent, Izd-vo AN UzbSSR, 1963, 56-67

TOPIC TAGS: silicon, Si, boron, B, impurity, acceptor element, isotope, B-super-10 (n, alpha) Li-super-7 reaction, pulse, pulse amplitude, diode

ABSTRACT: The paper describes an experimental investigation and sets forth theoretical relationships governing the presence of the extremely active acceptor element B in Si. The reaction $B^{10}(n, \alpha)Li^7$ for neutrons with an energy of 0.03 ev has a large cross section (4,000 barn). This reaction yields an α particle with an energy of 1.47 Mev, which has a short path in Si (appx. 5 micron) and a Li^7 nucleus with 0.88 Mev energy. This particle and this nucleus are distinguished by their great total energy (2.35 Mev) and their great ionization density which affords a highly effective registration if the carrier medium exhibits counting properties. In this respect Si is a very convenient material. The block scheme of the measuring

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ACCESSION NR: AT3007254

equipment employed is described. It comprises a Si diode, a power-supply battery, a load resistance, and a preamplifier, all of which are placed in an aluminum shield and are placed at the output of the horizontal channel of the reactor. The pulses arising in a Si n-p junction irradiated with reactor neutrons are rendered visible in an oscillogram. It is shown that the irradiation of Si junctions with reactor neutrons provides a fundamentally sound means for the determination of some impurities in the material, especially H and B. It is also shown how a junction can be employed as a fast-neutron counter, even though only for assessment purposes. The theory of the formation of the pulses in the surface-barrier n-p junction is traced, using an equivalent circuit to represent the surface-hole and -p junction. Expressions are developed for I(t) by the solution of the diffusion equation for various particular cases, depending on whether the point source of the charge lies within the n region or the region of body charge, or whether the track of the particle lies entirely within the n region. The formulas obtained will be employed for the calculation of the effective volume for prescribed bounds of the changes of the amplitude of the pulses excited by the neutrons in a diode and also for the calculation of the pulse-amplitude spectra. Orig. art. has: 6 figures and 17 numbered equations.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 14Oct63 ENCL: 00

SUB CODE: PH, EL NO REF SOV: 003 OTHER: 004

Card 2/2

L 17342-63 EPF(c)/EPF(n)-2/EWP(q)/EWT(m)/BDS/T-2 AFFTC/ASD/AFWL/SSD Pr-4/
Pu-4 WH/AR

ACCESSION NR: AT3007255 S/2952/63/000/000/0068/0070 74

AUTHOR: Aripov, G.; Lobanov, Ye. M.; Shadiyev, N. 72

TITLE: Radiation damage to radio parts in a strong field of gamma radiation 19

SOURCE: Radiatsion. effekty* v tverd. telakh. Tashkent, Izd-vo AN UzbSSR, 1963, 68-70

TOPIC TAGS: radiation effect, condenser gamma ray damage, capacitor radiation damage, radiation damage, radio part, gamma ray damage

ABSTRACT: The effect of powerful gamma-radiation doses on the electrical and mechanical properties of certain industrial types of capacitors has been investigated. Capacitors with mica, oil-impregnated paper, electrolyte, and ceramic dielectrics were studied. Several specimens of each type were tested and the results averaged to eliminate the effect of accidental errors. A cobalt irradiator with dose capacity of 650 rep/sec was used, with integral doses escalated from 100 x 10^6 to 1100 x 10^6 rep, in steps of 100 x 10^6 rep. After each dose the parameters were measured and compared with their

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ACCESSION NR: AT3007255

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original values. Certain specimens were irradiated continuously up to 1100 x 10^6 rep. In the case of a KDK-2 type capacitor of 12.56 pf initial capacitance, the measurements revealed no change after 100 x 10^6 rep, a reduction to 12.44 pf after 200 x 10^6 rep, and a further reduction to 12.23 pf after 800 x 10^6 rep. The capacitance of a second specimen of the same type dropped from an initial 12.80 pf to 12.50, 12.55, and 12.78 pf, respectively, after the same doses. A third specimen of the same type behaved similarly to the first. Capacitors of the types BM and KBGM, having initial capacitances of 0.0121 μf and 0.0247 μf, changed their capacitances after an integral dose of 1100 x 10^6 rep to 0.0144 μf and 0.0253 μf, respectively. The PM capacitor (4635 pf) changed its capacitance under the same conditions to 4622 pf, while the KSO type (1217 pf) remained unchanged. Radiation damage was especially apparent in paper dielectrics, evidently owing to radiolysis of the impregnating oil. The BM and KBGM capacitors showed bulging of the container and seepage of oil and sealing compounds. It is concluded that gamma radiation will shorten the life of capacitors, but that even powerful doses will not lead to immediate failure. Orig. art. has: 2 figures and 2 tables.

Card 2/2

LEUSHKINA, G.V.; ZVYAGIN, V.I.; LOBANOV, Ye.M.; DUTOV, A.G.

Fluorescence of silicon carbide. Izv. AN Uz. SSR. Ser. fiz.-mat.nauk 7 no. 6:98-99 '63. (MIRA 17:6)

1. Institut yadernoy fiziki AN UzSSR.

L 52628-65 EWT(m)/EWP(t)/EWP(b)/EWA(h) Peb LJP(c) JD/GS

ACCESSION NR: AT5012701 UR/0000/64/000/000/0005/0020

AUTHOR: Lobanov, Ye. M. (Candidate of physico-mathematical sciences); Zvyagin, V. I.; Zverev, B. P.; Blinkov, D. I.

TITLE: Use of the reactions of light nuclei with neutrons for the determination of light elements in silicon and other materials

SOURCE: Vsesoyuznoye koordinatsionnoye soveshchaniye po aktivatsionnomu analizu. 1st, Tashkent, 1962. Trudy. Tashkent, Izd-vo Nauka UzSSR, 1964, 5-20

TOPIC TAGS: neutron bombardment, thermal neutron, silicon analysis, boron determination, alpha particle counting, silicon semiconductor, activation analysis

ABSTRACT: One method of determining boron in silicon is to use the reaction B^{10} (n, α) Li^7, produced by thermal neutrons. This is done in two ways: (1) by measuring the intensity of the γ line of Li^7, and (2) by recording the α particles and Li^7 nuclei by means of nuclear emulsions. Both variants can be used when the boron content is greater than 10^{16} atoms per cm^3. Another method of determining boron in silicon (and also hydrogen and [illegible] elements) involves the use of the [illegible] ng properties of silicon single crystals. [illegible] theoretical treatment of the [illegible] method is given. The authors studied the

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L 52628-65

ACCESSION NR: AT5012701

distribution of boron on the surface of a single crystal of silicon by recording α particles; the technique makes it possible to determine boron on the surface of this semiconductor and various other materials. The recording of recoil nuclei of light elements (hydrogen, oxygen, nitrogen) by a p-n junction in silicon bombarded by 14.1 Mev neutrons also constitutes a potential method of determing these elements. The article is concluded by an exposition of the mathematical determination of the effective volume sensitive to the reaction $B^{10}(n, \alpha) Li^{7}$. Orig. art. has: 5 figures and 23 formulas.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 02 Dec 64 ENCL: 00 SUB CODE: NP, IC

NO REF SOV: 011 OTHER: 007

Card 2/2

L 41707-65 EWT(m) Peb DIAAP

ACCESSION NR: AR5008409 UR/0058/65/000/001/A038/A038

14
B

SOURCE: Ref. zh. Fizika, Abs. 1A345

AUTHORS: Bibayev, O.; Lobanov, Ye. M.

TITLE: Determination of lanthanum and cerium in minerals with the aid of activation analysis

CITED SOURCE: Dokl. AN UzSSR, no. 4, 1964, 22-25

TOPIC TAGS: lanthanum, cerium, activation analysis, spectrometry

TRANSLATION: A description is presented of an installation with a scintillation γ-spectrometer, intended for the determination of La and Ce in mineral samples irradiated in a reactor. The installation consisted of an AI-100-1 "Raduga" 100-channel pulse-height analyzer, stabilized high-voltage rectifier, vertical lead housing containing a spectrometric single crystal of NaI(Tl) of 40 mm diameter and 50 mm height, and a type FEU-1BS photomultiplier with cathode follower. The energy calibration of the spectrometer was carried out with the aid of the known

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ACCESSION NR: AR5008409

lines of the isotopes Hg^{203} (279.5 keV), Cs^{137} (661 keV), Mn^{56} (840 keV), Co^{60} (1.17 and 1.33 MeV), and Na^{24} (1.38 and 2.75 MeV), and also with the aid of the γ-lines of radioactive isotopes obtained upon irradiation of standards. The determined isotopes of La and Ce were determined directly from the energies of the γ-lines observed in the spectrum, and also by supplementary measurements of the half-life spectra. The samples investigated were those of monazite, orthite, davidite, euxenite, and garnet from different deposits. An analysis of the spectra shows that the content of La and Ce fluctuates over a wide range, depending on the type of the mineral and on their variety. The content of La and Ce was determined by comparing the activities of the samples with the activities of standards of La and Ce irradiated together with the samples. L. S.

SUB CODE: IC, OP ENCL: 00

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L 11020-65 EWT(m)/EWP(t)/EWP(b)/EWA(h) IJP(c)/ASD(a)-5/AFWL/SSD/ESD(c)
JD/MLK
ACCESSION NR: AT4046912 S/0000/64/000/000/0059/00063

AUTHOR: Lobanov, Ye. M., Zvyagin, V.I., Zverev, B.P.

TITLE: Neutron detectors made of silicon

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionny*ye effekty* v kondensirovanny*kh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 59-63

TOPIC TAGS: silicon diode, n-p junction, neutron detection, silicon n-p junction, silicon neutron detector, boron neutron detector

ABSTRACT: Experiments on neutron detection by silicon detectors were performed on both the open, commercial, fused-in type D-203 diode and on diffusion junctions of the p-type (diffusion of phosphorus in silicon) and n-type (diffusion of aluminum in silicon). The diodes were biased with 10V. Signals were taken from a resistor ($\sim 10^7$ ohms), fed into a preamplifier, a wide band amplifier of the ush-2 type, a 100-channel analyzer and then into an oscillograph. The silicon diode, batteries, loading resistor and preamplifier were mounted in an aluminum screen. Calibration of the amplitude analyzer was performed by 5.15 Mev α-particles from Pu^{239}. The rise time of the impulses originating in the n-p junction is around 1μ sec. and the exponential decay time is 50 μ sec.: the

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ACCESSION NR: AT4046912

average amplitude is 1 mV. The amplitude spectrum of impulses obtained by the neutron irradiation of the n-p diffuse junction in silicon is given in Fig. 1 of the Enclosure. As indicated, the neutron detection efficiency with a polyethylene filter is about 0.1%. For detection of thermal neutrons, boron filters enriched with B^{10} to 84% are used. The neutron spectrum from a reactor column obtained by covering n-type silicon with a boron filter was also determined. The noise of the system corresponds to a 0.5 Mev α-particle and the efficiency of neutron detection is 3%. However, it is believed that by making sandwiches of boron and silicon detectors, one can increase the detection efficiency for thermal neutrons to 20%. Orig. art. has: 4 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 01 SUB CODE: NP

NO REF SOV: 001 OTHER: 003

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ACCESSION NR: AT4046912

ENCLOSURE: 01

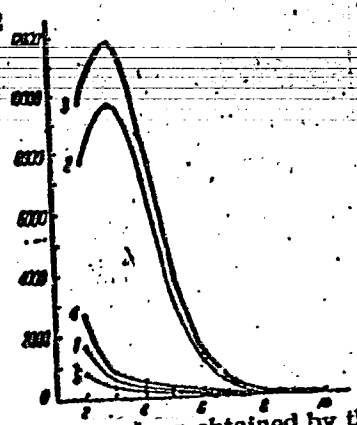

Fig. 1. Amplitude spectrum of impulses obtained by the neutron irradiation of a silicon n-p junction: 1 - without a filter; 2 - with a 75μ polyethylene filter; 3 - with a 150 μ polyethylene filter; 4 - with a 350 μ silicon filter; 5 - with a 320 μ germanium filter. Ordinate = No. of impulses/3 seconds; abscissa = channel number.

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BR

L 9970-65 EWT(m)/EWP(b) DIAAP/SSD/AFWL/RAEM(t) JD/MLK

ACCESSION NR: AT4046913 S/0000/64/000/000/0064/0073

AUTHOR: Lobanov, Ye. M.; Zvyagin, V. I.; Zverev, B. P.; Blinkov, D. I.

B

TITLE: Sensitivity of the neutron capture method for the determination of boron in silicon

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionnyye effekty v kondensirovannykh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 64-73

TOPIC TAGS: n-p junction, silicon n-p junction, neutron capture, quantitative analysis, boron determination, silicon analysis, B(n,Alpha)Li reaction

ABSTRACT: After reviewing the merits, shortcomings and sensitivities of a number of methods for determining B in Si, the authors point out the sensitivity of the n-p junction of silicon to charged particles and discuss two new methods both based on the $B^{10}(n,\alpha)Li^7$ reaction, in considerable detail. The first method makes use of 479Kev γ-quanta from the excited Li^7 nuclei, while the second method is based on the ionization effects of α particles in the n-p junction. From the number of registered 479Kev γ-quanta corrected for the spatial distribution of the source, it is estimated that one can detect a boron concentration of $10^{15}cm^{-3}$ in silicon. Such a concentration would be represented by 32% of the γ-radiation back-

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ACCESSION NR: AT4046913

ground which can be resolved. Such a background can be avoided, however, by counting α-particles from the $B^{10}(n,\alpha)Li^7$ reaction. Methods of α-particle detection are discussed. If one uses a photographic plate with silicon containing $10^{15}cm^{-3}$ of boron in a neutron beam of $10^8cm^{-2}sec^{-1}$, one would have 5 α-particles per minute. The other method of α-particle detection is based on the effect of the α-particle on the p-n junction in silicon. The sensitivity of this method is determined by: a) the density of the neutron flux; b) the neutron spectrum and c) the presence of materials with concurrent reactions in the sample. In the ideal case, in order to determine a boron concentration of $10^{10}cm^{-3}$, one should have a junction with an effective volume of $10^{-7}cm$ in a neutron beam of $10^{10}cm^{-2}sec^{-1}$. However, in the real case, one should consider the presence of fast neutrons, different nuclei, and a standard deviation. The minimum concentration of boron which can be detected by this method is estimated to be $10^{14}cm^{-3}$ in a beam of thermal neutrons at $5.10^8cm^{-2}/sec^{-1}$. Orig. art. has: 14 formulas.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 00 SUB CODE: NP, IC

NO REF SOV: 010 OTHER: 009

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L 9971-65 EWT(m)/EWP(b) AFWL/ASD(a)-5/ESD(t)/RAEM(t) JD/MLK

ACCESSION NR: AT4046914 S/0000/64/000/000/0074/0076

AUTHOR: Lobanov, Ye. M.; Zvyagin, V. I.; Zverev, B. P.

TITLE: Determination of small amounts of boron in silicon

B

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionnyye effekty v kondensirovannykh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 74-76

TOPIC TAGS: n-p junction, silicon n-p junction, effective volume, boron determination, quantitative analysis, silicon, silicon analysis, semiconductor

ABSTRACT: The basic difficulty in measuring the concentration of boron impurities in silicon is to determine the effective volume, so that the magnitude of a pulse can be calculated as a function of the position of the ionization process relative to the n-p junction. It is concluded from the calculation of the pulse magnitude that the effective volume is given by the area of the n-p junction multiplied by the diffusion length. The concentration of boron in silicon is therefore given by

$$K = \frac{n}{I\sigma V_{eff}}$$

where n is the number of pulses produced by the products of the reaction $B^{10}(n,\alpha)Li^7$ and recorded by the junction in one second, I is the flux of neutrons, σ is

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ACCESSION NR: AT4046914

the cross section of the reaction $B^{10}(n,\alpha)Li^7$, V_{eff} is the effective volume, and $f = 0.185$; is determined by placing a boron filter in front of the n-p junction. The amplitude of a pulse decreases e times at the distance of a diffusion length from the n-p junction. Thus, for $B^{10}(n,\alpha)Li^7$, the energy interval $(2.35 - \frac{2.35}{e})$ Mev corresponds to the effective volume. Amplitude spectra were recorded on a 100-channel analyzer of the AI-100 type. Calibration of the analyzer was performed with α particles from P_n^{239} ($E = 5.15$ Mev). The experiments were performed on a silicon n-p junction obtained by diffusion of aluminum in silicon and on the n-p junction barrier formed by deposition of gold on silicon. It was found that the boron concentration is 10^{14} cm^{-3} for the former and 10^{15} cm^{-3} for the latter. Orig. art. has: 2 figures and 4 formulas.

ASSOCIATION: Institut yaderhoy fiziki, AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 00 SUB CODE: NP, IC

NO REF SOV: 001 OTHER: 000

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L 11019-65 EWT(m)/EWP(t)/EWP(b) DIAAP/IJP(c)/SSD/AFWL/ESD(gs) JD/MLK

ACCESSION NR: AT4046915 S/0000/64/000/000/0077/0083

AUTHOR: Lobanov, Ye. M.; Zvyagin, V. I.; Kist, A. A.; Sviridova, A. I.; Yevseyenko, Yu.; Koskovtseva, G. A.

TITLE: Determination of impurities in a single crystal of germanium by the method of activation analysis

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionnyakh effekty v kondensirovannykh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 77-83

TOPIC TAGS: germanium, germanium crystal, semiconductor purity, activation analysis, neutron bombardment, gallium determination

ABSTRACT: The author considers the use of activation analysis of germanium samples to verify electrophysical measurements indicating an almost compensated acceptor concentration of 4×10^{15} atoms/cc. A parallel investigation of germanium containing less than 10^{10} atoms/cc of Ga was conducted to correct for Ga formed by the (n,p) reaction with fast neutrons, and a combination of radiochemical and γ-spectral analysis was used to interpret the results. The sample was irradiated for 5 minutes in a reactor flux of 1.8×10^{12} n/cm^2·sec, etched with acid for 1 min., and the γ-spectrum taken with a single-crystal scintillation spectrometer,

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L 11019-65

ACCESSION NR: AT4046915

using a 40 x 50 NaI (Tl) crystal, FEU-43 photomultiplier and 100-channel kicksorter, 2 min. after the completion of irradiation. The concentration of possible Al impurities was found to be not greater than 10^{-10}%. In activating the germanium samples, targets of the same materials (In, Ga, Sb, As) as the impurities were prepared and irradiated along with the germanium for 8 hours in a flux of 1.8 x 10^{13} n/cm^2·sec. The author describes in detail the preparation of the targets and the radiochemical procedures used after bombardment to separate out each of the impurities under study. Typical spectra are shown for the reference materials and the fractions separated from the germanium sample, the shapes of the spectra indicating good separation. This was confirmed by obtaining the decay curves of β-activities over 2-3 weeks. The concentration of impurities was calculated from the number of counts in the photopeaks. Formation of the Ga in the pure, control Ge sample by (n,p) reaction was verified by calculating the reaction cross section, a value of 1.3 x 10^2 mb being obtained, which is close to the theoretical value of 1.5 x 10^2 mb for 4 MeV neutrons, showing that there were 10^{17} atoms/cc of Ga in the Ge sample before irradiation. The results of the activation analysis differed substantially from those given by electrophysical measurements, as may occur in insufficiently pure or compensated samples. In the present case, the main contributions came from Ga (acceptor) and Sb (donor), the content found by activation analysis being one order of magnitude higher than that given by electrical measurements. Upper limits were determined for the concentrations of In, Al and As.

Card 2/3

T. 11019-65

ACCESSION NR: AT4046915

Orig. art. has: 1 table and 2 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 00 SUB CODE: NP, IC

NO REF SOV: 001 OTHER: 002

Card 3/3

L 52629-65 EWP(e)/EWT(m)/EWP(i)/EWP(t)/EWP(b)/EWA(h) Pq-4/Peb DIAAP/IJP(c)
JD/GS/WH

ACCESSION NR: AT5012705 UR/0000/64/000/000/0091/0093

AUTHOR: Lobanov, Ye. M.; Chanyshev, A. I.; Dutov, A. G.; Khudayberganov, A.; Ashirov, M. G.

TITLE: Determination of impurities in boron and in quartz crystals by means of neutron activation analysis

SOURCE: Vsesoyuznoye koordinatsionnoye soveshchaniye po aktivatsionnomu analizu. 1st, Tashkent, 1962. Trudy. Tashkent, Izd-vo Nauka UzSSR, 1964, 91-93

TOPIC TAGS: activation analysis, neutron bombardment, boron analysis, quartz analysis, gamma spectrometer

ABSTRACT: The article describes a γ-spectrum variant of the activation analysis of boron and quartz crystals withoug their chemical decomposition. After irradiation in the thermal column of a reactor, the γ spectra of the samples were recorded with a multichannel scintillation gamma-spectrometer. The impurities being determined were identified directly by means of the energies of the γ lines observed in the spectrum. The amounts of Cu, Mn, and Na present in boron were determined; the values obtained were multiplied by a correction factor of 6, which was required because boron absorbs neutrons strongly and their flux in the bulk of the sample is much weaker than at its surface. In

Card 1/2

L 52629-65
ACCESSION NR: AT5012705

quartz crystals, the following impurities were determined: Na, Al, Co, Fe (synthetic quartz) and Na, Al Sb (natural varieties). Orig. art. has: 1 figure and 1 table.

ASSOCIATION: Institut yadernoy fizki AN UzSSR (Institute of Nuclear Physics, An UzSSR)

SUBMITTED: 02 Dec. 64 ENCL: 00 SUB CODE: IC, NP

NO REF SOV: 000 OTHER: 000

Card 2/2

L 24446-65 EWT(m) DIAAP

ACCESSION NR: AP4044791 S/0166/64/000/003/0049/0055

AUTHOR: Zvyagina, L. S.; Kist, A. A.; Lobanov, Ye. M.; Nikolayev, A. I.; Zvyagin, V. I.

TITLE: Nondestructive activation analysis of biological samples

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 3, 1964, 49-55

TOPIC TAGS: activation analysis, radiochemical separation, isotope, gamma activity, beta activity, half life determination, spectrometry, sodium, potassium, chlorine, phosphorus, biological analysis

ABSTRACT: The authors suggest the wider use of activation analysis in biological research. The high sensitivity (10^{-12} g for Mn, Cu, As, Au, etc.), small sample weight (10 mg), possibility of simultaneous determination of microelements, and absence of contamination make this method convenient for the processing of biological materials. As many as 24 elements can be rapidly separated and determined. The same sample can be preserved and used for further analysis. Activation-analysis procedure can be converted to a fully automatic

Card 1/3

L 24446-65

ACCESSION NR: AP4044791

system. Automatic units for irradiation, activity counting, and data processing have already been developed. The basic problem in this analysis is the separation of the activity of a given element. This problem can be solved by chemical separation, identification from γ spectra, β activity, or half life, etc., depending on the composition of the sample. The authors used activation analysis to study the brains of healthy and cancerous rats, irradiating 10 mg of the tissue for 10 min in a neutron flux ($1.8 \times 10^{13} cm^{-2} \cdot sec^{-1}$ and $1.2 \times 10^{12} cm^{-2} \cdot sec^{-1}$), for determination of sodium, chlorine, potassium, and phosphorus. Activities of these elements were measured by means of a γ-spectrometer, a β-analyzer consisting of an anthracene crystal (1 x 2 cm), an FEU-11 photomultiplier, and a PS-10000 radiometer. A description is given of the method used. The accuracy of the determinations falls in the 5—10% error range (e.g., half life for K^{42} was 12.3—12.8 hr, as compared to 12.5 hr). The number of elements determined in nondestructive analysis can be augmented by the removal of Na from the sample after irradiation, and by the use of anticoincidence, γ-γ, and β-γ coincidence schemes developed for this purpose, magnetic analyzers, resonance irradiation, etc. Orig. art. has: 5 figures and 2 tables.

Card 2/3

L 24445-65

ACCESSION NR: AP4044791

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Insitute of Nuclear Physics, AN UzSSR)

SUBMITTED: 06Dec63 ENCL: 00 SUB CODE: LS, GC

NO REF SOV: 002 OTHER: 004 ATD PRESS: 3128

Card 3/3

ABDULLAYEV, A.A.; ZAKHIDOV, A.Sh.; LOBANOV, Ye.M.; KHAITOV, B.K.

Motion of various indicators in underground water currents. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 8 no.6:43-47 '64. (MIRA 18:3)

1. Institut yadernoy fiziki AN UzSSR.

S/0032/64/030/007/0822/0824

ACCESSION NR: AP4041766

AUTHORS: Dvukhbabnaya, Ts. M.; Lobanov, Ye. M.; Miranskiy, I. A.; Pozy*chanyuk, V. F.; Sayfutdinova, D.G.; Khaydarov, A. A.

TITLE: Determining small quantities of gold and rhenium in rock samples by the neutron activation method

SOURCE: Zavodskaya laboratoriya, v. 30, no. 7, 1964, 822-824

TOPIC TAGS: gold, rhenium, analysis, neutron activation method, gamma radiation spectrum, scintillation spectrometer, isotope determination, arsenic isotope interference, molybdenum isotope interference, isotope half life

ABSTRACT: A method is described for determining gold and rhenium in ores by measuring the gamma-spectra of the irradiated samples. It eliminates a preliminary radiochemical separation of the isotopes. Samples of gold ores (containing from 0.5-40.0 g of gold per ton) and of molybdenite ores and concentrates (with a rhenium content of 0.001% and up) were exposed to irradiation of 1.8×10^{13} neutrons/cm^{2}sec for periods from 30 min to 9 hrs. The spectra of gamma-radiation were obtained with a monocrystal-scintillometric spectrometer. It was possible to determine accurately the gold content at the 0.412 Mev spectral line,

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ACCESSION NR: AP4041766

provided that the summary radio activity background of Na, As, and Fe isotopes was not excessive. The usually high As content of the ores was reduced to 0.8% by heat treating the ore in a carbon arc before its exposure to irradiation. Additional reduction of the As^{76} content was achieved by allowing the samples to stand for 9-16 days prior to their spectral analysis. This waiting period is effective because the half life of As^{76} is 27 hours and that of Au^{198} is 2.69 days. The determination of the Re^{186} isotope was possible at the 0.137 Mev spectral line in the presence of the Mo^{99} isotope, provided that the intensity of the photopeak of Mo^{99} did not exceed that of Re^{186} by more than twice. Allowing the irradiated samples to stand for 15 hours reduced the Mo interference by doing away with Mo^{99} isotope (half life of 67 hours). Orig. art. has: 3 charts.

ASSOCIATION: Institut yadernoy fiziki Akademii nauk UzSSR (Institute of Nuclear Physics, Academy of Sciences, Uzbek SSR)

SUBMITTED: 00

ENCL: 00

SUB CODE: GC,GP

NO REF SOV: 002

OTHER: 001

Card 2/2

LOPANOV, Ye.M.; YANKOVSKIY, A.V.

Use of the neutron activation method in determining bismuth in rock and ore samples. Izv. AN Uz.SSR. Ser. fiz.-mat.nauk 9 no.3:65-66 '65. (MIRA 19:1)

1. Institut yaderney fiziki AN UzSSR. Submitted January 14, 1965.

LOBANOV, Ye.M.; CHANYSHEV, A.I.; CHANYSHEVA, T.I.

Use of activation analysis in determining the scandium content in rocks. Izv. AN Uz.SSR. Ser.fiz.-mat.nauk 9 no.3:66-68 '65.

Quantitative determination of fluorine in fluorite ores and their derivatives by the activation method using a polonium-beryllium neutron source. Ibid.: 68-69. (MIRA 19:1)

1. Institut yadernoy fiziki AN UzSSR. Submitted February 17, 1964

LOBANOV, Ye.M.; ARIPOV, G.

Determining chromium and some other elements by analyzing the gamma-ray spectra from the (n, γ) reaction. Izv. AN Uz. SSR. Ser.fiz.-mat. nauk 9 no.6:64-67 '65. (MIRA 19:1)

1. Institut yadernoy fiziki AN UzSSR. Submitted April 25, 1964.

LOBANOV, Yu.M.; AKBAROV, U.; KHUDAYBERGENOV, A.

Determining copper in ore samples by the radioactivation method using a magnetic β-separator. Izv. AN Uz. SSR. Ser.fiz.-mat. nauk 9 no.6:68-71 '65. (MIRA 19:1)

1. Institut yadernoy fiziki AN UzSSR. Submitted June 24, 1964.

LOBANOV, Ye.M.; KHUSNUTDINOV, R.I.

Determination of irridium in copper and nickel slimes and in platinum concentrates by the method of neutron activation analysis with the aid of coincidence spectrometry. Izv. AN Uz. SSR. Ser.fiz.-mat. nauk 9 no.6:72-76 '65. (MIRA 19:1)

1. Institut yadernoy fiziki AN UzSSR. Submitted Dec. 14, 1964.

KIST, A.A.; ZVYAGINA, L.S.; LORANOV, Ye.M.; MOSKOVTSEVA, G.A.

Determination of halogens in biological materials by the activation method. Zhur. anal. khim. 20 no.1:112-117 '65. (MIRA 18:3)

1. Institut yadernoy fiziki AN UzSSR, Tashkent.

DVUKHBABNAYA, TS.M.; LOBANOV, Ye.M.; MIRANSKIY, I.A.; POZYCHANYUK, V.F.; SAYFUTDINOVA, D.G.; KHAYDAROV, A.A.

Use of neutron activation analysis in determining minute amounts of gold and rhenium in rock samples. Zav. lab. 30 no.7:822-824 '64. (MIRA 18:3)

1. Institut yadernoy fiziki AN UzSSR.

LOBANOV, Ye.M., kand. fiz.-matem. nauk, otv. red.; KISELEVA, V.N., red.

[Transactions of the First All-Union Coordinating Conference on Activation Analysis] Trudy Vsesoiuznogo koordinatsionnogo soveshchaniia po aktivatsionnomu analizu. Tashkent, Izd-vo "Nauka" UzSSR, 1964. 178 p. (MIRA 18:7)

1. Vsesoyuznoye koordinatsionnoye soveshchaniye po aktivatsionnomu analizu. 1st, Tashkent, 1962.

L 23078-66 EWT(m)/EWP(t) DIAAP/IJP(c) JD/JG

ACC NR: AP6009433 SOURCE CODE: UR/0075/66/021/003/0292/0295

AUTHOR: Lobanov, Ye. M.; Gureyev, Ye. S.; Dutov, A. G.; Kist, A. A.

ORG: Institute of Nuclear Physics AN UzbSSR, Tashkent (Institut yadernoy fiziki AN Uzbekskoy SSR)

TITLE: Determination of rare earth elements in certain metals and rocks using radioactivation method

SOURCE: Zhurnal analiticheskoy khimii, v. 21, no. 3, 1966, 292-295

TOPIC TAGS: rare earth element, activation energy, neutron interaction, neutron radiation, radioactivity effect, spectrographic method, multichannel analyzer

ABSTRACT: A rapid method for the determination of some rare earth elements in certain geological samples using neutron activation was developed. The method includes a rapid radiochemical treatment of the irradiated material followed by γ-spectrometric analysis on a multichannel analyzer. Orig. art. has: 6 figures and 2 tables. [Based on author's abstract] [NT]

UDC: 543.53

Card 1/2

L 23070-66

ACC NR: AP6009433

SUB CODE: 07,20/ SUBM DATE: 12Mar64/ ORIG REF: 008/
OTH REF: 003/

Card 2/2 UVR

RUSANOV, Vladimir Vasil'yevich; POSPELOV, I.I., retsenzent; SELEZNEV, A.I., retsenzent; LOBENSKIY, O.S., red.; LOBANOV, Ye.M., red.

[Maintenance and running repair of electrical and radio navigation equipment on ships of the river fleet] Profilaktika i tekushchii remont elektroradionavigatsionnoi apparatury na sudakh rechnogo flota. Moskva, Transport, 1964. 103 p. (MIRA 17:11)

1. Inzhener sluzhby svyazi Volzhskogo ob"yedinennogo rechnogo parokhodstva (for Pospelov, Seleznev).

LOBANOV, Ye.M., inzh.

Study of the functioning of traffic tunnels on the "Sadovoye kol'tso." Gor. khoz. Mosk. 36 no.9:20-23 S '62. (MIRA 15:10)
(Moscow—Underpass) (Moscow—Traffic engineering)

PAVLENKO, Vladimir Georgiyevich; VELEBNITSKIY, I.O., red.; LOBANOV, Ye.M., red.

[Elements of the theory of inland navigation] Elementy teorii sudovozhdeniia na vnutrennikh vodnykh putiakh. Moskva, Transport. Pt.2. [Standardizing overall dimensions and the maneuverability of river boats and convoys] Normirovanie gabaritov i povorotlivosti rechnykh sudov i sostavov. 1964. 118 p. (MIRA 17:10)

BALANIN, Vasiliy Vasil'yevich, kand. tekhn. nauk, dots.; BORODKIN, Boris Solomonovich, kand. tekhn. nauk, dots.; MELKONYAN, Georgiy Ivanovich, kand. tekhn. nauk, dots.; KONOVALOV, I.M., prof., red.; LOBANOV, Ye.M., red.

[Utilizing the heat of deep waters to maintain ice-free water areas] Ispol'zovanie tepla glubinnykh vod vodoemov dlia podderzhaniia nezamerzaiushchikh akvatorii. Moskva, Transport, 1964. 271 p. (MIRA 18:2)

1. Leningradskiy institut vodnogo transporta (for Balanin, Borodkin, Melkonyan).

MALOVA, Mariya Nikolayevna; PROKHOROV, Stepan Ivanovich; GUREVICH, Sh.M., red.; LOBANOV, Ye.M., red.

[Business accounting in parts for river transportation] Vnutriportovyi khoziaistvennyi raschet na rechnom transporte. Moskva, Transport, 1965. 61 p. (MIRA 18:7)

VELEDNITSIY, Il'ya Oskarovich; LOBANOV, Ye.M., red.; GOFMAN, A.D., red.

[Resistance of water to the movement of pusher tug trains] Soprotivlenie vody dvizheniiu tolkaemykh sostavov. Moskva, Transport, 1965. 115 p. (MIRA 18:2)

BLANK, Shlioma Pinkhusovich; BELYAVSKAYA, Maia Iosifovna; VYSHKVARTSEVA, Liliya Timoleyevna; BARAKIN, A.P., red.; LOBANOV, Ye.M., red.

[Performance analysis of enterprises operating in inland navigation] Analiz raboty ekspluatatsionnykh predpriiatii rechnogo flota. Moskva, Transport, 1965. 171 p. (MIRA 18:7)

OL'SHAMOVSKIY, Sergey Borisovich; SARATOV, V.F., retsenzent; CHALKIN, I.Ya., retsenzent; CHESTKOV, Ye.I., inzh.-sudovoditel', red.; LOBANOV, Ye.N., red.

[Navigation on inland waterways] Sudovozhdenie na vnutrennikh vodnykh putiakh. Moskva, Transport, 1965. 267 p. (MIRA 18.4)

BARAKIN, Aleksandr Pavlovich; SVIRIDOV, A.A., red.; LOBANOV, Ye.M., red.

[Business accounting on river-going merchant ships] Khoziaistvennyi raschet rechnykh transportnykh sudov. Moskva, Transport, 1965. 107 p. (MIRA 18:5)

L 45321-66 EWP(e)/EWT(m)/EWP(t)/ETI IJP(c) JD/JG/WH

ACC NR: AP6024291 SOURCE CODE: UR/0075/66/021/007/0867/0870

AUTHOR: Lobanov, Ye. M.; Dutov, A. G.; Leushkina, G. V.

ORG: Institute of Nuclear Physics, Academy of Sciences Uzbek SSR, Tashkent (Institut yadernoy fiziki AN UzSSR)

TITLE: Determination of dysprosium in samples of yttrium oxide and ferrite garnets by a method of radioactivation

SOURCE: Zhurnal analiticheskoy khimii, v. 21, no. 7, 1966, 867-870

TOPIC TAGS: dysprosium, radioactivation method, yttrium oxide, ferrite, garnet, yttrium compound, chemical detection

ABSTRACT: A method has been developed for determining dysprosium in samples of yttrium oxide and ferrite garnets using the isomer ^{165m}Dy with a half-life of 1.3 min. The sensitivity of determination is 10^{-4} to 10^{-5}% of Dy. The mean experimental error is 9% on condition that intervals between measurements are strictly maintained. Orig. art. has: 2 figures and 1 table. [Based on authors' abstract] [KP]

SUB CODE: 07,20/ SUBM DATE: 20Jan65/ ORIG REF: 002/ OTH REF: 004/

UDC: 543.53

Card 1/1 mjs

ACC NR: AP7008895 SOURCE CODE: UR/0425/66/009/009/0012/0016

AUTHOR: Lobanov, Ye. M.; Khotamov, Sh.; Kist, A. A.

ORG: Physics-Engineering Institute im. S. U. Umarov, AN TadzhSSR (Fiziko-tekhnicheskiy institut AN TadzhSSR); Nuclear Physics Institute, AN UzSSR (Institut yadernoy viziki AN UzSSR)

TITLE: Determination of certain rare-earth elements in the ash of plants and soils by the method of neutron activation

SOURCE: AN TadzhSSR. Doklady, v. 9, no. 9, 1966, 12-16

TOPIC TAGS: gamma spectrum, neutron irradiation, rare earth element, radioisotope, botany

SUB CODE: 06, 18, 20

ABSTRACT: Radiation of Artemisia terrae albae wormwood ash in a stream of 1.8×10^{13} neutrons/cm^2, with 40-hour holding period, is sufficient for determination. Prolonged "cooling" prevents determination of short-lived isotopes. A complete γ-ray spectrum of the sample was used and decay curves were plotted for accurate identification of individual γ-emitters and separation of individual photopeaks, followed by graphical analysis. From the Compton distribution of Na^{24} and Sc^{46} the contribution from Na^{24} was determined by comparison with a standard. Results were compared with those from radiochemical separation of La, Ce, Sm, and Lu. Accuracy is 5-12 percent. This paper was presented by A. A. Adkhamov, Corresponding Member, Tadzhik Academy of Sciences, 19 March 1966. Orig. art. has: 2 figures and 2 tables. [JPRS: 39,658]

UDC: none

Card 1/1

LOBANOV, Ye.M.; SOLODOVNIKOV, A.C.; KRYLOV, B.Ye.; NULEL'MAN, B.I.; ROZOV, M.N.

Use of radioisotopes in testing the lining of rotary cementation furnaces. Atom. energ. 19 no.2:204-205 Ag '65. (MIRA 18:9)

LOBANOV, Ye.M., inzh.

Traffic capacity of intersections at the same level. Avt. dor. 28 no.12:23-25 D '65. (MIRA 19:1)

LOBANOV, Ye.N.

Increasing the extraction of tellurium during the melting of copper refinery slimes. TSvet. met. 36 no.6:82-83 Je '63. (MIRA 16:7)

(Copper industry--By-products)
(Tellurium)

LOBANOV, Yu., starshiy akkumulyatorshchik tsekha svyazi

In big as well as in small... Sov. profsoiuzy 18 no.7: 25-26 Ap '62. (MIRA 15:3)

1. Zamestitel' predsedatelya komissii okhrany truda zavoda "Azovstal'".

(Zhdanov--Steel industry--Safety measures)

LOBANOV, Yu.A.; KUNIN, T.I.; SMIRNOVA, G.M.

Kinetics and mechanism of the decomposition of zinc hydrosulfite in aqueous solution. Izv.vys.ucheb.zav.;khim. i khim.tekh. 6 no.2:189-194 '63. (MIRA 16:9)

1. Ivanovskiy khimiki-tekhnologicheskiy institut, kafedra obshchey khimicheskoy tekhnologii.
(Dithionites) (Zinc salts)

ANDZHAN, B.T.; LOBANOV, Yu.A.

Automatic proportioning of ingredients on the continuous rubber compound production lines. Kauch. i rez. 23 no.2:27-31 F '64. (MIRA 17:3)

1. Nauchno-issledovatel'skiy konstruktorsko-tekhnologicheskiy institut shinnoy promyshlennosti, g. Omsk.

NIKOL'SKAYA, G.F.; NIKITINA, V.K.; YEVFIMOVSKIY, I.V.; LOBANOVA, Yu.K.

Alloys of the system gold - antimony in the solid and liquid states. Izv.AN SSSR.Neorg.mat. 1 no.10:1826-1833 O '65. (MIRA 18:12)

1. Institut obshchey i neorganicheskoy khimii imeni N.S. Kurnakova AN SSSR. Submitted April 27, 1965.

VASIL'YEV, Yu.S.; KALININ, A.G.; POPOV, V.M.; LUBANOV, Yu.K.

Effect of the configuration of a slant hole on the load on the hook when lifting a tool. Trudy VNIIBT no.14:98-101 '65. (MIRA 18:5)

L 15209-66 EWT(m)/EWP(w)/EPF(n)-2/T/EWP(t)/EWP(b) IJP(c) JD/WW/JG

ACC NR: AP6001296 SOURCE CODE: UR/0363/65/001/008/1311/1319

AUTHOR: Nikitina, V. K.; Lobanova, Yu. K.

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

27

B

TITLE: Study of the interaction of bismuth and sulfur

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 8, 1965, 1311-1319

TOPIC TAGS: bismuth alloy, sulfur alloy, bismuth compound, sulfur compound

ABSTRACT: A series of sulfur-bismuth alloys containing from 0 to 60 at.% S was studied by the following methods: differential thermal analysis, microstructural analysis, and measurements of hardness, microhardness, and electrical resistivity. All the properties were measured on samples annealed for 650 hr at 220C, and the resistivity was determined on cast polycrystalline samples. Thermal analysis showed that the interaction of molten sulfur and bismuth at 280C involves an exothermic reaction which forms the chemical compound Bi_2S_3 in all alloys. The phase diagram plotted from the data obtained belongs to the eutectic type with a strongly degenerate eutectic, this being very characteristic of systems having a semiconductor as one component. Microhardness data indicate that bismuth and bismuth sulfide are mutually insoluble. The hardness and electrical resistivity of the eutectic systems change symbatically in accordance with Kurnakov's rules. It is concluded that only one chemical compound, Bi_2S_3, having a congruent melting point (779C) and semiconducting properties,

Card 1/2

UDC 546.87'221

2

L 15209-66

ACC NR: AP6001296

is formed in the interaction of bismuth and sulfur. Orig. art. has: 11 figures and 2 tables.

SUB CODE: 07,11 / SUBM DATE: 24Mar65 / ORIG REF: 005 / OTH REF: 020

Card 2/2

LOBANOV, Yu. N.

LOBANOV, Yu. N.: "Experimental principles of the theory of particle capture in betatron acceleration." Moscow State U imeni M. V. Lomonosov. Physics Faculty. Second Sci Res Thysics Inst. Moscow, 1956. (Dissertation for the Degree of Candidate in Physicomathematical Sciences)

Knizhnaya letopis', No 39, 1956. Moscow.

LOBANOV, Yu.N., LOGUNOV, V.N., OVCHINNIKOV, E.P., PETUKHOV, V.A., RABINOVICH, M.S., RUSONOV, V.D.

"Experimental Investigations of Physical Processes Facilitating the Capture of Electrons Injected into the Betatron," paper presented At CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

LOBANOV, Yu.N.; PETUKHOV, V.A.

Experimental basis of the theory of particle capture in betatron accelerators. Atom.energ.supplement no.4:73-82 '57. (MIRA 10:10)
(Particle accelerators)

21.2100

69161

S/139/59/000/06/018/034
E032/E114

AUTHORS: Lobanov, Yu.N., and Tulinova, N.I.

TITLE: On Certain Properties of the Capture Mechanism and the Acceleration Process in a Betatron 19

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 6, pp 124-130 + 2 plates, (USSR)

ABSTRACT: This paper was presented at the Inter-Collegiate Conference on Accelerators, held in Tomsk (February 1958). It is well known that a stable equilibrium orbit will exist in a betatron if the magnetic field in the working part of the gap is chosen so that $H = H_0(R_0/R)^n$ where $0 < n < 1$ and $\bar{H} = 2H_0$, where H is the mean field in the region of the orbit of radios R_0, and H_0 is the field on the orbit itself. When this condition is satisfied, the electrons are accelerated in an orbit having a constant radius R_0. However, the above condition does not take into account the possible effect of the electron current circulating in the chamber on the stability conditions for the motion in other orbits having a radius different from R_0. It is natural to suppose that when the circulating current is sufficiently large,

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69161

S/139/59/000/06/018/034
E032/E114

On Certain Properties of the Capture Mechanism and the Acceleration Process in a Betatron

there may appear another orbit of a radius greater than R_o which will be stable during the acceleration cycle. In that case the betatron should produce two pulses of γ radiation which are separated in time. This effect has in fact been found in the case of the 3 MeV betatron of the Scientific Research Institute of Nuclear Physics of Moscow State University. This betatron has been built specially for the purpose of studying the electron capture mechanism. In papers concerned with the mechanism of capture of particles in a betatron, the decrease in the intensity of γ radiation as a function of the injection current, for currents exceeding a certain optimum value, is explained by the defocussing effect due to surplus electron space charge which fills the chamber during the admission process. However, a careful analysis of the behaviour of the electron beam circulating in the chamber during the injection process shows that the defocussing effect of the surplus electrons can only lead to a reduction in the rate of increase of the intensity with

Card 2/4

69161
S/139/59/000/06/018/034
E032/E114

On Certain Properties of the Capture Mechanism and the Acceleration Process in a Betatron

increased injection current. Therefore the above effect must be due to some other causes. It is suggested that the decrease in the intensity for admission currents exceeding the optimum value is due to the collective capture mechanism whose efficiency is strongly dependent on the injection current. In fact if the injection currents are smaller than the optimum value and the collective capture mechanism ensures the reduction of the radii of instantaneous electron orbits of about 1 mm per revolution, then for admission currents much greater than the optimum value this orbit contraction may become very large. As a result, the electrons will approach the inner wall of the chamber and will be taken out of the acceleration process. Thus for injection currents considerably greater than the optimum value it is in general impossible to accelerate electrons in a betatron, because of the particle losses at the inner wall. It has been found that the collective capture mechanism ensures maximum intensity of radiation for such injection currents for which the efficiency of the mechanism is

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E032/E114

On Certain Properties of the Capture Mechanism and the Acceleration Process in a Betatron

still relatively low. For injection currents considerably greater than the optimum value, the efficiency of the collective mechanism is greater still and the electrons leave to smaller radius orbits after one or two revolutions, but the intensity in this case is smaller than the limiting intensity owing to the capture of some of the electrons by the inner walls of the chamber.

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There are 6 figures and 2 Soviet references.

ASSOCIATION: Moskovskiy gosuniversitet imeni M.V. Lomonosova (Moscow State University imeni M.V. Lomonosov)

SUBMITTED: December 27, 1958

Lobanov, Yu N

81987

S/120/60/000/03/018/055
E041/E521

9.3260

AUTHORS: Kolotov, O.S., Lobanov, Yu.N., Obukhov, A.S. and Polev, N.M.

TITLE: Short-Duration Pulse Generators

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No 3, pp 73-76

ABSTRACT: At present the most suitable industrial thyratron available for short pulse work is the TGI1-3/1 which breaks down in less than 5 ns with a variation in the instant of breakdown of less than 1 ns (see Refs 2-4). However it will only support about 1 kV at the anode and is thus suitable for low-voltage working only. The production of high-voltage pulses requires a subsequent amplifier. Fig 1 shows a suitable circuit in which the pulse driving the thyratron is formed in valves 6P14P and 6P13s. The output stages use GI-30 valves. The driving pulse is positive, 200 V and has a rise time of 20 ns. The pulse-forming line at the thyratron anode is a shorted length of RK-20 coaxial cable. A capacitance of 10-20 pF is found to be necessary at the

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Short-Duration Pulse Generator

anode to improve the pulse shape. The cathode load of the thyratron is the input impedance of the length of terminated coaxial cable which connects the pulse to the final amplifier. This final driving pulse is positive, 300 V and has a rise time of 5 ns. The final amplifier offers alternative paths giving either polarity output. Each output valve is a parallel-connected double-tetrode. Valve L5 gives out a negative pulse whose rise and fall times will be less than 5 ns provided the load resistance is less than 200 ohms. Valve L_4 gives a positive output and special precautions are necessary when driving this valve, as shown in Fig 2. In order to transmit a flat-topped pulse of given duration, the cable inductance must satisfy the condition at the foot of p 75. For short pulses the practical arrangement consists of 17 turns of RK-20 cable of adjustable pitch wound on a 40 mm diameter ceramic former containing a ferrite core. This produces

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an inductance of 10 microhenries suitable for a 0.1 μsec pulse. The interstage pulse transformer in the thyratron drive circuit has two windings of 40 turns of TEL-0.23 wound on a toroidal ferrite core, internal diameter 2.5 cm and 0.42 cm^2 section. With 75 ohm loads the positive output is 1 kV with a rise time of 5 ns, the negative output is $>$1 kV with a rise time $<$ 4 ns. With a higher resistance load the positive output can be raised to 2.5 kV in 6 ns. Pulse amplitudes may be varied smoothly by controlling the final anode supply between 0 and 3.5 kV. At repetition frequencies up to 1 kc/s the current required is only about 10 mA mean. Fig 3 shows oscillograms of pulses with half-amplitude durations of 8 ns and 50 ns. The marker pulses are spaced at 8 ns. The author thanks A. A. Sanin for his assistance.

There are 3 figures and 4 Soviet references.

SUBMITTED: May 5, 1959

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KOLOTOV, O.S.; LOBANOV, Yu.N.; OBUKHOV, A.S.; POLEV, N.M.

Short pulse generator. Prib. i tekh. eksp. no.3:73-76 My-Je '60. (MIRA 14:10)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

(Oscillators, Electron-tube)

27704
S/120/61/000/003/015/041
E073/E535

9.6000 (1040, 1159)

AUTHORS: Kolotov, O.S., Lobanov, Yu.N. and Shil'berskiy, Z.

TITLE: Generator of nanosecond pulses with continuous regulation of the pulse duration

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No.3, pp.87-89

TEXT: The authors utilise the well known method of generation of pulses of microsecond duration with two thyratrons, the instants of triggering of which can be controlled for generating square topped voltage pulses with a maximum amplitude of 1.2 kV. Two thyratrons (Fig.1) feed a common load, the resistance in the cathode of one of the thyratrons $Л_4$ (L_4).

provided for improving the shape of the pulse and increasing the amplitude of the triggering pulse. The stages with the tubes $Л_2$ (L_2) and $Л_3$ (L_3) have the additional function of reducing the mutual influence of the grid circuits of the thyratrons. The surge taken from the cathode load of the thyratrons will have a front with a rise time of 5 to 6 nanoseconds. To improve further the steepness of the front, the formed pulse is fed to the input of a limiter $Л_6$ (L_6) in which pulses with front rise times below 3 nanoseconds and an amplitude of 400 V can be generated using a relatively low anode load (50 Ohm cable). The amplitude of this pulse can be increased to 1200 V by using one amplifier stage, the load of which is a cable having a wave resistance of 75 Ohm. Since the tubes operate under surge conditions, only a negative polarity pulse can be generated in the anode circuits of the tubes under cut-off conditions. For triggering the tubes of the output stage, the negative pulse from the previous stage has to be inverted. This is done by means of a section of coaxial cable which is wound onto a ferrite core. The oscillator is triggered with pulses of 0.5 μsec and longer and with fronts of

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Generator of nanosecond pulses ... S/120/61/000/003/015/041
E073/E535

0.25 μsec of a minimum amplitude of about 40 V. The pulse generator is stable in operation for pulse repetitions with frequencies up to 3 kc/s. The pulse duration can be controlled within the limits of 3 to 300 nanoseconds. Acknowledgments are expressed to A. A. Sanin for advice and comments. There are 3 figures and 2 references: 1 Soviet and 1 English which reads as follows: R. W. Rochelle. Rev. Scient. Instrum. 1952, 23, 298.

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy fiziki MGU (Scientific Research Institute for Nuclear Physics, Moscow State University)

SUBMITTED: July 18, 1960

Card 3/4

KOLOTOV, O.S.; LOBANOV, Yu.N.

Amplifying short pulses in case of pulsed current supply to amplifier tubes. Prib. i tekh. eksp. 6 no.2:94-97 Mr-Ap '61. (MIRA 14:9)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.
(Amplifiers, Electron-tube)

S/057/61/031/002/006/015
B124/B204

21,2300 (2217,2417,1033)

AUTHORS: Lobanov, Yu. N. and Tulinova, N. I.

TITLE: Behavior of an electron beam in a betatron during the injection period

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 2, 1961, 194-199

TEXT: The experiments were carried out by means of a betatron of the NIIYaF MGU (Scientific Research Institute of Nuclear Physics, Moscow State University) specially equipped for this purpose; the experiments were made at 200 cps. Fig. 2 shows the scheme of the chamber, the position of the injector, and the probes in the branches. Tantalum plates, 15 x 30 mm large and 0.5 mm thick were used as probes. In the present paper, the electron flux density intercepted by one or the other probe is measured immediately in the chamber in dependence on its radial position. Besides, also the effect produced by the depth of each probe introduced into the chamber upon the magnitude of the fluxes intercepted by other probes are studied with a radial shift in the chamber (Figs. 3, 4, 5). By means of the data obtained,

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the distribution of the electron charge in the cross section of the beam, and also the distribution of the beam in the chamber could be determined during the first cycles. The electron beam emitted from the source during radial oscillations, periodically approaches the outer chamber wall, which occurs in the 4th and 6th cycles, on the azimuths 135° and 225°, where the probes nos. 1 and 3 were fastened. The experimental results obtained permitted determination of the distribution of the charge over the cross section of a separate beam. Fig. 6 shows the curve of the dependence of the flux upon probe no. 3 during its shift from the outer to the inner wall of the chamber. If a quantity be taken as beam width that corresponds to the half-width of the differential curve concerned, it holds from Fig. 7 that the radial dimensions of the beam do not exceed 10 mm. The authors thank Professor V. A. Petukhov for discussing the results obtained. There are 7 figures and 4 Soviet-bloc references.

SUBMITTED: May 27, 1959

30098
S/057/61/031/011/013/019
B125/B102

9.4230 (1532)
26.7331

AUTHORS: Volodichev, N. N., Grishin, V. K., Koval'skiy, S., Lobanov, ~~Yu. N.,~~ and Savenko, I. A.

TITLE: The magnetic-field characteristics of a strongly focusing accelerator with spiral sectors

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 11, 1961, 1350-1357

TEXT: The authors' experimental study of the possibility of generating a field of the type

$$H_z|_{z=0} = H_0\left(\frac{R}{R_0}\right)^k F\left(N\theta - N\operatorname{tg}\xi \ln\frac{R}{R_0}\right),$$
$$H_R|_{z=0} = H_\theta|_{z=0} = 0, \qquad (2)$$

by means of spiral sectors had the following aims: Guarantee of a radial dependence of the field $\langle H_z \rangle = H_0(R/R_0)^k$, study of the modulation frequency F, of procedures for its correction and of the possibility of determining a sufficiently high modulation coefficient $A \simeq 2$. In the arrangement described, a magnetic three-sector element modulates part of

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the magnetic system of an accelerator with spiral sectors. This device had the parameters $k = 9$, $H_{min} = 11$ oe, $H_{max} = 300$ oe, $R_{min} = 45$ cm, $R_{max} = 65$ cm, $\zeta = 65^o$, $C = 2$, $N = 10$, $\theta_s = 45^o$, $\theta_p = 14^o$. Fig. 1 shows shape and dimensions of a sector. Magnetic measurements were made by a method based on the galvanomagnetic Hall effect. An n-type Ge crystal served as pickup for the Hall electromotive force. Fig. 4 shows the experimentally found azimuthal distribution of the field for a fixed value of the radius and also the sinusoidal line of the period $\theta_p + \theta_b$ which is equal to the period of the magnetic system. For R = const, the azimuthal distribution can be represented as $H(\theta) = H(\theta_o)(1 + A \sin\frac{2\pi\theta}{\theta_p + \theta_b})$.

According to these experimental data, the amplitude $A = \frac{H(\theta)_{max} - H(\theta)_{min}}{H(\theta)_{max} + H(\theta)_{min}}$ was equal to 0.2. Further experimental results are given by Figs. 5 - 8. The compensating field consists of the fields from the compensating coils wound on the lateral surfaces of the two

30098
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B125/B102

The magnetic-field...

neighboring sectors. By investigation of the simulated magnetic field, the law of the distribution of the ampere turns of the principal and of the compensating coils was found. Varying the current in these coils, the rate of increase of the magnetic field with respect to radius and amplitudes of modulation can be varied within certain limits. This fact facilitates the development of an accelerator with spiral sectors. There are 11 figures and 4 references: 2 Soviet and 2 non-Soviet. The two references to English-language publications read as follows: K. R. Symon, D. W. Kerst, L. W. Jones, L. J. Laslett, K. M. Terwillinger. Phys. Rev., 103, 1837, 1956; T. Ohkawa. Rev. of Sci. Instr., 29, 108, 1958.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: January 28, 1961

Fig. 1. Geometry of a spiral sector.

Legend: (1) Center of the machine.

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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 АИ-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

L 10747-65 EWT(1)/EPA(w)-2/EEC(t)/EWA(m)-2 Pab-24 ASD(a)-5/ESD(gs)/ASD(m)-3/SSD/AS(mp)-2/ASD(f)-2/ASD(d)/ESD(t)/RAEM(a)/AEDC(b)/AFWL/AFETR/ASD(p)-3

ACCESSION NR: AP4046348 S/0057/64/034/010/1863/1866

AUTHOR: Andreyev, A.D.; Lobanov, Yu.N.

B

TITLE: Some peculiarities of an electrodeless ring discharge

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.10, 1964, 1863-1866

TOPIC TAGS: plasma, high frequency discharge, electron concentration, electron temperature, nitrogen

ABSTRACT: The authors investigated discharges in nitrogen and air at 0.01 to 20 mm Hg in a 4 cm diameter glass tube, excited by an external ring electrode forming part of a 0.9 Mc oscillating circuit. The oscillations were excited by a vacuum tube triggered by a rectangular pulse; they were damped and reached one-tenth the initial amplitude after 40 microsec. The maximum amplitude of the rf potential on the ring electrode was 8 kV, and the maximum current in it was 4 A. The discharges were photographed. At the higher pressures the luminous region was ring-shaped, while at the lower pressures it was extended along the axis of the tube. Auxiliary experiments were performed with two concentric ring electrodes connected in series so that the magnetic fields of the two rings either cancelled or complemented each

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ACCESSION NR: AP 4046348

other. The shape of the luminous region was very little affected by the manner in which the two rings were connected, and it is concluded that the shape is conditioned mainly by the electron mean free path and not by the high frequency magnetic field. Electron temperatures and densities in the plasma were measured with a double probe by the method described by E.O.Johnson and L.Malter (Phys.Rev.80,58, 1950) and others. Electron densities as great as 4×10^{11} cm^{-3} were found, and the electron temperatures were of the order of 5×10^4 °K. It is noted that at these temperatures and the frequency employed, the high-frequency plasma confinement mechanism should be nearly inoperative. Orig.art.has: 5 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 28Jul63 ENCL: 00

SUB CODE: ME NR REF SOV; 003 OTHER: 001

2/2

LOBANOV, Yu.N., inzh.

Ceramic nozzle for welding in carbon dioxide. Svar. proizv. no.10:39-40 O '65. (MIRA 18:10)

1. Chelyabinskiy radiozavod.

KOLOTOV, O.S.; LOBANOV, Y u.N.; TULINOVA, N.I.

Generation and recording of short pulses of electron current from a betatron injector. Prib. i tekh.eksp. 10 no.5:37-39 S-O '65. (MIRA 19:1)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta. Submitted July 27, 1964.

L 21714-66 EWT(1)/EWT(m) IJP(c) AT SOURCE CODE: UR/0057/66/036/001/0151/0154

ACC NR: AP6004891

AUTHOR: Lobanov, Yu.N.; Tulinova, N.I.

ORG: None

TITLE: On the capture of electrons into betatron orbits

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 1, 1966, 151-154

TOPIC TAGS: betatron, electron beam, electron interaction, electron capture

ABSTRACT: The authors have investigated the effect of injection current and duration of the injection pulse on the output of a betatron. Injection pulses as short as 10 nanosec were employed; with such short pulses electrons were injected into only about one-third of the circular orbit, so that any collective effects that might arise from interaction between successive turns of the injected beam were eliminated. When much longer injection pulses were employed (pulse durations up to 160 nanosec were investigated) the effects (if any) of such multiturn interactions would be present and might be identified. The inner and outer radii of the betatron chamber were 4.5 and 10.6 cm and the radius of the equilibrium orbit was 7.5 cm. The electrons were injected at energies of 1 to 2 keV; the injection phase was selected for maximum betatron output and corresponded to an initial orbit radius of 9 cm. When the pulse length was 11 nanosec the betatron output N was proportional to the injection current I (determined

UDC: 539.107.6

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ACC NR: AP6004891

from the measured average injection current $\bar{I}$ and the duty cycle) for I less than 30 mA and to I^2 for I between 35 and 70 mA. The critical value I_c = 30 M mA of I at which dlogN/dlogI changed from 1 to 2 (injection energy 1 keV) agreed within a factor 2 or 3 with the value calculated by the formula of I.M.Samoylov (ZhETF, 39, 705, 1959). The value of I_c for an injection energy of 2 keV decreased from 43 to 4 mA as the pulse duration was increased from 23 to 103 nanosec. When the injection current I was increased sufficiently the betatron output began to decrease with increasing I. The value I_{max} of I at which N assumed its maximum value N_{max} was in approximate agreement with the value calculated by the formula of L.Gonella (Nucl. Instr. and Meth., 22, 269, 1963) but decreased slightly with increasing pulse duration. The value of N_{max} depended significantly and nonmonotonically on pulse duration. The authors expect to discuss this phenomenon in a future paper. The authors thank Professor V.A.Petukhov for proposing the investigation of short injection pulses, and O.S.Kolotov for assistance with the work. Orig. art. has: 2 formulas and 3 figures.

SUB CODE: 20/ SUBM DATE: 09Dec64/ ORIG REF: 009/ OTH REF: 001

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