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L.A. Sena and Yu.M. Kagan deal with "Elementary Processes of Determining the Motion of Ions in Gas".
A paper by Ye. Bedereu (Rumania) dealt with "The Role of Resonance--recharging in the Kinetics of Ions".
I.S. Stekol'nikov considered the initial stages of the development of sparks (corona-leader, main channel and the final channel).
B.N. Klyarfel'd gave a survey of the ignition processes of the discharges in highly rarified gases.
The mechanism of the breakdown of a high-vacuum gap was elucidated in a paper by V.L. Granovskiy.
L. Tonks (USA) expounded a theory of the motion of electrons in a magnetic trap (see p 1316 of this journal).
Academician R. Rompe (Eastern Germany) described a number of experiments on non-stationary plasma conducted by himself.
M. Stenbeck (Eastern Germany) gave a generalised theory of plasma. The conference was divided into six sections. The first section was presided over by L.A. Sena and was

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concerned with the elementary processes in gas discharges.
The following papers were read in this section:
Ya.M. Fogel' - "Transformation of Positive Ions Into Negative Ones in Rarified Gases".
Ya. M. Fogel' with V.A. Ankudinov and D.V. Pilipenko - "Capture and Loss of Electrons During the Collision of Fast Atoms of Carbon and Hydrogen with the Molecules of Gases".
N.V. Fedorenko et al. - "Dissociation of Molecular Ions of Hydrogen During Collisions in Gas".
I.P. Flaks and Ye.S. Solov'yev - "Capture Cross-sections of Electrons in Multicharge Ions in Inert Gases".
R.M. Kushnir et al. - "Experimental Investigation of the Resonance Recharging in Certain Single-atom Gases and Metal Vapours".
O.B. Firsov - "Qualitative Investigation of Inelastic Collisions of Atoms".
L.M. Volkova - "Effective Excitation Cross-sections of the Spectral Lines of Potassium and Argon".
I.P. Zapesochnyy and S.M. Kishko "Some Results of the

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Investigation of the Optical Functions of the Excitation Bands of a Negative System".

A.A. Vorob'yev and A.G. Vlasov - "Investigation of the Scattering of the Electrons in a Betatron Chamber".

The second section was presided over by B.N. Klyarfel'd and was devoted to the problems of the electrical breakdown in rarified gases and in high vacuum. The following papers were read in this section:

G.Ye. Makar-Limanov and Yu.A. Metlitskiy - "Electrostatic Control of the Ignition of Glow-discharge Tubes"(see p 1274 of the journal).

S.V. Ptitsyn et al. were concerned with the breakdown in a high-voltage mercury rectifier (see p 1278 of the journal).

L.G. Guseva "Ignition of the Discharge in Non-uniform Fields at low Gas Pressures" (see p 1260 of the journal).

A.S. Soboleva and B.N. Klyarfel'd - "The Discharge Phenomena Between a Point and a Plane at Gas Pressures of 10^{-3} - 1 mm Hg".

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T.B. Fogel'son - "Methods of Reducing the Energy Lost in the Formation of a Breakdown".
L.I. Pivovar and V.I. Gordiyenko - "Microdischarges and pre-breakdown Currents Between Metal Electrodes in High Vacuum".
V.A. Simonov and G.P. Katukov - "Investigation of the Processes of Initiation and Development of a High-voltage Discharge in Vacuum".
E.M. Reykhrudel and G.V. Smirnitskaya - "The Characteristics of Ignition in High-vacuum in Magnetic Fields".
L.V. Tarasova et al. dealt with the transfer of the electrode material during the pre-breakdown stage in vacuum.
N.B. Rozanov et al. - "The Motion of Micro-particles of Substances During Electric Breakdown in Vacuum".
The third section dealt with the problems of electric sparks, corona and their practical applications. It was presided over by I.S. Stekol'nikov. The following papers were read:
V.I. Levitov et al. - "Probe Investigation of the a.c. Corona Fields".

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G.N. Aleksandrov - "Elementary Processes in the Ionisation Zone of Corona-type Conductors at Atmospheric Pressures".
V.A. Burmakin - "Appearance of a Corona Discharge in Hydrogen and Nitrogen"
P.N. Chistyakov et al. - "Some Properties of the Corona Discharge in Hydrogen in a Coaxial, Cylindrical System".
A.S. Soboleva and B.N. Klyarfel'd - "Appearance of Discharge Phenomena Between a Point and a Plane at Gas Pressures of 10^{-3} - 1.0 mm Hg".
Ya.Yu. Reynet et al. - "Methods of Unipolar Ionisation of Air By Means of Aero-ionisers (see p 1335 of the journal).
M.P. Vanyukov et al. - "Time Spectra of the Radiation of a Spark Discharge in Inert Gases" (see p 1284 of the journal).
M.P. Vanyukov and A.A. Mak - "Production of High Temperatures by Means of Spark Discharges".
V.A. Peretyagin - "Influence of the Magnetic Field of the Electric Discharge on the Dividing Surface of Two Media".

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I.S. Stekol'nikov - "New Data From the Study of Long Sparks".
M.I. Sysoyev - "Properties of the Breakdown of Compressed Air in a Comparatively Uniform Field in the Presence of Localised Non-uniformities".
A.A. Vorob'yev et al. - "Pulse and Oscillographic Techniques for the Measurement of the Discharge Lags in Dielectrics" (see p 1257 of the journal).
A paper by B.N. Zolotykh dealt with the problem of the basic theory of the electric erosion (see p 1330 of the journal).
The fourth section was presided over by S.Yu. Luk'yanov and was concerned with the non-stationary and low-frequency discharges. The following papers were read:
I.G. Nekrashevich and A.A. Labud - "The Nature of the Current Interruption During the Electric Explosion of a Metal Wire".
V.A. Simonov - "Propagation of Plasma From Local Pulse Sources".
G.G. Timofeyev et al. - "Observation of an Electro-dynamically Compressed Arc By Means of an Electron-optical

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Converter".
M.S. Ioffe and Ye.Ye. Yushmanov - "Investigation of the Radial Electric Field in an Ion Magnetron".
V.A. Belyayev and M.K. Romanovskiy - "Experiments with an Electron Model of a System with Magnetic Samples".
A.M. Andrianov et al. "Distribution of Magnetic and Electric Fields in Powerful Pulse Discharges".
G.N. Harding (England) - "Spectroscopic Determination of the Plasma Temperature in the "Zeta" Equipment" (see p 1326 of the journal).
The papr by Harding aroused a lot of interest and Academician L.A. Artsimovich expressed the opinion that the electrons and ion temperatures in the "Zeta" should be of the same order; instead, according to Harding, the electron temperature is lower by an order than that of the ions.
A paper by S.Yu. Luk'yanova and V.I. Sinitsyn was devoted to the problem of spectroscopic investigation of heated plasma.

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I.M. Podgornyy and N.G. Koval'skiy - "New Data on X-ray Radiation During Pulse Discharges"
V.A. Khrabrov and M.M. Sulkovskaya dealt with the investigation of the neutron radiation in powerful gas discharges in chambers with conducting walls.
N.A. Borzunov et al. - "Investigation of the Gas Discharge in a Conical Chamber".
S.M. Osovets et al. - "A Turn of Plasma in Transverse Magnetic Field".
I.G. Kesayev "Data on the Division of a Cathode Spot on Mercury in a Low-pressure Arc" (see p 1289 of the journal).
A.E. Robson (England) - "A New Theory of the Cathode Spot" (see p 1295 of the journal).
L.N. Breusova - "Positive Column in a Hydrogen Discharge With Stationary and Pulse Loads".
I.G. Nekrashevich and A.A. Labud - "Current Distribution on the Surface of Electrodes in Electric Pulse Discharges".
L.S. Eyg - "Some Properties of Gas Discharges in Low-voltage in Halogen Counters".

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G.I. Glotova and V.L. Granovskiy - "Comparison of the Initial De-ionisation in the Isotopes of Hydrogen (H and D)".

L.A. Akol'zina communicated some results on the pre-breakdown current pulses at low pressures.

M.Ya. Vasil'yeva and A.A. Zaytsev - "Charge-density oscillation Waves in Cylindrical Plasma".

L. Pekárek of Czechoslovakia communicated some information on the wave-like phenomena in gas-discharge plasma.

B.G. Brezhnev dealt with the problem of the determination of the energy of fast ions in pulse discharges.

B.B. Kadomtsev - "Convection Instability of a Plasma String".

S.I. Braginskiy and V.D. Shafranov - "Theory of a High-temperature Plasma String".

The fifth section was presided over by N.A. Kaptsov and dealt with high-frequency currents in gases. The following papers were read:

V.Ye. Golant - "Formation of Ultra-high Frequency Pulse Discharges in Inert Gases".

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G.I. Pateyuk - "Influence of the Boundary Conditions on the Formation and Maintenance of High-frequency Discharges".
P.S. Bulkin et al. - "Investigation of a Self-maintained Ultra-high Frequency Pulse Discharge and the Process of its Development".
G.N. Zastenker and G.S. Solntsev - "Some Results of the Investigation of the Formation of Low-pressure High-frequency Discharges".
G. Margenau (USA) - "Conductivity of Weakly Ionised Plasma".
A.A. Kuzovnikov - "The Conditions of Transition From High-frequency Corona Discharge at Atmospheric Pressures".
V.Ye. Golant - "The relationship Between the Characteristics of the Ultra-high Frequency Current and the Direct Current in Gas Discharges".
B.B. Lagov'yer analysed the conductivity of the disintegrating plasma in the window of a resonance discharge tube.
S.M. Levitskiy and I.P. Shashurin dealt with the applicability of the probe method to high-frequency

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discharges (see p 1238 of the journal).
The paper by V. Ye. Mitsuk et al. was devoted to the investigation of the ultra-high frequency plasma by means of the Stark effect.
G.S. Solntsev et al. dealt with the problem of electric fields in a high-frequency discharge at low pressures.
Ye. Bedereu of Rumania read a paper entitled "High-frequency Discharges in Methane".
The work of the sixth section was devoted to the problems of plasma and its radiation; the section was presided over by V.A. Fabrikant. The following papers were read:
Yu.M. Kagan - "New techniques in the Probe Methods of Plasma Investigation".
V.I. Drozdov - "Oscillographic Measurements in Plasma".
V.A. Simonov and A.G. Mileshkin - "Investigation of the Movement of Plasma by Means of a Mass Spectrometer of the Transit Time".
A.V. Rubchinskiy - "Application of the Oscillations on a Small Anode to the Measurements of the Vapour or Gas Density" (see p 1311 of the journal).

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A.A. Timofeyev - "Measurement of the Gas Density During the Dynamic Operation of a Discharge" (see p 1306 of the journal). A.V. Nedospasov - The Nature of a Striated Positive Column".
V.I. Perel' and Yu.M. Kagan - "The Theory of Probes for Arbitrary Pressures".
Yu.M. Kagan et al. - "The Positive Column of a Discharge in a Diffusion Regime".
M.V. Konyukov - "Influence of the Processes of the Annihilation of the Negative Ions on Their Concentration in the Column".
M.D. Gabovich and L.L. Pasechnik - "Anomalous Scattering, Excitation of Plasma Oscillations and Plasma Resonance"
Yu.L. Klimantovich - "Energy Lost by Charged Particles for the Excitation of the Oscillations in Plasma (the Langmuir paradox)" and "The Theory of Non-linear Plasma Oscillations".
Ye.G. Martinkov and I.G. Nekrashevich - "Dependence of the Temperature in the Near-electrode Region of a Pulse Discharge on the Material of the Electrodes".

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N.A. Neretina and B.N. Klyarfel'd - "Formation of Light Spots on the Anode of a Gas Discharge (see p 1301 of the journal).
N.A. Matveyeva -"Distribution of Binary Mixtures of Inert Gases in a d.c. Discharge".
V.G. Stepanov and V.F. Zakharchenko - "Some Phenomena in Rarified Plasma".
V.G. Stepanov and V.S. Bezel' - "The Possibility of Obtaining Highly Concentrated Plasmas".
G.V. Smirnitskaya and E.M. Reykhrudel' - "Some Characteristics of the Discharge in an Ion Pump and in a Magnetic Ionisation Vacuum Gauge".
Ye.T. Kucherenko and O.K. Nazarenko - "Properties of a Discharge with Electron Oscillations in a Magnetic Field" (see p 1253 of the journal).
The paper by L.M. Biberman and B.A. Veklenko considered the approximate methods for determining the concentration of atoms at the radiation levels.

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I.I. Sobel'man and L.A. Vaynshteyn read a paper on "A Non-stationary Theory of the Stark Broadening of the Spectral Lines in Plasma".
M.A. Mazing and S.L. Mandel'shtam - "The Broadening and the Shift of Spectral Lines in a Gas-discharge Plasma".
R. Lunt (England) - "The Kinetics of Electron Collisions Leading to the Excitation of the Molecular Hydrogen in a Hydrogen Discharge".
V.N. Kolesnikov et al. - "Some Properties of the Arc Discharge in an Atmosphere of Inert Gases".
A.A. Mak and M.P. Vanyukov - "Production of High Temperatures By Means of Spark Discharges".

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21(8)

AUTHORS: Dobrokhotov, Ye. I., Lazarenko, V. R., Luk'yanov, S. Yu. SOV/56-36-1-12/62

TITLE: The Search for the Double β-Decay in Ca^{48} (Poiski dvoynogo β-raspada v Ca^{48})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 76-87 (USSR)

ABSTRACT: In the introduction, the results obtained by publications by other authors, which concerned this subject, (Refs 1-6) are discussed. For their investigations the authors used a sample enriched up to 72.2 % with Ca^{48}, which contained 423 mg Ca^{48}; the control sample was enriched with Ca^{44} up to 94.7 %. Both samples consisted of calcium fluoride powder pressed into thin discs (diameter: 37 mm); the discs were covered by aluminum foils (30μ) and were set in aluminum rings. The impurities in the samples amounted to less than 0.02 %. The measuring arrangement and the electronic device are described in detail by a schematical drawing and a block scheme, and so are the gauging of the scintillation counters, between which the samples were alternatingly located (Fig 1). Energy-gauging was carried out by means of the conversion lines of Ba^{137} (0.625 MeV).

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Furthermore, the control tests and, finally, measurements themselves were discussed. The latter were carried out in two series from December 1956 to January 1957, and from July to August 1957. The energy interval within which the search for double β-decays was carried out depends on the decay energy and on the electron energy losses in the sample. The decay energy for Ca^{48} is known from mass-spectroscopic measurements (Ref 14) as amounting to (4.3 ± 0.1) MeV. The errors occurring in investigations are estimated as amounting to 1) ±5.6 % as a result of amplitude scattering (straggling, spread) by each scintillation counter, 2) ±3 % as a result of errors in counter energy calibration, 3) ±1.5 % because of instability of intensification, 4) ±1.5 % as a result of errors committed when measuring the film. The spectra of total electron energy was analyzed in the domain 3.0-4.4 MeV. In the course of 730 hours 11 cases of coincidence were recorded in this interval if the sample enriched with Ca^{48} was between the counters, 12 cases of coincidence at Ca^{44}. The difference "Ca^{48} - Ca^{44}" is therefore $(-1\pm4.8)/730$ imp/h, i.e. $(-0.14\pm0.66)/100$ imp/h ($=\Delta n$). The half-life is determined from the formula

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$\tau = \ln 2 \frac{N_0}{A} \frac{km\eta}{\Delta n}$, where m denotes the materialing of which the samples are made, A - the mass number, N_0 - Avogadro's Number, k and η - coefficients. $\tau = (0.9/\Delta n).10^{19}a$, i.e. one obtains $\tau_{Ca^{48}} \geq 0.7.10^{19}a$.

The following results were obtained by previous investigations carried out with scintillation counters:

McCarthy (Mak-Karti) (Ref 16): $1.1.10^{17}a$ (1955)

The authors in a previous paper (Ref 13): $> 1.10^{18}a$ (1956)

Awshalom(Avshalom)(Ref 17): $\geq 2.10^{18}a$ (1956)

The authors finally thank I. S. Shapiro for discussions, I. V. Galkin for establishing the electronic plant, and K. S. Mikhaylov for preparing the scintillators. There are 11 figures, 2 tables, and 17 references, 10 of which are Soviet.

SUBMITTED: September 6, 1958

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21(7), 24(7) SOV/56-36-6-2/66

AUTHORS: Luk'yanov, S. Yu., Sinitsyn, V. I.

TITLE: Spectroscopic Investigations of Powerful Pulsed Discharges in Hydrogen.III (Spektroskopicheskiye issledovaniya moshchnogo impul'snogo razryada v vodorode. III)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1621 - 1624 (USSR)

ABSTRACT: The authors give a report on spectroscopic determinations of the parameters of a high-temperature plasma at the instant of maximal constriction in a cylindrical chamber connected in a shock circuit (cicuit parameters: $C = 86\ \mu F$, $V_0 = 35$ kv, $J_{max} = 460$ ka, $dJ/dt = 1.5.10^{11}$ a/sec (at t=0)). For the purpose of evaluating electron temperature the energy distribution in the continuous plasma spectrum is investigated and the density of the charged particles is determined from the absolute intensity of the continuum. Intensity measurements were carried out photoelectrically. Ion temperature was determined from the Doppler broadening of the line N IV 3479($3^3S - 3^3P$) with introduction of several % of nitrogen into the discharge (observation

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Spectroscopic Investigations of Powerful Pulsed Discharges in Hydrogen. III

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along the discharge axis, quadratic Stark effect). The lines were Gaussian in shape, Zeeman splitting-up did not exceed 0.05 Å, which was beyond the limits of measuring accuracy. The authors used the spectrograph ISP-28 and quartz object lenses. The method has already been described by an earlier paper. In such a discharge (in 95% H_2 and 5% N_2) also lines of highly ionized nitrogen are recorded besides the continuous spectrum. For 9 N II-, N IV-, and N V-lines the table gives the wavelengths, transitions, and excitation energies. From an analysis of the energy distribution in the continuous spectrum it follows that $T_e > 10$ev. The density of the charged particles at p_o=0.05 torr amounted to n= $1.2.10^{17}$ cm^{-3}, i.e. in the case of 100% ionization it exceeds the initial density of the neutral molecules in the chamber axis by the 35-fold (T_e= 100 ev). Figure 1 shows the development of such a discharge with respect to time, figure 2 shows in a diagram the variation of charged particle density with pressure (straight line), and figure 3 shows the ion temperature measured by means of the Doppler broadening of the line N IV 3479

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Spectroscopic Investigations of Powerful Pulsed Discharges in Hydrogen. III

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at the instant of molecular constriction, in dependence on the nitrogen admixture. Ion temperature was determined as amounting to $1.2.10^6$ °K (at 0.05 Hg). There are 2 figures, 1 table, and 6 references, 1 of which is Soviet.

SUBMITTED: December 16, 1958

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21(7),24(3)

AUTHORS: Luk'yanov, S. Yu., Podgornyy, I. M. SOV/56-37-1-4/64

TITLE: A Magnetic Trap With a Field Increasing Towards the Periphery (Magnitnaya lovushka s polem, narastayushchim k periferii)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 1, pp 27-32 (USSR)

ABSTRACT: The present paper gives results of investigations carried out of the behavior of a plasma produced by an electron beam (0.5 a, voltage up to 1 kv). The vacuum chamber was within such a coil system causing the magnetic field; each coil consisted of 30 windings of a copper tube and was cooled by running water. The maximum current passing through the coil was 350 a. The magnetic field H_2 within the magnetic barrier attained a maximum of 500 Oe, and on the periphery of the chamber a maximum of 1,250 Oe (chamber axis - z - 120 cm, width of the barrier 12 cm)(Figs 1,2). Current measurement was carried out by means of a probe. The first experiments were carried out for the purpose of investigating the current distribution on the wall in the longitudinal direction (parallel to z) in dependence on the gas pressure in the

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chamber. Direct measurements showed that charged particles reach the wall only through annular slits in the magnetic field. Figure 3 shows the variation of the electron current on the probe, which has a wall potential, and during the motion of which along the chamber axis, hydrogen pressure in the chamber amounted to $5 \cdot 10^{-5}$ torr. The figure shows two steep current maxima at the gaps. Figure 4 shows the dependence of the current passing through the magnetic slits on the hydrogen pressure in the chamber. The curves have a particularly sharp pressure dependence for slits located far from the injector. Experiments carried out with an orientated probe showed a certain anisotropy in the flux distribution of the charged particles. Figure 6 shows the experimentally recorded dependence of the effective slit width δ on the magnetic field voltage (200-1,100 Oe) for electron energies of 100, 200, and 400 ev in the primary beam at a hydrogen pressure of $2 \cdot 10^{-5}$ torr. At $H > 800$ Oe, the slit width is found to be independent of H and of primary electron energy, and it amounts to about 0.4 mm. With decreasing H the slit width increases considerably especially in the case of high primary energies.

For 400 ev, an exponential increase is thus found with falling H; in the case of H = 200 Oe, δ > 5 mm. In conclusion, the authors discussed a probable explanation of the observed dependence δ(H). They thank L. A. Artsimovich, R. Z. Sagdeyev, and O. B. Firsov for their interesting discussions, and V. N. Sumarokov for his assistance in carrying out the experiments. There are 6 figures and 3 Soviet references.

SUBMITTED: February 1, 1959

KAPTSOV, N.A., prof.; GVOZDOVER, S.D., prof.; LOPUKHIN, V.M., dotsent; SPIVAK, G.V., prof.; DUBININA, Ye.M., assistent; ZAYTSEV, A.A., dotsent; SOLNTSEV, G.S., assistent; LUK'YANOV, S.Yu., prof., retsenzent; KARASEV, M.D., dotsent, retsenzent; YERMAKOV, M.S., tekhn.red.

[Electronics and radio physics] Radiofizicheskaia elektronika. Moskva, Izd-vo Mosk.univ., 1960. 561 p. (MIRA 13:10)
(Electronics) (Radio)

27521
S/089/61/011/004/002/008
B102/B138

24.6740
26.2321

AUTHORS: Luk'yanov, S. Yu., Podgornyy, I. M.

TITLE: Magnetic traps with cusped fields

PERIODICAL: Atomnaya energiya, v. 11, no. 4, 1961, 336 - 344

TEXT: The authors review problems of plasma trapping by strong magnetic fields of complex configuration (such as used in the "Ogra", "Zeta", or stellarator systems). The behavior of plasma in this kind of trap is discussed and principal experimental data are compared. The type of trap considered is as shown in Fig. 1 produced by two coaxial coils which are oppositely directed, so that around zero point the components of field strength will increase with the coordinates: $H_Z = aZ$; $H_r = -ar/2$. If plasma is injected ideally into the center of the trap (H=0), it will press apart the lines of force, filling the region of weak field so that a plasma-free central domain is formed. The plasma then withdraws through an annular magnetic gap $4\varrho_e$ in width (ϱ_e - Larmor radius of electrons at the gap). At the same time, however, mutual diffusion starts between field

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and plasma, the width of the gap increases, and it moves along the lines of force. Where there is pressure equilibrium, the extension rate of the annular gap will coincide with the rate of formation of the skin layer, and will not depend on magnetic field. The time dependence of the plasma density may be described by $dN/dt = -nv_iS/4$, where n is the total number of particles in the field-free region, n the plasma density, v_i the ionic velocity, and S the area of the magnetic gap. This theoretical representation of the behavior of a trapped plasma differs from the real behavior, especially since the behavior and characteristics of a trapped plasma are closely related to the method of injection. The ideal injector which would fill the trap with hot plasma in minimum time, has not yet been found. With actual injectors there is some intermingling between field and plasma, and the field equation has to be accomplished by a time-dependent term which also takes into account injector effects. A model of a partly pure plasma with entrapped magnetic flux is discussed. In all cases, the time of escape is finite. In the second part of the paper, some experimental data are discussed and compared; most of them are taken from non-Soviet publications. Details of the "Orekh" apparatus

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S/089/61/011/004/002/008
B102/B138

Magnetic traps with...

(I. M. Podgornyy, V. N. Sumarokov, Paper no. 204/A, Salzburg Conference on Plasma Physics, 1961), and axisymmetric system of 900 mm diameter, 1200 mm length, and a magnetic field of 4.5 kilogauss, are given. The plasma density in it reaches 10^{13} - 10^{14} cm^{-3}, and its life is 60μsec. Some particular results gained at the Institut atomnoy energii im. I. V. Kurchatova (Institute of Atomic Energy imeni I. V. Kurchatov) are discussed in brief. Finally, it is pointed out that future research and experiments should be aimed at producing plasma with higher initial temperatures and densities. This means improving existing injectors as well as changing the geometries of injection and traps. The authors thank L. A. Artsimovich, I. I. Gurevich, S. M. Osovets, and O. B. Firsov for discussions. There are 13 figures, 2 tables, and 16 references: 7 Soviet and 9 non-Soviet. The four most recent references to English-language publications read as follows: Watteau, Phys. Fluids, 4, 607 (1961); F. Coensgen, A. Sherman et al. Phys. Fluids, 3, 764 (1960); Nucl. Sci. Abstrs, 14, 24A, 3400 (1960); F. Scott, H. Woorhies. Phys. Fluids, 4, 600 (1961).

SUBMITTED: June 18, 1961

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27162
S/057/61/031/009/002/019
B109/B138

24.6730
26.2331

AUTHORS: Luk'yanov, S. Yu., Podgornyy, I. M., Chuvatin, S. A.

TITLE: Investigation of the electrodynamic acceleration of plasmoids. III (Coaxial system)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 9, 1961, 1026-1032

TEXT: Experimental means, investigation methods, and results of measurements of the electrodynamic acceleration of plasmoids are given. Apparatus (Fig. 1): length of injector 1,000 mm, capacitor bank of 75 microfarads, charged to 10-20 kv, pressure in the test tube about 10^{-6} mm Hg, gas amount introduced about 0.3 cm^3. The total energy of a plasmoid is determined calorimetrically, the velocity photoelectrically by measuring the time of flight. The mass-spectroscopic analysis of a plasmoid was conducted by the Thomson parabola method (magnetic field 80-790 oersteds, voltage 100-1,325 v). Results of measurement: Fig. 2 shows the calorimetrically found radial distribution of the energy density for capacitor bank voltages of 20 kv (1), 15 kv (2), 10 kv (3). These

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B109/B138

Investigation of the ...

values of the total kinetic energy are compared with the photoelectrically measured directional velocity of the plasmoid, from which the efficiency of the injector and the number of accelerated particles is estimated (Table 1). Table 2 shows the mass-spectroscopic investigation of the mass composition of a plasmoid for various gases. The photoelectric measurement of velocity fails for fast particles; it must then be determined from the blackenings of the photoemulsion recording the mass-spectroscopic data. Values of up to $3.5 \cdot 10^8$ cm/sec are found for protons. The formation of very fast particles is not due to the usual acceleration in the electric field since the energy of these particles often surpasses the field energy eU_o (U_o discharge voltage). The authors think it probable that the existence of these fast particles is due to the reasons found by L. A. Artsimovich, A. M. Andrianov, Ye. I. Dobrokhotov, S. Yu. Luk'yanov, I. M. Podgornyy, V. I. Sinitsin, N. F. Filippov (Atomnaya energiya, 3, 84, 1956) according to which the formation of such particles is possible with strong pulse discharges. The authors thank V. D. Pis'menn and V. M. Chicherov for measurements made. There are 3 figures, 3 tables, and 13 references: 9 Soviet-bloc and 4 non-Soviet-bloc.

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20455

S/056/61/040/002/008/047
B113/B214

26.2212
26.2321

AUTHORS: Luk'yanov, S. Yu., Podgornyy, I. M., Sumarokov, V. N.

TITLE: Confinement of a plasma in traps with a magnetic field increasing toward the periphery

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 2, 1961, 448-451

TEXT: This work represents a continuation of an earlier work (c.f. J. Nuclear Energy, Part C, 1, 236, 1960). Also in this case, a coaxial electrodynamic injector which created accelerated hydrogen clusters, was used for filling the trap with plasma. The plasma parameters in the trap of the accelerated clusters were measured. for which purpose a vacuum chamber of stainless steel was employed; its height was 100 cm, and its diameter 21 cm. The magnetic field of 1500 oe was generated by two solenoids in the circuit of the injector. Langmuir probes were used for measuring the plasma parameters. As is seen from Fig. 1, in the region of the trap there exists a plasma long after switching off the discharge current ($C = 2.5\mu F$, $V = 3 - 11$ kv) in the injector circuit. The confine-

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ment time is about 40 μsec. Probe measurements showed that the density of the charged particles in the trap increases with increasing potential of the injector. This is inferred from Fig. 2, in which the ion saturation current J on the probe is shown as a function of the injector potential. Assuming that the temperature of the charged particles remains unchanged, the saturation current is proportional to the ion concentration. Measurements at different injector potentials showed that the electron temperature remained unchanged in both cases. On switching off the magnetic trap no accumulation of the plasma was observed in the vacuum chamber (Fig. 3). A comparison of Figs. 1 and 3 shows that a confinement of the plasma takes place within a certain time. To observe the different stages of plasma formation in the trap, ultrahigh-speed photography was applied. To observe the processes better, a vacuum chamber made of glass instead of steel was used. The magnetic trap used here is shown schematically in Fig. 4 (field = 6000 oe, duration of a field pulse = 2000 μsec). It was found that after the end of injection, the plasma does not leave the trap immediately. Now and then the plasma exhibited an abnormal behavior. In this case, the lifetime of the plasma was much shorter than that in the case represented in Fig. 5. It is not

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Confinement of a plasma in...

yet clear, however, whether the observed abnormal behavior of the plasma is a consequence of a macroscopic instability or is connected with the method of filling the trap with plasma. There are 6 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc.

SUBMITTED: August 24, 1960

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B113/B214

Confinement of a plasma in...

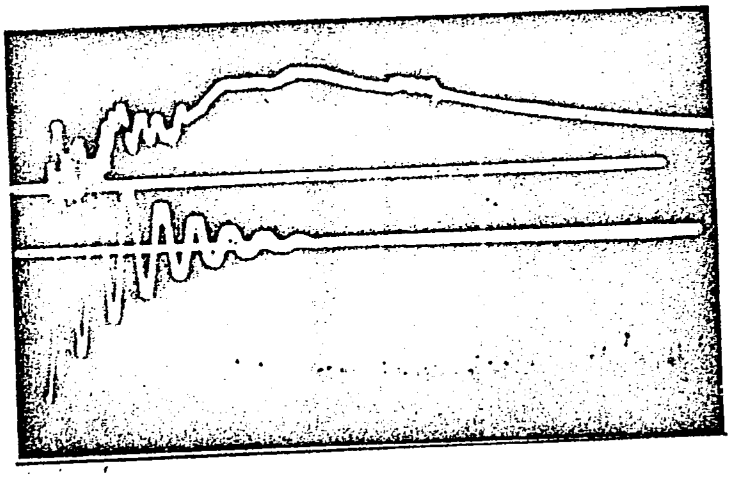

Fig.1

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Confinement of a plasma in...

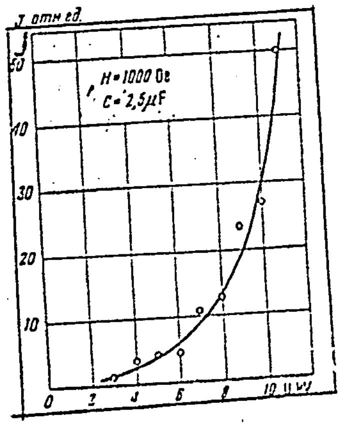

Fig. 2

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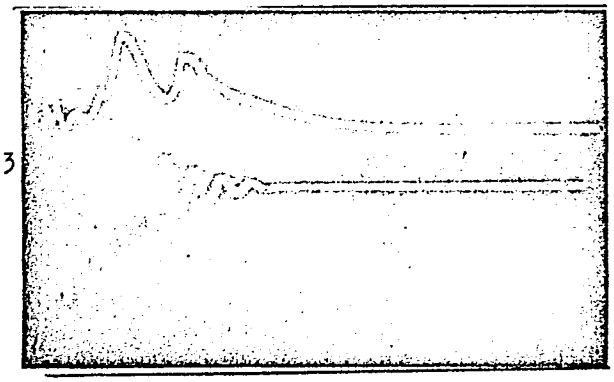
Confinement of a plasma in...

Fig. 3



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Confinement of a plasma in...

Legend to Fig. 4: Scheme of the magnetic trap; 1) coils producing the magnetic field, 2) high-speed photographic camera, 3) evacuation.

Fig.4

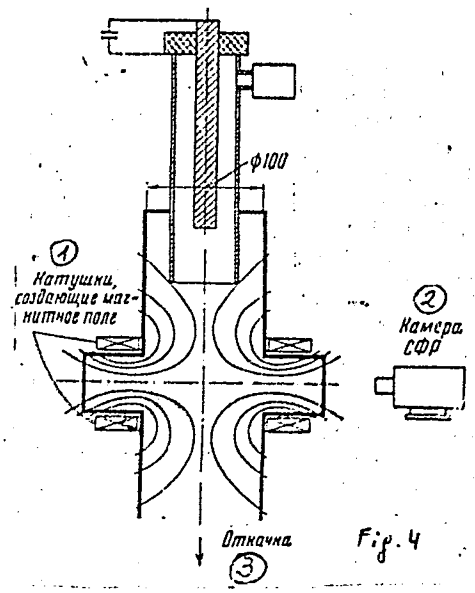

Fig. 4

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41282

S/035/62/000/010/031/128
A001/A101

3/5940

AUTHORS: Babin, A. N., Luk'yanov, S. Yu., Severnyy, A. B., Sidorov, G. G., Sinitsyn, V. I., Steshenko, N. V.

TITLE: Investigation of hydrogen line broadening in a powerful pulse discharge

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 10, 1962, 50, abstract 10A356 ("Izv. Krymsk. astrofiz. observ.", 1962, v. 27, 52 - 70)

TEXT: The authors have taken spectra of a powerful pulse hydrogen discharge by means of a spectrograph with a diffraction echelette-grating (dispersion~1.5 A/mm). A spectrophotometric study of broadening of hydrogen emission wings ($H\alpha$ - $H\varepsilon$) leads to the following results: 1) In observations of spectra of a self-pinched column in perpendicular direction, emission of wings of hydrogen lines (extending to 30 - 40 A) proves to be broadened due to the linear Stark-effect (at the initial pressure p_o = 0.1 mm Hg); 2) at p_o = 0.5 mm Hg emission extends up to 50 - 80 A and is broadened in the wing mainly due,

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Investigation of hydrogen line broadening in a... S/035/62/000/010/031/128 A001/A101

probably, to the quadratic Stark-effect; 3) in observations of spectra along the plasma column, broadening of hydrogen emission in wings of the lines is caused by macroscopic motions of the plasma with speeds of $\sim 10^8$ cm/sec. The variation of intensity in wings is well explained by the assumption of oriented, along discharge axis, motion of plasma of jet-type with velocity gradients; 4) in observations beyond the dischage axis, both in the transverse and longitudinal direction (alongside of the column), broadening of hydrogen emission (in case of p_o = 0.1 mm Hg) is fully caused by the linear Star-effect. A comparison of the cited results with the data on emission broadening in lines of solar flares points to analogous causes of broadening and on the dependence of the broadening aspect on direction along which the observation is being performed. There are 9 references.

Author's summary

[Abstracter's note: Complete translation]

Card 2/2

VVEDENSKIY, B.A., glav. red.; VUL, B.M., glav. red.; SHTEYNMAN, R.Ya., zam. glav. red.; BALDIN, A.M., red.; VONSOVSKIY, S.V., red.; GALANIN, M.D., red.; ZERNOV, D.V., red.; ISHLINSKIY, A.Yu., red.; KAPITSA, P.L., red.; KAPTSOV, N.A., red.; KOZODAYEV, M.S., red.; LEVICH, V.G., red.; LOYTSYANSKIY, L.G., red.; LUK'YANOV, S.Yu., red.; MALYSHEV, V.I., red.; MIGULIN, V.V., red.; REBINDER, P.A., red.; SYRKIN, Ya.K., red.; TARG, S.M., red.; TYABLIKOV, S.V., red.; FEYNBERG, Ye.L., red.; KHAYKIN, S.E., red.; SHUBNIKOV, A.V., red.

[Encyclopedic physics dictionary] Fizicheskii entsiklopedicheskii slovar'. Moskva, Sovetskaia Entsiklopediia. Vol.4. 1965. 592 p. (MIRA 18:1)

L 9396-66 EWT(m)/EWP(t)/EWP(b) DIAAP IJP(c) JD

ACC NR: AP5024693 SOURCE CODE: UR/0056/65/049/003/0751/0754

AUTHOR: Lazarenko, V. R.; Luk'yanov, S. Yu.

ORG: none

30

B

TITLE: Attempts to detect double Beta decay 19 in Ca^{48}

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 3, 1965, 751-754

TOPIC TAGS: Beta decay, calcium, 27 photoelectron, neutrino

ABSTRACT: The described experimental search for double β decay in Ca^{48} supersedes an experiment peformed seven years ago (ZhETF v. 36, 76, 1959). The experimental setup and the scintillation technique were essentially the same, but the sample used is much larger, containing 3.8 grams of pure Ca^{48}, and provision had to be made to ensure uniformity in the collection of the photoelectrons from the larger sample. The apparatus and the procedure are described briefly. The results show that the lifetime of the process exceeds 5×10^{19} years if the β decay is neutrinoless and 3×10^{18} years for two-neutrino decay. Authors thank L. A. Artsimovich and S. N. Vernov for making the experiment possible, I. S. Shapiro for constant interest, and Ye. I. Lazarev and L. G. Tokareva for directly participating in the preparation and performance of the experiment. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 17Apr65/ ORIG REF: 001/ OTH REF: 004

Card 1/1

KONSTANTINOV, Boris Alekseyevich; LUK'YANOV, Tikhon Petrovich; SAPAROVA, A.L., redaktor; LARIONOV, G.Ye., tekhnicheskiy redaktor.

[Operation of electrical equipment of industrial enterprises] Ekspluatatsiia elektroustanovok promyshlennykh predpriiatii. Moskva Gos.energet. izd-vo, 1955. 383 p. (MLRA 8:8)
(Electric engineering)

LUK'YANOV, T.P.

25(5) p.3 PHASE I BOOK EXPLOITATION SOV/1359

Spravochnik mekhanika mashinostroitel'nogo zavoda v dvukh tomakh. t. 1: Organizatsiya i konstruktorskaya podgotovka remontnykh rabot (Handbook for Mechanics of Machinery Manufacturing Plants in Two Volumes. Vol. 1: Organization and Design-Preparation for Repair Work) Moscow, Mashgiz, 1958. viii, 767 p. 40,000 copies printed.

Resp. Ed.: Noskin, R.A.; Candidate of Technical Sciences; Ed.: Gliner, B.M., Engineer; Tech. Ed.: Sokolova, T.F.; Eds. of Set: Borisov, Yu.S., Engineer, A.P. Vladziyevskiy, Doctor of Technical Sciences, and R.A. Noskin, Candidate of Technical Sciences; Managing Ed. for Reference Literature (Mashgiz): Krylov, V.I., Engineer.

PURPOSE: This handbook is intended for personnel responsible for repair and maintenance operations in machinery manufacturing plants.

COVERAGE: The handbook contains information on the operation of industrial equipment, organization of repair and maintenance, design-preparation for maintenance work, modernization of metal-cutting machine tools, and the economics of maintenance. Maintenance personnel of the following plants participated in the preparation of this handbook: Leningrad Plant imeni Kirov, Khar'kov Plant

Card ~~1/15~~

for Transport Machinery imeni Malyshev, Moscow Plant imeni Likhachev, Chelyabinsk Tractor Plant, etc. Contributions by the following are also acknowledged: workers of scientific research institutes (ENIMS, TsNIITMASH, NITI) and vtuzes (MVTU imeni Bauman, Leningrad Polytechnical Institute, Moscow Institute for Engineering Physics, Moscow Industrial Engineering Institute); and workers in engineering and planning institutes (VPTI b. MINTRANSMASH, VPTI b. MINTYAZHMASH, GSPI-8). There are no references.

TABLE OF CONTENTS:

Handbook for Mechanics of Machinery (Cont.) SOV/1359

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Lukiyanov, T.P.

ANTOSHIN, Ye.V.

.25(5) p 3 PHASE I BOOK EXPLOITATION SOV/1361

Spravochnik mekhanika mashinostroitel'nogo zavoda v dvukh tomakh. t. 2: Tekhnologiya remonta (Handbook for Mechanics of Machine-building Plants in Two Volumes. Vol. 2: Technology of Repair Operations) Moscow, Mashgiz, 1958. vii, 1059 p. 40,000 copies printed.

Resp. Ed.: Yu.S. Borisov, Engineer; Ed.: K.G. Tsepin, Engineer; Tech. Ed.: T.F. Sokolova; Eds. of Set: Yu.S. Borisov, Engineer, A.P. Vladziyevskiy, Doctor of Technical Sciences, and R.A. Noskin, Candidate of Technical Sciences; Managing Ed. for Reference Literature (Mashgiz): V.I. Krylov, Engineer.

PURPOSE: This handbook is intended for personnel responsible for repair and maintenance operations in a machinery-manufacturing plant.

COVERAGE: The handbook contains information pertinent to the organization of repair and maintenance operations, design-preparation of maintenance work, and economics of maintenance. Information on scientific research organizations and plants participating in preparation of this volume is included in the coverage of Volume 1 (SOV/1359). There are no references. Basic topics covered include reconditioning and making of parts in maintenance operations; metal-working, hoisting, and pipe-fitting; finishing operations involved in maintenance work; checking parts for precision; basic bench and assembly work; maintenance of power equipment; and maintenance of foundations.

Card 24/26

LUK'YANOV, Tikhon Petrovich; GERR, A.D., retsenzent; ARTSYSHEVSKIY, L.I., retsenzent; BIKKENIN, I.Kh., retsenzent; LEZNOV, S.I., nauchnyy red.; FAYERMAN, A.L., red.; TOKER, A.M., tekhn. red.

[Adjustment of electrical systems]Naladka elektroustanovok. Moskva, Proftekhizdat, 1962. 618 p. (MIRA 15:9)
(Electric apparatus and appliances) (Electric measurements)
(Electric engineering—Safety measures)

LUK'YANOV, V.

"Determination of dissolved oxygen in pulps" by G. Thomas, T. Ingraham. Atom. energ. 12 no.4:352 Ap '62. (MIRA 15:3)

(Ores--Oxygen content)
(Thomas, G.)
(Ingraham, T.)

LUK'YANOV, V.

Wages based on the finished product. Sots. trud 7 no.12:108-110 D '62. (MIRA 16:2)

1. Nachal'nik planovogo otdela Minskogo kirpichnogo zavoda No.4. (Minsk—Wages—Brick industry)

VAYNSHTEYN, L.; LUK'YANOV, V.; KACHANOV, Ya.

Discussion of the White Russian experiment. Sots. trud 8 no.6:28-34 Je '63. (MIRA 16:9)

1. Zaveduyushchiy laboratoriyey ekonomicheskikh issledovaniy Ukrainskogo nauchno-issledovatel'skogo instituta pishchevoy promyshlennosti Khar'kovskogo soveta narodnogo Khozyaystva (for Vaynshteyn). 2. Nachal'nik planovogo otdela Minskogo kirpichnogo zavoda No.4 (for Luk'yanov). 3. Nachal'nik planovogo otdela Suoyarvskoy kartonnoy fabriki Karel'skoy ASSR (for Kachanov).

(Time study)

SEMENOV, V.; GRINBERG, I., inzh.; LUK'YANOV, V., inzh.; MAYOROV, P., inzh.; MORKOVIN, G., inzh.

Against conservatism in technology and mechanical engineering. NTO 2 no.4:32-35 Ap '60. (MIRA 13:6)

1. Predsedatel' soveta pervichnoy organizatsii Nauchno-tekhnicheskogo obshchestva konstruktorskogo byuro mashinostroitel'noy promyshlennosti, Moskva (for Semenov). 2. Chleny Nauchno-tekhnicheskogo obshchestva mashinostroitel'noy promyshlennosti, Moskva (for Grinberg, Luk'yanov, Mayorov, Morkovin).

(Factory management--Technological innovations)

LUK'YANOV, V.

Achievements of miners working at the "Baydayevskiye Uklony Mine."
Shakht. stroi. no.4:29 '58. (MIRA 11:6)
(Coal mines and mining)

LUK'YANOV, V., master sporta SSSR

The strongest on underwater routes. Voen.znan. 41 no.11:40-41 N '65. (MIRA 18:12)

LUK'YANOV, V. A.
25895

Redkiy Slushay Ostrogo Ekssudativnogo Perikardita
Malyariynoy Etiologii.
Sbornik Nauch. Rabot Lecheb.
Uchrezhdenii Mosk. Voyen. Okr.
Gor'kiy, 1948, s. 245-47

SO: LETOPIS NO. 30, 1948

PEN'KOV, A.I.; LUK'YANOV, V.A.

Freezing of a tool and the evaluation of drilling muds. Burenie no.3:3-6 '65. (MIRA 18:5)

1. Turkmenskiy filial Vsesoyuznogo neftegazovogo nauchno-issledovatel'skogo instituta.

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68032

SOV/155-58-6-34/36

AUTHORS: Priselkov, Yu.A., Luk'yanov, V.B.

TITLE: A New Method for the Determination of the Maximum Free Length of Path of the Nuclear ß-Particles 19

PERIODICAL: Nauchnyye doklady vysshey shkoly. Fiziko-matematicheskiye nauki, 1958, Nr 6, pp 212-218 (USSR)

ABSTRACT: The determination of the free length of path of the ß-particles ist mostly carried out by evaluating the experimentally measured weakening of the original radiation in dependence on the thickness of the absorbing layer. The authors describe different already known insertions and then propose to carry out this determination with the aid of the relation

$$(7) \qquad \left(\frac{4}{\pi} \text{ arc tg } \frac{I}{I_0}\right)^{1/4} = 1 - \frac{d}{R}$$

where I, I_0 are the intensities and R is the maximum length of path. Measurements with S^{35}, Ca^{45}, W^{185}, Cs^{137}, Cl^{36}, P^{32}

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A New Method for the Determination of the Maximum Free Length of Path of the Nuclear β-Particles SOV/155-58-6-34/36

showed that (7) is well satisfied for $\lg \frac{I}{I_o} < 2.2$. The maximum lengths of path calculated with the aid of (7) show a good coincidence with the results of Glendenin [Ref 1]. There are 4 figures, 1 table, and 13 references, 4 of which are Soviet, 6 American, 2 English, and 1 Swiss.

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

SUBMITTED: July 30, 1958

4

Card 2/2

LUK'YANOV, V.B.; KOROBKOV, V.I.

Study of the method of relative measurements of radioactivity by means of dispersion analysis. Radiokhimiia 7 no.3:350-355 '65. (MIRA 18:7)

LUK'YANOV, V.B.; GAVRICHEV, V.S.

Use of dispersion analysis for selecting the conditions for the determination of aliphatic alcohols and aldehydes by paper chromatography. Vest. Mosk. un. Ser. 2: Khim. 20 no.1: 25-30 Ja-F '65. (MIRA 18:3)

1. Kafedra radiokhimii Moskovskogo universiteta.

LUK'YANOV, V.B.; NESMEYANOV, An.N.; YEREMEYEV, A.P.

Products of reaction of labeled carbon oxides with a mixture of acetylene and hydrogen in an electrical discharge. Vest. Mosk. un. Ser. 2: Khim. 19 no.6:11-13 N-D '64. (MIRA 18:3)

1. Kafedra radiokhimii Moskovskogo universiteta.

LUK'YANOV, V.B.; NESMEYANOV, An.N.; YEREMEYEV, A.P.

Selecting optimum conditions for the synthesis of carbonyl compounds in an electric discharge. Zav. lab. 30 no.10:1248-1251 '64. (MIRA 18:4)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

LUK'YANOV, V.B.; SIMONOV, Ye.F.

Complex investigation of the accuracy of the quantitative determination of norleucine with ninhydrin. Vest. Mosk. un. Ser. 2:Khim. 20 no.4:30-33 Jl-Ag '65. (MIRA 18:10)

1. Kafedra radiokhimii Moskovskogo gosudarstvennogo universiteta.

ZABORENKO, Kaleriya Borisovna; IOFA, Boris Zinov'yevich; LUK'YANOV, Valeriy Borisovich; BOGATYREV, Igor' Olegovich; KONDRASHKOVA, S.F., red.

[Radioactive-tracer technique in chemistry] Metod radioaktivnykh indikatorov v khimii. Moskva, Vysshaia shkola, 1964. 370 p. (MIRA 17:12)

LUK'YANOV, V.B.; KOSINSKAYA, E.A.

Use of methods of multifactor experimenting in choosing variants of analytical methodology.- Zav. lab. 30 no.7:869-872 '64. (MIRA 18:3)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

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22331
S/189/61/000/003/001/002
D224/D302

AUTHOR: Luk'yanov, V. B.

TITLE: Calibration of face,meters for absolute measurements of β-rays and the determination of the amount of radioactive ingredients

PERIODICAL: Moskva. Universitet. Vestnik. Seriya II. Khimiya, no. 3, 1961, 57-59

TEXT: The use of face meters for absolute measurements of radioactivity introduces the problem of calibrating the corresponding apparatus. The calibration coefficient may be found by dividing the counting-rate of a compound I by its absolute activity measured on a 4p-meter. In practice, however, it is more expedient to define this coefficient as the ratio of the counting-rate of a compound I to the counting-rate I_0 which must have a place in analytical geometry (Ω) in the absence of the all too possible side effects of β-radiation scattering and absorption. In this case

$$k = \frac{I}{I_0} \quad \text{where} \quad I_0 = A\Omega \qquad (2)$$

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Besides the size of the solid angle, the calibration coefficient k thus includes all factors affecting the coefficient of counting, so that

$$k=\frac{?}{\Omega}=\sum(p_i K_i S_i q_i) \quad (3)$$

where p_i is the probability of decay with emission i of the partial spectrum, K_i is the partial coefficient of β-ray absorption in the layer between the preparation and the sensitive volume of the meter, S_i is the partial coefficient of self-absorption and q_i is the partial coefficient of reverse reflection from the lining. In the above equation k is called the dispersion coefficient, and the counting-rate corrected for scattering is called the reduced counting-rate. If filtration of the radiation is put into effect, it may be shown that there is no longer any need to repeat the whole calibration procedure for each solid angle or for each new absorber when using the dispersion coefficient k. For measurements carried out with solid angles Ω_1, and Ω_2 and absorber thicknesses d_1 and d_2, the counting-rates I_0 should be proportional to

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the values of the relative solid angles, so that

$$\frac{\Omega_1}{\Omega_2} = \frac{I_{o1}}{I_{o2}} \qquad (4)$$

Then, if I_{11}, I_{21}, I_{12} and I_{22} are the counting-rates for Ω_1, and d_1, Ω_2 and d_1, Ω_1 and d_2 and Ω_2 and d_2 respectively, and, taking note of expression (2),

$$\frac{\Omega_1}{\Omega_2} = \frac{I_{11} \cdot k_{21}}{k_{11} \cdot I_{21}} \quad \text{or} \quad \frac{k_{11}}{k_{21}} = \frac{I_{11}}{I_{21}} \cdot \frac{\Omega_2}{\Omega_1} \qquad (5)$$

Should the measurements be made with different absorbers for a fixed solid angle, then

$$\frac{k_{11}}{k_{12}} = \frac{I_{11}/\Delta\Omega_1}{I_{12}/\Delta\Omega_1} = \frac{I_{11}}{I_{12}} \qquad (6)$$

and

$$\frac{k_{21}}{k_{22}} = \frac{I_{21}}{I_{22}} \qquad (7)$$

These three equations contain four unknown coefficients of dispersion, but provided one of them is known, it is easy to find the others:

(for (8) see next card)

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Calibration of face...

$$k_{11} = k_{12} \cdot \frac{I_{11}}{I_{12}} = k_{21} \cdot \frac{I_{11}}{I_{21}} \cdot \frac{\Omega_2}{\Omega_1} = k_{22} \cdot \frac{I_{11}}{I_{22}} \cdot \frac{\Omega_2}{\Omega_1},$$
$$k_{12} = k_{11} \cdot \frac{I_{12}}{I_{11}} = k_{21} \cdot \frac{I_{12}}{I_{21}} \cdot \frac{\Omega_2}{\Omega_1} = k_{22} \cdot \frac{I_{12}}{I_{22}} \cdot \frac{\Omega_2}{\Omega_1},$$
$$k_{21} = k_{11} \cdot \frac{I_{21}}{I_{11}} \cdot \frac{\Omega_1}{\Omega_2} = k_{12} \cdot \frac{I_{21}}{I_{12}} \cdot \frac{\Omega_1}{\Omega_2} = k_{22} \cdot \frac{I_{21}}{I_{22}},$$
$$k_{22} = k_{11} \cdot \frac{I_{22}}{I_{11}} \cdot \frac{\Omega_1}{\Omega_2} = k_{12} \cdot \frac{I_{22}}{I_{12}} \cdot \frac{\Omega_1}{\Omega_2} = k_{21} \cdot \frac{I_{22}}{I_{21}}. \quad (8)$$

Since expression (2) represents the four equations, the problem is reduced to ascertaining I_0' for a given value of Ω. In order to find the coefficients k and the other values of Ω and d, it is best to determine from the test the relation of the corresponding counting-rates of the same preparation and to calculate the relation of the solid angles that are being used. If the error of measurement by the

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counting-rate amounts to ± 3% and if the error in the dispersion coefficient obtained through direct calibration is of a similar magnitude, the coefficients k computed from formulae (8) will have a precision of ± 5%. It is also possible to show that the dispersion coefficients thus found allow the amount of a radioactive ingredient in the preparation to be evaluated. Suppose there is a mixture of two isotopes A and B in which I_A, I_{OA} and k_A denote the recorded counting-rate, the reduced counting-rate and the dispersion coefficient respectively for isotope A, the corresponding quantities for isotope B being I_B, I_{OB} and k_B. The mixture of the two isotopes will then be characterized by indices AB, and for constant conditions of measurement (Ω and d)

$$I_A + I_B = I_{AB} \quad \text{and} \quad I_{oA} + I_{oB} = I_{o(AB)} \qquad (9)$$

Therefore, in accordance with equation (2)

$$k_{AB} = \frac{I_{AB}}{I_{o(AB)}} = \frac{I_{oA}k_A + I_{oB}k_B}{I_{oA} + I_{oB}} = \frac{I_{oA}}{I_{oA} + I_{oB}}k_A + \frac{I_{oB}}{I_{oA} + I_{oB}}k_B .$$

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S/189/61/000/003/001/002
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In the case of k_A and k_B the coefficients are none other than the apportionment of isotopes A and B in the mixture. Denoting these portions by m and n, the last expression can be rewritten as

$$k_{AB} = mk_A + nk_B \quad (10)$$

Since m + n = 1, it is finally found that

$$m = \frac{k_{AB}-k_B}{k_A-k_B} \quad \text{and} \quad n = \frac{k_{AB}-k_A}{k_B-k_A} \quad (11)$$

The calculated relationship between the dispersion coefficients for an $S^{53}-Cl^{36}$ mixture and the activity composition of the mixture is presented graphic form. By varying the conditions of measurement it is also possible to determine ingredients with closer energies. For an equilibrium mixture of two isotopes,

$$k_{AB}^{equil.} = \frac{1}{2}(k_A + k_B). \quad (12)$$

Thus, knowing the dispersion coefficients for an equilibrium mixture and for one of the components, it is possible to determine k for the other component. There is 1 figure.

ASSOCIATION: Kafedra Radiokhimii (Department of Radiochemistry)

SUBMITTED: November 16, 1959

S/189/63/000/002/005/010
A057/A126

AUTHORS: Karasev, B.V., Luk'yanov, V.B., Priselkov, Yu.A., Wan Wen-Zui

TITLE: A 4π-counter for measuring the absolute activity of β-emitting preparations

PERIODICAL: Vestnik Moskvoskogo universiteta, Seriya II, Khimiya, no. 2, 1963, 24 - 27

TEXT: A relatively simple 4π-counter working with technical grade methane for measuring the absolute activity of β-emitters with an accuracy, for example, of 4.5% for P^{32} and 10% for Ca^{45} was developed. The schematic drawing in Figure 1 shows the flow-counter containing two polished steel cylinders 1 with an inner diameter of 35 mm and a height of 25 mm. One end of the cylinder is screwed up with a copper sleeve 2 through the opening of which in a teflon insulator 3 the copper rod 4 with 2 mm diameter is inserted. A 0.5 mm diameter opening is at a 1 mm distance from the end of the rod. The molybdenum thread (0.038 mm diameter) loop 5 is placed into the opening and fastened with a dowel. The distance from the loop to the preparation 6 is 9 mm. The adjacent ends of

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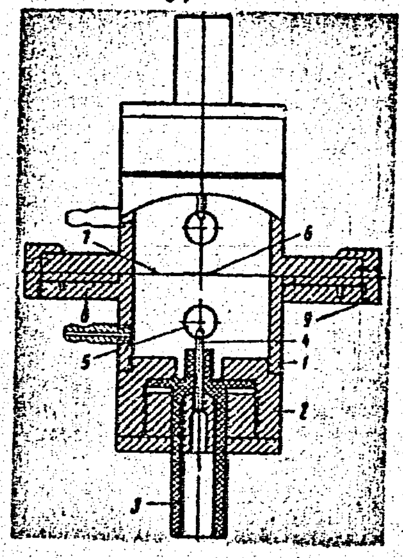
the cylinders have flanges 8, which are hermetically coupled by means of the coupling sleeve 9 with thread. The preparation is placed into the space between the cylinders. The holder 7 for the preparation is a 0.2 mm thick aluminum disc with three small openings at the circumference for the gas flow and a central opening of 15 mm. On the latter there is placed the preparation on a specially prepared thin (a few $\mu g/cm^2$ to 100 $\mu g/cm^2$) PVC film. The cathode of the counter are both cylinders, the copper sleeves and the aluminum foil, while the loop is the anode. A high negative voltage from the rectifier of the type "Orekh" was used, and the pulses amplified and shaped by a УШ-2 (USh-2) amplifier. The scaling was carried out with the ПС -10000 (PS-10000) circuit "Kalina". The methane was purified before use by passing through wash bottles. The resolution time of the counter was determined by the radiotechnical circuit and regulated with different load resistances. The efficiency of the counter was controlled with uranium and Co^{60} preparations. Thin layers were prepared from these substances on PVC (uranium 200 - 300 $\mu g/cm^2$) films and a 97% efficiency of the counter for α-rays observed with standard deviations 6.8%. β, γ-coincidence measurements with Co^{60} showed a higher counting rate in the upper half of the counter due to the absorption and self-absorption of β-rays. The corresponding correction was determined with 4.5%. There are 6 figures.

A 4 π-counter for measuring the absolute S/189/63/000/002/005/010
A057/A126

ASSOCIATION: Kafedra Radiokhimii (Department of Radiochemistry)

SUBMITTED: June 28, 1961

Figure 1: Cross section of the 4 π-flow counter



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LUK'YANOV, V.B.; PANKRATOVA, L.N.; LAPITSKIY, A.V.

Evaluation of accuracy of a determination of Ki (instability constant) by a restricted-logarithmic method based on spectrometry data. Zhur. neorg. khim. 10 no.2:565-566 F '65. (MIRA 18:11)

1. Submitted July 6, 1964.

LUK'YANOV, Valeriy Borisovich; MELESHKO, V.K., red.; VLASOVA, N.A., tekhn. red.

[Measurement and identification of beta-radioactive preparations] Izmerenie i identifikatsiia beta-radioaktivnykh preparatov. Moskva, Gosatomizdat, 1963. 166 p. (MIRA 16:10)
(Beta rays) (Radioactive substances)

LUK'YANOV, V.B.; MAKAROV, A.V.; FEDIN, A.D.

Mathematical statistics in the control of radiometric apparatus.
Zav.lab. 29 no.7:844-849 '63. (MIRA 16:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Radiometry) (Mathematical statistics)

LUK'YANOV, V.B.

Use of dispersion analysis for the selection of conditions for determining fatty acids by paper chromatography. Vest.Mosk.un. Ser.2:Khim. 18 no.6:39-41 N-D '63. (MIRA 17:4)

1. Kafedra radiokhimii Moskovskogo universiteta.

AM4016862 BOOK EXPLOITATION S/

Luk'yanov, Valeriy Borisovich

Measurement and identification of beta radioactive preparations (Izmereniye i identifikatsiya beta-radioaktivny*kh preparatov) Moscow, Gosatomizdat, 63. 0166 p. illus., biblio. 3000 copies printed

TOPIC TAGS: Beta activity, Beta active compound, tracer atom, tagged atom, tracer technique, radioactive tracer, Beta radiation properties, Beta radiation registration, Beta radiation identification, Beta ray detector, Beta ray measurement accuracy

PURPOSE AND COVERAGE: The book deals with a group of problems connected with procedures for measuring and identifying β active compounds in laboratories. It covers essentially radioactive tracer techniques and is concerned with the radiation rather than the detection aspect of the problem. The book is intended for instructors

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AM4016862

in higher educational institutions as well as for researchers who employ tagged atoms.

TABLE OF CONTENTS [abridged]:

SUB CODE: PH, SD SUBMITTED: 12Jul63 NR REF SOV: 038

OTHER: 017 DATE ACQ: 10Dec63

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LUK'YANOV, V.D., arkhitektor.

Flower plots for parks, plazas, and boulevards. Gor.khoz.Mosk. 27 no.8:30-33 Ag '53. (MLRA 6:8)
(Moscow--Park districts) (Park districts--Moscow)

LUK'YANOV, V.D., arkhitektor.

Problems in the development of the hothouse and nursery industry. Gor.khoz.Mosk. 28 no.12:18-20 D '54. (MLRA 8:3)
(Moscow--Nurseries (Horticulture))

LUK'YANOV, V.D., arkhitektor

Moscow prepares for the festival. Gor.khoz.Mosk. 31 no.5:11-13 My '57. (MIRA 12:3)
(Moscow--Landscape gardening) (Moscow--Municipal services)
(Youth--Congresses)

LUK'YANOV, V.D., arkhitektor

Improve entrances to the capital. Gor. khoz. Mosk. 34 no.11:3-4 N '60. (MIRA 13:11)
(Moscow--City planning) (Moscow--Landscape gardening)

LUK'YANOV, V.D.

Moscow preserves the memory of Lenin. Gor. khoz. Mosk.
36 no.10:10-12 O '62. (MIRA 15:12)
(Lenin, Vladimir Il'ich, 1870-1924)
(Moscow--Monuments)

LUK'YANOV, V. F.

"Orthohydroxyquinoline as a Reagent for Colorimetric Determination of Traces of Metals." Sub 25 May 51, Moscow Order of Lenin State U imeni M. V. Lomonosov.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

5(2), 5(3), 5(4) SOV/75-14-2-11/27

AUTHORS: Chernikhov, Yu. A., Luk'yanov, V. F., Knyazeva, Ye. M.

TITLE: Photometric Determination of Zirconium in Phosphorites With Pyrocatechol Violet (Fotometricheskoye opredeleniye tsirkoniya v fosforitakh s pirokatekhinovym fioletovym)

PERIODICAL: Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 2, pp 207-210 (USSR)

ABSTRACT: The authors investigated the reaction of zirconium with pyrocatechol violet (3,3',4'-trihydroxyfuchsone-2"-sulfonic acid), and ascertained the optimum conditions for a photometric determination of zirconium in solutions of pure salts as well as in natural materials. Hafnium yields a similar reaction with pyrocatechol violet, and therefore disturbs the determination. The determination of zirconium in the presence of a reagent excess is possible since in the range of the absorption maximum of the zirconium complex (λ = 620 mμ) the pure reagent absorbs only weakly. The absorption maximum of pyrocatechol violet is at 445 mμ. Since pyrocatechol violet is an acid - base indicator, the determination of zirconium

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SOV/75-14-2-11/27

Photometric Determination of Zirconium in Phosphorites With Pyrocatechol Violet

must be carried out at a constant pH value of the solution. The pH value is maintained by an acetate buffer at 5.2 - 5.4. In this range the reagent is yellow, while the zirconium complex is blue. The formation of the complex takes place much more rapid if the zirconyl chloride solutions are previously treated with concentrated acids (nitric acid, hydrochloric acid or perchloric acid). The absorption of the solutions of the zirconium complex without previous treatment with acids is considerably lower than the absorption of solutions previously treated with acids. The effect of the treatment with acids on the optical density of the solutions is shown in a table. Maximum light absorption is attained 30 minutes after the combination of the two solutions; after 1 - 2 hours the absorption of the solutions decreases again. The reaction of zirconium with pyrocatechol violet is highly sensitive. The coloration of 0.1 γ Zr in a 1 ml solution is still clearly visible. For the photometric determination the range of from 5 to 70 γ zirconium in 50 ml solution is best suited. In this range processes take place according to Beer's law.

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Photometric Determination of Zirconium in Phosphorites With Pyrocatechol Violet

In the presence of complexon III neither any amount of alkali and alkaline earth metals at pH 5.2 - 5.4 nor Al, Fe^{3+}, Be, Ti, Th, UO_2^{2+}, Bi, V, Mo, W and Co disturb the determination of zirconium if their quantitative relation to zirconium is smaller than 100 : 1. Ions with intense natural color (Cu, Ni) disturb the determination if the ratio between their amount and the amount of zirconium surpasses 10 : 1. Among anions Cl^-, NO_3^-, ClO_4^- and SO_4^- in moderate quantities produce no disturbing effect; F^-, PO_4^{3-} and organic complex-forming anions disturb the determination. A solution of pyrocatechol violet in an acetate buffer serves as a comparative solution. The results of the determination of zirconium in phosphorites according to the method described are given in a table. For the purpose of comparison ZrO_2 was determined also according to the X-ray spectra. These determinations were made by M. A. Petrova. The determination of zirconium with

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SOV/75-14-2-11/27

Photometric Determination of Zirconium in Phosphorites With Pyrocatechol Violet

pyrocatechol violet in pure solutions of its salts and also in phosphorites is described in detail in this paper. There are 3 figures, 2 tables, and 10 references, 3 of which are Soviet.

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05712
SOV/32-25-10-1/63

5 (2)

AUTHORS: Luk'yanov, V. F., Savvin, S. B., Nikol'skaya, I. V.

TITLE: Photometric Determination of Thorium in Zircons by Means of the New "Arsenazo III" Reagent

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 10, pp 1155-1157 (USSR)

ABSTRACT: The separation of thorium (I) from zirconium (II) by the usual methods is wearisome and incomplete. A rapid method of determining (I) in zircons was developed, in which a previous separation of other elements (including (II)) is not necessary. The method is based on the colorimetric measurement of (I) by means of the new "arsenazo III" reagent (1,8-dioxy-naphthalene-3,6-disulphonic acid-2,7-bis <azo-1> benzene-2-arsonic acid) in the presence of oxalic acid. The reagent was prepared by S. B. Savvin (Ref 2). Already in the presence of 1-35 γ of (I)/50 ml, the reagent produces a green coloring which, in the case of excess reagent, turns into blue-violet. The oxalic acid used in the determination eliminates the influence of (II) (the content of which in zircon may amount to up to 80%) and of titanium, since it forms complex compounds with these elements. The oxalic acid acts much less

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05712
SOV/32-25-10-1/63

Photometric Determination of Thorium in Zircons by Means of the New "Arsenazo III" Reagent

upon (I) in the highly hydrochloric-acid medium. Data on the reproducibility of the results obtained by the method described (Table 1), and of the results obtained by determinations of (I) in zircon (Table 2), are given. The course of analysis indicated shows that calibration curves are used for the determination of (I) with "arsenazo III", that the colorimetric determination was made by the device of type FEK-M-1 (with a red light filter), that the analysis takes 3 hours, and that the method is suitable for a content of (I) exceeding 0.005%. There are 3 figures, 2 tables, and 2 Soviet references.

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5.5220

77751
SOV/75-15-1-13/29

AUTHORS: Luk'yanov, V. F., Knyazeva, Ye. M.

TITLE: Complexometric Determination of Zirconium

PERIODICAL: Zhurnal analiticheskoy khimii, 1960, Vol 15, Nr 1, pp 69-72 (USSR)

ABSTRACT: A new procedure of complexometric determination of zirconium is proposed. The proposed procedure is based on the formation of a complex of Zr with complexon III in an excess of the latter and back-titration of complexon III with $Th(NO_3)_4$ using arsenazo as an indicator. The following procedure is given: The sample to be analyzed (alloys, ores, concentrates), 0.1-0.2 g (depending on Zr content), is fused in a platinum dish with 1-5 g of potassium bifluoride and after cooling is dissolved in 15-20 ml of concentrated sulfuric acid. The solution is evaporated to heavy SO_3 fumes, cooled and transferred into a 300 ml beaker. Zirconium is precipitated with 20% NaOH or 25% ammonia solution, filtered, and washed with 5% ammonia solution. The

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Complexometric Determination of Zirconium

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precipitate (zirconium hydroxide) is dissolved in hot 2N HCl and boiled for 2-3 min. Ascorbic acid is added to reduce Fe^{3+}. To the boiling solution an excess of complexon III is added and boiled for 2-3 min; to the cooled solution 1-2 drops of a 1% alcoholic solution of α-dinitrophenol is added and neutralized with ammonia until a bright yellow color appears. Then 1:2 HCl is added carefully until the color disappears (pH 2.3-2.4). Now 6-8 drops of a 0.1% aqueous arsenazo solution is added, and the excess of complexon III is titrated with $Th(NO_3)_4$.

Table 1. Effect of interfering elements on Zr determination by the complexometric method (in the first 15 experiments, 15.37 mg Zr was taken; in other experiments, 15.59 mg Zr). (a) Introduced admixtures; (b) Zr found (mg); (c) error (%); (d) absolute; (e) relative.

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TABLE 1 ON FOLLOWING CARD (3/4)

Complexometric Determination of Zirconium

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(a) mg	(b)	(c) (d)	(c) (e)	(a) mg	(b)	(c) (d)	(c) (e)
30 Zn^{2+}	15,37	0,0	0,0	50 UO_2^{2+}	15,37	0,0	0,0
500 Zn^{2+}	15,37*	0,0	0,0	500 WO_4^{2-}	15,37*	0,0	0,0
500 Zn^{2+}	15,37**	0,0	0,0	500 MoO_4^{2-}	15,28*	−0,09	−0,6
200 Cu^{2+}	15,46	+0,09	+0,6	200 VO_3^-	15,46*	+0,09	+0,6
500 Cu^{2+}	15,37**	0,0	0,0	5 Fe^{3+}	15,59	0,0	0,0
5 Ni^{2+}	15,28	−0,09	−0,6	3 Ti^{IV}	15,59	0,0	0,0
200 Ni^{2+}	15,46**	+0,09	+0,6	15 Ti^{IV}	15,69***	+0,1	+0,6
15 Co^{2+}	15,37	0,0	0,0	100 Ce^{3+}	15,69	+0,1	+0,6
200 Co^{2+}	15,41**	+0,04	+0,25	200 La^{3+}	15,69	+0,1	+0,6
500 Al^{3+}	15,41*	+0,04	+0,25	200 Nd^{3+}	15,69	0,0	0,0
150 Mn^{2+}	15,37	0,0	0,0				

*After precipitation with NaOH
**Precipitated with ammonia
***Precipitated with ammonia in presence of H_2O_2

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Complexometric Determination of Zirconium

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The method is applicable to samples containing from 2 to 40% Zr. The mean relative error is 0.6%. There are 2 tables; and 15 references, 3 U.S., 4 U.K., 2 German, 6 Soviet. The 5 most recent U.S. and U.K. references are: Fritz, J., Fulda, M., Analyt. Chem., 26, 1206 (1954); Milner, G., Edwards, J., Analyst 80, 957 (1955); Milner, G., Barnett, G., Analyt. Chem., 14, 414 (1956); Milner, G., Edwards, J., Analyt. chim. acta, 13, 230 (1955); Fritz, J., Johnson, M., Analyt. Chem., 27, 1653 (1955).

SUBMITTED: February 16, 1959

Card 4/4

GRIGOR'YEV, V.F.; LUK'YANOV, V.F.; DUDEROVA, Ye.P.

Analytical chemistry of uranium. Report No.1: Luminescence method for determining uranium. Zhur.anal.khim. 15 no.2:184-190 Mr-Ap '60. (MIRA 13:7)

(Uranium—Analysis) (Luminescence)

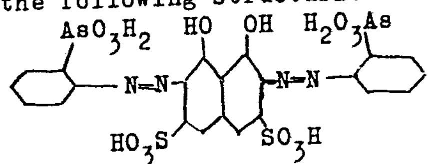
S/075/60/015/003/017/033/XX
B005/B066

AUTHORS: Luk'yanov, V. F., Savvin, S. B., and Nikol'skaya, I. V.

TITLE: Photometric Determination of Microquantities of Uranium by Means of the Arsenazo III Reagent

PERIODICAL: Zhurnal analiticheskoy khimii, 1960, Vol. 15, No. 3, pp. 311 - 314

TEXT: In the present communication the authors continued their studies on the analytical properties of the new reagent arsenazo III, the synthesis and properties of which have been already described (Ref. 7). Arsenazo III has the following structural formula:



This reagent forms with many elements very stable chelates which are stable also to strong acids and in the presence of anions which, in general, have

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APPROVED FOR RELEASE: 07/12/2001 CIA-RDP86-00513R001030820014-2"

Photometric Determination of Microquantities of Uranium by Means of the Arsenazo III Reagent

S/075/60/015/003/017/033/XX
B005/B066

a masking effect in color reactions (sulfates, phosphates, oxalates, and others). In strongly acid solutions arsenazo III reacts only with tetravalent cations (Ref.7). The authors devised a colorimetric method for the rapid determination of microquantities of uranium by means of arsenazo III. In order to increase the selectivity of the reagent, uranium is reduced to the tetravalent stage prior to determination by means of granulated zinc in the presence of ascorbic acid. Ascorbic acid protects the tetravalent uranium from oxidation by atmospheric oxygen. The best results are obtained if arsenazo III occurs in the determination in a 2-5fold molar excess with respect to uranium. In this case the solution is at once colored violet to red-violet. The color intensity remains constant for at most 2 hours (Fig.1). The color of the complex reaches its maximum value only in strongly acid solutions (>3.5 N HCl) (Fig.2). The colorimetric determinations were performed in a colorimetric photometer of the ФЭК-М-1 (FEK-M-1) type by using a red filter. Fig.3 shows the absorption curves of the pure reagent and of its complex with tetravalent uranium in the visible spectrum range. The molar extinction coefficient of the complex has at 670 mμ a value of ~100000; the optical density of a

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Photometric Determination of Microquantities of Uranium by Means of the Arsenazo III Reagent

S/075/60/015/003/017/033/XX
B005/B066

solution of the complex with a uranium content of 0.04 γ/ml, measured in a 20 mm cuvette, is 0.030. Anions (fluoride, phosphate, sulfate) only little affect the determination. From among the cations only zirconium and thorium disturb the determination; the rare earths may be present in a 60fold excess at the most with respect to uranium. In the presence of titanium the solution must be oxidized after the reduction of uranium with zinc by means of hydroxylamine hydrochloride, since otherwise the reagent may be destroyed by the trivalent titanium formed in the reduction. The disturbing influence of zirconium may be considerably reduced by adding oxalic acid, so that the determination of uranium is possible also in the presence of a 20fold quantity of zirconium without appreciable error (Table 1). Thorium disturbs the determination. If the quantities of uranium and thorium are in the same order of magnitude, thorium alone may be determined prior to the reduction of uranium (Ref.8). After reduction with zinc the sum Th+U(IV) is determined. The uranium content results from the difference of the two determinations. Table 2 compares the results of the uranium determination by means of the method described with the results obtained by other methods. Accuracy and reproducibility of the

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Photometric Determination of Microquantities of Uranium by Means of the Arsenazo III Reagent

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B005/B066

method devised are satisfactory. The sensitivity of the method is 0.04 γ uranium/ml, the limit lies at a uranium content of 0.002% in the sample to be analyzed. Specifications are given for carrying out the determination. There are 4 figures, 3 tables, and 8 Soviet references.

SUBMITTED: October 15, 1959

Card 4/4

S/075/60/015/004/015/030/XX
B020/B064

AUTHORS: Chernikhov, Yu. A., Luk'yanov, V. F., and Kozlova, A. B.

TITLE: Analytical Chemistry of Thorium. Information 2. Complexometric Determination of Thorium in Monazite Concentrates After Its Separation on the Cationite КУ-2 (KU-2)

PERIODICAL: Zhurnal analiticheskoy khimii, 1960, Vol. 15, No. 4, pp. 452 - 454

TEXT: The authors aim at simplifying and shortening the determination of thorium in monazite concentrates. The present paper describes the sorption of thorium from hydrochloric solutions on the cationite KU-2 (Ref. 15) with subsequent thorium titration by means of complexon III at pH 2.4 - 2.6 and xylenol orange as an indicator (Ref. 16). Thorium is quantitatively sorbed on the cationite KU-2 from a 35% hydrochloric acid solution (Table 1). High acidity increases the selectivity of the method. The elution curve (Fig. 1) indicates that for a complete desorption of 40 mg of Th, 24 ml of the eluant (20% ammonium carbonate solution) suffice, which is added in quantities of 2 - 3 ml. Together with Th, zirconium and

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