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1. Iz Kubanskogo meditsinskogo instituta i I gorodskoy polikliniki.
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Regularities in the development of sulfate-reducing bacteria in the D_1 oil-bearing beds of the flooded Romashkino field. Mikrobiologiia 33 no.2:314-320 Mr-Ap '64. (MIRA 17:12)

1. Institut mikrobiologii AN SSSR i Tatarskiy neftyanoy nauchno-issledovatel'skiy institut.

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1. Institut mikrobiologii AN SSSR.

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Algebraic meaning of the fundamental axonometric theorems. Dokl. na nauch. konf. 1 no.3:94-98 '62. (MIRA 16:8)
(Axonometric projection)

ACCESSION NR: AP4040526 S/0080/64/037/006/1334/1340

AUTHOR: Kuznetsova, V. A.; Kryazhev, Yu. G.; Rogovin, Z. A.; Toroptseva, T. N.

TITLE: Synthesis of graft copolymers of 2-methyl-5-vinylpyridine, acrylic, or methacrylic acid

SOURCE: Zhurnal prikladnoy khimii, v. 37, no. 6, 1964, 1334-1340

TOPIC TAGS: copolymer, graft copolymer, pyridine. 2-methyl-5-vinyl-, acrylic acid, methacrylic acid, poly(vinyl chloride), ftorlon, polyethylene, polycaprolactam, ion exchange material, current conductive material, chemically stable material, free radical polymerization

ABSTRACT: Graft copolymers of chemically stable water-repellant polymers with electrically dissociating monomers have been synthesized. Free radical graft copolymerization of 2-methyl-5-vinylpyridine, acrylic, or methacrylic acid on swollen films, fibers, and fabrics of poly(vinylchhloride) ftorlon, polyethylene, or polycaprolactam yielded materials with an ion-exchange capacity of

ACCESSION NR: AP4040526

1—3.5 mg-equiv/g, which swell in aqueous media and exhibit high mechanical strength and low electrical resistivity in the swollen state. Films of polyethylene-methacrylic acid copolymers retain their strength and electrical conductivity after immersion for six months at 500C in a 40% KOH solution. Orig. art. has: 3 figures and 5 tables.

ASSOCIATION: none

SUBMITTED: 20Oct62 DATE ACQ: 06Jul64 ENCL: 00

SUB CODE: OC NO REF SOV: 001 OTHER: 000

Card 2/2

KHADZHAY, Ya.I.; KUZNETSOVA, V.F.

Pharmacological study of the photosensitizing preparation beroxan. Farm. i toks. 26 no.2:219-224 Mr-Ap '63. (MIRA 17:8)

1. laboratoriya farmakologii (rukovoditel' - kand. med. nauk Ya.I. Khadzhay) Khar'kovskogo nauchno-issledovatel'skogo khimiko-farmatsevticheskogo instituta.

KHADZHAY, Ya.I.; KUZNETSOVA, V.F.

Some pharmacological data on the action of imperatorin.
Farmatsev. zhur. 17 no.6:57-63 '62. (MIRA 17:6)

1. Laboratoriya farmakologii Khar'kovskogo nauchno-issledovatel'skogo khimiko-farmatsevticheskogo instituta.

KUZNETSOVA, V.F.

USSR/Chemistry - Petroleum, Technology Oct 51

"Synthesis of 3-Methyl -4 -Ethyl Thiophene," I. Ya. Postovskiy, N.P. Bednyagina, V.F. Kuznetsova

"Zhur Prik Khim" Vol XXIV, No 10, pp 1071-1073

Properties of alkylated thiophenes are little known, a fact which makes their identification difficult when they are sepd from petroleum distillates. Synthesized 3-methyl-4-ethyl thiophene by condensing pentanedione-2, 3 with thiodiglycol ether, which yielded a dicarbonylic acid. This was then decarboxylized to he final product. The product it gives indophenine reaction and forms complex compd with mercury acetate.

PA 190T42

KUZNETSOVA, V.G.

ZEYNALLY, M.I.; SHAPIRO, B.A.; BABAYEVA, V.A.; KUZINA, V.V.; KUZNETSOVA, V.G.

Some results of flooding the Kirmaki 11 horizon in the southern depressed section of the Buzovny oil fields. Azerb.neft.khoz. 35 no.10:13-16 O '56. (MLRA 10:1)

(Buzovny--Oil filed flooding)

CHERENKOVA, Yelena Lazarevna; KUZ'MIN, V.A., redaktor; VERKHOVINA, T.M., redaktor; LEDNEVA, N.V., tekhnicheskiy redaktor.

[Distortion of telegraph signals in short wave transmission] Iskazheniia telegrafnykh signalov pri peredache na korotkikh volnakh. Moskva, Gos.izd-vo lit-ry po voprosam sviazi i radio, 1955. 43 p. (MLRA 9:5)

(Telegraph, Wireless)

KUZ'MIN,V.A., redaktor; VERKHOVINA,T.M., redaktor; SOKOLOVA,R.Ya., tekhnicheskiy redaktor

[Communications engineering; controlled quartz-crystal oscillators and exciters for frequency radiotelegraphy; a manual] Tekhnika sviazi; upravliaemye kvartsevye generatory i vozbuditeli dlia chastotnogo radiotelegrafirovaniia, informatsionnyi sbornik. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1955. 230 p. (MIRA 9:2)

1. Russia (1923- U.S.S.R.) Ministerstvo svyazi. Tekhnicheskoye upravleniye.

(Telegraph, Wireless)

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928220016-1"

KUZ'MIN, V. A.

V. A. KUZ'MIN: "On the operation of semiconducting triodes in the saturation region." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep. 58

Physical processes occurring in a typical switching circuit with a common base are analyzed in the saturation region.

An expression has been obtained for the resorption time of the minority carriers at the collector for the case of supplying a rectangular current impulse of arbitrary duration to the input. A method of measuring the lifetime of holes in the base is proposed.

SOV/109-3-10-5/12

AUTHORS: Kuz'min, V.A. and Shveykin, V.I.

TITLE: Operation of a Transistor in the Saturation Region (O rabote poluprovodnikovogo trioda v oblasti nasyshcheniya)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 10, pp 1269 - 1273 (USSR)

ABSTRACT: The saturation region in a junction transistor is defined as the operating condition in which both the emitter and the collector of the transistor have a positive bias with respect to the base. This type of operation can be observed in a simple switching circuit, such as shown in Figure 2. If a current pulse:

$$I_{\ni 1} > \frac{-E_K}{\alpha_o R}$$

is fed into the emitter and then rapidly reduced to a value $I_{\ni 2}$, the collector current will be practically constant for the duration of a time T ; this current

Card1/5

is approximately equal to E_K/R. This phenomenon can be explained as follows: the concentration of the carriers (holes) in the base region near the collector is larger than the equilibrium value, and this results in a positive biasing of the collector junction. The flow of the holes from the base to the collector and their recombination gradually reduces the hole concentration at the collector and, after a time T reaches the equilibrium value p_n (Figure 3). The time interval T can be referred to as the storage time. An attempt is made to evaluate this time under the following assumption: 1) the behaviour of the holes in the base is described by the usual, linear diffusion equation, and it is assumed that the emitter and collector areas are equal to S ; 2) the leakage current is negligible in comparison with the diffusion current; 3) the injection coefficient γ is equal to unity for both the emitter and the collector; 4) the duration of the switching pulse τ is sufficiently large, so that the distribution of the holes in the base at the end of the pulse is independent of τ ; 5) the collector current

I_{K1} is constant during the storage time and the voltage across the collector junction is small in comparison with E_K. The problem is tackled by solving the equation:

$$\frac{\partial p}{\partial t} = D_p \frac{\partial^2 p}{\partial x^2} - \frac{p - p_n}{\tau_p} \qquad (1)$$

with the boundary conditions expressed by Eqs.(2), where q is the charge of a hole, D_p and τ_p are the diffusion coefficient and the lifetime of the holes, W is the base width, $j_{\text{Э}2}$ and j_{K1} are the current densities of the emitter and collector, respectively. At the instant of the termination of the switching pulse, the distribution $p_o(x)$ can be found from the solution of Eq.(3), which should fulfil the boundary conditions given by Eqs.(4). After a time T, the voltage at the collector junction is zero, so that the storage time can be found from the Shockley condition expressed by Eq.(5). The solution of the

Eq.(1) with the boundary conditions expressed by Eqs.(2) and the initial condition $p_o(x)$ can be represented by Eq.(6). The condition expressed by Eq.(5) can be written in the form of Eq.(7). From the above, it is found that T can be expressed by:

$$T = \tau_p \ln \frac{I_{э1} - I_{э2}}{\frac{I_{K1}}{\alpha} - I_{э2}} \qquad (8) .$$

This is valid for $L_p^2/W^2 \geq 10$. From this equation, it is possible to determine the lifetime of the holes, τ_p, from a single pulse measurement. If Eq.(8) is compared with the corresponding formula derived by Moll (Ref 2), it is found that the expressions under the logarithm are identical; the meaning of Moll's coefficient in front of the logarithm is that it represents the lifetime τ_p.

SOV/109-3-10-5/12

Operation of a Transistor in the Saturation Region

Eq.(8) was used to determine τ_p for a number of transistors as a function of emitter current. The results (together with the values of τ_p determined from the transient characteristics) are shown in Figures 4.

The authors express their gratitude to K.S. Rzhevkin and V.V. Migulin for their advice and help.

There are 4 figures and 3 references, 2 of which are Soviet, (1 translated from English) and 1 English.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova (Physics Department of Moscow State University imeni M.V. Lomonosov)

SUBMITTED: October 30, 1957

Card 5/5 1. Transistors--Operation

KUZ'MIN, V. A.

10 июня

(с 16 до 22 часов)

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

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11 июня

(с 10 до 16 часов)

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[illegible]

В. А. Кузьмин

[illegible]

11 июня

(с 16 до 22 часов)

[illegible]

[illegible]

[illegible]

[illegible]

17

report submitted for the Centennial Meeting of the Scientific Technological Society of Radio Engineering and Electrical Communications im. A. S. Popov (VNORIE), Moscow, 8-12 June, 1959

"On the influence of the saturation regime in semiconductor triodes on the work of the impulse system,"

9,4310
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67848
SOV/142-2-5-3/19

AUTHOR: Kuz'min, V.A.

TITLE: Saturation Conditions in Transistors in the Presence of Strong Signals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1959, Vol 2, Nr 5, pp 566 - 574 (USSR)

ABSTRACT: The author examines the limits of applicability of the small-signal theory under saturation conditions, especially for alloy transistors working under saturation conditions in case of arbitrary injection levels. The first attempt to establish a theory of saturation conditions was made by D. Moll [Ref 1]. V.A. Kuz'min, V.I. Shveykin [Ref 2] and K.S. Rzhevkin, V.I. Shveykin [Ref 3], who solved the continuity equation for holes within the transistor base in the saturation region. They investigated the influence of a rectangular pulse of great duration [Ref 2] and the influence of a current pulse of arbitrary duration [Ref 3] on a common-base

Card 1/5

67848
SOV/142-2-5-3/19

Saturation Conditions in Transistors in the Presence of Strong Signals

transistor switching circuit. The Shockley theory was used in both papers without examining the limits of applicability of the small-signal theory for the saturation region. M.A.Abdyukhanov /Ref 4/ stated that the small-signal theory is correct for amplifier operation, if the hole concentration at a base with n-type conductivity is much smaller than the electron concentration. The small-signal criterion for the base current under saturation conditions is a logic result of the Shockley theory applied to a one-dimensional model. Consequently, the quantitative estimations will be correct only to that extent as far as the saturation conditions of an actual transistor agree with those of the one-dimensional model, which is not observed with modern alloy transistors. With high injection levels, the electric field E influences the hole distribution within the base. The calculation of this

Card 2/5

67848
SOV/142-2-5-3/19

Saturation Conditions in Transistors in the Presence of Strong Signals

field is connected with great difficulties, especially, if the transistor model used is not one-dimensional. Further, noticeable electron currents flow thru the junctions. For this reason, the direct solution of the continuity equation is a very complicated task. The author uses B.N. Kononov's method for examining the so-called "protsess rassasyvaniya" (Translation unknown). He discusses briefly the influence of the emitter current on "perekhodnaya kharakteristika" (transient characteristics) of a transistor in a common em'tter circuit and the work of an "obrashchennyy triod"("inversed transistor") . A transistor whose emitter and collector change places in amplifier operation is defined as an "inversed transistor". The "transient characteristics" of an "inversed transistor " in a common emitter circuit is somewhat reduced with a rise of the base input current. Time constants of this "transient characteristics", obtained at high base currents for three PlZh

Card 3/5

67848
SOV/142-2-5-3/19

Saturation Conditions in Transistors in the Presence of Strong Signals

and two P6B transistors, are shown in Table 1. Time constants were measured by an IO-4 oscilloscope with time marks of 1-0.1 microseconds. The table shows that the time constants decrease by not more than 20% compared to the time constants at low currents. The author discusses saturation conditions of transistors in switching circuits and describes briefly an experimental investigation. The latter had the purpose of verifying the assumption that the effective life time of holes remains constant during saturation conditions in the presence of strong signals. The results of measurements of a P1Zh transistor in a common base circuit are shown in Figure 5. The assumption that the lifetime of holes is independent of the injection level was verified experimentally. The author expresses his gratitude to K.S. Rzhevkin and K.Ya. Senatorov

Card 4/5

67848

SOV/142-2-5-3/19

Saturation Conditions in Transistors in the Presence of Strong Signal

for their valuable remarks on this paper. The publication of this paper was recommended by the Kafedra teorii kolebaniy (Department of Oscillation Theory) of the Moskovskiy ordena Lenina gosudarstvennyy universitet imeni M.V. Lomonosova (Moscow - Order of Lenin - State University imeni M.V. Lomonosov)

SUBMITTED: October 27, 1958, and after re-working-March 17, 1959.

Card 5/5

KHMEL'NITSKIY, Yefroim Aronovich; KUZ'MIN, V.A., otv.red.; BASHCHUK, V.I., red.; KARABILOVA, S.P., tekhn.red.

[Diversity reception and its evaluation] Raznesennyi priem i otsenka ego effektivnosti. Moskva, Gos.izd-vo lit-ry po voprosam sviazi i radio, 1960. 49 p. (MIRA 13:4)
(Radio--Receivers and reception)

9.4310

77959
SOV/109-5-3-13/26

AUTHORS: Abdyukhanov, M. A., Berestovskiy, G. N., Kuz'min, V. A.

TITLE: On the Calculation of Processes in Transistor Triodes by the Charge Method

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 3, pp 450-459 (USSR)

ABSTRACT: Introduction. The usual method of calculating the electrical characteristics of semiconductor triodes is the solution of the continuity problem for the minority carriers in the emitter, base, and collector zones at certain boundary conditions, which depend on applied external voltages and currents (see W. Shokley, M. Sparkes, G. Teal, U.S. ref). Although this is the most universal method, it often leads to complicated calculations. A later method (J. Sparkes, R. Beaufoy, U.S. ref) considers the semiconductor triode as a system controlled by the charge of surplus minority carriers of the base zone. The present paper investigates the

Card 1/21

9.2580, 9.4310

77963
SOV/109-5-3-17/26

AUTHORS: Kuz'min, V. A., Vinogradov, B. N.

TITLE: Influence of Saturation in Transistor Triodes on Multivibrator Operation

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 3, pp 490-496 (USSR)

ABSTRACT: A method is proposed of calculating the time for the removal of surplus charge carriers from the base of a transistor triode. It is applicable to pulse circuits. The influence of saturation on the build-up time and width of multivibrator pulses is investigated theoretically and experimentally for two-junction triodes. Introduction. 1. Calculation of carrier removal time by the charge method. The equation of conservation of the total hole charge in the transistor triode base is

Card 1/15

$$\frac{dQ}{dt} = I_{pe} - I_{pk} - I_R. \qquad (1)$$

where $Q = q\int_V (p - p_n)\,dV$ is hole charge in base of arbitrary volume V, exceeding the equilibrium charge; I_{pe} and I_{pk} are hole currents for emitter and collector; I_R is recombination current. In a previous work by V. A. Kuz'min (Izv. MVO (Radiotekhnika) 1959, [illegible], 5) it was shown that in the first approximation of determining the removal time, the electron currents in the junctions can be ignored, and it can be assumed that $I_{pe} = I_e$, $I_{pk} = I_k$. Assuming $IR = Q/\tau_p$, where τ_p is the constant lifetime of holes in the base, Eq. (1) can be transformed to

$$\frac{dQ}{dt} = I_{pe} - I_{pk} - I_R. \qquad (1)$$

where $Q = q\int_V (p - p_n)\,dV$ is hole charge in base of arbitrary volume V, exceeding the equilibrium charge; I_{pe} and I_{pk} are hole currents for emitter and collector; I_R is recombination current. In a previous work by V. A. Kuz'min (Izv. MVO (Radiotekhnika) 1959, 2, 5) it was shown that in the first approximation of determining the removal time, the electron currents in the junctions can be ignored, and it can be assumed that $I_{pe} = I_e$, $I_{pk} = I_k$. Assuming $I_R = Q/\tau_p$, where τ_p is the constant lifetime of holes in the base, Eq. (1) can be transformed to

Influence of Saturation in Transistor Triodes on Multivibrator Operation

77963
SOV/109-5-3-17/26

$$\frac{dQ}{dt} = -\frac{Q}{\tau_p} + I_b. \quad (2)$$

Solution of (2) for any $I_b(t)$ with initial condition $Q(0) = Q_o$ is

$$Q(t) = \left[Q_0 + \int_0^t I_b(t) e^{t/\tau_p} dt \right] e^{-t/\tau_p}. \quad (3)$$

If for $t - T_p$ the triode changes from saturation to the amplification region, the hole charge in the base $Q(T_p)$ can be determined with a good approximation by

$$Q(T_p) = \frac{I_k(T_p)\tau_p}{\beta}, \quad (4)$$

Card 3/15

where $I_k(T_p)$ is collector current for $t = T_p$; β is amplification coefficient for circuit with common emitter. Now, the equation for determining the removal time T_p is

$$\left[Q_0 + \int_0^{T_p} I_{\zeta}(t)\, e^{t/\tau_p}\, dt\right] e^{-T_p/\tau_p} = \frac{I_k(T_p)}{\beta}\tau_p. \quad (5)$$

2. Influence of saturation on processes in the multivibrator.

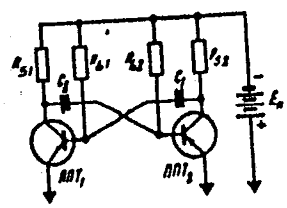


Fig. 1. Multivibrator circuit.

Influence of Saturation in Transistor Triodes on Multivibrator Operation

77963
SOV/109-5-3-17/26

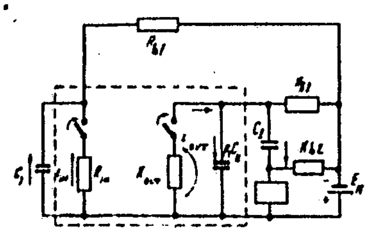
In the illustrated circuit the multivibrator triode ПШТ/1 is assumed conducting but $ПШТ_2$ is non-conducting. The capacitor is being recharged, voltage at $ПШТ_1$ base drops close to zero and the triode conducts. A part of $ПШТ_1$ collector current flows to the base of $ПШТ_2$ and hole removal of this base starts. While the $ПШТ_2$ collector potential remains close to zero, the feedback to $ПШТ_1$ is inactive and $ПШТ_1$ continues to operate as an amplifier. The feedback commences only after the end of the removal of surplus carriers from $ПШТ_2$ base, and a fast regeneration process starts. Thus, saturation causes a considerable increase of the front pulse of collector voltage of the conducting triode. The partial charge loss by C_2 during recombination shortens the flat pulse part of the closed $ПШТ_2$, but at higher

Card 5/15

Influence of Saturation in Transistor Triodes on Multivibrator Operation

77963
SOV/109-5-3-17/26

saturation the multivibrator oscillations may be disrupted. The removal time is calculated under the following simplifying assumptions: (1) The triode characteristics are linearly segmented. Triode begins conducting at $V_b = 0$, and its parameters R_{in}, R_{out}, β_1 and $C_{out} \simeq \beta_1 C_k$ assume their constant magnitudes abruptly. (2) The input resistance of the saturated triode may be ignored since it is considerably lower than the external resistances of the circuit. (3) The collector current during removal is constant and equals $I_{ks} = E_k/R_s$.



Card 6/15

Fig. 2. Equivalent circuit of a multivibrator.

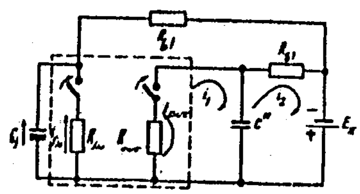


Fig. 3. Simplified equivalent circuit of a multivibrator during the removal period.

The dotted outline on Fig. 2 indicates the triode IIIIT$_1$. The triode layout per above figures has separated input and output circuits, thus, simplifying all calculations. The capacitances C_2 and β_1 C_k can be considered parallel connected and designating $C_2 + \beta_1 C_k = C''$; the equivalent

Influence of Saturation in Transistor Triodes on Multivibrator Operation

77963
SOV/109-5-3-17/26

circuit per Fig. 3 is made, which is described by Eq. A:

$$\frac{dU_{C_1}}{dt} + U_{C_1}\frac{R_{IN} + R_{\ell 1}}{R_{\ell 1} R_{IN} C_1} = \frac{E_K}{R_{\ell 1} C_1};$$

$$U_{C^*} + i_1 R_{out} - i_{out} R_{out} = 0;$$

$$U_{C^*} + E_K - i_2 R_{\delta 1} = 0;$$

$$i_1 - i_2 = i_{C^*};\ i_{C_1} = \frac{C_2}{C_2 + \beta_1 C_K} i_{C^*}.$$

The input and output currents are related per

$$i_{IN} = i_{IN}(0) h(t) + \int_0^t i'_{IN}(t-\tau) h(\tau) d\tau,$$

where $h(t) = \beta_1(1-e^{-t/\tau_{p1}})$. Using these equations and relation

$$I_{02} = \frac{E_K}{R_{k2}} - i_{C_1}$$

Card 8/15

$I_{b2}(t)$ can be determined. The hole charge Q_o in ППT_2 base at moment t = 0 is a solution of (2) for $I_{b2} = E_k/R_{b2}$. If the multivibrator pulse-width, while ППT_2. If the multivibrator pulse-width, while ППT_2 conducts, equals t_1, then

$$Q_0 = \tau_{p2} \frac{E_k}{R_2} (1 - e^{-t_1/\tau_{p2}}).$$

Usually $t_1 \geqslant 2$ and $Q_o \simeq {}_{p2}E_k/R_{b2}$. Substituting now the values of $I_{b2}(t)$ and Q_o into (5), a transcendental equation for calculating T_p is derived, the solution of which is very complicated. A simplification is achieved by substituting into it the mean hole life time τ_p (instead of τ_{p1} and τ_{p2}) of both tirodes, and expanding it under certain assumptions into a series, of which only the quadratic terms need be taken. Thus the following relations are derived

$$T_p = \tau_p \frac{b + c + \sqrt{(b + c)^2 + 2(a - b)(b - d)}}{a - b}. \tag{8}$$

WHERE

$$a = \frac{\beta_1}{R_{in} + R_{b1}} \frac{R''C_2}{R''C'' - R'C_1}; \quad b = \frac{1}{R_{b2}} - \frac{1}{\beta_2 R_{b2}};$$

$$c = a \frac{R'C_1}{\tau_p - R'C_1}; \quad d = c \frac{R'C_1}{\tau_p - R'C_1}.$$

For calculating the time T_p, Eq. (6) may be used, but complications arise because the mean base current $I_{b2}(t)$ for the removal time is not known. As an approximation for engineering calculations

2, 9, 1110 (1957)),

$$T_i = \frac{R_{b2}(r_{k02} + R_{s2})}{R_{b2} + r_{k02} + R_{s2}} C_2 \ln \frac{E_k + V'_{b2}}{E_k}, \qquad (11)$$

where r_{k02} is voltage on the collector junction of and V_{2b} is voltage of capacitance C_2 of the triode $\Pi\Pi T_2$ after end of regeneration process, respectively. The charge lost by the capacitance during regeneration is considerably lower than during recombination, and therefore with good approximation, it may be written

$$V'_{b2} = U_{C_2}(T_p).$$

3. Experiment. The purpose of experiments was determination of T_p and the pulse width with respect to the circuit elements. Experimental and theoretical data were plotted on diagrams. Figure 5 shows an experimental curve (1) and two theoretical curves (2) and (3).

Influence of Saturation in Transistor Triodes of Multivibrator Operation

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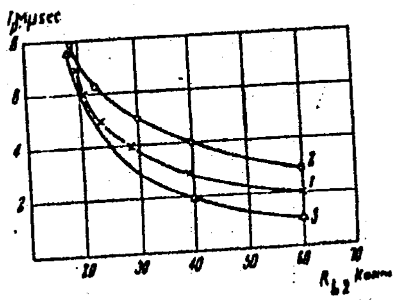


Fig. 5.

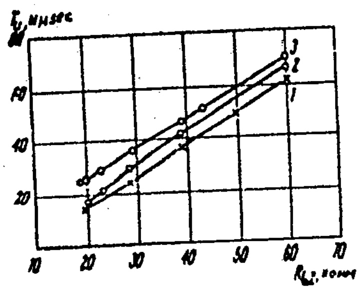


Fig. 6.

Fig. 5. Removal time vs magnitude of R_{b2}.

Fig. 6. Pulse duration vs magnitude of R_{b2}.

Card 13/15

Influence of Saturation in Transistor Triodes of Multivibrator Operation

77963
SOV/109-5-3-17/26

Curve (2) of Fig. 5 was calculated from Eq. (8), but curve (3) from (9) and (6). The multivibrator parameters were $\tau_{p1} = 9\ \mu sec$, $\tau_{pz} = 6\ \mu sec$, $\beta_1 = 34$, $\beta_2 = 30$, $R_{1r} = 500$ ohm; $R_{out} = 50,000$ ohm; $R_{s1} = 5,000$ ohm, $R_{s2} = 5,000$ ohm, $C_1 = 10^3$ pf, $C_2 = 2 \times 10^3$ pf, $E_k = 10$ v, $r_{k02} = 1$ meg. ohm, $C_k = 25$ pf, $R_{b1} = 100,000$ ohm. In Fig. 6 curve (1) is experimental, and curve (2) calculated from (10) and (11). Curve (3) was determined without consideration of charge loss by capacitance C_2. Parameters are the same as before, but $C_2 = 1,800$ pf. Parameters were determined by usual methods at base currents and collector voltages corresponding to the circuits, and then averaged. Comparison of theoretical results with experiments showing approximately 30% difference, proves the correctness of the method of calculations, the difference being caused by simplifying assumptions of the equivalent circuit and the averaging of triode parameters. There

Card 14/15

Influence of Saturation in Transistor Triodes of Multivibrator Operation

77963
SOV/109-5-3-17/26

are 6 figures; 1 table; and 6 Soviet references.

ASSOCIATION: Department of Physics, Moscow Goverhment University imeni M. V. Lomonosov (Fizicheskiy Fakul'tet Moskovskogo Gosudarstvennogo Universiteta imeni M. V. Lomonosova)

SUBMITTED: June 14, 1959

Card 15/15

9.4310

77954
SOV/109-5-3-18/26

AUTHOR: Kuz'min, V. A.

TITLE: On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 3, pp 497-501 (USSR)

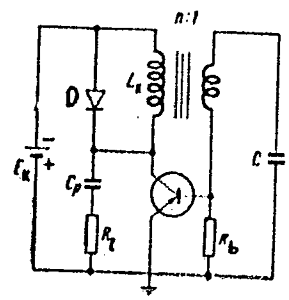
ABSTRACT: The calculations of blocking oscillators are difficult because the pulse formation occurs in the saturation zone and its width is determined by the recombination time of nonbasic carriers. The circuit shown in Fig. 1 gives the maximum pulse with a short leading edge, so that the investigation of it has both practical and theoretical value. In the present paper the calculations of the pulse width are made by a simple and more general method, which can be applied to analysis of different circuits operating in the saturation zone. There are no limitations imposed on the parameters of the blocking oscillator, and the load resistance is considered. (1) Relations between pulse duration and

Card 1/15

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77964
SOV/109-5-3-18/26

Fig. 1. Layout of blocking generator.



parameters of the circuit and triode. While the pulse and the leading edge are forming, the triode is in the saturation stage, and the collector voltage drops to values which are very low as compared with E_k; therefore, the collector L_k winding voltage is close to E_k, but on the base windings it is close to E_k/n. The capacitor is charged by the source

Card 2/15

E_k/n through the input resistance of the triode, and then the base current stops, while the collector current continues to rise linearly. This process continues until, owing to recombination, the concentration of minority carriers drops to equilibrium; the triode thus changes to the active zone. The subsequent regeneration process starts the triode conducting. To minimize the collector voltage oscillation after the end of the pulse, a diode D is included in the circuit. The equation of charge conservation of holes in the base is used for pulse width calculation.

$$\frac{dQ}{dt} = I_{pe} - I_{pk} - I_n. \qquad (1)$$

where

$$Q = q\int (p - p_0)\, dV$$

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928220016-1"

is hole charge in the base of volume V, exceeding the equilibrium charge; I_{pe}, I_{pk}, I_R are hole currents of emitter and collector, and the recombination current. Experiments and theoretical calculations prove that the electron currents in the junctions influence the hole recombination time but very little, even for base currents of 100 to 150 ma, and they may be ignored in the first approximation, taking $I_{pe} = I_e$, $I_{pk} = I_k$. Assuming as usual $I_R = Q/\tau_p$ where τ_p is effective constant hole lifetime at saturation,

$$\frac{dQ}{dt} = -\frac{Q}{\tau_p} + I_b(t). \qquad (2)$$

Solution of (2) for initial $Q(0) = Q_0$ for arbitrary $I_b(t)$ is:

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77904
SOV/109-5-3-18/26

$$Q(t) = \left[Q_0 + \int_0^t i_b(t)\, e^{t/\tau_p}\, dt\right] e^{-t/\tau_p}. \qquad (3)$$

The beginning of the pulse flat section is taken as the instant of zero time, and $t = t_1$ is the end of the pulse corresponding to a transition of the triode from saturation to amplification. The base hole charge with sufficient accuracy is:

$$Q(t_1) = \frac{i_k(t_1)\,\tau_{ap}}{\beta}, \qquad (4)$$

where β is amplification coefficient for circuit with common emitter; τ_{ap} is hole lifetime during

Card 5/15

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77954
SOV/109-5-3-18/26

amplification measured at low injection levels for the usual direct triode connection in a circuit with common emitter. Equation (4) is applicable if the collector current varies slowly as compared with the diffusion time $\tau_D = W^2/2Dp$, which is always the case for circuits with common emitter. After the end of the saturation there remains a hole charge in the periphery of the base, which is higher than the collector current during the removal of carriers. Formula (4) does not consider this charge which shortens the observed removal time as compared with the calculated, especially for triodes П1 and П6 for collector currents above 20 ma. The final equation for the pulse width is:

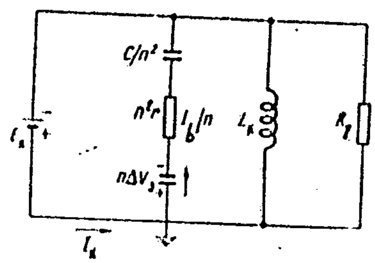
$$\left[Q_0 + \int_0^{t_i} I(t) e^{t/\tau_p} dt\right] e^{-t_i/\tau_p} = \frac{I_k(t_i)\tau_{op}}{3} \qquad (5)$$

Card 6/15

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77954
SOV/109-5-3-18/26

In many circuits currents $I(t)$ and $I_k(t)$ are fully determined by external elements, because the triode resistance is very low. The base current of a blocking oscillator depends on the input resistance during the saturation, which in turn decreases with increase of the base current, so that $I_b(t)$ can be determined only approximately.



Card 7/15

Fig. 2. Basic circuit of blocking oscillator during pulse formation.

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77964
SOV/109-5-3-18/26

The equivalent circuit of Fig. 2 is used for determining currents $I_b(t)$ and $I_k(t)$. The base resistance during saturation r is assumed constant; ΔV_e is voltage on emitter junction, varying during the process of pulse formation, but not exceeding the contact potential difference. Ignoring $n\Delta V_e$ as compared with E_k, and the capacitor charge during the interval of the leading edge, it is found that:

$$I_b(t) = \frac{E_k}{nr} e^{-t/rC}. \quad (6)$$

The collector current of the blocking oscillator is:

$$I_k(t) = j_0 + \frac{E_k}{L_k} t + \frac{I_b(t)}{n} + \frac{E_k}{R_L}.$$

Card 8/15

where J_o is magnetizing current at the end of the leading edge. Since at moment $t = t_1$ the magnetizing current $\frac{E_k}{L_k} t_1$ considerably exceeds J_o, and the base current is zero, we have:

$$I_{\kappa}(t_1) = \frac{E_{\kappa}}{L_{\kappa}} t_1 + \frac{E_{\kappa}}{R_l}. \qquad (7)$$

Considering (6) and (7) and ignoring Q_o, Equation (5) is rewritten as:

$$\frac{L_{\kappa} C \tau_p}{n(\tau_p - rC)} \left[1 - e^{-\frac{t_1(\tau_p - rC)}{rC\tau_p}} \right] e^{-t_1/\tau_p} = \left(t_1 + \frac{L_{\kappa}}{R_l} \right) \frac{\tau_{op}}{\beta} \qquad (8)$$

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77964
SOV/109-5-3-18/26

The above equation is transcendental and very difficult to solve. Therefore, some further formulas are given, which are valid for specific values of rC. 1. $rC < \tau_p$ is a very often encountered case. Solution of (8) is:

$$t_i = \tau_p \ln \frac{L_n C \beta^*}{n(\tau_p - rC)\left(t_i + \frac{L_n}{R_l}\right)}, \qquad (9)$$

where $\beta^* = \beta \dfrac{\tau_p}{\tau_{ap}}$. A similar formula for $rC \ll \tau_p$, $R_l = \infty$, is derived in the paper of V. N. Yakovlev (this Journal, 1958, 3, 9, 1167). 2. rC close to τ_p:

$$t_i = \tau_p \ln \frac{L_n \beta^* t_i}{nr\left(t_i + \frac{L_n}{R_l}\right)\tau_p}. \qquad (10)$$

Card 10/15

3. $rC > \tau_p$ takes place when capacitances C are higher than several microfarads. The pulse width is large, and

$$t_i \approx rC \ln \frac{I_n C \beta^*}{n(rC - \tau_p)\left(t_i + \frac{I_n}{n_1}\right)} \qquad (11)$$

(2) Experimental results. The pulse width was determined for different values of the circuit components, and different triode parameters. The magnitude τ_p was determined from the transient characteristic of the "reversed" triode. Most complicated is the determination of the r-resistance of the base, because the accumulating base charge considerably increases its conductivity. For the determination of r, input characteristics of the triode at saturation and large base

currents (Fig. 3) were measured.

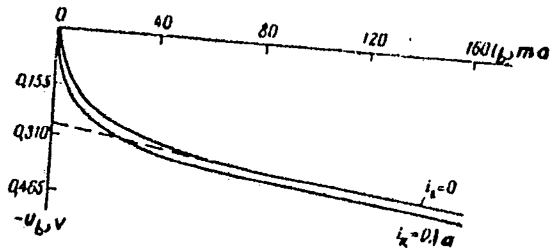


Fig. 3. Static input characteristic of semiconductor triode in the saturation zone.

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode

77904
SOV/109-5-3-18/26

The maximum possible base charge ПП T/Q_{max} = EC/n corresponds to the steady-state base current I_{bo} = = EC/n τ_p. For example, for C = 0.5 μf, E_k = 10 v, n = 5, τ_p = 6 μsec, we get I_{bo} = 165 ma. For capacitances C below 0.1 μf, rC $\ll \tau_p$, and there is no need to determine the base resistance. Therefore, the resistance was considered to follow the straight dotted line, which approximates the true input characteristic for large base currents. Typical r magnitudes for triodes П1, П6 were 1 to 1.5 ohm. Data of experiments conducted for the determination of pulse width with respect to blocking oscillator circuit parameters are shown in Fig. 4. The difference between theory and experiment increases with decrease of L_k. K. Ya. Senatorov and G. N. Berestovskiy helped. There are 4 figures; and 6 references, 5 Soviet, 1 U.S. The U.S. reference is: I. G. Linvill, R. H. Mattson, Proc.

Card 13/15

77964
SOV/109-5-3-18/26

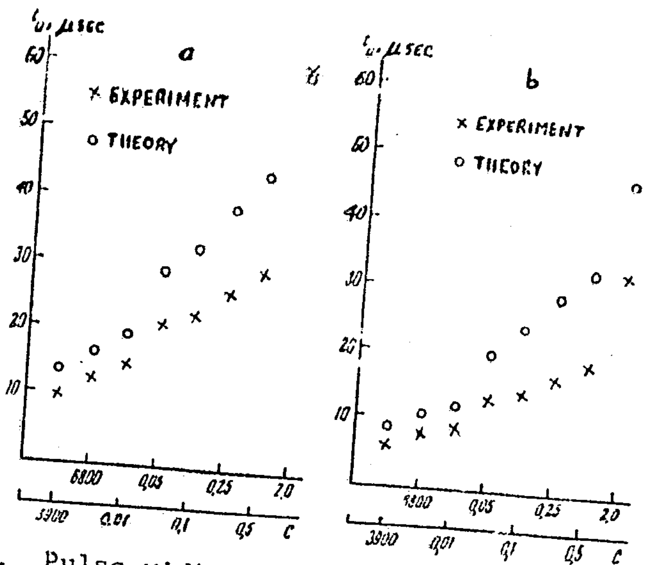


Fig. 4. Pulse width vs capacitance C: (a): (x) experiment; (0) theory; E_k = 20 v; R_l = 2 k; L_k = 32 mhenrys; n = 5; (b): (x) experiment; (0) theory; E_k = 20 v; R_l = ∞; L_k = 4.5 mhenrys; n = 5.

Card 14/15

On the Calculation of the Pulse Duration of a Blocking Oscillator With a Semiconductor Triode.

77964
SOV/109-5-3-18/26

I.R.E., 43, 11, 1632 (1955).

ASSOCIATION: Moscow Government University imeni M. V. Lomonosov, Department of Physics, Chair of Oscillation Theory (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta imeni M. V. Lomonosova, kafedra teoriyi kolebaniy)

SUBMITTED: June 30, 1959

Card 15/15

KUZ'MIN, V. A., CAND PHYS-MATH SCI, "INVESTIGATION OF CONDITIONS OF SATURATION IN SEMICONDUCTOR TRIODS AND ITS ROLE IN PULSE CIRCUITS." MOSCOW, 1961. (MOSCOW ORDER OF LENIN AND ORDER OF LABOR RED BANNER STATE UNIV IM M. V. LOMONOSOV, PHYS FAC). (KL, 3-61, 204).

45038
S/109/63/008/001/023/025
D295/D308

9.4340

AUTHOR: Kuz'min, V. A.

TITLE: The current-voltage characteristic of semiconductor devices with a p-n-p-n structure in the closed state

PERIODICAL: Radiotekhnika i elektronika, v.8, no.1, 1963, 171-177

TEXT: The paper gives a theoretical treatment of 4 layer p-n-p-n-type switching devices for a n-type base region of high-resistance silicon (10Ω cm resistivity) of say 100 - 200 μ width and the remaining regions of lower resistivity (0.01 - 1Ωcm) and much smaller thickness. The object is to obtain the carrier distribution and the electron-field distribution for the closed device, and to evaluate the current-voltage characteristic by relating it to such parameters as the thickness of the crystal, the lifetime of minority carriers, etc. The equations describing the behavior of holes and electrons in each base region are solved on the assumption of: 1) zero volume charge density, 2) current flow in one direction only, 3) constant lifetimes, 4) efficiency of both emitter junctions

Card 1/2

equal to unity. The following four cases are dealt with separately: small and large injection level in the p-type base and small and large injection level in the n-type base. Calculated electron, hole and field distributions are plotted for a total current density of 50 a/cm² and for a hole-current-to-total-current ratio equal to 0.1. The hole distribution has a minimum, the position and depth of which depends on the base width and diffusion length. The potential differences across the junctions are evaluated and prove to be of opposite sign and close in absolute value. The voltage drop across the n-type base region is shown to increase exponentially with the ratio of the base width to the diffusion length of minority carriers; it is independent of current intensity (above 10 a/cm²) and ~0.1 - 0.2 v. There are 3 figures.

SUBMITTED: February 5, 1962

S/109/63/008/002/027/028
D413/D308

AUTHOR: Kuz'min, V.A.

TITLE: Contribution to the theory of the voltage-current characteristic of p-n-p-n semiconductor devices

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 2, 1963, 351-352

TEXT: In analyzing the differential impedance of 4-layer devices in the negative-resistance region, Mackintosh obtained an equation from which it follows that the slope $dU/dI \rightarrow -\infty$ at the turn-off current. The author writes down the current through the central junction j2, differentiates it to obtain the differential impedance, and shows that Mackintosh's formula only follows provided $dI_{co}/dU_{j2} = 0$, where I_{co} is the leakage current across j2. Since in fact this quantity increases when the bias on the junction is small, becoming appreciable in magnitude, the conclusion derived by Mackintosh is erroneous, and methods of determining turn-off current on this principle are inaccurate. The author thanks V.I. Stafeyev

Card 1/2

for discussion of the problem. There are 2 figures. The most important English-language reference reads as follows: I.M. Mackintosh, Proc. I.R.E., 46, 6, 1958, 1229.

SUBMITTED: October 16, 1962

EWT(1)/EWG(k)/BDS--AFFTC ASD

ACCESSION NR: AP3003720 S/0109/63/008/007/1193/1198

AUTHOR: Kuz'min, V. A.

60

TITLE: Dynamic properties of p-n-p-n type devices 21

SOURCE: Radiotekhnika i elektronika, v. 8, no. 7, 1963, 1193-1198

TOPIC TAGS: controlled rectifier dynamic properties, switching voltage, collector-emitter junction, gate signal, shunting resistance, controlled rectifier collector, collector-emitter, emitter

ABSTRACT: Results are given of an experimental study of the dependence of switching voltage of a p-n-p-n controlled rectifier on the speed of the voltage rise across the collector-emitter (up to 10^8 v/sec). A brief theoretical analysis was made of the dependence of a current passing through the device on the shape of the voltage across the collector-emitter junction (i.e., on the parameters of the four-layer structure). Experiments were carried out with a sweep generator which generates a sawtooth voltage with amplitudes of 0 to 500 v and durations of 1 to 100 μsec. A total of 25 D235 controlled rectifiers were investigated, and the dependence of the "dynamic" switching voltage on the build-up rate of the applied voltage was recorded. The results showed that in a

Card 1/2

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ACCESSION NR: AP3003720

considerable portion of the rectifiers switching voltages (a) change but little during an increase in the applied-voltage buildup rate. This is due to the stabilizing action of the leakage of the emitter junction as well as by a slight dependence of the amplification factor on the current. It is suggested that the rectifier switching voltage in various circuits could be stabilized by means of a shunting resistance connected across the emitter junction. In the case of slow variation of a control signal, stabilization can be obtained by connecting a capacitor, or a capacitor and a resistor to the junction in parallel. A small number of rectifiers exhibited an increase in switching voltage with an increase in the buildup rate of the gating signal, owing to shunting action of an emitter junction capacitance and to an increase in the dynamic switching voltage above its static value. Orig. art. has: 2 formulas, 6 figures, and 2 tables.

ASSOCIATION: none

SUBMITTED: 19Jun62 DATE ACQ: 02Aug63 ENCL: 00

SUB CODE: SD NO REF SOV: 000 OTHER: 000

Card 2/2

L 18389-63 EDS

ACCESSION NR: AP3003731 S/0109/63/008/007/1279/1280

47

AUTHOR: Kuz'min, V. A.; Mochalkina, O. R.

TITLE: Method for reducing the cutoff time of p-n-p-n semiconductor devices

SOURCE: Radiotekhnika i elektronika, v. 8, no. 7, 1963, 1279-1280

TOPIC TAGS: p-n-p-n semiconductor device, D235 semiconductor device

ABSTRACT: Practical 4-layer semiconductor structures include one wide (100-200-micron) n-type base. The authors cut the switching time of the D235 device to one-fifth by reducing the lifetime of minority carriers in the wide base. The latter was alloyed with Au atoms. Other characteristics of the device were not impaired. Orig. art. has: 1 figure, 3 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 28Dec62 DATE ACQ: 02Aug63 ENCL: 00

SUB CODE: GE NO REF SOV: 001 OTHER: 001

Card 1/1

ACCESSION NR: AP4043675 S/0109/64/009/008/1410/1415

AUTHOR: Kuz'min, V. A.

TITLE: Turnoff time of p-n-p-n devices

SOURCE: Radiotekhnika i elektronika, v. 9, no. 8, 1964, 1410-1415

TOPIC TAGS: thyristor, thyristor turnoff time, pnpn controlled rectifier, controlled rectifier, semiconductor rectifier/D235 diode, D238 diode

ABSTRACT: The physical processes transpiring in a thyristor during turnoff are considered. This formula is developed for determining the turnoff time: $t_{to} = \tau \ln(I/I_r)$, where τ is the hole lifetime, I is the forward current prior to turnoff, I_r is a residual current. Forty D235 and D238 silicon diodes with rated currents of 2 and 10 amp, respectively, were tested by the negative impulse method. It was found that: (1) The turnoff time is directly proportional to the lifetime of holes in the wider base and to the logarithm of the forward current; it

ACCESSION NR: AP4043675

is possible to determine the lifetime by measuring the turnoff time; (2) The majority-carrier charge does not decrease through the turnoff reverse current; hence, the amplitude of the reverse voltage, not exceeding the static breakdown voltage of the reverse branch of the current-voltage characteristic, does not affect the turnoff current; if the reverse voltage does exceed the above breakdown voltage, the turnoff time rises abruptly; (3) The turnoff time rises somewhat with an increase in the rate-of-rise of the positive voltage dU/dt, which apparently is due to a smaller residual charge remaining in the base at the turnoff moment. "The author wishes to thank Ye. I. Bruk for his help with the measurement work. The impulse generator was developed by V. V. Chilikin." Orig. art. has: 6 figures, 1 formula, and 1 table.

ASSOCIATION: none

SUBMITTED: 21May63 ENCL: 00

SUB CODE: EC NO REF SOV: 002 OTHER: 005

Card 2/2

than W^{-2} when the base narrows, which can be explained by the accompanying rapid increase in gain α_n. Orig. art. has: 2 figures and 7 formulas.

KUZNETSOVA, V.A.; KRYAZHEV, Yu.G.; ROGOVIN, Z.A.; TOROPTSEVA, T.N.

Synthesis of graft copolymers of 2-methyl-5-vinylpyridine, acrylic, and methacrylic acids. Zhur. prikl. khim. 37 no.6:1334-1340 Je '64. (MIRA 18:3)

BOCHVAR, A.A.; KUZNETSOVA, V.B.; SERGEYEV, V.S.; BUTRA, F.P.

Self-diffusion in the alpha and beta phases of uranium. Atom. energ. 18 no.6:601-608 Je '65. (MIRA 18:7)

APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000928220016-1"

SOV/32-24-9-12/53

AUTHORS: Lukashova, Ye. N., Baram, N. M., Kuznetsova, V. G.

TITLE: Method for the Analysis of the Copper-Borofluoro Borate Electrolyte (Metodika analiza borftoroboratno-mednogo elektrolita)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 9, pp 1067-1068 (USSR)

ABSTRACT: At this institute (no name given) the copper separation is carried out from electrolytes containing copper-fluoro borate $Cu(BF_4)_2$, free fluoboric acid HBF_4, and boric acid H_3BO_3. In the laboratories of the institute, a method for the control of these electrolytes was developed. It is based on an electrolytical separation of copper from the solution and a subsequent hydrolytic splitting of the fluoboric acid by means of boiling with magnesium sulfate. In this process, sulfuric acid is formed in a quantity equivalent to the content of fluor-ions. The sulfuric acid can be titrated with a base (indicator methyl red). The initial boric acid, as well as that produced by hydrolysis, can be titrated with mannite or invert sugar (indicator bromothymol blue). The analysis takes 3 - 4 hours, and yields good results. A table of the results obtained and the analytical procedure aregiven.

Card 1/2

GRIGOR'YEV, D.P.; KUZNETSOVA, V.G.

New exhibition of minerals in the Mineralogical Museum. Zap. Vses. min. ob-va 87 no.1:69-75 '58. (MIRA 11:6)

1. Gornyy Muzey i kafedra mineralogii Leningradskogo gornogo instituta.

(Leningrad--Mineralogical museums)

Kuznetsova, V.G.

21(4) PHASE I BOOK EXPLOITATION SOV/2714

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

Doklady sovetskikh uchenykh; yadernoye goryucheye i reaktornyye metally. (Reports of Soviet Scientists; Nuclear Fuel and Reactor Metals) Moscow, Atomizdat, 1959. 670 p. (Series: Its: Trudy, vol. 3. 8,000 copies printed.

Ed. (Title page): A.A. Bochvar, Academician, A.P. Vinogradov, Academician, V.S. Yemel'yanov, Corresponding Member, USSR Academy of Sciences, and A.P. Zefirov, Doctor of Technical Sciences; Ed. (Inside book): V.V. Pereverzev and G.M. Pshelintseva; Tech. Ed.: E.I. Mazel'.

PURPOSE: This volume is intended for scientists, engineers, physicians, and biologists working in the production and peaceful application of atomic energy; for professors and students of schools of higher technical education where the subject is taught; and for people interested in atomic science and technology.

COVERAGE: This is volume 3 of a 6-volume set of reports on atomic energy, presented by Soviet scientists at the Second International Conference on the Peaceful Uses of Atomic Energy, held in Geneva from September 1 to 13, 1958. Volume 3 consists of two parts. The first part, edited by A.I. Zhukov, is devoted to geology, prospecting, concentration and processing of nuclear source material. The second part, edited by G.L. Zverev, includes 27 reports on metallurgy, metallography, processing technology of nuclear fuels and reactor metals, and neutron irradiation effects on metals. The titles of the individual papers in most cases correspond word for word with those in the official English language edition on the Conference proceedings. See SOV/2081 for the titles of the other volumes of the set.

Bochvar, A.A., V.G. Kuznetsova, and V.S. Sergeyev. Self-diffusion of Uranium in the Gamma-phase (Report No. 2306)	370
Bochvar, A.A., S.T. Konobeyevskiy, V.I. Kutaytsev, T.S. Men'shikova, and N.T. Chebotarev. Plutonium Interaction With Other Metals in Connection with Their Arrangement in Mendeleyev's Periodic Table (Report No. 2197)	376
Konobeyevskiy, S.T., A.S. Zaymovskiy, B.M. Levitskiy, Yu.N. Sokurskiy, N.T. Chebotarev, Yu. V. Bobkov, P.P. Yegorov, G.N. Nikolayev, and A.A. Ivanov. Some Physical Properties of Uranium and Plutonium and Their Alloys (Report No. 2230)	396
Ogarev, A.N., V.V. Shestrakov, N.G. Aksenov, S.B. Shtrupenian, and L.A. Stepina. Plastic Zirconium Production by the Electrolysis of Fused Salts (Report No. 2047).	414

Card 7/11

KUZNETSOVA, V.G.; RAZUMOVSKIY, N.K.

Solubility of carbonates in hydrochloric acid as a diagnostic sign in their determination. Zap. Vses. min. ob-va 88 no.1:110-112 '59. (MIRA 12:3)

(Carbonates (Mineralogy)) (Hydrochloric acid)
(Mineralogy, Determinative)

GRIGOR'YEV, D.P.; KOLOMENSKIY, V.D.; KUZNETSOVA, V.G.

Compilation of a mineralogy of meteorites. Meteoritika no.20:172-177 '61. (MIRA 14:5)

(Meteorites)

BOCHVAR, A. A.; KUZNETSOVA, V. G.; et al

"Investigation of Self-Diffusion Processes in Uranium and its Alloys."

report submitted for 2nd Intl Conf, Peaceful Uses of Atomic Energy, Geneva, 31 Aug-9 Sep 64.

ACCESSION NR: AP4027216 S/0286/64/000/006/0068/0068

AUTHOR: Kazantsov, Ye. A.; Vishnitskiy, A. L.; Gusev, N. N.; Kuznetsova, V. G.; Korolev, N. V.

TITLE: Method for the electrochemical grinding and polishing of articles in a drum (Class C 23b; 48a, 1_{05} No. 161197 from 8 February 1963)

SOURCE: Byul. izobret. i tovarn. znakov, no. 6, 1964, 68

TOPIC TAGS: grinding, polishing, electrochemical grinding, electrochemical polishing, abrasive

ABSTRACT: 1. Method for the electrochemical grinding and polishing of articles in a drum has the special feature that, for the purpose of intensifying the process and reducing the work area, the very articles being processed are used as the electrodes, being separated in the drum or vibrating container into two parts by a perforated separation partition, with the electrochemical disolution carried out by means of alternating current realizing a constant circulation of the electrolyte, and with the current source being switched off during finishing treatment.

2. Method for electrochemical grinding and polishing of articles in a drum described

in paragraph 1 has the special feature that the articles to be processed are loaded simultaneously into the drum with an abrasive material. [Abstractor's note: this is a complete translation of the original article.] Orig. art. has: no graphics.

ASSOCIATION: none

SUBMITTED: 06Feb63 DATE ACQ: 22Apr64 ENCL: 00

SUB CODE: SD, IE NO REF SOV: 000 OTHER: 000

L 3466-66 EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c) IJP(c) ES/JD/JG/WW

ACCESSION NR: AP5016929 UR/0089/65/018/006/0601/0608
621.039.542.32

AUTHORS: Bochvar, A. A.; Kuznetsova, V. G.; Sergeyev, V. S.; Butra, F. P.

TITLE: Self diffusion in the alpha and beta phases of uranium

SOURCE: Atomnaya energiya, v. 18, no. 6, 1965, 601-608

TOPIC TAGS: metal diffusion, uranium, metal phase system, activation energy

ABSTRACT: This is paper no. 333 presented by the SSSR at the Third Geneva Conference in 1964. The authors investigated by an autoradiography method the dependence of the rate of self-diffusion on the crystallographic direction in the two low-temperature phases of uranium. Earlier data on the self-diffusion in these phases are contradictory. Apparatus was developed in which the self-diffusion coefficient was calculated from the rate of change of the α activity on the surface of the sample during the course of annealing, as well

Card 1/3

L 3466-66
ACCESSION NR: AP5016929

as by autoradiography of the surface of the sample. The investigations were made on single crystals, polycrystalline samples with large perfect grains, and polycrystalline samples with imperfect grains. The test procedure and the method of calculating the self-diffusion coefficients from the change of α activity and from the autoradiograms are described. The results for α-uranium are listed in Table 1 of the Enclosure. The results for β-uranium are similar to those for α-uranium, but the experimental conditions did not make it possible to establish the directions with the maximum and minimum self diffusion coefficients. The coefficient obtained for the temperature range 700--750C from the variation of the α activity lies in the range (2--6) $\times 10^{-11}$ cm^{2}sec. The results demonstrate convincingly the presence of anisotropy of self-diffusion in the α and β phases of uranium. Orig. art. has: 7 figures, 4 formulas, and 1 table.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 01 SUB CODE: NP, MM

NR REF SOV: 001 OTHER: 010

Card 2/3

L 3466-66

ACCESSION NR: AP5016929 ENCLOSURE: 01

0

Table 1. Values of the self-diffusion coefficients in different crystallgraphic directions in alpha-uranium.

Grain number	Crystallogr. direction	Self diffusion coeff. cm^2/sec
2	[010]	$\leqslant 10^{-14}$
8	[010]	$\leqslant 10^{-14}$
1	[021]	$6,3 \cdot 10^{-14}$
5	[240]	$6,4 \cdot 10^{-14}$
7	[130]	10^{-13}
6	[153]	$1,6 \cdot 10^{-13}$
4	[111]	$1,8 \cdot 10^{-13}$
3	[001]	$2,1 \cdot 10^{-13}$

Card 3/3 DP

KUZNETSOVA, V.I.; NIKOLAYEVA, N.V.

Interdepartmental conference on transcription of geographical names. Vest.LGU 16 no.18:124-127 '61. (MIRA 14:10)
(Names, Geographical)

KUZNETSOVA, V.I.

Using polyvinyl alcohol in making mesh patterns. Obm. tekh. opyt. [MLP] no.9:30-31 '56. (MIRA 11:10)
(Vinyl alcohol) (Textile printing)

KUZNETSOVA, V.I., kand. tekhn. nauk, red.; KUZ'MINA, P.P., kand. geogr. nauk, red.; PUSHKAREVA, V.F., kand. fiz,-mat. nauk, red.

[Materials of the Interdepartmental Conference on the Problem of Studying Evaporation from the Land Surface, August 1-5, 1961] Materialy Mezhduvedomstvennogo soveshchaniia po probleme izucheniia ispareniia s poverkhnosti sushi, 1-5 avgusta 1961 g. Valdai, Gos.gidrologicheskii in-t, 1961. 263 p. (MIRA 17:2)

1. Mezhduvedomstvennoye soveshchaniye po probleme izucheniya ispareniya, 1961. 2. Gosudarstvennyy gidrologicheskiy institut, Leningrad (for Kuz'mina, Pushkareva).

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Search for effective chemical vaccines against some zoonoses. Report No.3: Development of a chemical plague vaccine and its experimental test in animals. Zhur. mikrobiol., epid. i immun. 4 no.4:66-71 Ap '63. (MIRA 17:5)

BENEVOLENSKIY, Aleksandr Mikhaylovich; KUZNETSOVA, V.I., red.

[Sosnovskiy Mineral Springs] Sosnovskii mineral'nyi istochnik. Izd.2., dop. IAroslavl', Verkhne-Volzhskoe izd-vo, 1964. 45 p. (MIRA 17:7)

KUZNETSOVA, V. I.

"Clinical Aspects of Chronic Tularemia," pages 256-259 of the book "Treatment of Infectious Diseases," Moscow, 1953

Presented 6 March 1953 (Moscow at the All-Union Conference on the Control of Dysentery sponsored by the Ministry of Public Health SSSR.

Translation No. 474, 19 Oct 1955.

MOROZOVA, M.G.; TROFIMOV, K.A.; MAKSIMOVA, T.K.; TURONOK, L.F.; ABAKUMOVA, A.I.; GLADKIKH, V.G.; YAKOVENKO, Z.L.; KUZNETSOVA, V.I.; DUSHKINA, M.M.; LEYBIN, L.S.; DEKHTYAR', S.M.

Viacheslav Vasil'evich Aliakritskii. Arkh. pat., Moskva 15 no.2: 95-96 Mar-Apr 1953. (CIML 24:3)

1. Professor Vyacheslav Vasil'yevich Alyakritskiy is a Doctor Medical Sciences and Head of the Department of Pathological Anatomy at Voronesh Medical Institute.

KUZNETSOVA, V.I.

Dynamics of unconditioned vascular reflexes as an index of the effectiveness of bromine and caffeine in early pregnancy toxemias. Akush. i gin. no.3:25-31 My-Je '54. (MLRA 7:8)

1. Iz kafedry akusherstva i ginekologii (zav. prof. I.T.Mil'chenko) Kyubyshevskogo meditsinskogo insituta i Instituta okhrany materinstva i detstva (dir. prof. V.A.Lositskaya)

(BROMIDES, therapeutic use,
*pregn. toxemias, eff. on vasc. unconditioned reflexes)
(CAFFEINE, therapeutic use,
*pregn. toxemias, eff. on vasc. unconditioned reflexes)
(PREGNANCY TOXEMIAS, therapy,
*bromides & caffeine, eff. on vasc. unconditioned reflexes)
(REFLEX,
*unconditioned, vasc. reflex, eff. of bromides & caffeine in ther. of pregn. toxemias)

KUZNETSOVA, V. I., Cand of Med Sci — (diss) "Vascular reflexes and breathing during toxicosis of the first half of pregnancy which is treated by bromine and caffeine." Kuybyshev, 1957, 19 pp (Kuybyshev State Medical Institute, Chair of Obstetrics and Gynecology, Chair of Normal Physiology), 200 copies (KL, 29-57, 93)

CHIBRIKOVA, Ye. V.; KUZNETSOVA, V.I.; RAZUNOVA, L.P.; DUDKOVA, V.K.

Rapid method for the detection of Vibrio comma in water and in washings of objects in external environment by using fluorescence microscopy. Zhur. mikrobiol. epid. i immun. 29 no.12:52-56 D '58. (MIRA 11:12)

1. Iz Gosudarstvennogo nauchno-issledovatel'skogo instituta epidemiologii i mikrobiologii Yugo-Vostoka SSSR. ("Mikrob").
(VIBRIO COMMA,
detection in water, luminescence microscopic method (Rus))
(WATER, microbiology,
Vibrio comma, luminescence microscopic detection (Rus))

KUZNETSOVA, V. I., Candidate of Med Sci (diss) -- "Vascular reflexes and respiration in toxicoses of the first half of pregnancy treated with bromine and caffeine". Ufa, 1959. 17 pp (Bashkir State Med Inst im 15th Anniversary of VLKSM), 200 copies (KL, No 21, 1959, 119)

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(TRICHINA AND TRICHINOSIS)

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[Selected works] Izbrannye trudy. Moskva, Gos. izd-vo med. lit-ry Medgiz, 1961. 462 p. (MIRA 14:7)

1. Chlen-korrespondent AMN SSSR (for Smirnov)
(NEUROLOGY)

BEKKER, M.L.; KUZNETSOVA, V.I.; KUTSEMAKINA, A.Z.

Study of the immunogenicity of nucleoproteid fractions of the plague microbe. Zhur. mikrobiol., epid. i immun. 32 no.9:134 S '61. (MIRA 15:2)

1. Iz Nauchno-issledovatel'skogo i protivochumnogo instituta Kavkaza i Zakavkaz'ya.

(PLAGUE)