the oscillator. For an oscillator having an inductive "soft" feedback, the equation has the form (Ref 5)

$$x = A(\tau)\cos\left[\tau - v(\tau)\right] \qquad (1)$$

where the amplitude of the oscillation $A(\tau)$ and the phase $v(\tau)$ are determined by Eq (2) and (3). Solution of Eq (2) has the form

$$A(\tau) = \frac{A_{cm}}{\sqrt{1 + Ce^{-\frac{1}{4}\mu A_{cm}^2 \tau}}} \qquad (4)$$

where A_{cm} is the steady-state amplitude and C is an integration constant given by

$$C = \frac{A_{cm}^2 - A(0)^2}{A(0)^2} \qquad (6)$$

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where u is a parameter of the oscillator and is much

Amplitude and Frequency Distortions in Oscillators with Frequency-Keying

smaller than 1. Finally C is transformed into

$$C = \frac{1 - \alpha^2}{\alpha^2 + \frac{x(0)^2}{A_{cm}^2 - x(0)^2} - \frac{1}{2}\mu A_{cm}^2 \frac{\alpha}{b} \frac{x(0)}{\sqrt{A_{cm}^2 - x(0)^2}}} \qquad (17)$$

where x is the ratio of the grid-voltage to the cut-off voltage of the oscillator valve and $\alpha = \frac{\omega_{02}}{\omega_{01}}$;

ω_{01} is the natural frequency of the oscillator tuned circuit without the keyed capacitance, ω_{02} the frequency with the capacitance connected. Because C depends on the value of x(0), the oscillation amplitude (after connection of the capacitance)will change from a value A_{cm} to a value A(0) given by

$$A(0) = \frac{A_{cm}}{\sqrt{1 + C}} \qquad (18)$$

Amplitude and Frequency Distortions in Oscillators with Frequency-Keying

As time progresses, the value A given by Eq 18 tends to A_{cm}. Thus, parasitic amplitude modulation will be produced. The maximum depth of modulation is found by considering the two extreme values of C which the author shows to be

$$C_{max} = \frac{1 - \alpha^2}{\alpha^2} = \frac{\omega_{01}^2 - \omega_{02}^2}{\omega_{02}^2} \qquad (21)$$

and

$$C'_{max} = \frac{1 - \frac{1}{\alpha^2}}{\frac{1}{\alpha^2}} = \frac{\omega_{02}^2 - \omega_{01}^2}{\omega_{01}^2} \qquad (22)$$

For C = 0, there is no amplitude modulation. The relative maximum and minimum "throws" in amplitude corresponding to the extreme values of C are

Amplitude and Frequency Distortions in Oscillators with Frequency-Keying

$$\frac{\Delta A(0)_{min}}{A_{cm}} = \frac{A(0)_{min} - A_{cm}}{A_{cm}} \approx -\frac{\omega_{01} - \omega_{02}}{\omega_{01}} \qquad (23)$$

$$\frac{\Delta A(0)_{max}}{A_{cm}} = \frac{A(0)_{max} - A_{cm}}{A_{cm}} \approx \frac{\omega_{01} - \omega_{02}}{\omega_{02}} \qquad (24)$$

Thus, the depth of the amplitude modulation does not depend on the oscillator parameters but only on the ratio of the frequency change to the generated frequency. This conclusion is only valid if: (a) the capacitor is fully discharged when it is connected to the circuit; (b) the duration of the transients is small compared with the duration of the elementary "frequency-pulse". Finally, the author investigates the frequency distortion introduced by the keying. Ideally, the oscillation frequency should switch instantaneously from one steady-state value to the other but, in fact,

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the instantaneous frequency change differs from the difference between the two steady-state frequencies by an amount depending on the value of C. For C = 0, the step change of frequency is

$$\Delta\omega = \omega_1 - \omega_2 \qquad (27)$$

and the difference between the instantaneous step change of frequency and the ideal change is zero. For $C = C_{max}$ the difference between the actual step frequency change and the ideal is shown to be

$$\delta\Delta\omega_{max} = \frac{3}{8} A_{cm}^2 \mu p(\omega_{01} - \omega_{02}) \left(\frac{\omega_{02}}{\omega_{01}} + \frac{\omega_{02}^2}{\omega_{01}^2} \right) \qquad (30)$$

This is illustrated in Fig 4 which shows an oscillogram which would be obtained if the oscillator output were

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Amplitude and Frequency Distortions in Oscillators with Frequency-Keying

passed through an ideal discriminator. There are 4 figures and 5 Soviet references.

SUBMITTED: 25th July 1958

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28794
S/106/61/000/010/006/006
A055/A127

6,7110 (1121,1524)

AUTHOR: Nakhmanovich, V. E.

TITLE: Some possibilities of increasing the frequency stability of radio transmitters operating in frequency telegraphy

PERIODICAL: Elektrosvyaz', no. 10, 1961, 67 - 69

TEXT: One of the methods of increasing the frequency stability of radio transmitters in frequency telegraphy is based on the simultaneous existence of two stable frequencies in the exciter; to effect frequency keying, these two frequencies are applied alternately to the output. Phase jumps (up to 180°) occur however at the moments of switching and cause a widening of the spectrum of the radiated frequencies. The author proves analytically that the width of this spectrum can be reduced considerably by an adequate control of the phase jump. Let us assume that the phase jump at the passage from one of the frequencies to the other is $+\Delta\theta$ and $-\Delta\theta$ respectively. Fig. 1 shows the variation of the frequency and phase of the oscillations in the case of keying by a sequence of dots. Analytically, these variations can be expressed as:

$$a(t) = A_0 \sin[\omega_0 t + \theta(t)] = A_0[\sin\omega_0 t \cos\theta(t) + \cos\omega_0 t \sin\theta(t)], \quad (1)$$

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Some possibilities of increasing the...

$$\left.\begin{aligned}\theta(t) &= m(\Omega t - \tfrac{\pi}{2}) \text{ at } 0 < t < \tfrac{T}{2}\\ \theta(t) &= m(\tfrac{3}{2}\pi - \Omega t) + \Delta\theta \text{ at } \tfrac{T}{2} < t < T,\end{aligned}\right\} \quad (2)$$

where $\Omega = 2\pi/T$ is the keying frequency, and $m = \Delta\omega/\Omega$ is the keying index. To determine the spectral composition of the oscillations, $\sin\theta(t)$ and $\cos\theta(t)$ must be developed into Fourier series, such as:

$$\sin\theta(t) = \frac{1}{m\pi}\sin\frac{m\pi}{2}\sin\Delta\theta + \sum_{k=1}^{\infty} A_k\cos(k\Omega t - \varphi_k)$$

where $\varphi_k = \text{arc tg}(\frac{k}{m}\text{tg}\frac{\Delta\theta}{2})$,

and:

$$\cos\theta(t) = \frac{2}{m\pi}\sin\frac{m\pi}{2}\cos^2\frac{\Delta\theta}{2} + \sum_{k=1}^{\infty} B_k\cos(k\Omega t - \psi_k)$$

where $\psi_k = \varphi_k$. Substituting these series in (1), we obtain:

$$a(t) = A_0\left\{\frac{C_0}{2}\cos(\omega_0 t - \alpha_0) + \sum_{k=1}^{\infty} C_k\cos[(\omega_0 - k\Omega)t + \varphi_k - \alpha_k] + \right.$$

$$\left. + \sum_{k=1}^{\infty} C_k\cos[(\omega_0 + k\Omega)t - \varphi_k - \alpha_k]\right\}, \quad (3)$$

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where

$$C_k = \frac{4m}{\pi(k^2-m^2)} \sin\frac{m\pi}{2} \cdot \sqrt{\cos^2\frac{\Delta\theta}{2} + \left(\frac{k}{m}\right)^2 \sin^2\frac{\Delta\theta}{2}} \qquad (4)$$

for even values of k, and

$$C_k = \frac{4m}{\pi(k^2-m^2)} \cos\frac{m\pi}{2} \cdot \sqrt{\cos^2\frac{\Delta\theta}{2} + \left(\frac{k}{m}\right)^2 \sin^2\frac{\Delta\theta}{2}}, \qquad (4')$$

for odd values of k; $\varkappa_k = \text{arc tg}\frac{B_k}{A_k}$. The relative increase in amplitude of the spectrum components, brought about by the phase jump, is

$$q = \sqrt{\cos^2\frac{\Delta\theta}{2} + \left(\frac{k}{m}\right)^2 \sin^2\frac{\Delta\theta}{2}}. \qquad (5)$$

Formulae (4) and (5) make it possible to determine the dependence of the spectrum components on their number (no.) and on the magnitude of the phase jump. The examination of these formulae and of the corresponding graphs shows that, at small magnitudes of the phase jump and at small numbers (small k), the width of the spectrum of the oscillations with phase jump does not differ much from the width of the spectrum of the oscillations without phase jump. For narrowing the pass-band of the receivers at keying with phase jump, in comparison with the band required at reception of nonstable frequency-keyed signals without phase jump, it is neces-

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sary that the following inequality should be satisfied:

$$\Delta f_1 \leq \Delta f_2 + \Delta f_3 \qquad (6)$$

where Δf_1 is the frequency band required for the transmission of signals with phase jump, Δf_2 is the frequency band required for the transmission of signals without phase jump, and Δf_3 is the instability of the generator of signals. The frequency band required for the transmission of signals without phase jump is determined by formulae:

$$\left.\begin{aligned} \Delta f &= \frac{4}{3}(1+m)B \text{ at } 2.5 < m \leq 8 \\ \Delta f &= (\frac{3}{2} + 1.1m)B \text{ at } 8 \leq m \leq 20 \end{aligned}\right\} \qquad (7)$$

where $B = 2F_M$ is the keying rate in bauds. These formulae show that the smallest components of the frequency spectrum to be taken into consideration when determining the band will have the number N:

$$\left.\begin{aligned} N &= \frac{4}{3}(1+m) \text{ at } 2.5 < m \leq 8 \\ N &= \frac{3}{2} + 1.1m \text{ at } 8 \leq m \leq 20 \end{aligned}\right\} \qquad (8)$$

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The numbers of the smallest components of the spectrum of the oscillations with phase jump (M) are determined by the following condition:

$$\frac{1}{N^2-m^2} \geqslant \frac{q}{M^2-m^2} \qquad (9)$$

Giving (6) the following form:

$$2F_M M \leqslant 2F_M N + \Delta f_3,$$

we obtain:

$$M \leqslant N + \frac{\Delta f_3}{2F_M}. \qquad (10)$$

It follows from (9) and (10) that:

$$\sqrt{1 + \frac{N^2-m^2}{m^2} \sin^2 \frac{\Delta\theta}{2}} \leqslant \frac{\left(N+\frac{\Delta f_3}{2F_M}\right)^2-m^2}{N^2-m^2}. \qquad (11)$$

Formula (11) sets up a relationship between two methods of forming frequency-keyed signals. If this formula is considered with the sign of equality (=), it is possible to determine (for a known instability of the source of signals) the phase jump at which the widening of the frequency band in the case of frequency keying with phase jump will be equal to the instability of the source of signals in the

Card 5/6

Nakhmanson, G. L.

IVANOVA, M.G.;GOL'DENBERG, I.Ya.;LUKASHEV, I.I.;KARUT, T.A.;KANDYBA,S.G.;
MIKHEYLICHENKO, P.M.;NAKHMANSON, G.L.

Studies on biological properties of Mycobacterium tuberculosis muris.
Probl. tuberk., Moskva no. 3:22-28 May-June 1952. (CIML 22:4)

1. Of the Ukrainian Tuberculosis Institute (Director -- Prof. B. M.
Khmel'nitskiy), Khar'kov.

NAKHMANSON, G. L.

USSR/Microbiology - Medical and Veterinary Microbiology F-4

Abs Jour : Referat Zhurn - Biol., No 16, 25 Aug 1957, 68640

Author : Shmaliy, K.V., Nakhmanson, G.L.
Title : A more Rapid Method of Detecting Tuberculosis Mycobacteria in Spinal Cord Fluid.

Orig Pub : Material po obmenu Nauch. inform. Ukr. n.-i in-ta tuberkuleza, 1955, No 2, 128-131

Abstract : The method is based on "violent antagonism" between tuberculosis bacilli and yeast. 1 ml of fresh spinal cord liquid and 2 loops of cultured yeast are sterilely added to a centrifuge tube containing 4 ml of a physiological solution. After incubation for 48 hours at 37° the mixture is centrifuged and smears-- prepared from the sediment-- are dyed by the Ziehl-Neelsen method and examined microscopically. As a result of 200 inoculations of spinal cord fluid from 30 children ill with tuberculous meningitis, TB was found in 100% of patients, and in 90% of

Card 1/2

SHMALIY, K.V.; NAKHMANSON, G.L.; MEL'NIKOV, Ye.L. (Khar'kov); BORINA, M.Ya. (Kiyev); SOTNIKOVA, N.A.; BORSHCHEVSKIY, M.A. (Odessa)

Primary drug resistance in pulmonary tuberculosis. Vrach. delo no.1: 98-100 Ja '62. (MIRA 15:2)
(TUBERCULOSIS) (BACTERIA, EFFECT OF DRUGS ON)

NAKHMANSON, R. S.

95

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inshenerno-fizicheskogo instituta (Scientific Conference of the Moscow Engineering Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 503 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fivovskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Ryazanov, theory of ionisation losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of nuboritical plasma;

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18

Nauchnaya konferentsiya... S/089/62/013/006/019/027
B102/B186

B. V. Pletnev, F. M. Spevakov, A. M. Stolov, supply of synchrotron electromagnets; G. L. Sakaganskiy, V. Ya. Moiseyev, flanged separable heat-resistant junctions of great diameter; B. G. Klimov, A. S. Vayradyan, V. P. Yevseyev, I. B. Mikhaylov, I. N. Afonskiy, B. N. Belov, Ye. I. Mamonov, B. I. Strelkov, Ye. V. Sedykh, B. A. Shchukin, optical principles in computer engineering technique; R. S. Nakhmanson, N. M. Noysin, M. E. Mostovlyanskiy, Yu. A. Volkov, electronics; Ye. L. Sulim, transmitter for electromagnetic flow-meter, V. M. Ovsyankin, V. M. Plushnikov, application of varicondes for transforming d.c. into a.c.

Card 4/4

L 10495-63

ACCESSION NR: AP3000331 S/0142/63/006/002/0156/0165

AUTHOR: Nakhmanson, R. S. 44

TITLE: Design of RC voltage and power amplifier using nonlinear capacitance

SOURCE: Izv. VUZ: Radiotekhnika, v. 6, no. 2, 1963, 156-165

TOPIC TAGS: RC amplifier design, semiconductor varactor, amplification factor, time constant, lf envelope, peak detection

ABSTRACT: An RC amplifier for use in microminiaturized circuits, utilizing varactors, is described. The basic circuit is shown in Fig. 1 of the Enclosure. An hf signal is applied to varactors 1 and 2 through capacitor 3. Resistors 4 and 5 were chosen so that, at hf signal ω_1, their resistances are much greater than, and at signal frequency $\omega_2 \ll \omega_1$ much less than, the resistances of varactors 1 and 2. Point A, in relation to the lower frequency ω_2, is grounded through resistor 6. Resistor 4 prevents shunting of varactor 2 by the internal impedance of a signal source. Amplification of an lf signal to point B leads to the amplitude modulation of the hf carrier at point A. The envelope is separated by means of peak detection. The time constant, $\tau_1 = R_1 C_1$, of the filtering network is within the limits of $1/\omega_1 \ll \tau_1 \ll 1/\omega_2$. The circuit of an amplifier using four

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L 10495-63
ACCESSION NR: AP3000331

varactors is also presented. The voltage gain of such a device was found to be two times greater than that of the amplifier described above, while the input-to-output impedance ratio was four times less. A push-pull version of the amplifier is also analyzed briefly. An approximate calculation of the power gain is given for the case when the amplifier is matched to the signal source. Orig. art. has: 9 figures and 8 formulas.

ASSOCIATION: Kafedra elektroniki Moskovskogo inzhenerno-fizicheskogo instituta (Department of Electronics of the Moscow Engineering Physics Institute)

SUBMITTED: 20Sep62 DATE ACQ: 13Jun63 ENCL: 01

SUB CODE: SD NO REF SOV: 002 OTHER: 003

Card 2/2

ACCESSION NR: AP4028439 S/0181/64/006/004/1115/1124

AUTHOR: Nakhmanson, R. S.

TITLE: Theory of surface capacitance

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1115-1124

TOPIC TAGS: capacitance, semiconductor, dielectric, variable potential, space charge, current leakage, surface property

ABSTRACT: The author considers the metal-dielectric-semiconductor system. The theory of surface capacitance in this system, for a low variable signal and without leakage through the dielectric, was recently examined by F. Berz (J. Phys. Chem. Sol., 23, 1795, 1962), but that author considered only one type of surface state. The formulas are so cumbersome (without physical interpretation) that the results are difficult to use. The present author has therefore developed a low-signal theory of surface capacitance for semiconductors in which mobile carriers are predominantly of a single sign. He first examines the case in which leakage is absent, and then considers the leakage of minor carriers, bringing the concentration of these carriers to zero at the surface. First an n-type semiconductor is considered

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ACCESSION NR: AP4028439

in which the equilibrium concentration of electrons is much greater than the hole concentration. When a variable potential is applied, it falls partly in the dielectric, partly in the field of the space charge, and partly in the body of the semiconductor. The author considers the resistance of the dielectric to be purely capacitative, that of the semiconductor purely active. The more complex problem is discovery of the resistance associated with the region of the space charge and with the surface states. This value is found by setting up equations relating currents flowing through the surface of the semiconductor. It becomes necessary to introduce several values, particularly the electron capacitance, the hole capacitance, the disequilibrium capacitance of the space charge, and the capacitance of the surface states. The desired resistance is then obtained in a linear approximation. The author considers his results valid for strongly doped material within certain frequency limits. Although his scheme applies specifically to surface capacitance, he believes it applicable to other surface phenomena. Orig. art. has: 5 figures and 22 formulas.

ASSOCIATION: none

Card 2/3

ACCESSION NR: AP4028439

SUBMITTED: 28Oct63 DATE ACQ: 27Apr64 ENCL: 00

SUB CODE: SS, EM NO REF.SOV: 002 OTHER: 008

Card 3/3

L 00682-66 EWA(h)/EWT(1)/T IJP(c) AT

ACCESSION NR: AP5012576 UR/0181/65/007/005/1556/1557

AUTHOR: Nakhmanson, R. S.

TITLE: Effect of external electric field on the breakdown of pn, pnp, and pnpn structures

SOURCE: Fizika tverdogo tela, v. 7, no. 5, 1965, 1556-1557

TOPIC TAGS: electric breakdown, volt ampere characteristic, solid state device, ferroelectric material, surface material, pn junction, pnp junction, pnpn junction

ABSTRACT: The author describes the results of a series of experiments, carried out early in 1960, in which it was observed that the external field has a strong influence on the breakdown of a pn junction and on the volt-ampere characteristics of pn, pnp (npn), and pnpn structures. The experiments were carried out on germanium and silicon structures obtained by drawing. Samples measuring ~ 1 x 1 x 10 mm were pressed against a thin (~ 100 μ) plate of ferroelectric ceramic, the other side of which was chemically nickel plated and was soldered to a metal plate serving as the external electrode. The maximum capacitance was of the order of 0.06 $\mu F/cm^2$. Families of volt-ampere characteristics for pn (surface spacistor) and pnpn (surface thyristor) structures at different control-electrode voltage are shown schematically in Fig. 1 of the Enclosure. The real characteristics, observed on the

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oscilloscope screen after application of a control voltage that had led to breakdown, relaxed to the initial state within times of the order of 10 seconds, apparently as a result of screening of the external field by the charge of slow surface states. An analogous phenomenon (breakdown and slow relaxation) were observed after an external voltage of opposite polarity was turned off. Application of a sawtooth voltage at 50 cps frequency resulted in a stationary pattern on the oscilloscope screen, but loops were observed in the characteristics. Stability of the characteristic can be obtained by using dense dielectric films. The limiting operating frequency of the surface spacistor is determined by the time of travel of the carriers through the space-charge region and the time of charging of the capacitance of the control electrode, and can reach tens of Gcs if properly constructed. The pnp structure has larger gain, but poorer frequency characteristic. An advantage of the surface thyristor is the low power consumed in "ignition," thus favorably distinguishing it from the ordinary thyristor or thyratron. All the devices described have high input resistance. "The author thanks L. Lymar', A. V. Shutov, and V. Polekhov for supplying the drawn structures used in the experiments." Orig. art. has: 1 figure.

ASSOCIATION: Institut fiziki poluprovodnikov SO AN SSSR, Novosibirsk (Institute of Physics of Semiconductors, SO AN SSSR)

ACCESSION NR: AP5012576

SUBMITTED: 07Dec64 ENCL: 01 SUB CODE: EM, SS

NR REF SOV: 001 OTHER: 004

Card 3/4

APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R001136020

ACCESSION NR: AP5012576 ENCLOSURE: 01

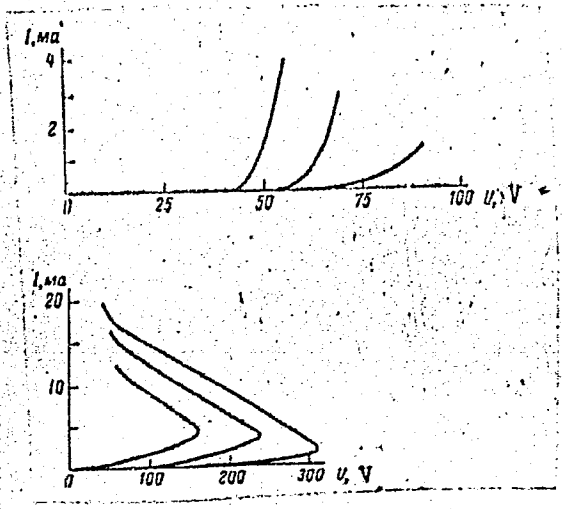

Fig. 1. Families of characteristics of surface spacistor (top) and of surface thyristor (bottom)

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L 9573-66 EWT(1)/ETC/EPF(n)-2/ENG(m) IJP(c) AT
ACC NR: AP5027441 SOURCE CODE: UR/0181/65/007/011/3439/3442

44,55 59

AUTHOR: Nakhmanson, R. S. B

44,55

ORG: Institute of Physics of Semiconductors SO AN SSSR, Novosibirsk (Institut fiziki poluprovodnikov SO AN SSSR)

TITLE: Taking account of recombination in the space charge region close to the surface of a semiconductor

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3439-3442

21,44,55 21,44,55

TOPIC TAGS: carrier lifetime, semiconductor theory, recombination reaction, space charge

ABSTRACT: The contribution made by the space charge region to recombination in a semiconductor is studied on the basis of equivalent circuits. A formula is derived for the recombination conductance in the space charge region, and curves are given for recombination conductance as a function of surface potential. An equation is derived for the maximum contribution due to recombination in the space charge region. The carrier lifetime in this region is evaluated. The author is grateful to N. I. Lukicheva for assistance with the computations. Orig. art. has: 2 figures, 7 formulas. 44,55

SUB CODE: 20/ SUBM DATE: 12Jun65/ ORIG REF: 001/ OTH REF: 002

Card 1/1

2

NAKHMANSON, S. Kh.

"The Experience With Treatment of Patients With TB Empyemas by Active Aspiration Method," Voyenno-Med. Zhur., No. 11, p. 41, 1955.

NAKHMANSON, S. Ye., podpolkovnik meditsinskoy sluzhby (Smolensk)

Combined corticoid and antibacterial treatment of tuberculous pleuritis. Vrach. delo no.7:69-73 Jl '62. (MIRA 15:7)

(PLEURA--TUBERCULOSIS) (CORTICOSTEROIDS)

NAKHMANSON, S. Ye.; ALEKSANDROVA, M. S. (Smolensk)

Case of serum sickness following ACTH administration in toxic nephritis caused by tuberculostatic preparations. Probl. tub. 40 no.5:105-106 '62. (MIRA 15:7)

(TUBERCULOSIS) (ACTH) (SERUM SICKNESS)
(KIDNEYS--DISEASES)

NAKHMANSON, S.Ye.

Evaluation of the effectiveness of steroid hormones in a tuberculosis clinic. Trudy SMI 16:52-61 '63. (MIRA 18:2)

NAKHMANSON T.L.

BELOZOROV, P.T.; FANENSHTIL', M.I.; NAKHMANSON, T.L. (Khar'kov)

Changes in the cerebrospinal fluid in patients with tuberculous meningitis during streptomycin therapy. Vrach.delo no.5:531-533 My '57. (MLRA 10:8)

1. Ukrainskiy nauchno-issledovatel'skiy institut tuberkuleza
(CEREBROSPINAL FLUID) (MENINGES--TUBERCULOSIS)
(STREPTOMYCIN)

NAKHMANSON, V.M.; OSIDZE, D.F.; SEROV, M.F.; ALEKSANDROVA, V.T.; SOLOV'YEV, S.; MALYSHEV, N.; IVANENKO, N.M.; POTATURKIN, V.; CHIZHOV, A.I.; MIKHAYLOV, N.N.

In the Soviet Union. Veterinariia 39 no.1:88-96 Ja '63. (MIRA 16:6)

(Veterinary medicine)

ABRYUTIN, Viktor Nikolayevich; TIMOFEYEV, V.A., doktor tekhn. nauk, prof., retsenzent; GESSEN, V.Yu., dots., retsenzent; IVANOV, Ye.A., dots., retsenzent; NAKHMANSON, Ye.Ye., dots., retsenzent; RUZIN, Ya.L., dots., kand. tekhn. nauk, retsenzent; KLIMOV, V.A., st. prepod., retsenzent; VOL'PE, L., red.

[Electromagnetic transients in electrical networks and systems] Elektromagnitnye perekhodnye protsessy v elektricheskikh setiakh i sistemakh; uchebnoe posobie. Leningrad, Severo-zapadnyi zaochnyi politekhn. in-t, 1962. 278 p. (MIRA 17:5)

DZHEMUKHADZE, K.M.; MILESHKO, L.F.; NAKHMEDOV, F.G.

Catechols in the wild tea plant. Biokhim. chain. proizv., no.9:56-60 '62. (MIRA 16:4)

1. Institut biokhimii A.N.Bakha AN SSSR, Moskva.
(Catechol) (China--Tea)

NAKHMEDOV, F.G.

Catechins in a green leaf of tea in the former Astara District of the Azerbaijan S.S.R. Dokl. AN Azerb. SSR 19 no.6:73-78 '63 (MIRA 17:7)

1. Institut genetiki i selektsii AN AzSSR i Institut biokhimii imeni A.N. Bakha AN SSSR. Predstavleno akademikom AN AzSSR I.D.Mustafayevym.

NAKHMEDOV, F.G.

Catechins in green tea leaves of Zakataly District of the Azerbaijani S.S.R. Dokl. AN Azerb. SSR 19 no.11:65-70 '63. (MIRA 17:3)

1. Institut genetiki i selektsii AN AzSSR. Predstavleno akademikom AN AzerSSR I.D. Mustafayevym.

DZHEMUKHADZE, K.M.; NAKHMEDOV, F.G.

Effect of watering on the catechin synthesis in a tea plant. Dokl. AN SSSR 155 no.6:1447-1448 Ap '64. (MIRA 17:4)

1. Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.I.Oparinym.

NAKHMEDOV, F.G.

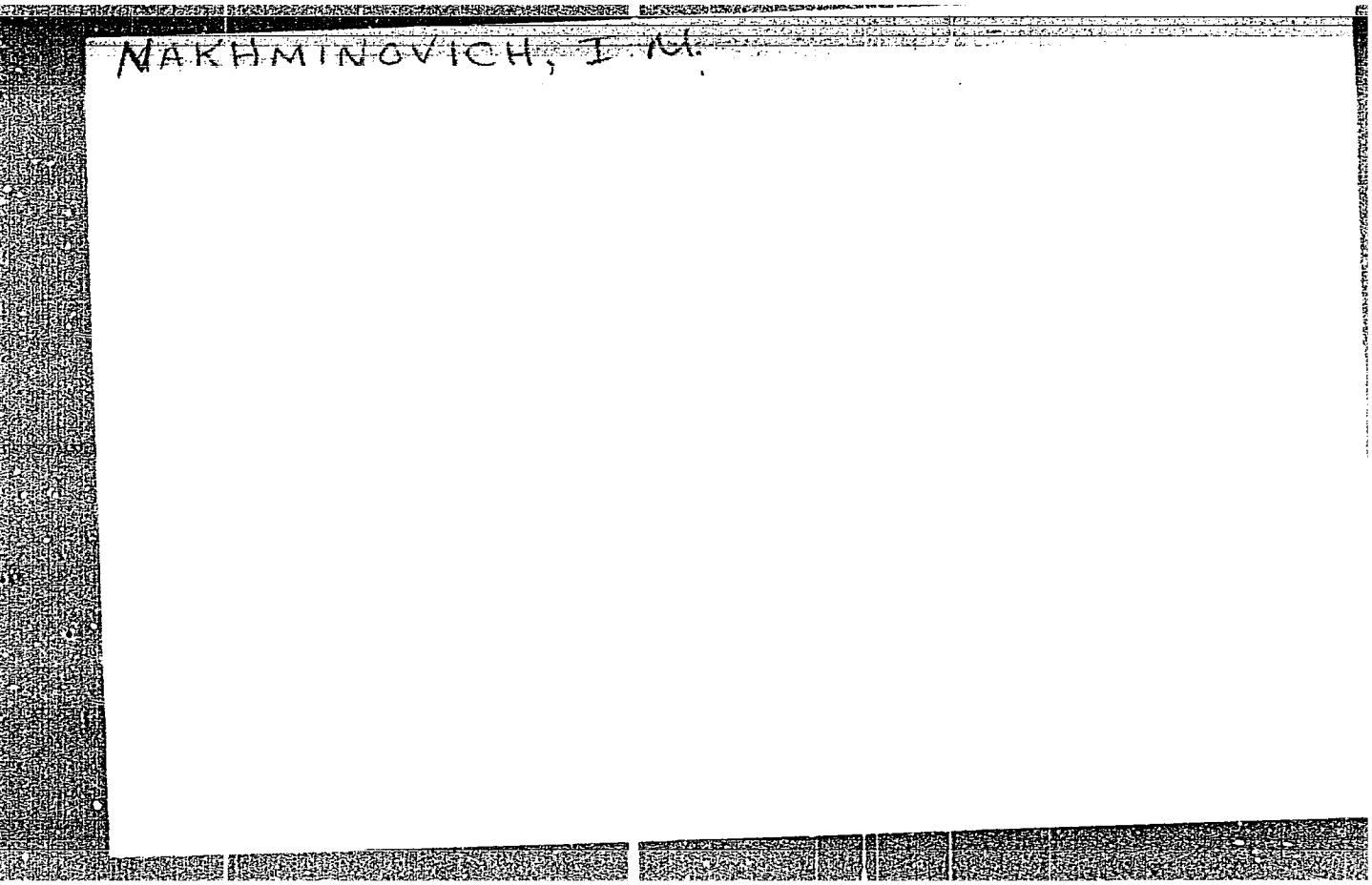
Catechins of a green tea leaf of the Lenkoran' region of the Azerbaijan S.S.R. Dokl. AN Azerb. SSR 19 no.9:63-68 '63. (MIRA 17:8)

1. Institut genetiki i selektsii AN AzSSR i Institut biokhimii imeni Bakha AN SSSR. Predstavleno akademikom AN AzSSR I.D. Mustafayevym.

NAKHMINOVICH, I.M.

Role of dietetic factor in pathogenesis and therapy of scrofulous diseases of the eye; neurogenous interpretation of the etiology of ocular scrofulosis. Vest. oft., Moskva 31 no. 5:35-45 Sept-Oct 1952. (CIML 23:3)

1. Of the Eye Division of Mogilev-Podol'sk Inter-Rayon Hospital (Head Physician -- G. M. Gertskis).



NAKHMINOVICH, I. M.

Modification of the operation of dacryocystorhinostomy proposed by B. S. Brodskii. Oft. zhur. no.2:116-117 '62. (MIRA 15:4)

1. Iz glaznogo otdeleniya Mogilev-Podol'skoy mezhrayonnoy bol'nitsy.

(DACRYOCYSTORHINOSTOMY)

NAKHODKIN, B. I., Engineer

"Investigation of the Operation of Whirling Pumps on Water." Sub 21 Dec 51, Moscow Order of Lenin Power Engineering Inst imeni V. M. Molotov

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

SO: Sum. No. 480, 9 May 55

NAKHODKIN, B. I., kandidat tekhnicheskikh nauk.

Characteristic curve of a pump. Gidr. i mel. 8 no.6:42-47 Je '56. (MLRA 9:9)

(Pumping machinery)

NAKHODKIN, B.I., kand.tekhn.nauk

Finishing mass-produced cantilevered pumps. Trudy VIGM no.22:81-90 '58. (MIRA 11:11)

(Centrifugal pumps)

NAKHODKIN, G.A.; TREFILOVA, G.V.; IVANOV, B.Ye.

Preparation of adhesives from settled gas producer tar. Gidroliz. i lesokhim.prom. 14 no.3:16-18 '61. (MIRA 14:4)

1. Izhevskiy metallurgicheskiy zavod (for Nakhodkin and Trefilova).
2. Izhevskiy mekhanicheskiy institut (for Ivanov).
(Adhesives) (Wood tar)

29506

18.7530 1521 1043 1145 1160

S/120/61/000/004/016/034
E032/E514

AUTHORS: Nakhodkin, I. G. and Nemtsev, V. P.

TITLE: A device for the investigation of the electrical properties of thin films as a function of their thickness

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No. 4, pp. 113-116

TEXT: The device described in the present paper may be used to obtain thin films of metals and semiconductors at a pressure of $\sim 10^{-9}$ mm Hg, and to measure their electrical conductivity and other parameters. The electrical conductivity may be measured at twelve points corresponding to different thicknesses of the wedge-shaped film. The temperature of the target, upon which the variable-thickness film is deposited, may be maintained at a constant temperature in the range between the liquid hydrogen temperature and $\sim 300°C$. The experimental tube was based on the principle put forward by N. D. Morgulis and S. A. Vekshinskiy (Ref. 2: N. D. Morgulis, Dopovidi sichnevoi sesii AN UkrSSR, 1942, 2, 215. C. A. Vekshinskiy, Novyy metod metallograficheskogo issledovaniya splavov (New Method of Metallographic Investigation

Card 1/4

A device for the investigation of ... S/120/61/000/004/016/034
E032/E514

of Alloys), 1944). The substance under investigation is evaporated onto a sectionalized dielectric target with metal contacts. The method has the advantage that the vacuum remains the same throughout, the thickness of the deposit can be determined quite easily, and the entire experiment is carried out in a sealed-off tube within which a low residual pressure can be maintained. Fig.1 shows a schematic drawing of the device. The target is made of glass and consists of separate 10 x 4 x 1 mm^3 plates sealed to a glass support so that the "wedge" of the evaporated material is divided into separate parts. Each of the plates carries silver contact wires. The tube is carefully outgassed and evacuated (Alpert gauge, titanium pump, special cooled getter). Provision is made for measuring the contact potential difference relative to a tungsten wire, the thermal e.m.f. (in the case of semiconductors), the sign of the current carriers, etc. The thickness of the film can be calculated as described in Ref.2 and also determined directly after releasing the vacuum by means of the Linnik interferometer as described in Ref.4 (M. P. Lisitsa, G. N. Tsvelykh, Zavodsk. laboratoriya, 1959, 31, 1072). Fig.3 shows the logarithm of the

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A device for the investigation of ... S/120/61/000/004/016/034
E032/E514

resistivity of beryllium as a function of thickness (mμ). Curve 1 refers to a freshly deposited layer at 90°K, curve 2 refers to a fresh layer heated to room temperature and curves 3 and 4 refer to the "equilibrium film" (470°K and 90°K, respectively). There are 4 figures and 7 references: 6 Soviet and 1 non-Soviet. The English-language reference reads as follows: (Ref.6: J. Thomson, Proc. Camb. Phil. Soc. 1901, 11, 120; K. Fuchs, Ibid, 1938, 34, 100; E. Sondheimer, Adv. Phys., 1952, 1,1).

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet
(Kiyev State University)

SUBMITTED: September 13, 1961

Legend to Fig.1

A - source of oxygen, B - cooled tube (getter), b - connection to titanium pump and Alpert gauge, C - cooled cylinder with the deposited material, D - evaporator with movable shutter,, E - electron gun for measuring the potential difference.

Card 3/4 3

NAKHODKIN,M.D., kandidat tekhnicheskikh nauk; PETROV,G.A., inzhener

Selecting parameters for new railroad motorcars. Tekh.zhel.dor 6 no.7:1-5 Jl'47. (MLRA 8:11)
(Railroads--Rolling stock)

NAKHODKIN, M. D.

USSR (600)

Electric Railway motors

Precise heat characteristics of the traction motor model DPE-340A.
Trudy TSNII MPS, No. 7, 1947.

9. Monthly List of Russian Accessions, Library of Congress, October 1953, Uncl.
2

NAKHODKIN, M.D., kandidat tekhnicheskikh nauk; KHVOSTOV, V.S., inzhener.

Classification of the characteristics of direct current electric train motors. Trudy TSNII MPS no. 88:5-35 '53. (MLRA 7:7)
(Electric railroads--Equipment and supplies)

NAKHODKIN, M.D., kandidat tekhnicheskikh nauk; KHVOSTOV, V.S., kandidat tekhnicheskikh nauk; KURBASOV, A.S., inzhener; KLIMOV, V.F., kandidat tekhnicheskikh nauk, redaktor; KHITROV, P.A., tekhnicheskiy redaktor.

[Investigation of direct-current electric traction engine units] Issledovanie raboty uzlov tiagovykh elektrodvigatelei postoiannogo toka. Moskva, Gos.transp. zhel-dor. izd-vo, 1956. 93 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut zheleznodorozhnogo transporta. Trudy, no. 122). (MLRA 9:10)
(Electric locomotives)

NAKHODKIN, M.D., kandidat tekhnicheskikh nauk, dotsent.;KHVOSTOV, V.S., kandidat tekhnicheskikh nauk.

Nature of ring fire on the collector of high-voltage d.c. machines. Vest. elektroprom. 27 no.4:34-41 Ap '56. (MLRA 9:11)

1. TSentral'nyy nauchno-issledovatel'skiy institut Ministerstva putey soobshcheniya.
(Electric machinery)

SOV/112-57-9-18870

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 9, p 122 (USSR)

AUTHOR: Nakhodkin, M. D., Khvostov, V. S.

TITLE: On the Nature of Flashover on the Commutator of High-Voltage DC Traction Electric Motors (K voprosu o prirode krugovogo ognya na kollektore vysokovol'tnykh tyagovykh elektrodvigateley postoyannogo toka)

PERIODICAL: Tr. Vses. n.-i. in-ta zh.-d. transp., 1956, Nr 122, pp 67-81

ABSTRACT: The viewpoint is expressed that flashover may be caused by a single flash between two adjacent commutator bars, the flash being provoked by contamination of the gap between the bars with brush dust or lubricant, by burrs or other chance causes. The conditions that cause development of a single flash into flashover are: the voltage between two adjacent bars is sufficient to sustain the arc, while the duration of the voltage and the arc power are sufficient to ionize the contiguous air layer. In such a case, an individual arc leaves behind it ionized gases and, propagating against the commutator rotation into the ionized region, it develops the flashover. According to the aforesaid,

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SOV/112-57-9-18870

On the Nature of Flashover on the Commutator of High-Voltage DC Traction . . . .

there is a "danger zone" on a commutator within which a single flash may develop into flashover. To the right of this zone (see figure), the voltage is insufficient for sustaining the arc; to the left, the duration of the arc-sustaining voltage is insufficient for dangerous ionization of gas. Experiments that led to the above conclusions are described. Experiments were conducted with a DK-103G motor, which was operated as an externally-excited generator under no-load conditions. Special commutator maintenance is recommended.

M.I.Ch.

Card 2/2

NAKHODKIN, M.D., kand. tekhn. nauk, dots.; KHVOSTOV, V.S., kand. tekhn. nauk.

What is flashing over? Elek. i tepl. tiaga no.1:42-43 '57. (MIRA 12:3)

(Armatures) (Electric railway motors)

NAKHODKIN, M.D., kandidat tekhnicheskikh nauk, dotsent.

Heating d.c. electric traction engines and a method of determining their heat characteristics. Vest. TSNII MPS 16 no.4:23-29 Je '57. (Electric locomotives) (MLRA 10:8)

NAKHODKIN, M.D., kandidat tekhnicheskikh nauk, dotsent.;KHVOSTOV, V.S., kandidat tekhnicheskikh nauk.

Calculating magnetic tension of the toothed layer of d.c. electric machines. Vest. elektroprom. 28 no.1:42-45 Ja '57. (MIRA 10:4)

1. Tsentral'nyy nauchno-issledovatel'skiy institut Ministerstva putey soobshcheniya.
(Electric machinery)

MAKHODKIN M D

110-1-10/19

AUTHORS: Makhodkin, M.D. and Khvostov, V.S., Candidates of Technical Sciences

TITLE: A Universal Magnetic Characteristic for Direct-current Traction Motors (Universal'naya magnitnaya kharakteristika tyagovykh elektrodvigateley postoyannogo toka)

PERIODICAL: Vestnik Elektropromyshlennosti, 1958, Vol.29, No.1, pp. 44 - 48 (USSR).

ABSTRACT: Many authors have tried to characterise the behaviour of traction motors over the whole range of working current. However, none of the proposed methods has become widely used. The working characteristics of machines and their transient behaviour are mainly governed by their magnetic characteristics. Attempts should therefore be made to evaluate and describe these characteristics. In so doing, it is natural to make use of the magnetic saturation factor and the present article shows that by means of the characteristics and the saturation factor, the behaviour of the machines can be simply and accurately described for all possible load conditions. It is claimed that the magnetic characteristics of traction motors expressed in relative units practically coincide if the magnetic saturation factors relative to rated conditions are equal. This thought leads to the conclusion that for d.c. traction motors, there is

A Universal Magnetic Characteristic for Direct-current Traction Motors

a single universal magnetic characteristic expressed in relative units. Differences between the magnetic characteristics of individual machines depend on which point on the universal magnetic characteristic is taken as the rated value.
To simplify the study, the complicated magnetic system of a machine is considered to be replaced by an iron circuit of constant section and an air gap of the same magnetic characteristics as the machine. Such a substitution is justified mathematically and an expression derived for the magnetic characteristic of the equivalent magnetic system.
It is then shown that if, in any two machines, the saturation factors at rated conditions are the same, then the magnetic characteristics expressed in relative units coincide. This universal magnetic characteristic can be derived from an experimental relationship between flux and magnetising force for any type of traction motor. By suitable adjustment of scale, the magnetic characteristic of the motor can be derived. This is demonstrated by examples. The magnetic characteristic of traction motor type ДК-103 is given in Fig.3; it is then used to construct the universal magnetic characteristic in relative units given in Fig.4, taking as unity the co-ordinates of point A

A Universal Magnetic Characteristic for Direct-current Traction Motors

on Fig. 3. The corresponding saturation factor is 2. The method of construction is described with reference to Fig.4; the constructed and experimental curves are given in Fig.5 and show good agreement.
It is concluded that the saturation factor of a machine determines its entire magnetic characteristic. The saturation factor therefore serves as a criterion in evaluating the speed characteristics of a series traction motor because they are mainly determined by the magnetic characteristic. Applications of this criterion in conditions of full and reduced field are illustrated in Fig.6, which gives test results on a traction motor and the theoretical curve. The fallacy that the saturation factor is a functional criterion of the degree of saturation of iron parts in the machine is exposed by reference to Fig.7. The universal magnetic characteristic is recommended for solving many theoretical problems associated with the non-linear relationship between the magnetising force and the magnetic flux in traction motors and other electrical machines.
There are 7 figures and 7 references, 5 of which are Russian, 1 German and 1 Swedish.

110-1-10/19

A Universal Magnetic Characteristic for Direct-current Traction Motors

ASSOCIATION: All-Union Scientific Research Institute of Railway Transport (VNII zheleznodorozhnogo transporta)

SUBMITTED: December 19, 1956

AVAILABLE: Library of Congress

Card 4/4

IOFFE, Aleksandr Borisovich; MAKHOLKIN, M.D., doktor tekhn. nauk, retsenzent; IVANOV, V.M., inzh., red.

[Electric traction machines; theory, construction and design] Tiagovye elektricheskie mashiny; teoriia, konstruktsiia, proektirovanie. Izd.2., perer. i dop. Moskva, Energiia, 1965. 231 p. (MIRA 18:3)

NAKHODKIN, M.D., dots., kand.tekhn.nauk

Regulating the rotating velocity of d.c. motors with parallel excitation by changing the magnetic flux. Trudy MIIT 114 4-9 '59. (MIRA 13:4)
(Electric motors, Direct current)

NAKHODKIN, Mikhail Dmitriyevich; YAKOVLEV, D.V., inzh., red.; BOBROVA, Ye.N., tekhn.red.

[DPE-400 and NB-406A traction motors] Tiagovye dvigateli tipov DPE-400 i NB-406A. Moskva, Vses.izdatel'sko-poligr.ob"edinenie M-va putei soobshcheniia, 1960. 145 p. 145 p.

(Electric railway motors) (MIRA 14:1)

NAKHODKIN, M.D., kand.tekhn.nauk; KURBASOV, A.S., kand.tekhn.nauk

Creation of a single-phase traction commutator motor for industrial frequency. Vest.elektroprom. 31 no.1:61-65 Ja '60. (MIRA 13:5)

(Electric railway motors)

RAKOV, Vitaliy Aleksandrovich; GOKHSHTEYN, B.Ya., kand. tekhn. nauk, retsenzent; KRYLOV, V.I., inzh., retsenzent; LOZANOVSKIY, A.L., inzh., retsenzent; NAKHODKIN, M.D., kand. tekhn. nauk, retsenzent; NEVEZHIN, P.P., inzh., retsenzent; TARASOV, G.F., inzh., retsenzent; TIKHMENEV, B.N., doktor tekhn. nauk, retsenzent; SAZONOV, I.A., inzh., retsenzent; SUKHODOL'SKIY, P.I., inzh., retsenzent; KRYLOV, S.K., inzh. red.; DANILOV, L.N., red. izd-va; SOKOLOVA, T.F., tekhn. red.

[A.C. electric locomotives] Elektrovozy peremennogo toka. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 531 p. (MIRA 14:10)

(Electric locomotives)

RAKOV, Vitaliy Aleksandrovich; KALININ, S.S., inzh., retsenzent; SUSLOV, B.V., inzh., retsenzent; NAKHODKIN, M.D., kand. tekhn. nauk, retsenzent; FAMINSKIY, G.V., kand.tekhn. nauk, retsenzent; ROGOVA, Ye.N., inzh., retsenzent; KRYLOV, V.I., inzh., retsenzent; NOVIKOV, V.N., inzh., retsenzent; GORELIK, I.A., inzh., red.; BOBROVA, Ye.N., tekhn. red.

[Series ChS2 electric locomotive for passenger trains] Passazhirskii elektrovoz serii ChS2. Moskva, Transzheldorizdat, 1963. 359 p. (MIRA 17:1)

NAKHODKIN, M.D., dotsent

Role of first-order equalizing connections. Trudy MIIT no.205: 101-103 '65. (MIRA 18:9)

KARAL'NIK,S.M.; NAKHODKIN,M.G.; MELESHKO,L.I.

Microradiography of various simple substances by means of secondary electrons depending on their atomic number. Dop. AN URSR no.3:255-257 '55. (MLRA 8:11)

1. Kiivs'kiy derzhavniy universitet. Predstaviv diysniy chlen Akademii nauk URSR V.E.Lashkar'yov
(Atomic mass)

NAKHODKIN, M.G.

Atomic number dependence of the maximum coefficient of secondary emission. Nauk.zap.Kiev.un. 15 no.5:103-106 '56. (MLRA 10:7)
(Electron emission) (Periodic law)

86131

26.2531
9.4110 (1003, 1105, 1140)

S/112/59/000/012/072/097
A052/A001

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1959, No. 12, p. 208, # 25347

AUTHORS: Kulik, O.G., Nakhodkin, M.G.

TITLE: An Investigation of the Effect of Oxygen, Carbon Monoxide and Hydrogen at Low Pressures on the Oxide-Coated Cathode Emission

PERIODICAL: Nauk. shchorichnyk Radiofiz. Kyivs'k. un-tu, 1956, Kyiv, 1957, pp. 461-462 (Ukrainian)

TEXT: The cathode of the 6Ж2П (6Zh2P) tube manufactured and activated under industrial conditions was investigated. Methods of cutting finished tubes in a special vacuum installation were developed; the desired gas pressure (10^{-7}-10^{-6} mm Hg) was maintained in the installation by a continuous flowing through a capillary. Emission was measured under conditions of single exponential pulses of 100-150 microsec. duration. The anode and grid potential was $\leq$ 5-6 volts that is lower than ionization potential of residual gases. In different gases cathode behaves differently, however after being poisoned during several minutes in a

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S/112/59/000/012/072/097
A052/A001

An Investigation of the Effect of Oxygen, Carbon Monoxide and Hydrogen at Low Pressures on the Oxide-Coated Cathode Emission

selected range of temperatures (filament voltage 6.4.5 volts) and pressures it reduces without an additional increase of temperature. The investigations have shown that 1) in the process of poisoning the cathode with O_2 not only its surface takes part but the whole oxide layer; 2) in the process of poisoning, besides the processes of diffusion and poisoning, the process of cathode reactivation takes place; 3) the process of cathode reactivation is the more intensive the greater the steady component of cathode current. A theory is cited which assumes that O_2 forms unstable compounds with the active centers of emission. H_2 acting on cathode during 10 minutes within a selected range of temperature and pressures up to 10 mm Hg does not affect emission. CO, like O_2 poisons cathode, however at equal pressures the emission in the case of CO decreases at a rate several times lower than in the case of O_2. In the case of CO the nature of poisoning is quite different. So in presence of CO the depth of poisoning increases with the temperature whereas in presence of O_2 it decreases. This can be ascribed to two reasons: 1) with an

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86131

S/112/59/000/012/072/097
A052/A001

An Investigation of the Effect of Oxygen, Carbon Monoxide and Hydrogen at Low Pressures on the Oxide-Coated Cathode Emission

increase of temperature the dissociation of CO becomes stronger with the result that the admixture of O_2 present in CO increases; 2) with an increase of temperature the rate of reaction of CO with the oxide-coated cathode increases. There are 2 references.

I.V.Yu.

Translator's note: This is the full translation of the original Russian abstract.

Card 3/3

S/058/61/000/012/077/083
A058/A101

AUTHOR: Nakhodkin, M. G.

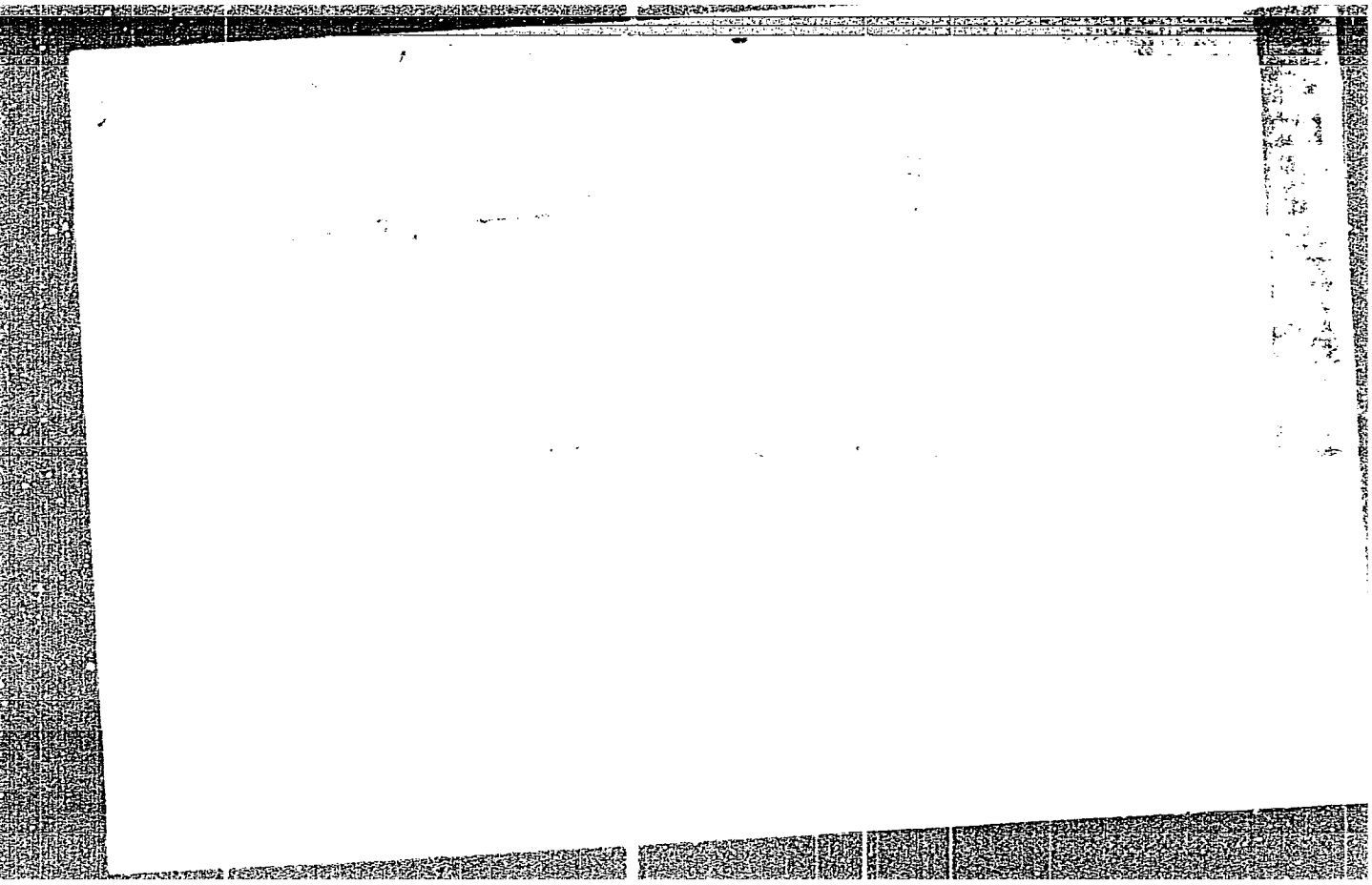
TITLE: Interpreting the periodic atomic-number dependence of the maximum value of coefficient of secondary emission

PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1961, 407, abstract 12Zh26 (Visnyk Kyyivs'k. un-tu, 1960, no. 3, ser. fiz. ta khimiyi, no. 1, 104 - 105, Ukr., Russ, summary)

TEXT: On the basis of the secondary-emission theory advanced by Vol'f, the periodic variation of σ_{max} values with atomic number of the elements is elucidated.

[Abstracter's note: Complete translation]

Card 1/1

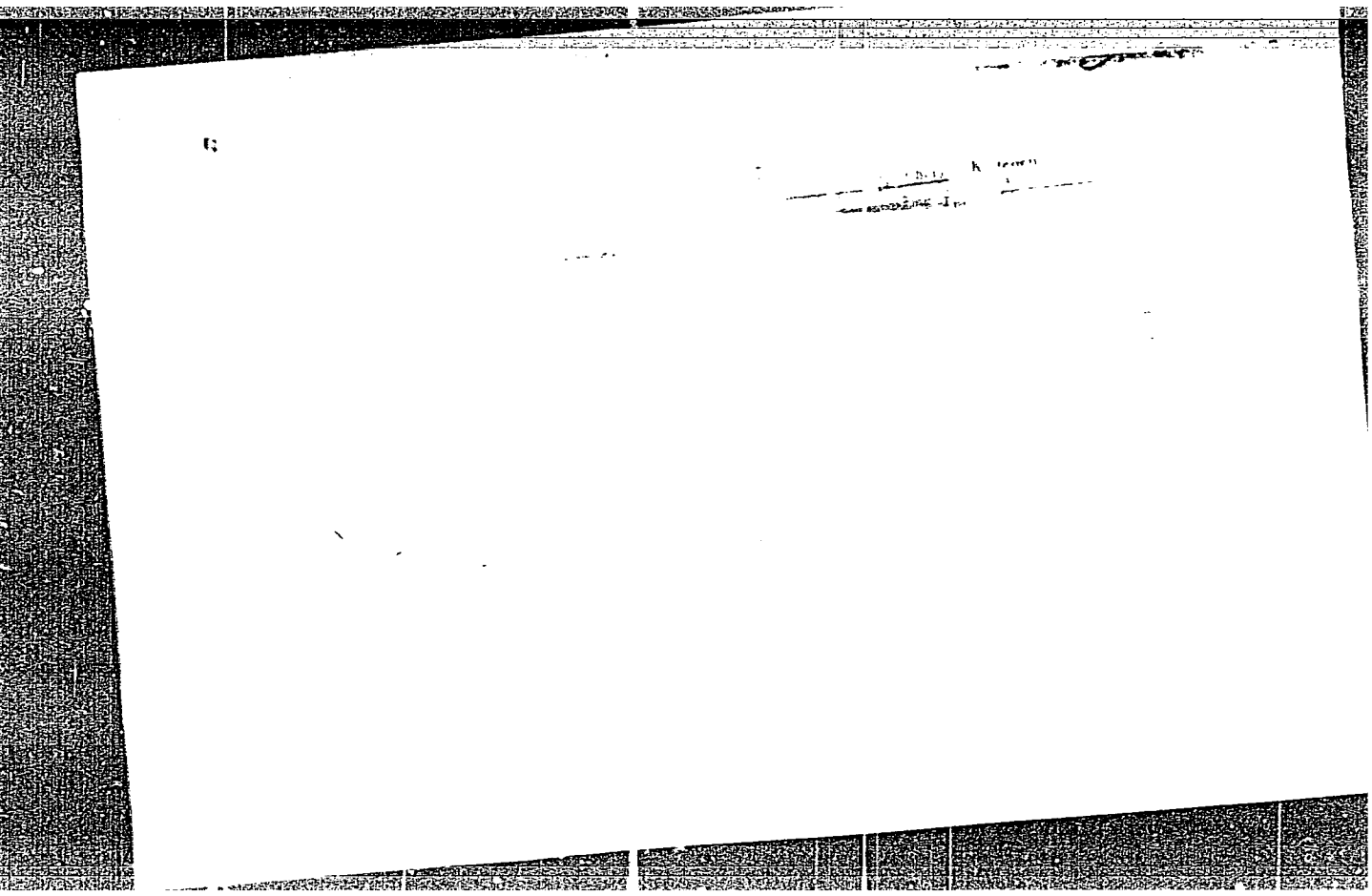


APPROVED FOR RELEASE: Monday, July 31, 2000 CIA-RDP86-00513R001136020

NAKHODKIN, N. G.

Dissertation: "Investigation of the Secondary Emission of Certain Metals and Semiconductors." Cand Phys-Math Sci, Kiev State U, Kiev, 1954. Referativnyy Zhurnal -- Khimiya, Moscow, No 8, Apr 54.

SO: SUM 284, 26 Nov 1954



NAKHODKIN, N. G.

Nuclear Science Abstracts
July 15, 1954
Physics

6 (3)

EFFECTIVE DEPTHS OF SECONDARY ELECTRON EMISSION. N. D. Morgulis and N. G. Nakhodkin (Kiev State Univ. im. T. G. Shevchenko, Russia). Doklady Akad. Nauk S.S.S.R. 94, 1029-32(1954) Feb. 21. (In Russian).

The effective depth of secondary electron emission in a number of metals and semiconductors was measured, and the results tabulated. The data were applied to a more generalized concept of the theory of electron emission. (J.S.R.)

9-21-54
RMZ

SOV/112-57-6-13023

Translation from: Referativnyy zhurnal, Elektrotekhnika, 1957, Nr 6, p 195 (USSR)

AUTHOR: Nakhodkin, N. G.

TITLE: Investigation of Secondary Emission of Some Metals and Semiconductors As a Function of Their Thickness (Issledovaniye vtorichnoy emissii nekotorykh metallov i poluprovodnikov v zavisimosti ot ikh tolshchiny)

PERIODICAL: Nauk. zap. Kiyevsk. in-t, 1955, Vol 14, Nr 8, pp 209-221

ABSTRACT: Studying secondary-emission properties which are a function of the thickness of the layer in question permits evaluating the portion of the total volume that takes part in the secondary-emission phenomenon; this portion characterizes the effective depth of secondary emission. This depth corresponds to the layer thickness at which dependence of secondary-emission properties on thickness discontinues. Both phenomena, the depth of penetration of primary electrons into the substance and the depth of emergence of secondary electrons, are involved. For the first time, measurements of the effective depth were made on the basis of the secondary-emission factor of a number of layers of the

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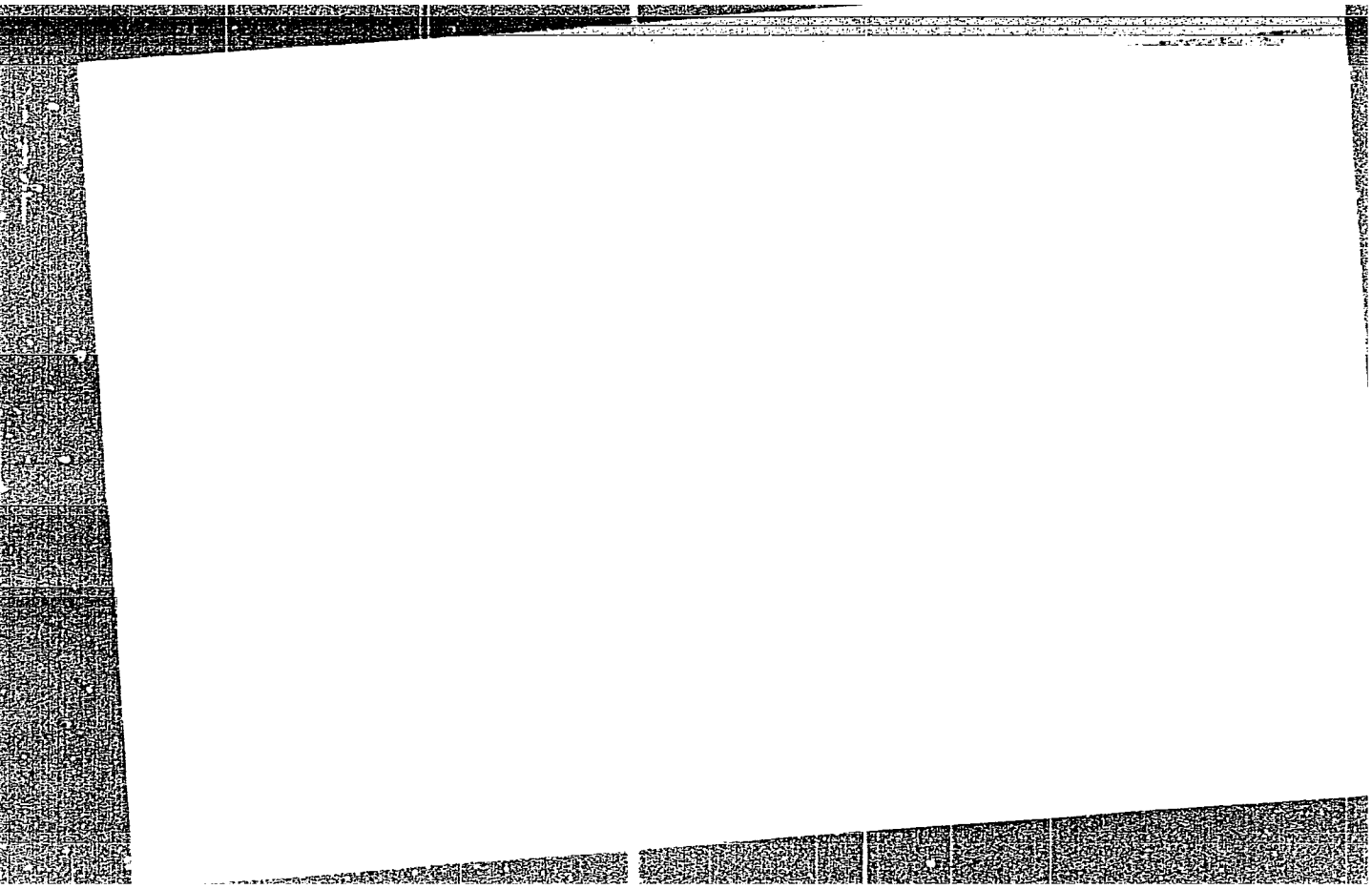
Investigation of Secondary Emission of Some Metals and Semiconductors . . . .

Substance	Secondary-emission factor δ_{max}	Primary-electron energy V_p max volts	Effective depth of secondary emission z_o (millimicrons)
Ag	1.47	800	9-10
Cu	1.35-1.40	600	10-11
Cr	1.35	600	4.5-6
Sb	1.48	500	13
Te	1.51	1,000	18-20
Ge	1.21	400-500	65-70

Principal conclusions are: (1) effective depth is greater for semiconductors than for pure metals; (2) within the studied range of V_p, the effective depth is independent of the primary-electron energy. A greater effective depth in the case of semiconductors can be explained by lower losses to secondary electrons because of a lower concentration of conductance electrons.

A.M.B.

Card 3/3



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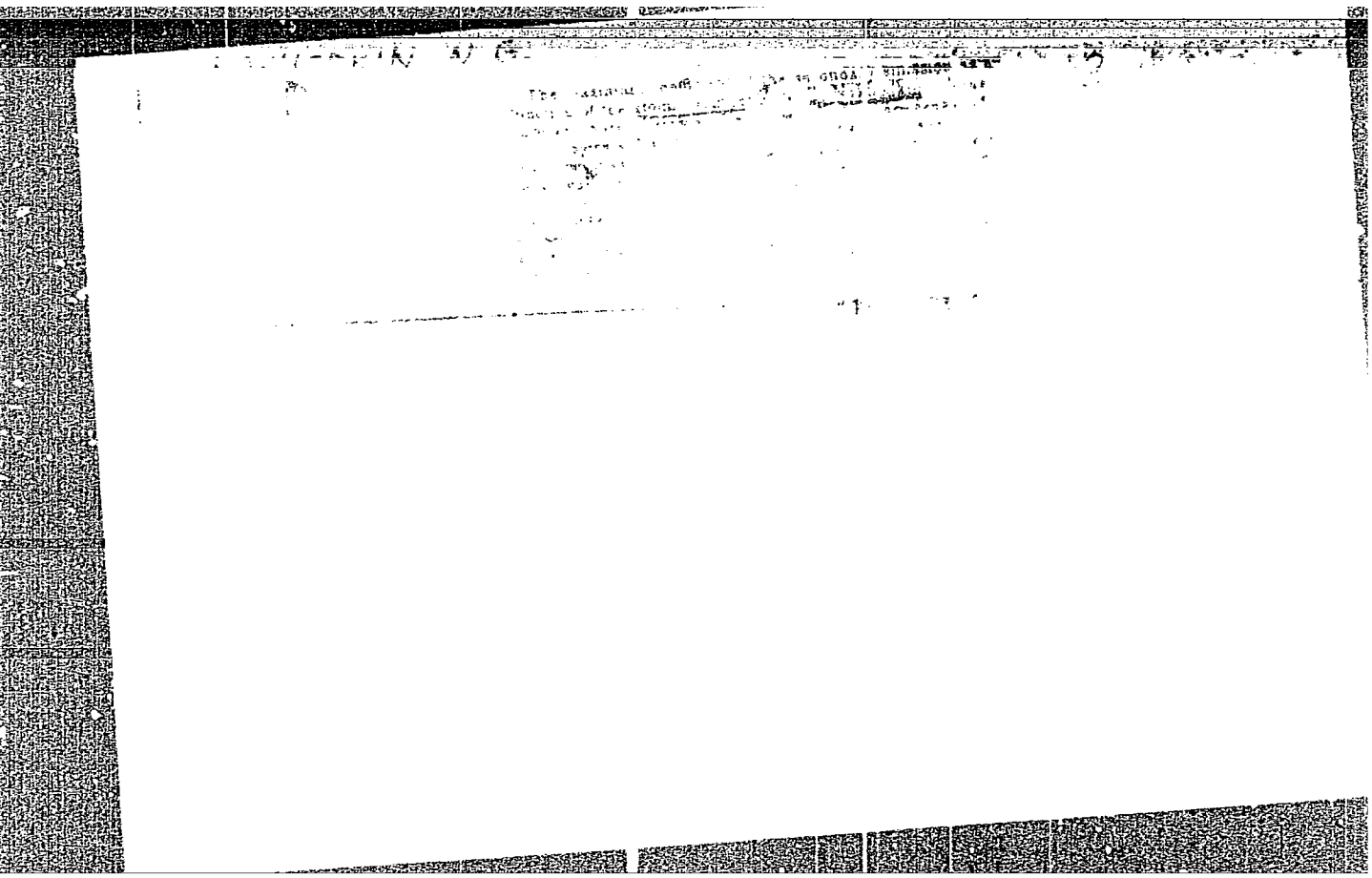

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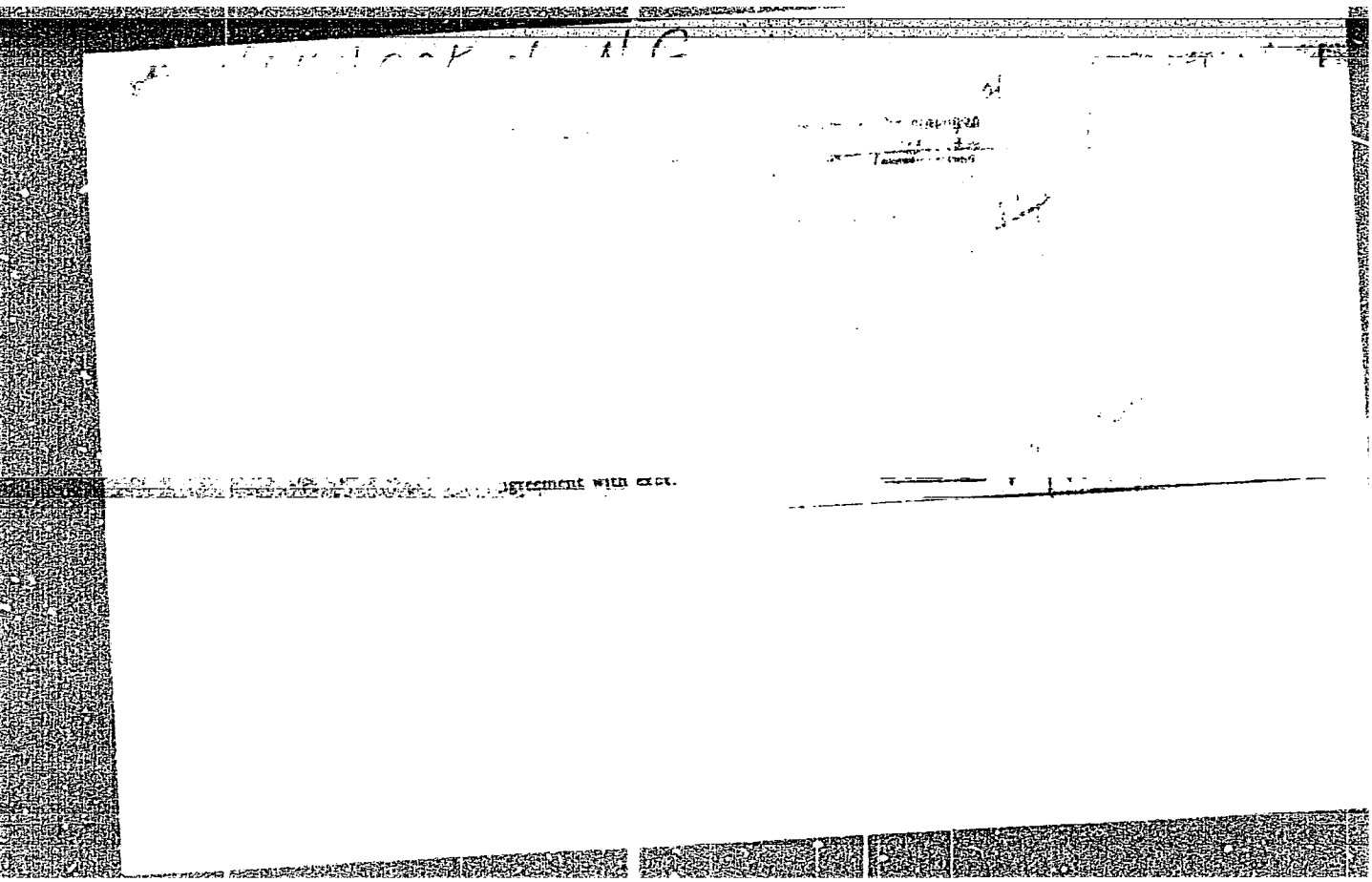

NAKHODKIN, N.

B-3

USSR/Physical Chemistry - Atom

Abs Jour : Referat Zhur - Khimiya, No 2, 1957, 3447

Author : Karal'nik S., Nakhodkin N., Meleshko L.

Title : Radiographic Study of Roentgen Photoelectron Emission

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 4, 780-781

Abstract : Investigation of the dependence of Roentgen photoelectron emission on atomic number of the substance. Samples of substances being compared were placed on photographic plate and irradiated through it with x-rays. Photoelectrons and secondary ("reflected") electrons induced by the irradiation cause darkening of photographic plate; due to great hardness of the radiations used (200 Kv) their direct photographic effect on passing through the plate is negligible. Series of elements of the same group of Mendeleyev's table show linearly increasing darkening with increasing atomic number. Series of elements of same period also show a linear increase,

- 3 -

Card 1/2

L 26984-65 EWT(1)/EWT(m)/T/EEC(b)-2/EWP(t)/EWP(b) EJP(c) JD/GG
ACCESSION NR: AP5003438 S/0181/65/007/001/0210/0216

AUTHORS: Nakhodkin, N. G.; Ostroukhov, A. A.; Romanovskiy, V. A. 32 31 13

TITLE: Inelastic scattering of electrons in thin films 14

SOURCE: Fizika tverdogo tela, v. 7, no. 1, 1965, 210-216

TOPIC TAGS: inelastic scattering, electron scattering, thin film, reflection coefficient, transparency coefficient

ABSTRACT: In view of the fact that the theory of elastic scattering developed in earlier papers by the authors (FTT v. 4, 1514, 1962 and v. 5, 41, 1963) yields results that are somewhat too high for the flux density of the unscattered electrons and for the coefficient of inelastic reflection in the case of heavy substances, the authors have modified in the present paper the approximate theory for large-angle scattering of electrons, taking a more consistent account of the conditions of the fast-electron emission. An integral transport

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L 26984-65
ACCESSION NR: AP5003438

equation is derived with an account of the conditions of motion and is solved for the case of normally and obliquely incident beams. The thickness dependence of the transparency coefficient is calculated for normal incidence. The connection between the total range and the extrapolated range is examined and it is noted that the extrapolated range coincides with the electron scattering length. The dependence of the coefficient of reflection on the atomic number of the target is calculated and found to agree with the experimental data for both small and large atomic numbers. Orig. art. has: 5 figures and 18 formulas.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiev State University)

SUBMITTED: 13Jul64 ENCL: 00 SUB CODE: NP, SS

NR REF SOV: 005 OTHER: 009

Card 2/2

SOV/109-3-8-8/18

AUTHORS: Zykov, G.A. and Nakhodkin, N.G.

TITLE: Influence of Certain Gases on the Emission of Oxide Cathodes (Vliyaniye nekotorykh gazov na emissiyu oksidnogo katoda)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 8, pp 1031 - 1039 (USSR)

ABSTRACT: Investigations were carried out on the oxide cathodes of the standard vacuum tubes, type 6Zh2P. For the purpose of investigation, a special method of unsealing tubes was developed and the pressure of the poisoning gases was maintained constant. The equipment and the methods of measurement are similar to those described by the authors in an earlier work (Ref 1). The oxygen employed in the experiments was obtained by chemical decomposition of potassium permanganate; the hydrogen was applied by means of a palladium capillary tube; the carbon monoxide was obtained by heating a mixture of zinc and calcium carbonate and the chlorine was obtained by thermal decomposition of potassium chloride. The gases were dessicated by means of P_2O_5. The emission current as a function of time for a cathode operating at a

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temperature of 1 020 °K and oxygen pressure of 7.10^{-7} mmHg, is represented by the curves of Figure 1; the falling portions of the curves represent the decay of current as a function of time, while the rising portions represent the recovery of the cathode after the evacuation of the gases. The numbers on the curves refer to successive admission cycles for the oxygen. Similar curves are shown in Figure 2 (for the same temperature and pressure). The poisoning and the recovery effect in a cathode subjected to the action of carbon monoxide is represented by the curves of Figure 3. These curves were taken at temperatures ranging from 3.10^{-6} to 6.10^{-5} mmHg. Figure 4 shows similar curves but these were taken at various temperatures (ranging from 860 °K to 1 020 °K). It was found that in the temperature range of 900 - 1 020 °K and at pressures up to 10^{-5} mmHg, the presence of hydrogen had no effect on the emission of the cathodes; in fact, in some cases, it appeared to enhance the emission. The effect of chlorine poisoning is illustrated in Figures 6, 7 and 8. From these, it is seen that at a

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certain temperature (1,020 °K), the presence of chlorine does not affect the emission; this temperature is very critical and, consequently, upward or downward changes lead to a quick deterioration of the cathode. The main conclusion of this investigation is that the poisoning effect of the gases is primarily dependent on the pressure of the gas, the temperature and activity of the cathode. Under certain conditions, such poisonous gases as water vapour or chlorine have no poisoning effect and, in fact, can enhance the emission. It was found that oxygen, carbon monoxide and chlorine have a critical pressure, below which the gas does not have any noticeable ill effect on the cathode. At a temperature of 1 020 °K, the critical pressure for hydrogen is about 5.10^{-8} mmHg, for carbon monoxide it is about 5.10^{-7} mmHg and for chlorine it is about 1.10^{-6} mmHg. The authors make acknowledgment to Corresponding Member of the Ukrainian Ac.Sc. N.D. Morgulis for his interest in this work and to G.Ya. Pikus for his help in carrying out the experiments.

SOV/109-3-8-8/18

Influence of Certain Gases on the Emission of Oxide Cathodes

There are 8 figures and 16 references, 7 of which are English, 2 German and 7 Soviet (4 of these are translations).

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T.G. Shevchenko (Kiyev State University imeni T.G. Shevchenko)

SUBMITTED: January 29, 1958

Card 4/4

1. Cathodes (Electron tube)--Performance 2. Metal oxides --Properties 3. Thermionic emission 4. Gases--Electrical effects

NAKHODKIN, N.G.

AUTHORS: Nakhodkin, N. G., Novosel'skaya, A. I. 48-22-4-20/24

TITLE: Investigation of the Structure and of the Properties of Tapered Films of Ge, Cr and Bi in Connection With Their Secondary Emission Properties (Issledovaniye struktury i svoystv klinoobraznykh plenok Ge, Cr i Bi v svyazi s ikh vtorichnoemissionnymi svoystvami)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 4, pp. 448-453 (USSR)

ABSTRACT: In order to clarify the nature of secondary emission, it is interesting to investigate the dependence of the coefficient of secondary emission δ on the thickness of the film (d). The authors of the present paper as well as others (references 1-3) showed, that the coefficient of secondary emission also varies with a modification of d up to a certain thickness (d_{eff}). This latter was denominated the effective depth of secondary emission. The investigation of the effective depth of secondary emission in various substances in metals as well as in semiconductors (germanium, Ag-Cs- and Sb-Cs-cathodes), showed, that d_{eff} varies only

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slighly with a variation of the energy of the primary electrons V_p of from 200 --- 3000 eV.

This fact makes assume, that a_{eff} is above all determined by the kinetics of motion of the excited secondary electrons. These investigations, however, exhibit a shortcoming reference 3). The values of the effective depth d_{eff} were of the same order of magnitude as the limit thickness of the aggregation of the film (references 4 and 5). In the present paper the authors investigated films of germanium, chromium and bismuth condensed in a vacuum. The germanium films with a thickness of from 3 to 100 mμ exhibit a continuous appearance under the electron microscope, that is to say, that no inhomogeneities were discovered at an accuracy of up to a permitted distance (below 100 Å).

In accordance with data from publications (reference 10) it can be maintained, that freshly precipitated germanium layers are amorphous. The authors also investigated the modification

of the specific electron resistance of the condensed layers with the thickness (figure 4). The shift of a markedly increasing resistance in the range of great thickness because of heating can easily be explained by an aggregation of the film, which actually can be observed after the action of an electron beam in the microscope. The thickness interval of bismuth films suitable for microscopic investigations was within the limits of from 6 — 60 m. Thicker layers were impenetrable to electrons. Electronographic pictures proved the assumption that the needles on the film represent single monocrystals. The structure of the bismuth film is shown by figure 5. After the recrystallization a finely crystalline layer is formed under the action of the beam and the texture disappears. In thinner layers a stronger increase of the specific resistance of the bismuth layer is observed, as is in germanium, namely at $d < 10$ mμ (figure 8). Next chromium was investigated. Freshly evaporated chromium films with a thickness of from 3-70 mμ look amorphous under the electron microscope. Electronographs, however, further the

Investigation of the Structure and of the Properties of Tapered Films of Ge, Cr and Bi in Connection With Their Secondary Emission Properties 48-22-4-20/24

assumption, that chromium films are polycrystalline. Under the action of an electron beam the chromium films form a finely crystalline structure. The increase of the specific resistance with a reduction of the thickness starts at 10 mμ (figure 9). At the same time the dependence of the coefficient of transmission τ and of the reflection R of monochromatic light on the layer thickness was investigated for all three substances (figures 10,11). The effective depth of secondary emission proves to be less in the metal (chromium) than in the semiconductor (germanium). The author expresses his gratitude to N. D. Morgulis for the interest exhibited by him, V. N. Lepeshinskaya, L. N. Dobretsov, A. N. Arsen'yeva, I. M. Bronshteyn, B. N. Popov took part in the discussion. There are 11 figures and 12 references, 8 of which are Soviet.

ASSOCIATION: Kiyevskiy gos. universitet im. T.G. Shevchenko (Kiyev State University imeni T. G. Shevchenko)

AVAILABLE: Library of Congress
Card 4/4 1. Bismuth films--Properties 2. Chromium films--Properties 3. Germanium films--Properties 4. Secondary emission--Theoretical analysis 5. Test equipment--Applications

NAKHODKIN, N.G.

AUTHORS: Nakhodkin, N. G., Romanovskiy, V. A. 48-22-4-21/24

TITLE: The Dependence of the Coefficient of Secondary Emission in KCl on the Thickness of the Layer (Zavisimost' koeffitsiyenta vtorichnoy emissii KCl ot tolshchiny sloya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 4, pp. 454-455 (USSR)

ABSTRACT: The dependence of the coefficient of secondary emission on the layer thickness permits to determine the effective depth of secondary emission. Various experimental data exist in publications on the variation of the effective depth of secondary emission on the energy of the primary electrons. (reference 1) It can be maintained, that the effective depth at medium energies of the primary electrons is immediately connected with the kinetics of motion of the excited secondary electrons in the solid. In the present paper the authors investigated the dependence of the coefficient of secondary emission in KCl on the layer thickness in the interval of from 480 — 6000 eV. A beryllium coating served as a base layer, which was evaporated onto the glass in a vacuum of the order of magnitude of 10^{-8} mm of mercury column.

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The Dependence of the Coefficient of Secondary Emission in KCl on the Thickness of the Layer

The difference between the δ of the base layer and the δ of the coating was sufficiently great, permitting highly accurate measurements. The measurements were performed with single pulses (duration τ = 2,5 micro seconds) with the application of a very weak current. This permitted to avoid a charging of the surface even at room temperature. (Reference 5) The thickness was determined according to the position of the interference bands of the same intensity. Figure 1 shows the characteristic dependence of the coefficient of secondary emission. The quantity d_1, which proved to equal 50 mμ as regards its order of magnitude, is identified by the authors as the effective depth of secondary emission. The quantity d_2 exceeds d_1 (figure 2) and is essentially dependent upon the energy of the primary electrons. The increase of the coefficient of secondary emission with a variation in thickness from d_1 to d_2 is of the order of magnitude of from 15-20 %. It can therefore be assumed, that this thickness d_2 so to speak must represent the passage of primary electrons in solids.

The Dependence of the Coefficient of Secondary Emission [illegible]
in KCl on the Thickness of the Layer

There are 2 figures and 5 references, 4 of which are Soviet

ASSOCIATION: Kafedra elektroniki Kiyevskogo gos. universiteta im. T. G. Shevchenko (Chair for Electronics, Kiyev State University imeni T. G. Shevchenko)

AVAILABLE: Library of Congress

1. Secondary emission--Coefficient-dependence
2. Coatings--Applications

Card 3/3

NAKHODKIN, N.G. [Nakhodkin, M.H.]; Romanovskiy, V.A. [Romanovs'kyi, V.O.]

Kinetics of the motion of electrons in secondary emission. Part 1.
Ukr.fiz.zhur. 4 no.4:479-490 Jl-Ag '59. (MIRA 13:4)

1.Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko.
(Secondary electron emission)

S/109/60/005/008/012/024
E140/E355

9,4000 (1143, 1138, 1159)

AUTHORS: Nakhodkin, N.G. and Romanovskiy, V.A.

TITLE: Kinetics of Electron Motion in Secondary Emission from Thin Metal and Semiconductor Films

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5, No. 8, pp. 1275 - 1283

TEXT: Deposition of various materials in thin wedges on various bases was used to study secondary emission of films. Two characteristic thicknesses were obtained on the curves of secondary-emission factor against depth, which are related to the path lengths of secondary and primary electrons. Electron microscope investigations of KCl film structures on various bases were performed. The dependence of the two characteristic depths on the primary electron angle of incidence was studied qualitatively. The results obtained are attributed to processes of electron reflection in the film and the base. Recommendations are made for the choice of base for studying the two characteristic depths. The existence of the two characteristic depths was first detected in 1953 by one of