ARONOV, B.M.; MAYEV, B.I.

Determining the gas-outflow angle from a plane turbine cascade of profiles. Izv.vys.ucheb.zav.; av.tekh. 7 no. 1:75-84 '64. (MIRA 17:5)

ARONOV, B.V.

ARONOV, B.V. Compressors in the mining industry Uchebnik dlia kursov masterov sotstruda. Khar'kov, Gos. nauch. -tekhn. izd-vo Ukrainy, 1938. 367 p. (49-57829)

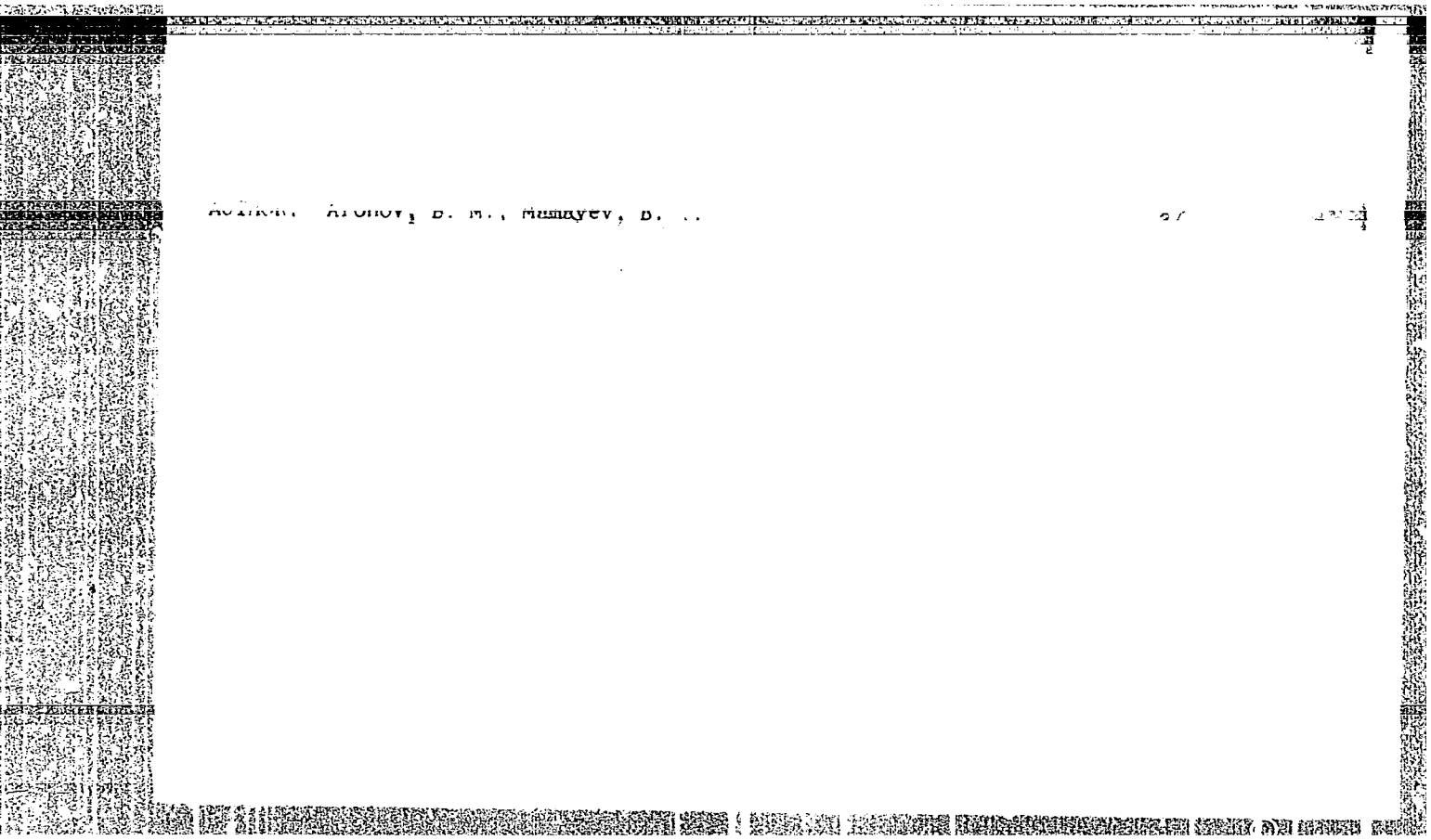
TJ990.A7

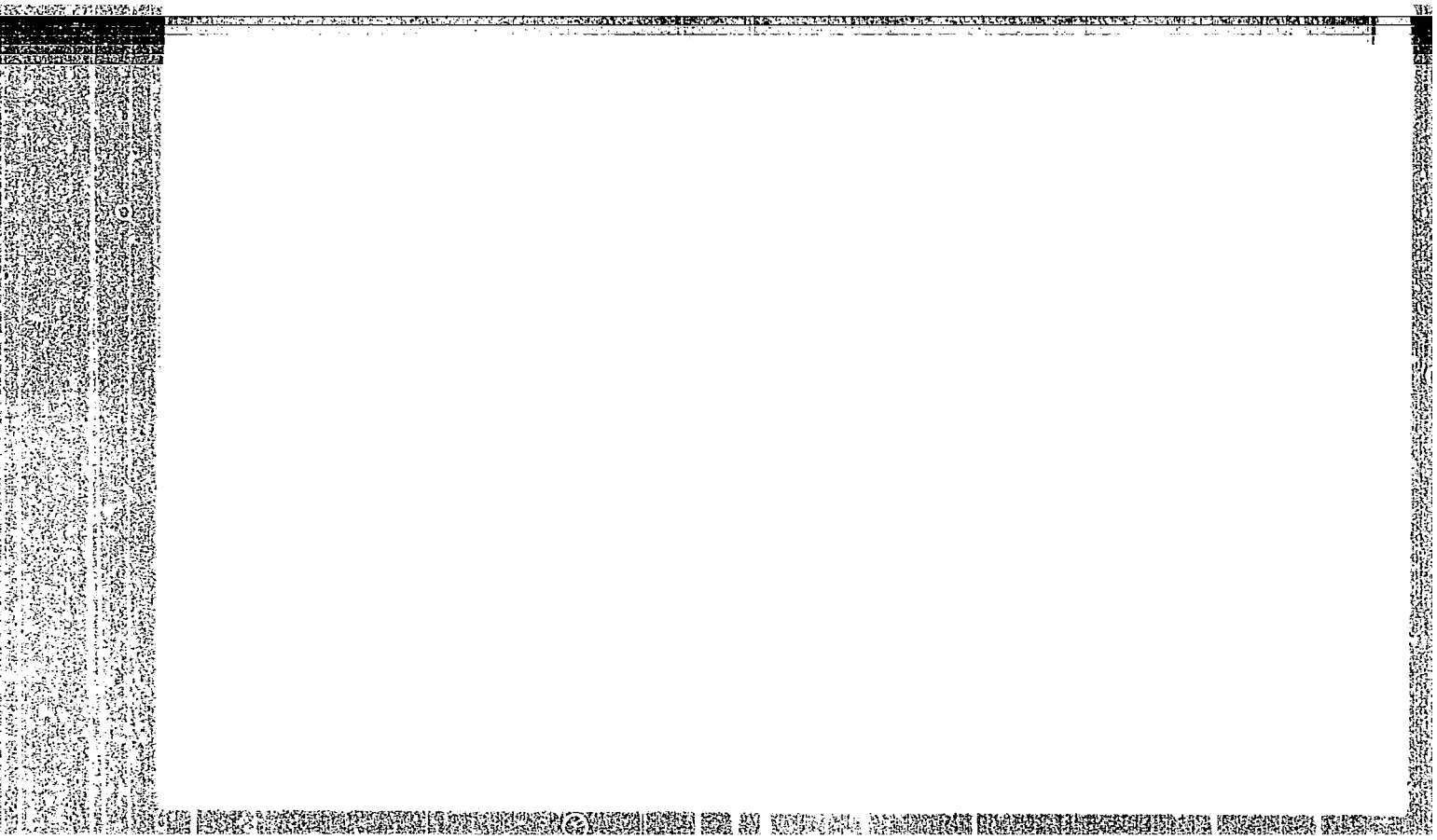
ARONOV., B. V.

Compressed Air

Quantitative losses of energy of compressed air in mines., Prom. energ., 9, No. 2, 1952.

Monthly List of Russian Accessions, Library of Congress, April 1952. UNCLASSIFIED.





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L 10906-66 EWT(m)/EWP(w)/EWA(f)/EWP(v)/T-2/EWP(k)/ETC(m) WW/EM

ACC NR: AP6003190 SOURCE CODE: UR/0147/65/000/004/0109/0117

AUTHOR: Aronov, B. M.

ORG: none

TITLE: Determining certain geometric parameters of turbine cascades

SOURCE: IVUZ. Aviatsionnaya tekhnika, no. 4, 1965, 109-117

TOPIC TAGS: turbine blade, aircraft turbine engine, blade calculation

ABSTRACT: The use of electronic computers instead of graphic methods for turbine blade calculation requires preliminary determination of the following geometric parameters (see Fig. 1):

$$\beta_{1k},\ \bar{X}_{d_m} = \frac{X_{d_m}}{l},\ d_m,\ r_1,\ \omega_1,\ \omega_2 \text{ and } \gamma.$$

To determine the dependence of these parameters on other known turbine blade characteristics, measurements were made of a series of blade cascades of various types of aircraft turbine engines. Formulas were

Card 1/3 UDC: 62.135

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ACC NR: AP6003190

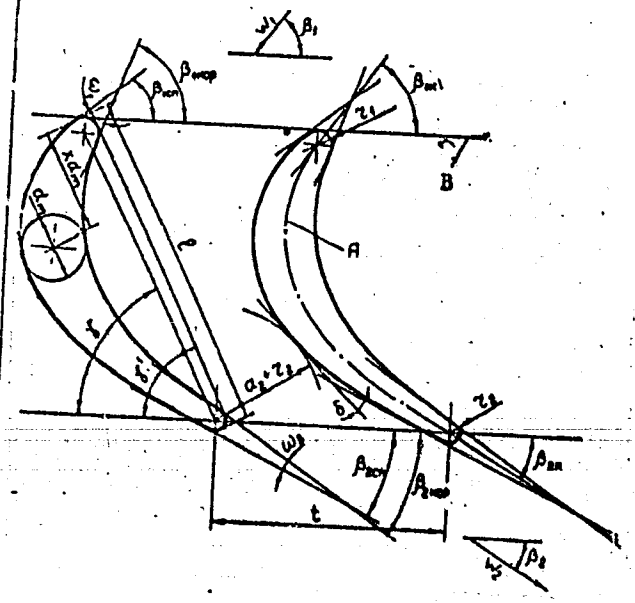

Fig. 1. Basic elements of a turbine blade and cascade

A - Center line; B - cascade front

$a_1 = t \sin \beta_{1ef}$, $\frac{d_m}{l} = \bar{d}_m$.

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ACC NR: AP6003190

derived for maximum blade thickness, blade profile area, inlet edge radius, inlet and exit angles, and blade angle. The interrelationship of geometric parameters was found to be the same for both nozzle and rotor blade cascades. Orig. art. has: 5 figures and 23 formulas. [AS]

SUB CODE: 21/ SUBM DATE: 15Feb65/ ORIG REF: 003

ATD PRESS: 4172

turbine blade 18

BC

Card 3/3

ARONOV, D.

AUTHOR: Aronov, D., Engineer 84-8-19/36

TITLE: Cost Reduction Possibilities in Aerial Photography (Istochniki snizheniya sebestoimosti aerofotos"yemochnykh rabot)

PERIODICAL: Grazhdanskaya Aviatsiya, 1957, Nr 8, pp. 28-29 (USSR)

ABSTRACT: The article analyzes cost components and indicates where and how they can be reduced. The finished product of aerial photography consists of aerial negatives, contact prints, and the reproduction of uncontrolled mosaic. It is measured in square kilometers of the area photographed. After the approval by the OTK, the product is forwarded to the customer at fixed price rates. The basic quantitative efficiency indicators are the number of square kilometers covered and the profit from the delivered product. But the main qualitative indicator is the cost per square kilometer surveyed. The main way of cutting costs is to raise productivity. Productivity depends on a number of factors, such as the training level of the crews, their experience, cooperation, the technical fitness of the flying stock, instruments, and photographic

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Cost Reduction Possibilities in Aerial Photography (Cont.) 84-8-19/36

laboratory equipment, the distance of operational airfields from the areas to be surveyed, etc. To cut cost, it is necessary to improve the productivity of every single flight. In case of work areas scattered over long distances, it is advisable to use local airstrips as jump-off points. Daily delivery of exposed filmstrip to the base airfield in many instances can be accomplished more economically by regular airlines. Another possibility of economy is the elimination of waste, which causes considerable expense in repeating flights. Minimizing waste requires a careful preparation to ensure correct lighting and atmospheric conditions and the right times for starting and ending the daily flights. The operators already have learned to avoid light spots and halos in working with wide-angle lenses. Fogging of lenses can be easily avoided by opening the camera hatch right after the take-off. Many defects can be corrected or eliminated by

Card 2/3

proper laboratory treatment. The central light spot in exposures with the Rodina-2 lens can be eliminated by overproportional clearing of negatives. Test flights for checking equipment, special instruments, and film can be combined with training flights of the crew. In many places it is possible to out the meteorological flights because of the existing network of permanent stations and the customers' field parties. Technical maintenance expense can be reduced if the crew members are able to accomplish the work locally, without flying the plane to the base. Economy is possible also in the consumption of photographic and chemical materials, as well as in cutting the time of laboratory work in the field by improving the efficiency of workers. Currently the laboratory work drags on up to 6 weeks after the completion of flights.

AVAILABLE: Library of Congress

Card 3/3

ARONOV, D., kand. tekh. nauk.

Is it possible to prevent the knocking of carburetor engines?
Avt. transp. 36 no.12:16-19 D '58. (MIRA 11:12)
(Automobiles--Engines)

ARONOV, D., kand. tekhn. nauk; BORISOV, M., insh.

New standards for motor oils. Avt. transp. 42 no.11:18-21 N '64. (MIRA 17:12)

1. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta.

9.4300 (and 1043, 1155)
26.1631

88746

S/166/60/000/006/006/008
C111/C222

AUTHOR: Aronov, D.A.

TITLE: On the Consideration of the Voltage Drop in the Interior of the Semiconductor in Diodes With a Crass p-n-Junction

PERIODICAL: Izvestiya Akademii nauk Uzbekskoy SSR, Seriya fiziko-matematicheskikh nauk, 1960, No. 6, pp. 68 - 77

TEXT: The author considers (figure 1) a crass p-n-junction appearing by a melting of indium into a germanium semiconductor if the concentration of the holes in the p-region ($p_p \sim 10^{19} cm^{-3}$) is much greater than the concentration of the electrons in the n-region ($n_n \sim 10^{14} + 10^{15} cm^{-3}$). For the calculation of the volt ampere-characteristic of the diode under consideration of the voltage drop in the interior the author obtains

(18) $$V = V_{p-n} + V_T = \frac{kT}{e} \ln\left(1 + \frac{j}{Bj_s}\right) +$$

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C111/C222

On the Consideration of the Voltage Drop in the Interior of the Semiconductor in Diodes With a Crass p-n-Junction

(18) $$+ \frac{j}{eu_p(b+1)} Y - \frac{kT}{e} \frac{b-1}{b+1} \ln \frac{p(d) + \frac{b}{b+1} N}{p(0) + \frac{b}{b+1} N}$$

where V_{p-n} is the voltage drop for the p-n-junction, V_T is the voltage drop in the interior ; N and p are the concentrations of the doner and the holes, e is the charge of the electron, u_p is the mobility of the holes, ß is given by

(16) $$ß = 1 + \frac{p(0)}{p(0) + N}$$

and Y is given by

(17a) $$Y = \int_0^d \frac{dx}{p + \frac{b}{b+1} N}$$

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C111/C222

On the Consideration of the Voltage Drop in the Interior of the Semiconductor in Diodes With a Crass p-n-Junction

Furthermore it holds

$$(15) \qquad j_s = \frac{eD_p p_n \operatorname{ch}\frac{d}{L} + \frac{D_p}{s_p^* L}\operatorname{sh}\frac{d}{L}}{L \; \operatorname{sh}\frac{d}{L} + \frac{D_p}{s_p^* L}\operatorname{ch}\frac{d}{L}} ,$$

where $D_p = \frac{kT}{e} u_p$, s_p^* is the effective velocity of the surface recombination, L is defined by

$$(7) \qquad \frac{1}{L^2} = \frac{1}{L_p^2} \frac{(b+1)p + bN}{b(2p+N)}$$

$L_p = \sqrt{D_p \tau_p}$, τ_p is the longevity of the holes ; d - compare figure 1.

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On the Consideration of the Voltage Drop in the Interior of the Semiconductor in Diodes With a Crass p-n-Junction

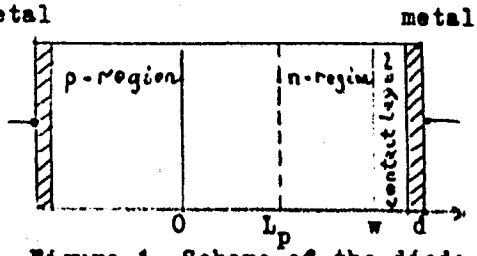

Figure 1. Scheme of the diode

The author considers the limiting cases of the formula (18) for low and high injection levels.
The author mentions V.I. Stafeyev. There are 2 figures and 8 references: 4 Soviet, 2 German and 2 English.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN Uz SSR (Physicotechnical Institute of the Academy of Sciences Uzbekskaya SSR)

SUBMITTED: March 11, 1960

Card 4/4

ARONOV, D. A.

Cand Phys-Math Sci, Diss -- "Development of the theory of semiconductor diodes operating in static and dynamic conditions". Tashkent, 1961. 15 pp, 22 cm (Acad of Sci UzSSR. Phys-Tec Inst. Dept of Theoretical Phys), 175 copies, Not for sale (Kl, No 9, 1961, p 174, No 24245). [61-55867]

AVAK'YANTS, G.M.; ARONOV, D.A.; KARAGEORGIY-ALKALAYEV, P.M.

Reverse volt-ampere characteristic of semiconductor diodes. Fiz. tver.tela 3 no.5:1400-1410 My '61. (MIRA 14:6)

1. Fiziko-tekhnicheskiy institut Akademii nauk UzSSR, Tashkent.
(Voltammetry) (Germanium diodes)

40559

S/166/62/000/004/008/010
B112/B186

24.7700

AUTHOR: Aronov, D. A.

TITLE: Theory of the I-V characteristics at diffusion p-n-junctions

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1962, 72-81

TEXT: The author considers the model of a semiconductor with wide p-n junction whose homogeneous parts are described by equations of the form

$$dN/d\xi = Ny + \varphi, \quad dz/d\xi = -zy \cdot -(\lambda - \varphi)/K,$$
$$dy/d\xi = N - z - 1, \quad d\varphi/d\xi = A^{0}(Nz - b), \qquad (1)$$

and whose transition region is described by equations of the form

$$dy/d\xi = N - z - \xi/\chi, \qquad (2)$$
$$d\varphi/d\xi = A'(1 + \gamma\xi/\chi)(Nz - b) \qquad (3)$$

Card 1/4

Theory of the I-V characteristics ...

For the metal semiconductor contact region the following boundary condition is valid

$$\lambda_1 - \varphi_1(\delta') = Ks_z^n \left[z_1(\delta') - b_1 e^{\int_{\delta'}^{\delta} (y_1 - y_{1,\lambda=0}) d\xi} \right]. \quad (4)$$

These equations are solved by taking account of the thermal generation and recombination of charge carriers, whence the following I-V characteristic is obtained:

Card 2/4

Theory of the I-V characteristics ...

This formula is applied to the limiting cases of "thick" and "thin" diodes. It is found that the inverse current may rise rapidly with the voltage because the contact resistance is reduced when the space charge is extended within a region of variable impurity concentration. There is 1 figure.

4

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR
(Physico-technical Institute AS UzSSR)

SUBMITTED: March 22, 1962

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S/166/62/000/004/009/010
B112/B186

AUTHOR: Aronov, D. A.

TITLE: Capacitance and differential resistance of diffused p-n junctions

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1962, 82-91

TEXT: This paper is a continuation of that by the same author, published in the same periodical, on the I-V characteristics of the diffused p-n junction in dioden of finite base thickness. It is concluded from theoretical considerations that with low voltage and a small value of $10\frac{kT}{e}$ the capacitance of the p-n junction decreases exponentially with the inverse voltage; with high values of $10\frac{kT}{e}$ it decreases cubically and in the region of high voltages $|V - V_K|^{-1/2}$. With low voltages the differential resistance increases with the voltage in a proportion which is approximately exponential. The same holds for medium voltages and

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asymmetrical p-n junctions; but in the region of high voltages it decreases as $|V|^{1/3}$. Further, diffused p-n junctions are studied under the conditions of a transparent specimen; the inverse current may then decrease with increasing temperature (anomalous temperature dependence), if $|F_K - K_{K,j=0}|d \rangle V_K$. The results obtained for the capacitance show good agreement with the experimental data. There is 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR
(Physico-technical Institute AS UzSSR)

SUBMITTED: March 22, 1962

ARONOV, D.A.

Impedance of diffusion p-n junctions on a minor variable signal. Izv. AN Uz. SSR. Ser. fiz-mat. nauk 6 no.6:75-86 '62. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Junction transistors)
(Impedance (Electricity))

ACCESSION NR: AP4025896

S/0166/64/000/001/0042/0048

AUTHOR: Aronov, D. A.

TITLE: Volt-ampere characteristic of semiconductive diodes for high injection levels

SOURCE: AN UzSSR. Izv. Seriya fiziko-matematicheskikh nauk, no. 1, 1964, 42-48

TOPIC TAGS: volt-ampere characteristic, semiconductive diode, high injection level, nonequilibrious current carrier, nonrectifying contact, vacancy recombination, generation velocity, ohmic contact, current density, transmissivity

ABSTRACT: Let s* be the effective velocity of surface recombination, p_d be the equilibrium concentration and p_n the boundary concentration. The generally used boundary conditions for the concentration of nonequilibrious charge carriers for a rear electrode for any levels of injection seem to reflect correctly the physics of the effects occuring at contact. For high injection levels, the theory using this boundary condition agrees with experiment and does not contradict the condition of quasineutrality for large (finite) recombination velocity at rear contact.

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ACCESSION NR: AP4025896

From the general formula of the volt-ampere characteristic satisfying the condition of quasineutrality at any point, it follows that the approximation $p_d = p_n$ is valid only for currents satisfying a certain inequality given in the paper. For very large currents this approximation may turn out to be invalid, since the concentrations p_d grow linearly with current. The formula of the volt-ampere characteristic of the form $j = j_0 \exp\left(\frac{qV}{ckT}\right)$ may be obtained not only for the condition $p_d = p_n$ for currents where the criteria of quasineutrality are not disturbed, but also under the condition $p_d = f(j) \gg p_n$. The impossibility of creating transfers which have, for high injection levels, a characteristic of the form $j \sim \exp\left(\frac{qV}{kT}\right)$ is related not to the disturbance of the ratio of current density to the change in density of the charge of the carrier at contact, but with the negligible (for low values of the parameter s*) non-ohmic voltage drop at contact. Here the conclusion of the possibility of creating devices on the principle of modulation of the surface recombination velocity remains valid. The new boundary condition, used by Yu. F. Sokolov (Radiotekhnika i elektronika, t. 8, 3, 471, 1963), contains the assumption that $j_p(d+0) = \frac{i}{Q} p_d$. This assumption cannot be considered justifiable,

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ACCESSION NR: AP4025896

since it leads to a conclusion on the independence of the concentration p_d from the current, which contradicts the fact of presence of saturation of the Demberovskiy voltage with increase in current. Also, it contains an unknown parameter Q, whose physical meaning is not clear. The basic reason for coinciding of the theory with experiment in the region of strong currents is the linear dependence of the concentration p_d on the current, and not on its constancy, as was asserted by Sokolov (op. cit.). Orig. art. has: 17 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physical and Technological Institute AN UzSSR)

SUBMITTED: 17May63 DATE ACQ: 17Apr64 ENCL: 00

SUB CODE: GE NO REF SOV: 007 OTHER: 003

Card 3/3

ARONOV, D.A.

Theory of volt-ampere characteristics of diffused p-n junctions. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.4:72-81 '62. (MIRA 15:9)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Junction transistors)

S/166/62/000/006/010/016
B104/B186

AUTHOR: Aronov, D. A.

TITLE: On the problem of the impedance of diffused p-n junctions with small alternating signal

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 2, 1962, 75-86

TEXT: The characteristic of a diffused p-n junction with a base of finite thickness is determined for the case where a small harmonic signal is superposed on the constant back bias. The object is to clarify the effect of the junction region with varying impurity concentration on the magnitude of the diffusion resistance and capacitance, as well as the effect on the characteristic of their frequency dependence. Starting from the system

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$$\frac{\partial N}{\partial \xi} = Ny + \varphi, \tag{1}$$

$$\frac{\partial z}{\partial \xi} = -zy - \frac{\lambda - \varphi}{K}, \tag{2}$$

$$\frac{\partial \varphi}{\partial \xi} = A^0 (Nz - b) + \frac{\partial N}{\partial \tau}, \tag{3}$$

$$\frac{\partial y}{\partial \xi} = N - z - 1, \tag{4}$$

$$\Lambda = \lambda - \frac{\partial y}{\partial \tau} \tag{5}$$

for the n-type semiconductors, lengthy calculation leads to expressions for the active conductivity and the capacitance. It is clear from this expression that for broad p-n junctions with a space charge the back bias affects only the diffusion resistance and the capacitance, not the nature of the frequency dependence. The frequency dependences of σ and C are determined essentially by the surface recombination rate at the contact. It is shown that a finite junction width reduces the frequency dependence of the impedance of a diode with a thin base, so that diodes

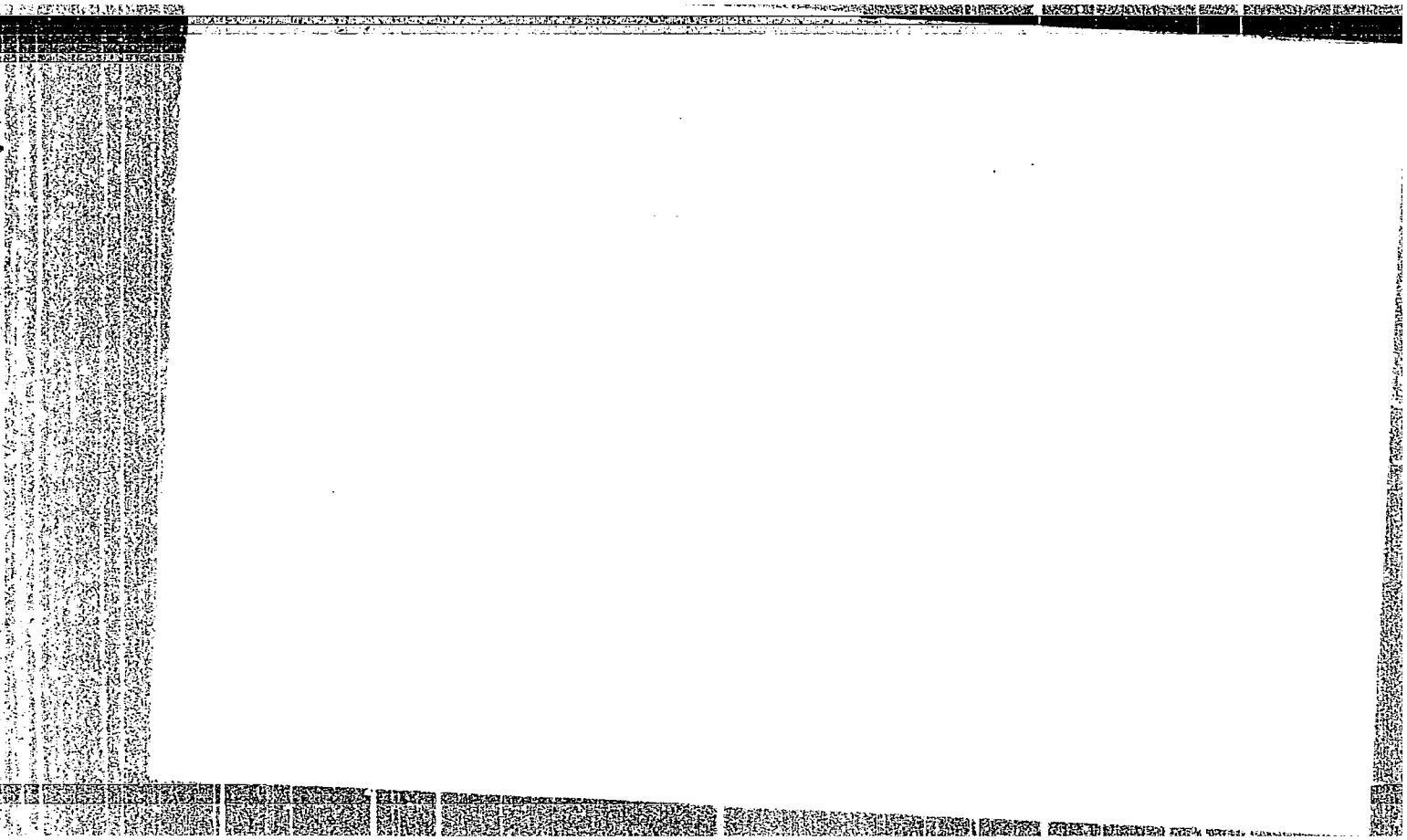
On the problem of the impedance of ... S/166/62/000/006/010/016
B104/B186

with diffused p-n junctions are more suitable for high frequency devices than diodes with fused junctions. With increase in the surface recombination rate from 0 to ∞ the resistance of diodes with anomalously narrow junction increases by a factor of $(L_p/l_1)^2$ where L_p and l_1 are as defined in a previous paper by this author (Izv. AN UzSSR, seriya fiz-mat. nauk, 1960, No. 1; 1961, No. 1).

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR
(Physicotechnical Institute AS USSR)

SUBMITTED: April 10, 1962

Card 3/3



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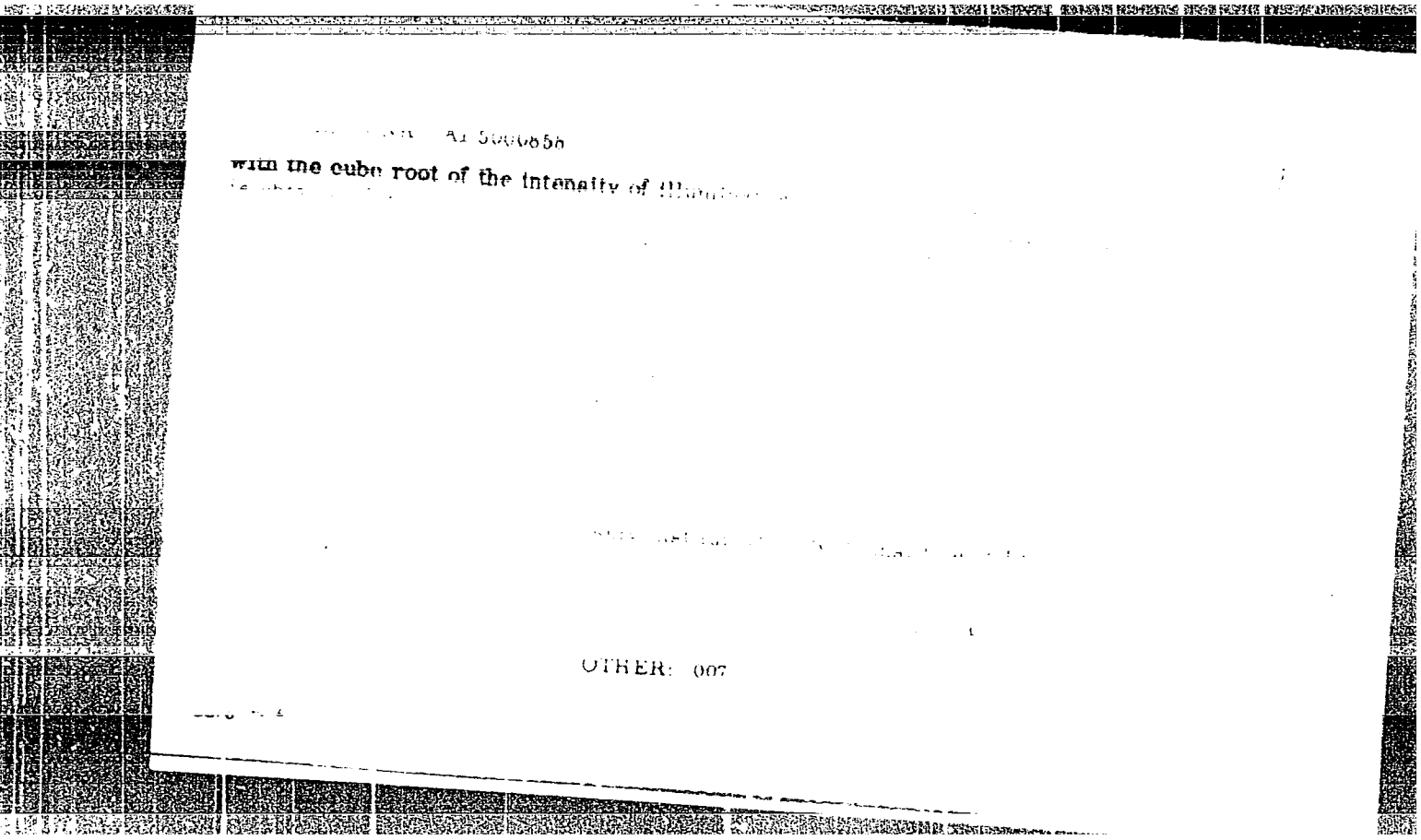

with the cube root of the intensity of

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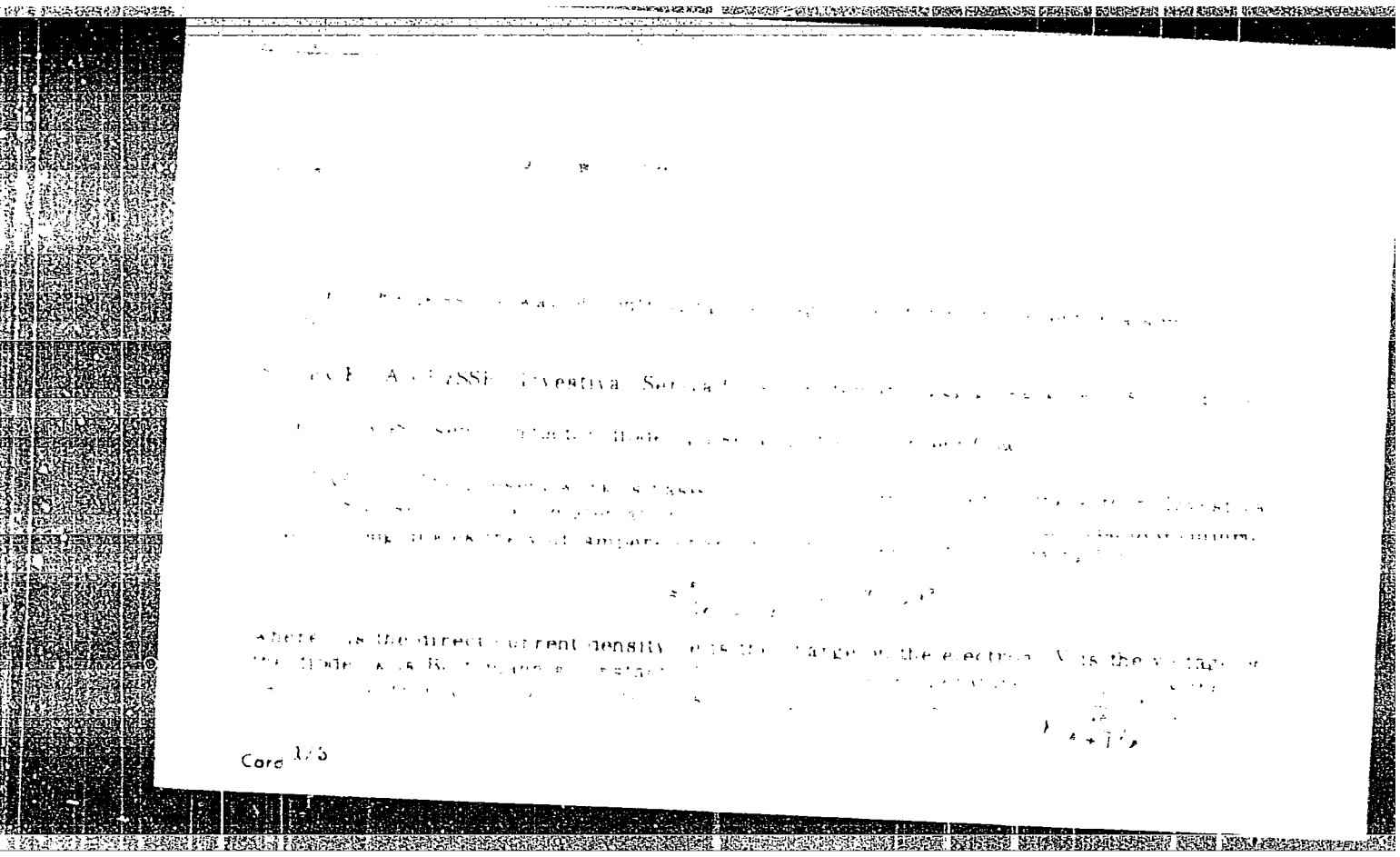

L_q is the diffusion length of unequilibrated charge carriers (holes) ρ is the specific resistance of the original semiconductor [illegible]

$$c = 2\frac{\quad}{b+1} \qquad (3)$$

The coefficient in the index of the exponent c turns out to be proportional to exp [illegible] i.e. in the case of [illegible] the [illegible]

[illegible] can cause a noticeable change in the coefficient c [illegible] by the ratio w/L. the index of the exponent this can cause [illegible]

Card 2/3

L 21350-65
ACCESSION NR: AP5000863

...pulses The role of the collector in such an amplifier is played by the contact with the metal containing the barrier layer the role of the emitter – the p-n junction the role of the base – the quasineutral n-region ...

... Leningrad Polytechnicheskiy Institut AN SSSR Institute of Physics and Technology AN SSSR

SUBMITTED: 23Dec63 ENCL: 00 SUB CODE: EC

NO REF SOV: 004 OTHER: 000

Card 3/3

ARONOV, D.A.

Volt-ampere characteristic of semiconductor diodes at high injection levels. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 8 no.1: 42-48 '64. (MIRA 17:6)

1. Fiziko-tekhnicheskiy institut AN UzSSR.

ACCESSION NR: AP4038623 S/0109/64/009/004/0716/0723

AUTHOR: Aronov, D. A.; Rabinovich, F. Ya.

TITLE: Investigating the current-voltage characteristic of tunnel diodes

SOURCE: Radiotekhnika i elektronika, v. 9, no. 4, 1964, 716-723

TOPIC TAGS: semiconductor, semiconductor diode, diode, tunnel diode, germanium tunnel diode, current voltage characteristic

ABSTRACT: A theoretical study in which a formula (30) is developed describing the current-voltage characteristic is reported; in the cases of strong degeneration and very low voltages (under the minimum voltage), the new formula is reduced to $J = J_m \frac{2V}{V_m}\left(1 - \frac{V}{2V_m}\right)$, where I_m is the maximum current, V_m is the maximum voltage, V is the supply voltage. The value and position of the current

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ACCESSION NR: AP4038623

maximum and their temperature dependence (positive or negative) are determined by the conditions of production of the tunnel diode. This holds true in both cases: (a) a strong degeneration and (b) a substantial blurring of the function of carrier distribution. The new formulas are claimed to be in good agreement with experimental data. "In conclusion, the authors consider it their pleasant duty to thank E. I. Adirovich for his valuable comments and useful discussion." Orig. art. has: 32 formulas.

ASSOCIATION: none

SUBMITTED: 21Jan63 DATE ACQ: 05Jun64 ENCL: 00

SUB CODE: EC NO REF SOV: 006 OTHER: 003

Card 2/2

ARONOV, D.A.; RABINOVICH, F.Ya.

Some studies of the volt-ampere characteristics of tunnel diodes. Radiotekh. i elektron. 9 no.4:716-723 Ap '64.
(MIRA 17:7)

ARONOV, D.A.

Some investigations of the straight branch of the volt-ampere characteristics of diodes with antiblocking tail-end contacts. Izv. AN Uz.SSR. Ser. fiz.-mat. nauk 7 no.5:71-76 '63. (MIRA 17:8)

1. Fiziko-tekhnicheskiy institut AN UzSSR.

ARONOV, D.A.

Frequency properties of diodes with an antiblocking rear contact at high injection levels. Izv. AN Uz.SSR.Ser.fiz.-mat.nauk 8 no.4:27-31 '64. (MIRA 18:3)

1. Fiziko-tekhnicheskiy institut AN UzSSR.

ADIROVICH, E.I.; ARONOV, D.A.

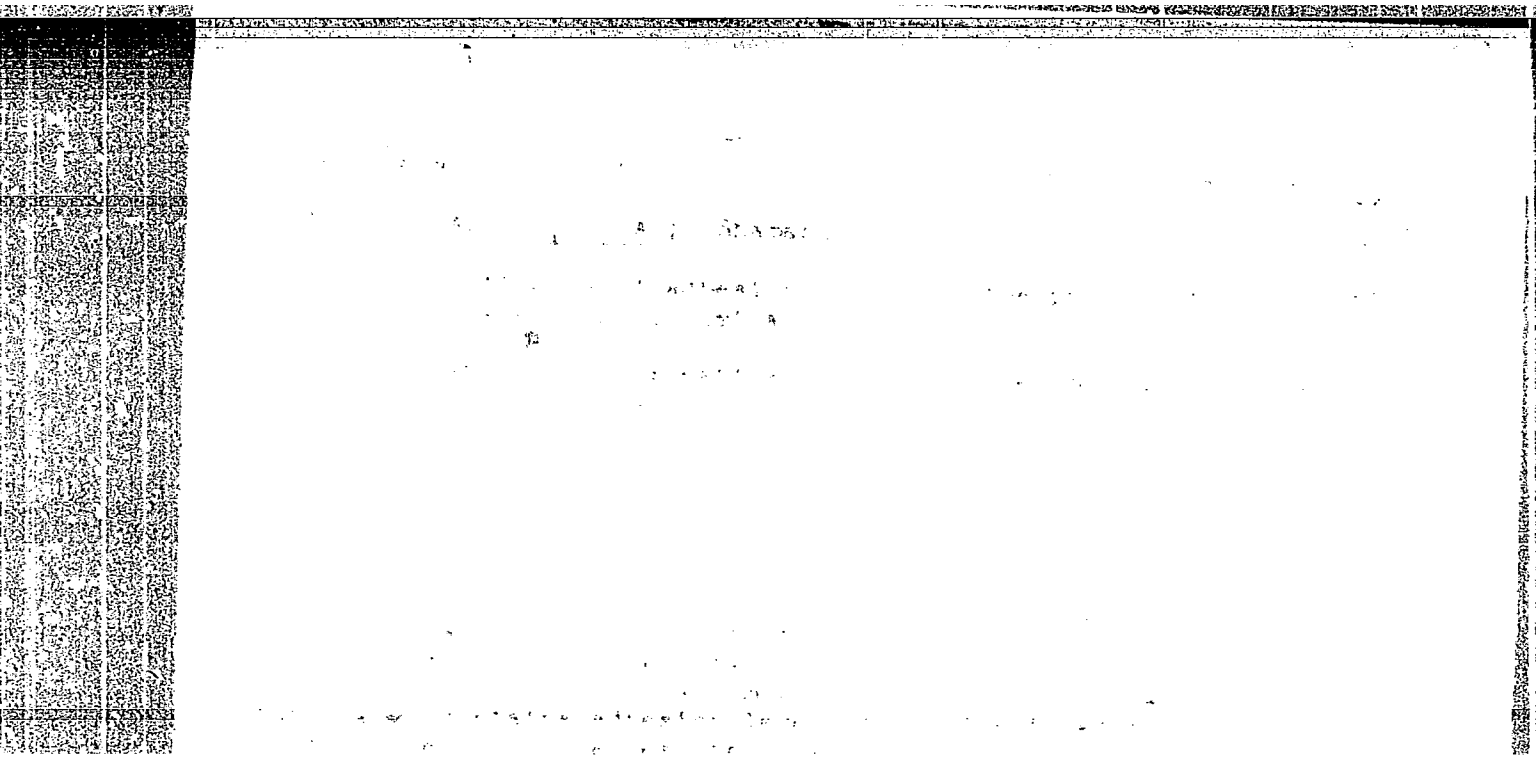
Theory of the photoconductivity of semiconductors induced by intense illumination. Izv. AN Uz. SSR.Ser.fiz.-mat.nauk 8 no.5:41-52 '64. (MIRA 18:2)

1. Fiziko-tekhnicheskiy institut AN UzSSR.

ARONOV, D.A.

One possible method for controlling the direct current intensity in a semiconductor diode. Izv. AN Uz. SSR.Ser.fiz.-mat.nauk 8 no.5:78-80 '64. (MIRA 18:2)

1. Fiziko-tekhnicheskiy institut AN UzSSR.



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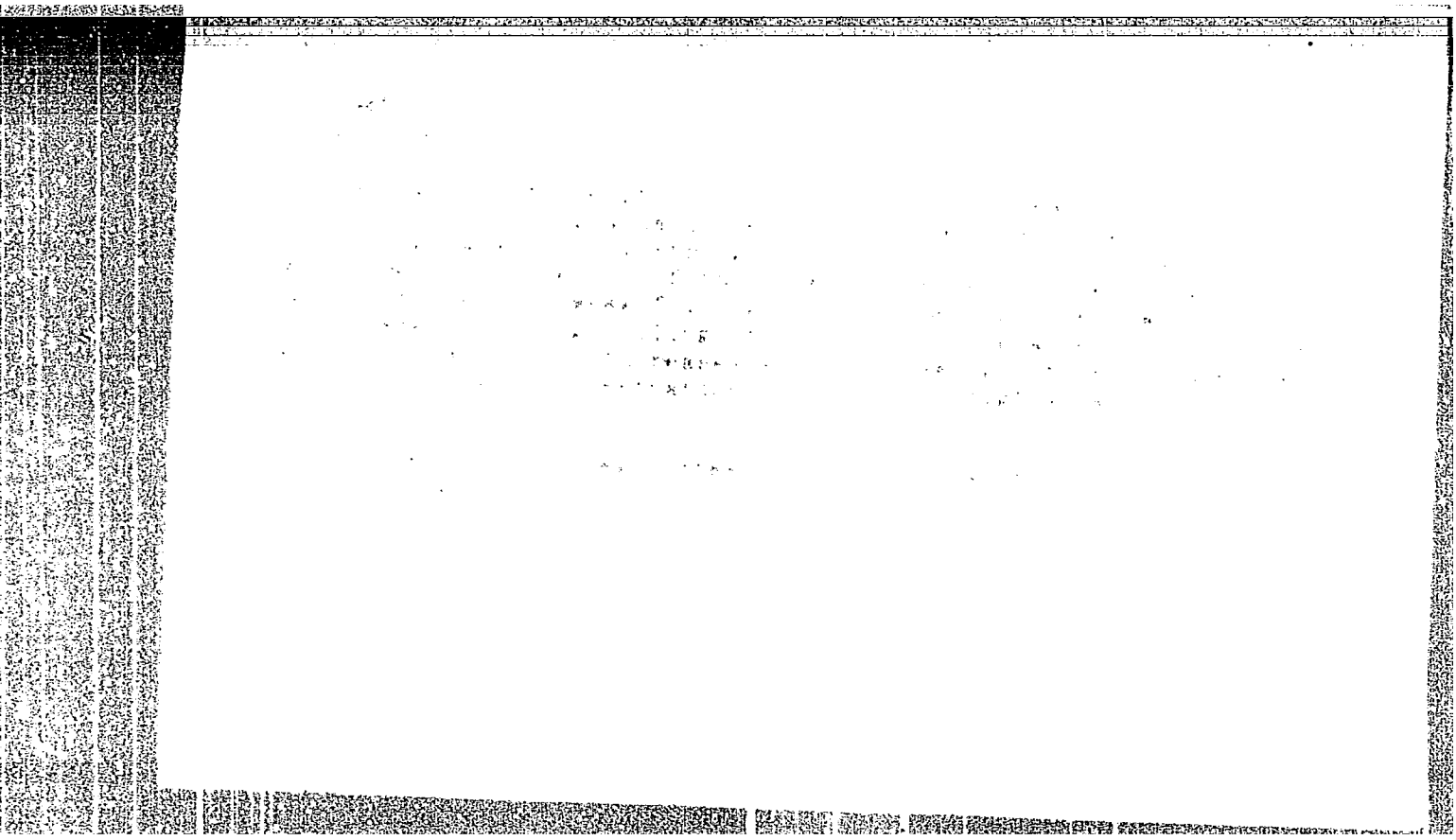

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ACCESSION NR: AP5020856 UR/0166/65/000/004/0045/0050

AUTHORS: Aronov, D. A. 44 Kotov, Ya. P. 44

TITLE: The differential resistance of tunnel diodes 25,44

39
37
B

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1965, 45-50

TOPIC TAGS: tunnel diode, differential resistance, temperature effect

ABSTRACT: The effect of fabrication techniques on the differential resistance of tunnel diodes was investigated so that the negative resistances, desirable for electronic devices, could be more readily obtained. This article extends earlier work in this field, particularly by D. A. Aronov and F. Ya. Rabinovich ("Radiotekhnika i elektronika," 9, 1964, No. 4, 716). With equations from this reference expressing the volt-ampere characteristics for electrons having a long mean free path, the situation for a symmetrically degenerate p- and n--region diode was analyzed. For voltages $0 \leq eV \leq 2\eta$ the tunnel current was studied for arbitrary temperatures and degrees of degeneration. The results, which agree with previous theoretical and experimental studies in the case of a very strong degeneracy, indicate that the differential conductivity is positive with $V < V_m$

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ACCESSION NR: AP5020856

2

and decreases with increasing V until, at V_m, it equals 0. It then changes signs and becomes more negative up to V_n, and again approaches 0. The change of differential resistance depends on the fabricating technology (increased impurity concentration, decreased temperature and fusing time reduce the negative resistance). The temperature dependency of the differential resistance was studied from the same starting point for very strongly degenerate n- and p-region diodes when the tunnel current is determined by the electrons with an energy << the energy corresponding to the level of the chemical potential (the temperature blurring of the carrier distribution function was disregarded). The results again agreed with earlier work and indicate that the character of the temperature dependence of the negative resistance varies with the degree of alloying and can be controlled. Orig. art. has: 14 formulas and 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut, AN UzSSR (Physics-Engineering Institute, AN UzSSR)

44

SUBMITTED: 30Jul64 ENCL: 00 SUB CODE: EC

NO REF SOV: 008 OTHER: 002

Card 2/2

L 9349-66 EWT(1)/EWT(m)/EPF(n)-2/T/EWA(h) IJP(c) DS/WW/GG/AT

ACC NR: AP5026348 SOURCE CODE: UR/0166/65/000/005/0063/0070

AUTHOR: Aronov, D. A.; Ablyayev, Sh. A.; Pilatov, U. U.; Shamasov, R. G.

ORG: Physicotechnical Institute, AN UzSSR (Fiziko-tekhnicheskiy institut AN UzSSR)

TITLE: Theory of the adsorption effect on the surfaces of semiconductors and gels due to effects of ionizing radiation

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 5, 1965, 63-70

TOPIC TAGS: adsorption, gel, chemosorption, semiconductor

ABSTRACT: The electronic theory of chemosorption is used to determine the sign of the adsorption effect as a function of the parameters of the semiconductor (or gel) and the experimental conditions. The case considered is limited to that of a strong absorption when the ionizing radiation generates electron-hole pairs near the surface. The expression for the adsorption effect, which determines its sign, is then applied to several special cases. It is shown that adsorption occurs more readily when volume recombination of carriers is low in comparison with surface recombination. This is the case of a gel with a strongly developed surface. Such effects have been observed experimentally in gels irradiated with slow electrons. Orig. art. has: 30 formulas and 2 figures. [CS]

SUB CODE: 8S/ SUBM DATE: 23Feb65/ ORIG REF: 009/ ATD PRESS: 4151

Card 1/1 HW

L 40910-66 EWI(l)/T IJP(c) AT

ACC NR: AP6015508 (N) SOURCE CODE: UR/0181/66/008/005/1647/1650

AUTHOR: Aronov, D. A.; Shamasov, R. G.

ORG: Physico-Technical Institute, AN UzSSR, Tashkent (Fiziko-tekhnicheskiy institut AN UzSSR)

TITLE: The effect of traps on the photoconductivity of semiconductors in radiative interzone recombination

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1647-1650

TOPIC TAGS: semiconductor research, photoconductivity, electron trapping, electron recombination, current carrier

ABSTRACT: The effect of current carrier traps on the kinetics of photoconductivity, the concentration of α-centers and the degree of their filling by carriers is examined. Calculations for interzone recombination with a consideration of the varying life level with varying exposure level were performed. Since the specimens were sufficiently thick and the radiation was strongly penetrating, the constructed system of kinetic equations was solved without regard to the diffusion, drift, and surface recombination of the carriers. The developed relations indicate that in a general case the growth relaxation and the decay curves of the photoconductivity in interzone recombination have a complex nature and cannot be described by simple exponential functions. With

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L 45910-66

ACC NR: AP6015508

increasing trap concentration, the growth curves take on a more pronounced *S*-shape. While this phenomenon has been described before, it is explained by nonlinear trapping during linear recombination or by a relocation of the holes between several (or two) types of recombination levels. Obviously, such a change in photoconductivity can also take place in interzone recombination, provided that there is a sufficiently large number of traps. Orig. art. has: 4 formulas, 2 figures.

SUB CODE: 20/ SUBM DATE: 16Jun65/ ORIG REF: 004/ OTH REF: 004

Card 2/2 fv

L 07871-67 EWT(1) LJP(c) AT

ACC NR: AP6030665 SOURCE CODE: UR/0166/66/000/004/0040/0045

AUTHOR: Aronov, D. A.; Shamasov, R. G. 44

ORG: Physicotechnical Institute AN UzSSR (Fiziko-tekhnicheskiy institut AN UzSSR)

TITLE: Concerning the influence of adhesion centers on the photoconductivity of semiconductors at large illumination levels

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1966, 40-45

TOPIC TAGS: photoconductivity, semiconductor carrier, impurity center, nonlinear differential equation, adhesion, electron trapping, light absorption, electron recombination

ABSTRACT: The authors calculate the photoconductivity in homogeneous semiconductors, for certain cases in which the solution of the corresponding nonlienar second-order differential equation with non-separating variables can be obtained in terms of elementary functions. A nonlinear second-order differential equation with non-separating variables is obtained for the behavior of the electrons and holes in the semiconductor. Solution of this equation reduces to obtaining the quadratures for strong and weak absorption of light only. The general solution is an elliptic integral, which under certain conditions is pseudoelliptic and can be expressed in terms of elementary functions. It is shown that this occurs in the case of surface photogeneration, if the impact recombination is negligibly small and the sample thickness is of the order of several diffusion lengths of the non-equilibrium carriers. The

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L 07871-67
ACC NR: AP6030665

cases of bimolecular recombination that can occur under these conditions are described. It is shown that the linear dependence of the photoconductivity on the illumination, which is observed quite frequently in experiments with large illumination leves, is obtained only if account is taken of the influence of the adhesion level, or if recombination with traps participating is included with the bimolecular recombination. Expressions for the hole distribution are obtained for the cases of pure bimolecular recombination neglecting the influence of traps and adhesion levels, where bimolecular recombination at relatively low recombination-center density but without account of the influence of adhesion levels, and for bimolecular recombination at high concentration of adhesion levels but without account of the influence of traps as recombination centers. Orig. art. has: 26 formulas.

SUB CODE: 20/ SUBM DATE: 27Feb64/ OTH REF: 001

Card 2/2

ACC NR: AT6007703 SOURCE CODE: UR/0166/66/000/003/0071/0077

AUTHOR: Aronov, D. A.; Kotov, Ya. P.

ORG: Physicotechnical Institute AN UzSSR (Fiziko-tekhnicheskiy institut AN UzSSR)

TITLE: Influence of adhesion centers on the Dember effect and photoconductivity of a semiconductor at large illumination levels

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 3, 1966, 71-77

TOPIC TAGS: photoconductivity, semiconductor carrier, carrier density, optic center, adhesion, radiative recombination

ABSTRACT: This is a continuation of earlier work (Izv. AN UzSSR, seriya fiz.-mat. nauk, 1965, no. 2, pp. 40-47) on the photoconductivity of a thick semiconductor exposed to strong illumination. The present paper deals with a semiconductor of arbitrary thickness in the case of monomolecular recombination via recombination centers, with account taken of the presence of adhesion levels. The differential equations and boundary conditions for such a semiconductor are derived and expressions are obtained for the Dember-effect voltage, for the electric field intensity, and for the carrier diffusion coefficients. Approximate equations are obtained for the particular cases when the hole density is much larger or much smaller than the equilibrium density in the valence band, and an expression is then derived for the photoconductivity. This expression consists of three terms, one independent of the illumination, the second proportional to the logarithm of the illumination, and the third linear in the

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L 09312-67
ACC NR: AP6028309 C

illumination. The last term does not depend on the number of adhesion centers, while the first two increase with increase of the number of these centers. The net result is that the photoconductivity increases in the entire range of variation of the light intensity, the effect of the adhesion centers being offset in some cases by the large number of long-lived electrons. Orig. art. has: 34 formulas.

SUB CODE: 20/ SUBM DATE: 25Nov64/ ORIG REF: 006/ OTH REF: 002

Card 2/2

ACC NR: AP7001180 SOURCE CODE: UR/0166/66/000/005/0063/0072

AUTHORS: Aronov, D. A.; Kotov, Ya. P.

ORG: Physicotechnical Institute, AN UzSSR (Fiziko-tekhnicheskiy institut AN UzSSR)

TITLE: The reactive properties theory of semiconductor p-n-n^+-structures at high injection levels

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 5, 1966, 63-72

TOPIC TAGS: semiconductor theory, pn junction, hole mobility, electric impedance

ABSTRACT: General expressions are obtained for the impedance of p-n-n^+-structures at high injection levels. The analysis is limited to a small variable signal region, superposed on a large forward bias. Using the previous results of D. A. Aronov's work (Izv. AN UzSSR, seriya fiz.-mat. nauk, 1964, No. 4, 27), calculations are made for the case of monomolecular electron and hole recombinations, including the diffusion and drift components of the electric current. Also included are injection leakages of nonequilibrium carriers through contact points. It is shown that for a monotonic distribution of carrier current concentration, in the case of diodes with arbitrary base length, the solution can be obtained by means of hypergeometric series. For a short base diode this solution leads to the expression

$$I = \frac{1}{\beta}\left[\frac{\exp(W/L_\omega)+\tilde{\beta}\exp(-W/L_\omega)}{1+\beta\exp(-2W/L_p)} - \frac{1+\tilde{\beta}}{1+\beta}\right] + \frac{\lambda}{\beta^2} I_1,$$

ACC NR: AP7001180

where

$$I_1 = \left(e^{-\alpha\lambda} - \tilde{\beta}e^{\alpha\lambda}\right)\ln\left(1 - \frac{2W}{L_p}\cdot\frac{\beta}{1+\beta}\right) +$$

$$+ \sum_{n=1}^{\infty}\frac{\lambda^n}{n\cdot n!}\cdot\left[e^{-\alpha\lambda} - (-1)^n\tilde{\beta}e^{\alpha\lambda}\right]\cdot\left[\left(\frac{2W}{L_p} + \alpha\right)^n - \alpha^n\right]$$

and

$$\alpha = -(1+\beta)/\beta,$$

which is true for an arbitrary frequency of the variable signal. Orig. art. has: 41 equations.

SUB CODE: 20/ SUBM DATE: 29Nov65/ ORIG REF: 018/ OTH REF: 008

Card 2/2

ACC NR: AP7001184 SOURCE CODE: UR/0166/66/000/005/0094/0096

AUTHORS: Aronov, D. A.; Kotov, Ya. P.

ORG: Physicotechnical Institute, AN UzSSR (Fiziko-tekhnicheskiy institut AN UzSSR)

TITLE: On the theory of the reactive properties of junctions in p-n-n^+-structures at high injection levels

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 5, 1966, 94-96

TOPIC TAGS: semiconductor theory, pn junction, electric resistance, electric capacitance, electric impedance, semiconductor carrier

ABSTRACT: The current and frequency dependences of the differential resistance and diffusion capacitance of junctions in p-n-n^+ structures in the presence of high current densities are analyzed. The work is based on an expression for the complex impedance obtained earlier by D. A. Aronov and Ya. P. Kotov (Izv. AN UzSSR, Ser. fiz-matem. nauk, No. 5, 1966). The expressions for p-n junctions (and n-n^+ junctions) are written as:

$$Z_{p-n}^{-1} = R_{p-n}^{-1} + i\omega C_{p-n}, \qquad (1)$$

$$R_{p-n} = \frac{kT}{e^2(b+1)\,p_0(0)} \times \frac{\left(bV_p^0 + \frac{D_1}{L_p}\right)^2 + \left(\frac{D_2}{L_p}\right)^2}{\left(bV_p^0 + \frac{D_1}{L_p}\right)\left[V_p^0 V_n^0 + \frac{D_2}{L_p}(V_p^0 + V_n^0) + \left(\frac{D}{L_p}\right)^2\right] + \frac{D_2}{L_p}\left[(V_p^0 + V_n^0)\frac{D_1}{L_p} + \omega D\right]} \cdots \qquad (2)$$

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$$C_{p-n} = \frac{e^2(b+1)\,p_0(0)}{kT\omega} \times \frac{\left(bV_p^\circ + \frac{D_1}{L_p}\right)\left[(V_p^\circ + V_n^\circ)\frac{D_1}{L_p} + \omega D\right] - \frac{D_2}{L_p}\left[V_p^\circ V_n^\circ + \frac{D_2}{L_p} \times (V_p^\circ + V_n^\circ) + \left(\frac{D}{L_p}\right)^2\right]}{\left(bV_p^\circ + \frac{D_1}{L_p}\right)^2 + \left(\frac{D_2}{L_p}\right)^2}, \quad (3)$$

$$D_1 = 2D\,\frac{\bar{\varphi}\,\mathrm{sh}\,\varphi\,(b\,\mathrm{ch}\,\varphi + \cos\psi) + \bar{\varphi}\sin\psi\,(\mathrm{ch}\,\varphi + b\cos\varphi)}{\mathrm{ch}\,2\varphi - \cos 2\psi}, \quad (4)$$

$$D_2 = 2D\,\frac{\bar{\varphi}\,\mathrm{sh}\,\varphi\,(b\,\mathrm{ch}\,\varphi + \cos\psi) - \bar{\varphi}\sin\psi\,(\mathrm{ch}\,\varphi + b\cos\psi)}{\mathrm{ch}\,2\varphi - \cos 2\psi}, \quad (5)$$

$$D_3 = D\,\frac{\bar{\varphi}\,\mathrm{sh}\,2\varphi + \bar{\psi}\sin 2\psi}{\mathrm{ch}\,2\varphi - \cos 2\psi}, \quad (6)$$

$$D_4 = D\,\frac{\bar{\psi}\,\mathrm{sh}\,2\varphi - \bar{\varphi}\sin 2\psi}{\mathrm{ch}\,2\varphi - \cos 2\psi}, \quad (7)$$

$$\varphi = \bar{\varphi}\frac{W}{L_p} = \frac{W}{L_p}\sqrt{\frac{\sqrt{1+\omega^2\tau_p^2}+1}{2}}, \quad (8)$$

$$\psi = \bar{\psi}\frac{W}{L_p} = \frac{W}{L_p}\cdot\sqrt{\frac{\sqrt{1+\omega^2\tau_p^2}-1}{2}} \quad (9)$$

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ACC NR: AP7001184

It was found that the differential resistance of the junctions always varies in inverse proportion to the current. A direct proportional relation between diffusion capacitance and current is observed only when the leakage rates of carriers through the corresponding contact are low. The linear relation between capacitance and current becomes quadratic with an increase in current. In some cases, the diffusion capacitance can be used to determine the life of excess carriers and the base length. At high frequencies, the differential resistance and capacitance are not always inversely proportional to the square root of the frequency. Orig. art. has: 22 formulas.

SUB CODE: 20, 09/ SUBM DATE: 30Apr66/ ORIG REF: 003/ OTH REF: 001

Card 3/3

S/262/62/000/002/011/017
1008/1208

AUTHOR: Aronov, D., Koltypin, S. and Shestukhin, V.

TITLE: Effect on engine performance upon removal of scum from the cooli g system

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 42. Silovyye ustanovki, no. 2, 1962, 56, abstract 42.2.318. "Avtomob. transport", no. 4, 1961, 14-16

TEXT: Test have shown that the removal of scum from the cooling system of an engine by flushing it with acids improves, due to an increase in the packing factor and a decrease in detonation, the mechanical and economic efficiencies by 4%. The composition of a scum-removing solution of hydrochloric acid and a method of flushing the cooling system are given. There are 4 figures.

[Abstracter's note: Complete translation.]

Card 1/1

ARONOV, D.I.; KOLOV, V.I.; LERNER, M.S.

Effect of antiknock additives to gasoline on engine wear. Khim. i tekh.topl.i masel 5 no.7:43-46 Jl '60. (MIRA 13:7)
(Gasoline--Antiknock and antiknock mixtures)

ARONOV, D. L.

USSR/Chemistry - Isomerism
Chemistry - Spectra

Sep/Oct 48

"Studies of the Rotational Isomerism of Some 1,2-Dihalogen-ethanes by the Method of Combined Dispersion of Light," D. L. Aronov, V. M. Tatevskiy, A. V. Frost, ½ p

"Iz Ak Nauk SSSR, Ser Fiz" Vol XII, No 5

Studies combination dispersion spectra of 1,2-dichloroethane, 1-chloro, 2-bromoethane, 1,2-dibromoethane and 1,1,2,2-tetrachloroethane in the liquid phase over a wide range of temperatures. (Synopsis. For detailed description, see "Vest Moskov U" 1, 125, 1948.)

19/49T4

ARONOV, D.A.

Theory of the voltampere characteristics of a semiconductor diode with a small variable signal. Izv. AN Uz. SSR. Ser. Fiz.-mat. nauk no.1:65-74 '61. (MIRA 14:3)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Diodes)

ARONOV, D.L.

Processing of mixed synthetic and natural fibers on cotton spinning machines (from "Man-made Textiles," Jan. 1957). Tekst.prom. 20 no.2:91-92 F '60. (MIRA 13:6)
(Great Britain--Textile fibers, Synthetic)

ARONOV, D.L. [translator]

Shrink-proof finishing of fabrics (from "Man-made Textiles," May, 1959). Tekst. prom. 21 no.1:84-85 Ja '61. (MIRA 14:3)
(United States--Textile finishing)

ARONOV, D.L., inzh.

Improvement of sizing operations. Tekst. prom. 24 no.3:92-94 Mr 64.
(MIRA 17:9)

ARONOV, D.L.

New dryer for raw cotton(from "Textile Industries," July, 1961). Tekst.prom. 21 no.6:81 Je '61. (MIRA 15:2)
(United States--Cotton--Drying)

ARONOV, D.L.

Ringless spinning machinery S.R.R.L (from the "Textile World," May, 1962). Tekst.prom. 23 no.5:80-83 My '63. (MIRA 16:5)
(United States--Spinning machinery)

ARONOV, D.L.

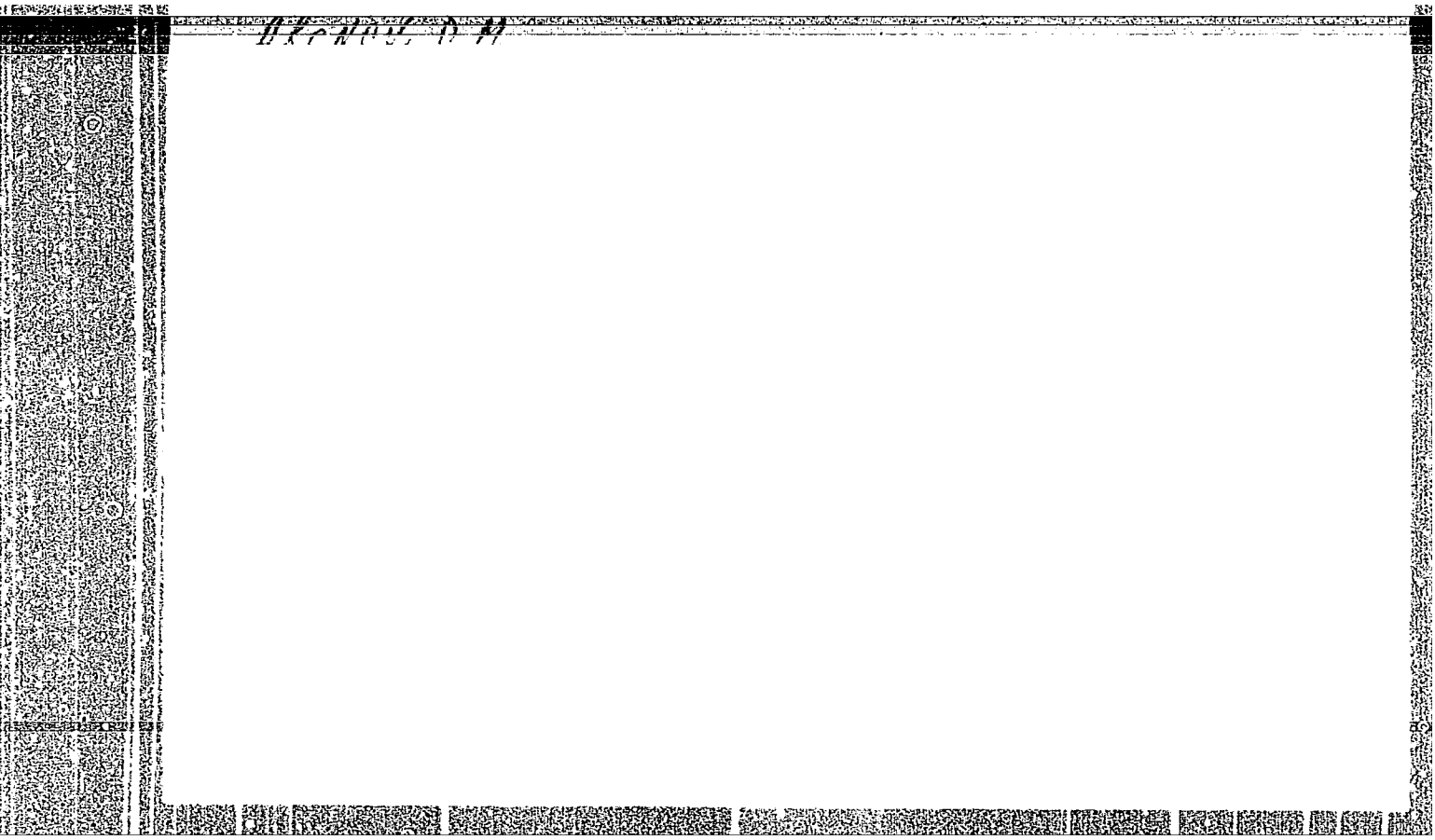
Reactive dyes for nylon. Tekst.prom. 21 no.2:82 Ja '61.
(MIRA 14:3)
(Dyes and dyeing—Nylon)

CHUDAKOV, Ye. A.; ARONOV, D. M.

Gasoline - Antiknock and Antiknock Mixtures

Requirements for antiknock property of automobile gasoline, depending upon structural characteristics and the type of work of an engine. Aronov. Avt. trakt. prom. No. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.



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ARONOV, D.M., kandidat tekhnicheskikh nauk; LEBEDINSKIY, A.P.

Technical and economic effectiveness of raising the octane number of automobile gasoline. Avt. i trakt.prom.no.10:5-11 O '56. (MLRA 10:1)

1. Nauchno-issledovatel'skiy avtomotornyy institut.
(Gasoline)

ARONOV, D.; MAST, V.

Engine wear due to detonation. Avt. transp. 34 no.12:19-22 D '56. (MLRA 10:2)

1. Nauchno-issledovatel'skiy avtomotornyy institut.
(Automobiles--Engines)

ARONOV, D.M., kandidat tekhnicheskikh nauk; LEBEDINSKIY, A.P.; GAL'PERIN, M.Ya.

Nonuniform performance of engine cylinders and gasoline octane requirements. Avt.i trakt.prom. no.4:3-8 Ap '57. (MLRA 10:5)

1.Nauchno-issledovatel'skiy avtomotornyy institut i Institut mashinovedeniya AN SSSR.
(Automobiles--Engines--Cylinders)
(Gasoline--Antiknock and antiknock mixtures)

AKONOV, D.; LEBEDINSKIY, A.

Disseminating advanced experience and new technical achievements. Avt. transp. 36 no.5:22 My '58. (MIRA 11:6)
(Transportation, Automotive--Study and teaching)

ARONOV, D.; LEBEDINSKIY, A.

Effect of carburetor needle regulation on the characteristics of the GAZ-51 engine. Avt. transp. 36 no.5:23-25 My '58. (MIRA 11:6)
(Automobiles--Engines--Carburetors)

BASOV, A.N.; ARONOV, D.M.; NOREYKO, L.M.

Economic effectiveness of increasing the octane rating of automobile gasoline. Khim. i tekh.topl. i masel 4 no.3: 60-64 Mr '59. (MIRA 12:4)

1. Institut nefti AN SSSR i Gosudarstvennyy soyuznyy ordena Trudovogo Krasnogo Znameni nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut Gosplana SSSR.
(Gasoline)

KONEV, Boris Fedorovich; ARONOV, David Matveyevich; KUROV, Boris Alekseyevich; LEBEDINSKIY, Aleksandr Pavlovich; NILOV, N.A., inzh., retsenzent; YEGORKINA, L.I., red.; NAKHIMSON, V.A., red.; TIKHANOV, A.Ya., tekhn.red.; UVAROVA, A.F., tekhn.red.

[Automobile carburetor engines; characteristics and methods for their determination] Avtomobil'nye karbiuratornye dvigateli; kharakteristiki i metody ikh opredeleniia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1960. 229 p. (MIRA 13:4)
(Automobiles--Engines)

ARONOV, D.M., kand.tekhn.nauk

Effect of changes in engine power on the dynamics of automobiles. Avt.prom. no.4:25-26 Ap '60. (MIRA 13:6)

1. Gosudarstvennyy soyuznyy ordena Trudovogo Krasnogo Znameni nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut. (Automobiles--Dynamics)

PANKOV, I.A.; ZABRYANSKIY, Ye.I.; ZARUBIN, A.P.; SHCHEGOL', V.V.; ARONOV, D.M.

IT 9-6 unit for the evaluation of the antiknock properties of automobile gasolines by means of a laboratory research method. Khim.i tekh.topl.i masel 5 no.10:49-54 O '60. (MIRA 13:10)
(Gasoline--Antiknock and antiknock mixtures)

SUKHAREVA, L. S., inzh.; ARONOV, D. M., kand. tekhn. nauk

Comparative investigation of overhead and bottom-valve combustion chambers in diesel engine compartments. Trudy MADI no.25:76-85 '60.
(MIRA 13:10)
(Diesel engines)

S/262/62/000/022/006/007
E194/E135

11.0171

AUTHORS: Lerner, M.O., Zaytsev, V.A., and Aronov, D.M.

TITLE: New anti-knock additives

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk, Silovyye ustanovki, no.22, 1962, 50, abstract 42.22.331. (In collection: Ekspluat.-tekhn. svoystva i primeneniye avtomob. topliv, smazochn. materialov i spetszhidkostey, no.2, 1961, M., Avtotransizdat. 17-18)

TEXT: A new anti-knock additive type ЦТМ (TsTM), based on manganese, has been tested in respect of anti-knock effectiveness, anti-wear properties and the tendency to deposit formation. The results are given and are compared with the corresponding values of standard tetra-ethyl lead fluid P-9 (R-9).

[Abstractor's note: Complete translation.]

Card 1/1

BRUSYANTSEV, Nikolay Vasil'yevich; ARONOV, Davld Matveyevich; KOLESNIK, P.A., red.; BODANOVA, A.P., tekhn. red.

[Motor-vehicle fuels; operating characteristics and use]Avtomobil'nye topliva; ekspluatatsionnye svoistva i primenenie. Moskva, Avtotransizdat, 1962. 98 p. (MIRA 15:7)
(Motor fuels)

S/890/61/000/002/001/007
A059/A126

AUTHORS: Aronov, D.M., Candidate of Technical Sciences

TITLE: Qualities of fuels and oils for prospective automobiles

SOURCE: Moscow. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta. Ekspluatatsionno-tekhnicheskiye svoystva i primeneniye avtomobil'nykh topliv, smazochnykh materialov i spetszhidkostey. no. 2, 1961, 5 - 16

TEXT: With reference to the trends in Soviet automotive industry, motor gasoline, Diesel fuels, oils, and transmission lubricants will have to meet requirements which are more rigorous than the present ones. For gasolines, the use of high-octane components with minimum content of toxic antiknocks, increased resistance to knocking and sooting by adding special additives, reduced content of aromatic compounds, and reduction of the boiling point by way of eliminating high-boiling fractions in the gasoline, are required. The production of seasonal and regional types of gasoline is provided for. High anticorrosive properties of the gasolines are obtained by desulfurization and the addition of corro-

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sion inhibitors, high resistance to pitching and sooting by removing the highly unsaturated compounds and by adding efficient stabilizers. Three kinds of gasoline are considered for mass production: 1) first-grade (for models of cars to be produced between 1961 and 1965); 2) second-grade (for cars produced in 1960); and 3) special-grade. Further development includes an increase in the octane number by 10 units. The fractional composition of the gasolines is controlled by the upper and lower limits of the saturated vapor pressures which are prescribed. Concerning Diesel fuels for future cars, increased cetane numbers, reduced pouring points, lighter and narrower cuts, complete desulfurization, low pitch content, and high viscosity indices are provided for, together with seasonal and regional types. The lubricating oils for future cars should exhibit high viscosity indices, high low-temperature qualities, high stability to oxidation and heat, good lubricating power, high anticorrosive properties, and good detergency. Thickeners, pour-point depressants, anitoxidants, anti-wear agents, corrosion inhibitors, detergents, and antifoaming agents are mentioned for type L (for easy operating conditions), S (mean operating conditions), T (hard conditions), and OT (extraordinarily hard conditions). Three seasonal types [M-6 (M-6), M-8, and M-10] of non-thickened oils and two types [M_3-6 (M_3-6) and

Qualities of fuels and oils for prospective ....

M_3-10] will be produced. The production of T (T) (general-purpose) and y (U) (universal-type) transmission oil either thickened (16 to 20 Centistokes at 100°C) for use in winter (pouring point -40°C) and in summer (pouring point -10°C) will be started. The importance of field tests for all these materials is stressed. There are 8 tables.

Card 3/3

S/890/61/000/002/002/007
A059/A126

AUTHORS: Lerner, M.O., Engineer, Zaytsev, V.A., Aronov, D.M., - Candidates of Technical Sciences

TITLE: New antiknocks

SOURCE: Moscow. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta. Ekspluatatsionno-tekhnicheskiye svoystva i primeneniye avtomobil'nykh topliv, smazochnykh materialov i spetszhidkostey. no. 2, 1961, 17 - 18

TEXT: Antiknocks based on the dicyclopentadienyl derivatives of metals were found to be equivalent to or exceeding the efficiency of tetraethyl lead. From these compounds, cyclopentadienyl tricarbonyl manganese (CTM) and its methyl derivative (MTCM) were the most outstanding. The antiknock AK-33X (AK-33Kh) based on the latter is also of interest. The toxicity of these antiknocks was experimentally established to be insignificant. The physicochemical properties of many such compounds were described by A.N. Nesmeyanov and Ye.G. Perevalova [Tsiklopentadiamidnyye soyedineniya metallov i rodstvennyye im soyedineniya (Cy-

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clopentadiamide compounds of metals and related compounds). Uspekhi khimii, XXVII, vyp. 1, 1958].

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A059/A126

AUTHORS: Lerner, M.O., Engineer, Zaytsev, V.A., Aronov, D.M., Candidates of Technical Sciences, Malanichev, S.G., Engineer (Deceased)

TITLE: Antiknock properties of CTM (cyclopentadienyl tricarbonyl manganese)

SOURCE: Moscow. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta. Ekspluatatsionno-tekhnicheskiye svoystva i primeneniye avtomobil'nykh topliv, smazochnykh materialov i spetszhidkostey, no. 2, 1961, 18 - 22

TEXT: The increase in the octane number of technical-grade motor gasoline and mixtures of the individual hydrocarbons was determined in dependence on the CTM and ethylfluid P-9 (R-9) concentrations, respectively, together with the knock-promoting efficiency of hydrocarbon halides (dichloroethane and ethylene bromide) added to ethylfluid to remove completely the metal from the cylinder. The octane numbers were determined with the standard setups ИТ 9-2 (IT 9-2) (motor tests) and ИТ 9-6 (IT 9-6) (research tests), respectively. The response of various types of hydrocarbons to CTM and ethylfluid R-9 was examined with mix-

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tures consisting of n-heptane (40% by volume) and one of the following hydrocarbons: iso-octane, benzene, cyclohexane, and di-isobutylene. Equal response to both CTM and ethylfluid R-9 has been established in all cases. The response of cyclohexane and benzene to CTM was lower than that with iso-octane, while that of di-isobutylene was minimal. In all cases, CTM was more efficient than R-9 in the two technical-grade gasolines A -56 (A-56) and A -72 (A-72) with the response of the latter to both antiknocks being less than that of the former. The octane number of methyl cyclopentadienyl tricarbonyl manganese determined with the research test method is nearly equal to that of CTM. Ethyl bromide in gasoline A-72 containing CTM is less efficient in reducing the octane number of CTM than is dichloroethane. CTM was experimentally shown to be more efficient than tetraethyl lead, and is highly efficient particularly in promoting the response of the fuels. There are 3 figures and 3 tables.

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AUTHORS: Lerner, M.O., Engineer, Zaytsev, V.A., Aronov, D.M., - Candidates of Technical Sciences

TITLE: The influence of CTM (cyclopentadienyl tricarbonyl manganese) on sooting in the engine

SOURCE: Moscow. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta. Ekspluatatsionno-tekhnicheskiye svoystva i primeneniye avtomobil'nykh topliv, smazochnykh materialov i spetszhidkostey. no. 2, 1961, 24 - 28

TEXT: The influence of CTM and ethylfluid P-9 (R-9) concentrations, respectively, on sooting with the motor gasoline A-72 (A-72) and the efficiency of hydrocarbon halides on the removal of manganese and its oxides from the combustion chamber have been examined. Antiknock-containing gasoline was tested by weighing the soot formed on the surface of a plug screwed into the combustion chamber. The method developed by K.K. Papok and collaborators [Nagary, lakovyye otlozheniya i osadki v automobil'nykh dvigatelyakh (Soots, deposited coatings,

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and sludges in automobile engines), Mashgiz, 1956] to evaluate sooting of Diesel fuels failed when it was used to examine the efficiency of metal and metal oxide removing agents. For this purpose, a soot-collecting valve was developed (Fig. 5). The quantity of soot on the valve was found to increase with the concentration of the antiknock, with CTM giving less soot than R-9. When, for instance, 1 g of CTM (0.27 g of metal) was contained in 1 kg of fuel, sooting was increased by 93% as compared to the gasoline containing no additive. When dichloroethane and ethyl bromide, respectively, were added in stoichiometric quantities (100%) to gasoline A-72 containing 1 g of CTM, sooting was reduced to 24 and 38%, respectively. If the concentration of the antiknock is further increased, the quantity of soot decreases and approaches that of antiknock-free gasoline. Halide-base removing agents are more efficient in the manganese-containing antiknock than in the lead-containing one. Thus, it has been shown that the new manganese antiknock produces less sooting than tetraethyl lead. There are 3 figures.

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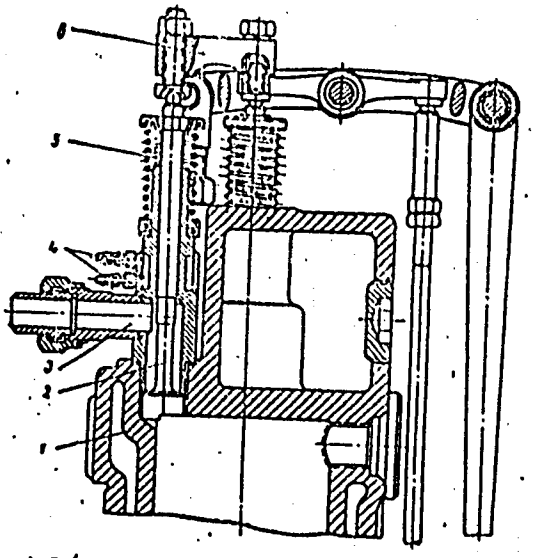

Figure 5: Scheme of the soot-collecting valve setup in the cylinder head of the engine MT 9-2 (IT 9-2): 1 - cylinder head; 2 - soot-collecting valve; 3 - outlet of exhaust gases; 4 - coolant supply to the valve sleeve; 5 - valve spring; 6 - valve drive.

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A059/A126

AUTHOR: Aronov, D,M., Candidate of Technical Sciences

TITLE: Antiknock qualities of automobile engines

SOURCE: Moscow. Nauchno-issledovatel'skiy institut avtomobil'nogo transporta. Ekspluatatsionno-tekhnicheskiye svoystva i primeneniye avtomobil'nykh topliv, smazochnykh materialov i spetszhidkostey. no. 2, 1961, 28 - 41

TEXT: Methods of testing the antiknock properties of internal-combustion automotive engines were developed under the guidance of the author by a team of collaborators of the Avtomobil'naya laboratoriya (Automobile Laboratory) of the AN SSSR (AS USSR), NAMI, VNII NP, and the automobile works. Bench tests were carried out. First, the controlling characteristics of the engine have to be determined from the angle of ignition advance (in degrees of deflection of the crankshaft, θ_{dc}) with full load for several rotary velocities of the crankshaft, and then the knock properties of the engine are to be established with several fuels. The final dependence of the change of duty and fuel economy on the octane

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numbers of the gasolines is shown in a figure, plotted from the results of the bench tests; the same is also true for the results of road tests performed on the engines. Optimum octane numbers were found to be between 78 and 90. The "knock index" (KI) has been introduced to characterize the knock quality of an engine; $KI = ON_a/ON_c$, with ON_a being the optimum octane number actually required by the engine, and ON_c the calculated mean octane number required by an engine with equal compression ratios and cylinder diameters. The knock index varies from 1.3 for failed designs and 0.8 for good-knock engines. As has been established by aspirant L. Sukhareva under the guidance of the author, tent-shaped combustion chambers gave maximum knock indices and wedge-shaped chambers minimum knock indices. The "index of utilization of the antiknock property of the fuel" (IAP) in the engine is the ratio of the actual liter turnover capacity of the engine (N_a) to the calculated capacity (N_c) determined from the experimental optimum octane number of the gasoline which is required by the engine. Its optimum values are 1.2, for inferior kinds 0.8. There are 8 figures and 1 table.

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BRUSYANTSEV, Nikolay Vasil'yevich; ARONOV, David Matveyevich; KOLESNIK, P.A., red.; GALAKTIONOVA, Ye.N., tekhn. red.

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(Motor vehicles--Lubrication)