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S/185/60/005/004/007/021
D274/D306

Effect of the external electric...

for a single surface state only. As the germanium and silicon surfaces have 4 fast states, it is of interest to generalize Johnson's formula for any number of states. V_p^S is determined from

$$V_p^S = \frac{kT}{e} \Delta Y \approx \frac{kT}{e} \cdot \frac{dY}{d\Delta_p} \Delta p, \quad (2)$$

where Δ_p is the relative increase in hole-concentration during illumination of the specimen. After some transformations one obtains

$$\frac{dY}{d\Delta_p} = \frac{\lambda(e^Y + e^{-Y} - 2) + \sum_j \beta_j \Phi_j}{(\lambda e^{-Y} - \lambda^{-1} e^Y + \lambda^{-1} - \lambda) + \sum_j \Phi_j}, \quad (11)$$

where

$$\beta_j = \begin{cases} +1 & \text{при } T_j \gg 1 \\ -\lambda^2 & \text{при } T_j \ll 1 \end{cases}, \quad (12)$$

$$\Phi_j = -\frac{2FN_j}{n_i L} [1 + e^{-(Y - \ln \lambda + \nu_j)}]^{-2} e^{-(Y - \ln \lambda + \nu_j)}$$

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Formulas (2) and (11) determine the dependence of the photo-emf V_p^S on the surface potential and surface states. Figures are shown with theoretical and experimental curves $V_p^S(Y)$. It is noted that the agreement between theory and experiment is good qualitatively only, whereas quantitatively there are discrepancies; these may be due to neglecting slow surface states, and to errors in determining the surface potential and surface states. Further, the drop is considered in the capacitor photo-emf which depends on Δ_p . For silicon, the time constants τ_p and τ are not only of different magnitude (in the absence of an external field), but their dependence on Y is of a different character too. It is likely that the formation of a p-n junction at the silicon surface hinders the relaxation of the photo-emf. The magnitude of τ_p is determined by diffusion processes and surface recombination. The surface conditions (zone buckling and surface states) have a considerable effect on the photo-emf of silicon and germanium. The surface potential Y can be determined in principle by comparing experimental and theoretical values of $V_p(U)$ and $V_p(Y)$. But such

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ASSOCIATION: Instytut fizyki AN USSR (Physics Institute AS UkrSSR)

SUBMITTED: November 5, 1959

J

Card 8/8

89270

S/181/61/003/001/002/042
B102/B212

94300 (1043, 1143, 1155)

AUTHORS: Primachenko, V. Ye. and Snitko, O. V.

TITLE: The role of a dielectric in investigations of the field effect in semiconductors

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 15-18

TEXT: One of the most important methods used to study the surface properties of semiconductors is the method of the field effect (change of the surface conductivity under the influence of an external electric field); here, the semiconductor is a capacitor plate which is covered with a dielectric (mica, strontium titanate) to increase the breakdown voltage. Therefore it is of interest to know the effect of the dielectric on the surface properties of the semiconductor; several studies made for this purpose (among others, by Shao and Morrison) are briefly discussed in the introduction. In the following, the authors report on their own experiments. First, they repeated the experiments of Shao and found that a considerable charge remains on the mica after the electrode has been removed under voltage. Then, experiments have been undertaken to measure

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B102/B212

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The role of a dielectric in...

the field effect and the capacitor photo-e.m.f. directly, with and without mica, in a vacuum and in air. These experiments were made with n- and p-type Ge and n-type Si. As the results obtained were similar, only those concerning the n-type Ge ($\rho = 28 \text{ ohm}\cdot\text{cm}$, thickness 340μ) are discussed. Fig. 1 shows the change of the conductivity $\Delta\sigma$ and the capacitor photo-e.m.f. V_{ph} , measured for 15 seconds after a constant field had been applied, as a function of the capacitor charge ($Q=CV$); C with mica has $25 \mu\text{F}$, without mica, $10.5 \mu\text{F}$. Fig. 2 illustrates the long-period relaxation effect of the field for various cases. It is demonstrated again that curves recorded with and without mica coincide in dry air and in a vacuum, while those recorded in humid air deviate considerably from each other. Relaxation is more rapid with mica. All experiments showed consistently that in fields up to $1-2 \cdot 10^5 \text{ v/cm}$, no charges are transferred from the semiconductor to the dielectric in dry air and in vacuo. Results obtained for humid air are indicative of a partial charge transfer to mica, which increases with humidity; this is related to the surface conductivity of mica in humid air. There are 2 figures and 9 references: 6 Soviet-bloc and 3 non-Soviet-bloc.

Card 2/5
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Sov. Physics AS USSR

SNITKO, O., kand.fiz.--matem.nauk

Semiconductors. Nauka i zhyttia 11 no.3:25-27 1fr '62.

(MIRA 15:8)

(Semiconductors)

44192

S/181/62/004/010/045/063
B102/B112

14177
11 15 77
AUTHORS:

Primachenko, V. Ye., Litovchenko, V. G., Lyashenko, V. I.,
and Snitko, O. V.

TITLE:

Minority carrier adhesion on the silicon surface

PERIODICAL:

Fizika tverdogo tela, v. 4, no. 10, 1962, 2925-2930

TEXT: This paper is aimed to show that under certain conditions a charge accumulation may occur on the silicon surface and that the bipolarity ($\Delta n = \Delta p$) may be disturbed. This is, however, contradictory to the observations made by other authors (see e.g. Phys.Rev.101, 1272, 1956; Semic.Surf.Phys., 85, 1957). The disturbance of bipolarity of the intrinsic photoconductivity observed is attributed to minority carriers accumulating on fast surface levels. The same method of investigation was used as described in previous papers (FTT 1, 980, 1959; FTT 2, 591, 1960; UFZh, 5, 345, 1960). The specimens were n-type Si single crystal platelets 200-400 μ thick with resistivities of 30 - 200 ohm-cm and volume lifetimes of $\sim 1000\mu$ sec, the surfaces of which had been etched with CP-8. In germanium the bipolarity of the surface photocurrent may be disturbed

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S/181/62/004/010/045/063
B102/B112

Minority carrier adhesion on ...

only at low temperatures, but in etched silicon it may be disturbed even at room temperature. This is proved (1) by the nature of the photo-conductivity relaxation of thin samples if the oscillogram shows two exponents with widely differing time constants; (2) by the constant τ_{sh} of the short-term photocurrent component being inversely proportional to the electric field applied; whereas the constant of the long-term component is independent of it; (3) by the fact that the long-term component can be caused to vanish by the usual method of trap filling; (4) by the long-term component increasing as the temperature decreases, while the short-term component decreases and almost vanishes completely, this being related to the intensified charge accumulation; in both cases $\ln \tau = f(1/T)$ follows a linear course; (5) by the results obtained in a study of the kinetics of the field effect also indicating a disturbance of bipolarity. This bipolarity is also indicated by the field dependence of τ_{sh} and τ_1 and (7) it is particularly pronounced in samples kept on air for a longer period of time after they had been etched. (8) Experiments on the condenser photo-emf proved that the disturbance of the photocurrent bipolarity of Si is related to a change in the surface charge. Such a

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Minority carrier adhesion on ...

disturbance occurs when $\frac{C_n}{C_p} \exp \frac{E_{tv} - \mu_{nc}}{kT} \ll 1$ and $\tau_c N_v C_p \exp(-E_{tv}/kT) \ll 1$

where C_p and C_n are the electron and hole trapping cross sections, E_{tv} the energy of the levels relative to the valence band, μ_{nc} the electron Fermi quasilevel relative to the conduction band, τ_c the recombinative lifetime and N_v the effective number of levels in the valence band. There are 3 figures.

ASSOCIATION: Institut poluprovodnikov AN USSR, Kiyev (Institute of Semiconductors AS UkrSSR, Kiyev)

SUBMITTED: February 6, 1962 (initially) June 12, 1962 (after revision)

NESTERENKO, B.A.; PASECHNIK, Yu.A.; SNITKO, O.V.; FROLOV, O.S.

Field effect in thin lead sulfide films. Fiz. tver. tela 5 no.11:
3199-3206 N '63. (MIRA 16:12)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

BONDARENKO, V.N. [Bondarenko, V.M.]; ZHINDULIS, A.I. [Zhyndulis, A.I.];
LITOVCHENKO, V.G. [Lytovchenko, V.H.]; SNITKO, O.V.;
FROLOV, O.S.

Effect of an external electric field on the work function
of thin lead sulfide films. Ukr. fiz. zhur. 8 no.10:1110-
1116 0 '63. (MIRA 17:1)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

I 10373-65 EWT(m)/EWP(b) IJP(c)/SSD/AEDC(a)/ESD(gs)/AFWL/ESD(t)/RAEM(t) JD
ACCESSION NR: AP4046597 S/0181/64/006/010/2913/2920

AUTHORS: Nesterenko, B. A.; Snitko, O. V.

TITLE: Investigation of atomically clean surfaces of germanium ^{1B}

SOURCE: Fizika tverdogo tela, v. 6, no. 10, 1964, 2913-2920 ²⁷

TOPIC TAGS: germanium, surface condition, surface conductivity, recombination, oxidation, surface potential, capture cross section

ABSTRACT: The surface conductivity, the field-effect kinetics and the generation-recombination noise of atomically clean and oxidized surfaces were investigated. The samples were rectangular slabs cut along the (111) plane from single-crystal p-type germanium (15 ohm.cm resistivity and 60 μ sec volume lifetime), and etched in CP-8. The atomically clean surface was obtained by helium-ion bombardment followed by heating to 700°C in 10^{-9} mm Hg vacuum. The oxidation was carried out in 5×10^{-4} mm Hg vacuum for several tens of hours. The

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L 10373-65

ACCESSION NR: AP4046597

clean surface had a high density ($\approx 10^{14} \text{ cm}^{-2}$) of fast surface levels with a 20 μsec time constant for the electron exchange with the valence band. This made the surface holes degenerate and gave rise to a considerable p-type surface conductivity. The oxidation of the surface reduced the density of these fast surface levels by several orders of magnitude and produced slow surface levels. The $1/f^2$ -type noise in the 1--5 kc frequency range was low for the clean surface but increased by several orders of magnitude on oxidation. The noise was due to fluctuations in the surface hole density due to thermal exchange between the surface acceptor levels. Therefore a study of the $1/f^2$ -type noise may be a convenient method of investigating the kinetics of surface levels with short time constants. Some parameters of the two types of germanium surface (the surface potential, the cross section for hole capture, etc.) were also determined. Orig. art. has: 7 figures and 2 tables.

ASSOCIATION: Institut poluprovodnikov AN UkrSSR, Kiev (Institute

Card

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L 10373-65

ACCESSION NR: AP4046597

of Semiconductors, AN UkrSSR)

SUBMITTED: 06Mar64

ENCL: 00

SUB CODE: SS

NR REF SOV: 008

OTHER: 013

Card

d. 3/3

L 20501-65 EWT(m)/EWP(b)/EWP(e)/EWP(t) Pq-4 SSD/AFWL/ESD(gs)/IJP(c) WH/JD
ACCESSION NR: AP4038648 S/0109/64/009/005/0876/0881

AUTHOR: Bondarenko, V. N.; Litvinova, E. M.; Snitko, O. V.; Tkhorik, Yu. A.

TITLE: Effect of some coatings and thermal treatment of the surface
recombination rate of silicon and germanium ²⁷

SOURCE: Radiotekhnika i elektronika, v. 9, no. 5, 1964, 876-881

TOPIC TAGS: silicon, metal coated silicon, germanium, metal coated ¹⁸
germanium, surface recombination, surface recombination rate

ABSTRACT: An experimental investigation of the effects of (1) low-temperature
annealing¹⁵ of Si and Ge in He atmosphere and in contact with low-melt inorganic
glasses and (2) coating Si and Ge with a very thin film of Au or Al upon the
surface recombination rate (s) is reported. Single-crystal, 0.4-0.7-mm thick,
Si and Ge plates were tested. Four types of glass were used: (1) $Tl_2SeAs_2Se_3$ ¹⁵
(with a softening temperature of 109C), $As_2Se_3 + I_{1.5}$ (85C), $As_2Se_3 + I_2$ (70C).

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L 20501-65

ACCESSION NR: AP4038648

and $Tl_2S \cdot 2As_2S_3$. It is found that annealing of n- or p-type Ge results in an increase of s by 2-3 times; a subsequent contact with glass results in an overall increase of s by 3-6 times. Annealing of Si results in 2-4 times lower s ; with a subsequent glass treatment, s was reduced to about 300 cm/sec. The same value of s was obtained by a vacuum-spraying of n-Si by gold (0.1-0.2 micron thick). The preliminary results of Al spraying were negative. "The authors wish to thank B. T. Kolomiyets and V. P. Shilo for lending the glasses." Orig. art. has: 1 figure, 2 formulas, and 3 tables.

ASSOCIATION: Institut poluprovodnikov AN UkrSSR (Institute of Semiconductors)
 AN UkrSSR

SUBMITTED: 22Mar63

ENCL: 00

SUB CODE: MM, SS

NO REF SOV: 006

OTHER: 004

Card 2/2

L 31047-65 EWT(l)/EWT(m)/EWP(t)/T/EWP(b)/EWA(h) Pz-6/Feb IJP(c) JD/AT

ACCESSION NR: AP5004321

S/0185/65/010/001/0039/0046

AUTHOR: Prymachenko, V. Ye. (Primachenko, V. Ye); Milenin, V.V.; Snitko, O.V.

33
39
B

TITLE: Investigation of gold-doped silicon surface

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 1, 1965, 39-46

TOPIC TAGS: silicon, surface state, doping, surface recombination, recombination rate, photo em

ABSTRACT: The method of single high-voltage pulses was used to investigate the field effect of 20 p-type silicon samples etched and doped with gold from the etching substance. The samples had an approximate resistivity 3500 ohm-cm and a non-equilibrium volume carrier lifetime 700 microseconds. The orientation of the investigated surface was (111). The method of etching and electrode deposition is described. Measurements were made of the conductivity, photoconductivity, and capacitive photoemf as functions of the external electrical field applied to the sample surface through a mica plate. The experimental set-up for measuring the field effect is shown in Fig. 1 of the Enclosure. The photoconductivity and

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L 31047-65

ACCESSION NR: AP5004321

capacitive photoemf were measured by applying rectangular pulses of white light with fronts up to 5×10^{-7} sec, produced by a rotating mirror. Details of the sample preparation and of the experimental procedure were described by one of the authors elsewhere (Snitko, with G. V. Litovchenko, *FTT* v. 2, 591 and 815, 1960). The measurements were made at 20C, with the temperature maintained constant with an ultrathermostat. By comparing the experimental results with the theory, the authors determined the parameters of the surface states on doped and undoped surfaces. The presence of 1×10^{-6} -- $1 \times 10^{-3}\%$ of gold in the etchant gives rise to an additional system of fast surface states, and also influences the parameters of the slow states. The most effective recombination level produced by the gold on the silicon surface lies 0.222 eV below the center of the forbidden band. This level is of the donor type ($C_n = 6 \times 10^{-15} \text{ cm}^2$, hole concentration $1 \times 10^{-22} \text{ cm}^2$), and the concentration of the level depends on the content of gold in the etchant, lying in the range $(0.8 \text{ -- } 4) \times 10^{12} \text{ cm}^{-3}$. To obtain small surface-recombination rates in silicon it is necessary to employ extremely pure reagents and to treat the surface in a way that precludes the introduction of harmful impurities. "The authors thank N. A. Petrov for help with etching the samples." Orig. art. has: 6 figures.

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L 31047-65

ACCESSION NR: AP5004321

ASSOCIATION: Instytut napivprovidnykiv AN UkrSSR (Institute of Semiconductors AN UkrSSR), Kiev

SUBMITTED: 12May64

ENCL: 01

SUB CODE: 88

NR REF SOV: 008

OTHER: 007

Card 3/4

L-31047-65

ACCESSION NR: AP5004321

ENCLOSURE: 01

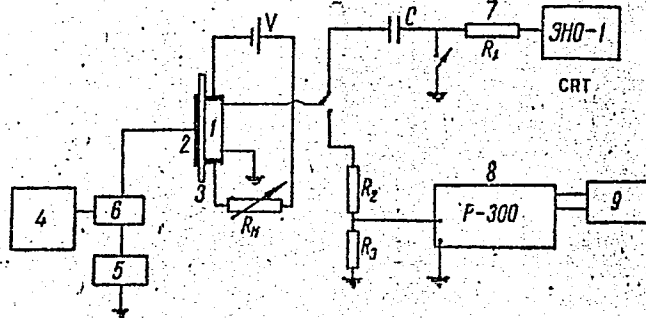


Fig. 1. Circuit for measuring the field effect.

- 1 - silicon sample, 2 - electrode, 3 - mica, 4 - square-wave generator,
- 5 - high-voltage pulse source, 6 - relay for hv pulses, 7 - oscillograph coupling circuit, 8 - circuit for measurement of the conductivity change,
- 9 - galvanometer

Card 4/4

L 31050-65 EWT(l)/EWT(m)/EWP(t)/T/EEC(b)-2/EWP(b) IJP(c) JD/GG
ACCESSION NR: AP5004322 8/0185/65/010/001/0047/0054

29
28
B

AUTHOR: Nesterenko, B.O. (Nesterenko, B.A.); Pasichnyk, Yu. A. (Pasechnik, Yu.A.);
Snitko, O.V.; Frolov, O.S.

TITLE: Investigation of the influence of an external electric field on the photo-
conductivity and noise of thin layers of lead sulfide

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 1, 1965, 47-54

TOPIC TAGS: lead sulfide, photoconductivity, noise voltage, dark conductivity,
field effect ✓ ✓

ABSTRACT: The authors studied the influence of surface factors (external electric field, adsorption of molecules) on the photoconductivity and low-frequency noise of thin lead-sulfide layers. Measurements were made of the dark conductivity, the stationary photoconductivity, the photoconductivity time constant, and the noise amplitude at 400 cps, on chemically and physically prepared PbS layers, as functions of the external electric field, the surrounding gas atmosphere, and low-temperature heating. The test set-up for the conductivity noise amplitude is illustrated in Fig. 1 of the Enclosure. The bulk of the measurements were made in

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ACCESSION NR: AP5004322

vacuum (1×10^{-6} mm Hg) and in dry air. The results have shown that physically and chemically deposited layers behave differently. Chemical layers had a conductivity relaxation that decreased with time following application of an external electric field, and exhibited appreciable influence of the external field on the photoconductivity and on the time constant. The physical layer showed a time-increasing conductivity, and no effect of the external field whatever. The dependence of the photoconductivity of chemical layers on the external field usually had a maximum which varied with the sample. It is assumed that to the left of the maximum the decrease in photoconductivity is connected with the increased rate of surface recombination, and to the right of the maximum it is possibly due to a decrease in the effective mobility. Tests have shown that there is no difference in the properties of the external surface of chemical layers and the surface in contact with the substrate. An external electric field and the surrounding gas atmosphere exerts a noticeable influence on the noise amplitude at 400 cycles. The surrounding gas and heating to 100C affect strongly the electrical parameters of chemical layers, with the most noticeable change taking place in the dark conductivity, which decreases in vacuum and also after heating in dry air. Some of the results are interpreted in light of earlier investigations by the authors.de-

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ACCESSION NR: AP5004322

voted to the effect of the field on the dark conductivity (FTT v. 5, 3199, 1963).
Orig. art. has: 7 figures, and 1 table.

ASSOCIATION: Instytut napivprovidnykiv AN UkrSSR, Kiev (Institute of Semiconductors,
AN UkrSSR)

SUBMITTED: 15May64

ENCL: 01

SUB CODE: EM,SS,OP

HR REF SOV: 004

OTHER: 010

Card 3/4

L 31050-65

ACCESSION NR: AP5004322

ENCLOSURE: 01

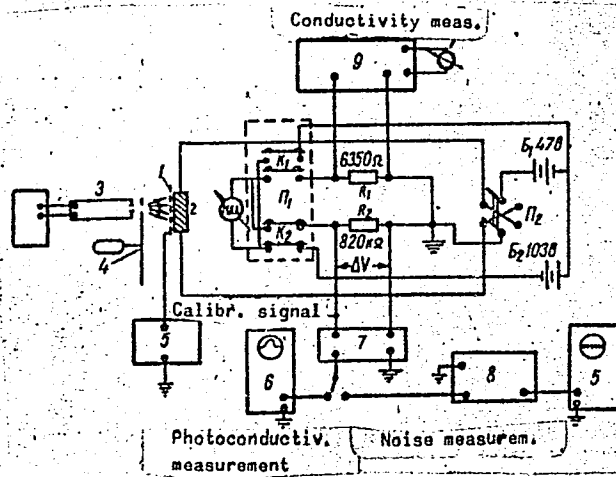


Fig. 1. Circuit for measurement of dark conductivity, photoconductivity, and noise amplitude.

- 1 - Transparent electrode, 2 - PbS sample, 3 - light source,
- 4 - motor with disc, 5 - high-voltage rectifier, 6 - oscillograph,
- 7 - cathode follower, 8 - amplifier,
- 9 - potentiometer

Card 4/4

L 51445-65 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) Pz-6/Peb IJP(c) JD/
ACCESSION NR: AP5011064 AT UR/0185/65/010/004/0382/0388

AUTHOR: Prymachenko, V. Ye. (Primachenko, V. Ye.); Snitko, O. V.; Milenin, V. V.

TITLE: Investigation of the non-equilibrium effect of depletion of majority carriers from silicon

SOURCE: Ukrayins'kyi fizychnyy zhurnal, v. 10, no. 4, 1965, 382-388

TOPIC TAGS: field effect, nonequilibrium effect, silicon, carrier depletion, conductivity modulation

ABSTRACT: The non-equilibrium field effect was investigated under the condition of intense depletion of majority carriers from silicon. The measurements were made at room and low temperatures (down to 170K) on p- and n-type samples measuring 1.2 x 0.5 x (0.02--0.05) cm. The samples were placed in a cryostat in which a vacuum of $\sim 1 \times 10^{-6}$ mm Hg was maintained. A diagram of the measurement set-up is shown in Fig. 1 of the Enclosure. Two methods of attaining non-equilibrium depletion were used -- turning on depleting field and turning off enriching field. Appreciable modulation of the conductivity of the silicon plates was observed, reaching complete removal of the movable carriers from them. Under such conditions the conductivity of a thin silicon plate dropped practically to zero. The

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ACCESSION NR: AP5011064

2

temperature dependence of the duration of such a state and of the half-life of the non-equilibrium field effect were investigated. A study was also made of the dependence of the duration of such a state and of the half-life on the applied voltage. Application of light exerts a noticeable influence on the non-equilibrium field effect. The results obtained demonstrate the possibility of employing the pulsed field effect in the depletion mode to obtain a non-equilibrium state without free carriers in the interior of a crystal at a depth on the order of several hundred microns (charged dielectric). At low temperature (-120C) this state exists for a relatively long time (tens of seconds) owing to the slowed down rate of thermal generation of surface charge, which does not have time to screen the external electric field in the pulsed depletion mode. A detailed discussion of the results on this basis of theoretical calculations are presented in a companion article (Accession Nr. AP5011065). Orig. art. has: 6 figures.

ASSOCIATION: Instytut napivprovidnykiv AN URSR, Kyiv [Institut poluprovodnikov AN UkrSSR, Kiev] (Institute of Semiconductors, AN UkrSSR)

SUBMITTED: 07Aug64

ENCL: 01

SUB CODE: SS

NR REF SOV: 004

OTHER: 002

Card 2/3

L 51445-65
ACCESSION NR: AP5011064

ENCLOSURE: 01

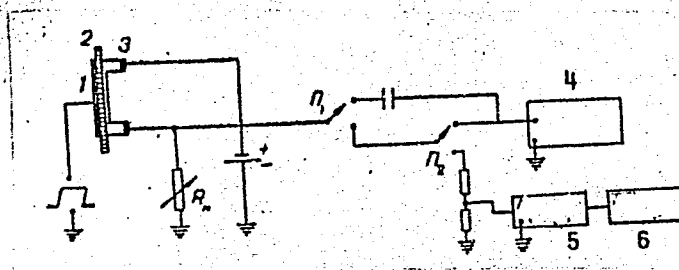


Fig. 1. Diagram of circuit for field-effect measurement

- 1 - Metallic electrode, 2 - mica, 3 - sample, 4 - Oscilloscope,
- 6 - potentiometer, 7 - galvanometer

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L 51444-65 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) Pz-6/Peб IJP(c)

JD/AT

ACCESSION NR: AP5011065

UR/0185/65/010/004/0389/0397

AUTHOR: Prymachenko, V. Ye. (Primachenko, V. Ye.); Snitko, O. V.; Milenin, V. V.

TITLE: Concerning the mechanism of the non-equilibrium effect of depletion of majority carriers from silicon 27

26
B

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 4, 1965, 389-397

TOPIC TAGS: field effect, nonequilibrium effect, silicon, carrier depletion, conductivity modulation

ABSTRACT: This is a theoretical explanation of the field effect in non-equilibrium depletion, proposed in the preceding paper in the same source (Accession Nr. 5011064). The change in the space charge, the electric field, the conductivity, and capacitance of the semiconductor are calculated as functions of the potential drop across the semiconductor in the non-equilibrium mode. It is shown that the calculated value of the depth of penetration of the field at the instant of the blocking of the current coincides with the thickness of the silicon plate, while the calculated value of the mobility of the field effect, with account of the change in the capacitance coincides in the case of large fields with the drift

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ACCESSION NR: AP5011065

mobility of the holes in the volume. This offers evidence of the quantitative agreement between the theoretical model and the experimental data, and confirms the main idea of the proposed mechanism, in which the dominant role is played by the majority carriers and the change in the conductivity and in the slowing down of the rate of their generation with decreasing temperatures from the surface level. The generation of the majority carriers within the volume of the semiconductor from local centers, and the generation of the minority carriers, apparently play no essential role. Orig. art. has: 8 figures and 14 formulas.

ASSOCIATION: Instytut napivprovidnykiv AN URSSR, Kyiv [Institut poluprovodnikov AN UkrSSR, Kiev] (Institute of Semiconductors, AN UkrSSR)

SUBMITTED: 07Aug64

ENCL: 00

SUB CODE: SS

NR REF SOV: 004

OTHER: 003

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me
Card 2/2

L 1562-66 EWT(m)/EPF(c)/EWP(t)/EWP(b) IJP(c) JD/WB

ACCESSION NR: AP5018635

UR/0185/65/010/007/0745/0752

AUTHORS: Nesterenko, B. O. (Nesterenko, B. A.); Snitko, O. V.

TITLE: Effect of oxidation on the properties of an atomically clean silicon surface

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 10, no. 7, 1965, 745-752

TOPIC TAGS: oxidation, surface ionization, surface property, silicon

ABSTRACT: The purpose of the work was to obtain information on the type, concentration, and other parameters of electronic levels of atomically clean and oxidized surfaces of silicon by studying the surface conductivity, the direct-current and voltage-pulse field effects, the noise and rate of recombination. Four samples cut out from single-crystal p-type silicon parallel to (111) were investigated at 295K. The specific resistance of the samples was 600 -- 1000 ohm-cm. The surface was bombarded with argon ions with subsequent heating to 1000K in a vacuum no worse than 1×10^{-9} mm Hg. Amplitudes of ± 200 v

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ACCESSION NR: AP5018635

and 40 μ sec to 2 millisecc long were used in the studies with voltage-pulse field effect. The hole conductivity of an atomically clean surface was found to be 1.3×10^{-7} ohm $^{-1}$. The adsorption of oxygen at 5×10^{-7} mm Hg leads to an increase of the surface conductivity by 4×10^{-8} ohm $^{-1}$. Further oxidation does not lead to appreciable changes. It is shown that an atomically clean surface of p-type silicon has a surface potential $\chi_s = 7-12$ kT/e. The nonexponential decay of the induced conductivity in the voltage-pulse field effect indicates screening of the external field by several different energy levels. The rate of surface recombination on a clean surface is large (1.2×10^3 cm/sec). The noise obeys a $1/f$ law. Oxidation of the surface affects its properties, with the exception of the kinetics of the field effect and noise, little. A correlation is observed in the change of the kinetics of the field effect and noise on oxidation. It is concluded that the effect of fast surface states in the noise

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ACCESSION NR: AP5018635

mechanism is appreciable. The appearance of slow levels in the oxidation process is demonstrated. Considerable differences are found between atomically clean surfaces of silicon and germanium. 'In conclusion the authors express their sincere gratitude to Professor V. I. Lyashenko, senior scientist V. G. Litovchenko, and junior scientist R. O. Litvinov for detailed discussions of the results and for valuable advice, and also the laboratory member comrade V. T. Rozumnyuk for help in carrying out the experiment.' Orig. art. has: 4 figures.

ASSOCIATION: Instytut napivprovidnykiv AN URSR [Institut poluprovodnikov AN UkrSSR] (Institute of Semiconductors, AN UkrSSR)

SUBMITTED: 24Nov65

ENCL: 00

SUB CODE: SS, GC

NR REF SOV: 005

OTHER: 012

Card

3/3

L 5266-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/AT
ACC NR: AP5022445 SOURCE CODE: UR/0109/65/010/009/1733/1735

AUTHOR: Primachenko, V. Ye.; Snitko, O. V.; Matsas, Ye. P. 44,45 44,45 44,45

43
B

ORG: none

TITLE: Investigation of the gold-doped physical surface of germanium 27

SOURCE: Radiotekhnika i elektronika, v. 10, no. 9, 1965, 1733-1735

TOPIC TAGS: germanium semiconductor, semiconductor research

ABSTRACT: The results of an experimental investigation of n-Ge specimens (45 ohms-cm, volume lifetime, 1 μsec) etchant-doped with Au are reported. Fast-state charge vs. surface potential and surface recombination rate vs. surface potential curves are shown. It is found that the Au-doping produces a second recombination level located above the E₁ (E₂ = +6kT) with capture cross-sections of C_{n2} = 10⁻¹⁶ cm², C_{p2} = 3 x 10⁻¹³ cm² (acceptor level). The Au-doping also creates a set of fast nonrecombination states located higher and lower than the center of the forbidden band E₁ as compared to E₁ and E₂. "The authors wish to thank N. A. Petrova for her help in doping the specimens." Orig. art. has: 2 figures. 44 55

UDC: 539.293.011.7:535.215.12:546.289
SUB CODE: EC/ SUBM DATE: 23Nov64/ ORIG REF: 003/ OTH REF: 003
0901 1148

L 20401-66 EWP(t) IJP(e) JD

ACC NR: AP5024755

SOURCE CODE: GE/0030/65/011/002/0711/0718

AUTHOR: Primachenko, V. E.; Snitko, O. V.; Milenin, V. V. 41
B

ORG: Institute of Semiconductors, Academy of Sciences UkrSSR, Kiev

TITLE: Nonequilibrium field effect on Si in the region of high depletion 27

SOURCE: Physica status solidi, v. 11, no. 2, 1965, 711-718

TOPIC TAGS: silicon semiconductor, electric conductivity, semiconductor band structure, nonequilibrium

ABSTRACT: The features of the non-equilibrium field effect are investigated for silicon in the region of high majority carrier depletion and non-equilibrium between the energy bands. The observed effects are a strong asymmetry of the amplitude dependence of conductivity with respect to the sign of the external field, a current-pinch effect, and a strong dependence of the kinetics of field effect

Card 1/2 2

L 20401-66

ACC NR: AP5024755

on field strength, temperature, and light intensity. A mechanism is proposed for the non-equilibrium field effect in the depletion region which involves a strong retardation of screening by surface states at low temperatures and thus allows penetration of the field into the volume of the crystal. The experimental data agree quantitatively with the calculation. Orig. art. has: 4 formulas, 10 figures. [Based on author's abstract]

SUB CODE: 20,09/ SUBM DATE: 16Jul65/ SOV REF: 003/ OTH REF: 003/

Card 2/2 BK

L 23113-66 EWT(m)/EWP(t) IJP(c) JD/JG

ACC NR: AP6006870

SOURCE CODE: UR/0181/66/008/002/0611/0613

AUTHOR: Klimovskaya, A. I.; Snitko, O. V.

ORG: Institute of Semiconductors, AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR)

TITLE: Influence of the adsorption of gold, aluminum, and antimony on the properties of atomically-pure germanium surface

SOURCE: Fizika tverdogo tela, v. 8, no. 2, 1966, 611-613

TOPIC TAGS: germanium, surface property, adsorption, electric conductivity, field emission, valence band, semiconductor impurity, aluminum, gold, antimony

ABSTRACT: To determine the properties of atomically-pure germanium surfaces and surfaces doped with certain elements, the authors investigated at 23C the surface conductivity of p-germanium with resistivity 40--50 ohm-cm and its response to an external electric field (field effect). The samples (0.5 x 0.5 x 0.05 cm) were cut parallel to the (111) plane and placed in an experimental tube, the pressure in which was maintained at a level down to $\sim 1 \times 10^{-9}$ torr. The surface was cleaned by cathode sputtering of the germanium in an argon atmosphere followed by annealing. The conductivity was measured with the aid of sealed-in molybdenum contacts. The field effect at constant voltage was measured with the aid of a field elec-

Card 1/2

L 23113-66

ACC NR: AP6006870

trode mounted over the surface of the sample. An investigation of the dependence of the conductivity on the charge induced on the surface has shown that an atomically-pure germanium surface has a clearly pronounced conductivity of p-type, brought about by a large negative charge $(1-7) \times 10^{12}$ el/cm² in the surface acceptor states located near the top of the valence band. Deposition of impurities on the atomically-pure surface changed its properties markedly. Gold and aluminum increased the resistivity with increasing concentration, while an increased concentration of antimony decreased surface resistivity. The field effect was also found to be strongly influenced by the state of the surface when gold was used for doping. Antimony exerted no influence on the field effect, although it did change the conductivity to a considerable degree. This indicates that gold forms acceptor surface states near the top of the valence band, screening the external electric field, while antimony produces donor states which lie above the valence band and above the Fermi level, and therefore do not take part in the screening. Both aluminum and antimony form acceptor and donor states on the surface of the germanium, in analogy with their behavior in the interior of the germanium. No such behavior is observed for gold. Orig. art. has: 2 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 20Sep65/ ORIG REF: 002/ OTH REF: 005

Card 2/2 *105*

L 8967-66 EWT(l)/EWT(m)/T/EWP(t)/EWP(h)/EWA(h) IJP(c) JD/AT
 ACC NR: AP5027432 SOURCE CODE: UR/0181/65/007/011/3422/3424

AUTHOR: ^{44,55} Pasechnik, Yu. A.; ^{44 55} Snitko, O. V. 74
B

ORG: ^{44,55} Institute of Semiconductors AN UkrSSR, Kiev (Institute popuprovodnikov AN UkrSSR)

TITLE: Infrared photoconductivity of silicon due to electron surface states

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3422-3424 ²⁷

TOPIC TAGS: photoconductivity, IR photoconductor, silicon semiconductor ^{21,44,55} ^{21,44,55}

ABSTRACT: Experiments are conducted to detect impurity surface photoconductivity in gold-doped polished silicon. The specimens were p-type silicon with a resistivity of 3500 Ω·cm and a carrier lifetime of 700 μsec, with dimensions of 1.2 × 0.4 × 0.05 cm. IR photoconductivity spectra are given for specimens before and after polishing, and before and after doping. Photoconductivity begins at 4.07 μ for a polished surface, and at 3.78 μ for a gold-doped surface and then increases monotonically as the wavelength is reduced. Studies of the effect of an external electric field on the impurity photoconductivity in these specimens showed an increase in the effect when a positive surface charge is induced. A theoretical explanation is given for the phenomena observed. The authors are grateful to V. Ye. Primachenko, V. G. Litovchenko and O. S. Frolov for discussion of the work. Orig. art. has: ^{44,55} 2 figures.

^{44,55} SUB CODE: 20/ SUBM DATE: 31May65/ ORIG REF: 004/ OTH REF: 003

Card ^{44,55} 1/1 2

AP7003610

SOURCE CODE: UR/0185/66/011/012/1316/1323

AUTHOR: Snitko, O. V.; Pasichnyk, Yu. A. Pasechnik, Yu. A.

ORG: Institute of Semiconductors, AN URSR, ^{Kiev}(Instytut napivproyidnykiv AN URSR)

TITLE: Investigation of extrinsic photoconductivity of a gold-doped silicon surface

SOURCE: Ukrayinsk'kyy fizychnyy zhurnal, v. 11, no. 12, 1966, 1316-1323

TOPIC TAGS: photoconductivity, IR photoelectric cell, IR photoconductor, IR spectrum

ABSTRACT: The extrinsic infrared photoconductivity spectrum of a silicon surface doped with gold was studied. Specimens of p-type (800—3500 ohm.cm resistivity) and n-type (resistivity 300 ohm.cm) silicon measuring 1 x 0.5 x 0.05 cm were used. Surface infrared conductivity was observed as temperature decreased. The magnitude and shape of the spectrum were dependent on the gold concentration in the etchant. The external electrical field affected surface intrinsic photoconductivity; the greatest effect was observed for the long-wave region of the spectrum. This proposed mechanism of surface infrared photoconductivity is in good qualitative agreement with experimental results. Orig. art. has: 5 figures and 6 formulas. [WP]

SUB CODE: 20/ SUBM DATE: 13Apr66/ ORIG REF: 007/ OTH REF: 003

Card 1/1

SNITKO, P.G., [Snitko, P.H.], dots., kand. istor.nauk

Great international force. Nauka i zhyttia li no.2:4-6 F '61.
(MIRA 14:3)

(Socialist countries)

SNITKO, F., ⁶Handlistor.nauk

Program of the development of communism. Nauka i zhyttia 11 no.8:
1-6 Ag '61. (MIRA 14:12)
(Communism) (Russia--Economic conditions)

SEDLUKHA, G.A., inzh.; SNITKO, V.A., inzh.; URNICH, A.B., kand. tekhn. nauk

Automating finishing operations on facades of buildings. Stroi.
i dor. mash. 9 no.3:15-17 Mr '64. (MIRA 17:6)

SHITKO, Vladimir Aleksandrovich; SEDLUKHA, Georgiy Andrianovich;
LEVCHENKO, Ya.V., red.

[New machines for facade operations] Novye mashiny dlia fa-
sadnykh rabot. Leningrad, 1965. 22 p. (MIRA 18:7)

155T6

USSR/Biology - DDT
Insectology

Jan 50

"Relationship of Generation Phase of the Destructive Eurygaster (Eurygaster Intergriceps Put.) to DDT," I. K. Tsitovich, Yu. S. Snitko, Krasnodar Kray Experimental Sta for Plant Protection, 3 pp

"Dok Ak Nauk SSSR" Vol LXX, No 1

Many authors have shown resistance of various insects to DDT depends on seasonal dynamics of physiological stages; thus, insects of same genus but in different stages of development will be affected differently by DDT. Reports results of studies conducted on

155T6

USSR/Biology - DDT (Contd)

Jan 50

Eurygaster intergriceps Put. to determine effect of DDT at various development stages. Finds DDT is most effective against larvae. Submitted by Acad L. A. Orbell 5 Sep 49.

SNITKO, Yu. S.

155T6

USSR/Biology (Agriculture) Nov/Dec 51
Chemistry - Herbicides

"Data on Comparative Tests for the Evaluation of Domestic Herbicides," I. K. Tsitovich, Yu. S. Snitko, Krasnodar Expt Station of Plant Protection

"Agrobioslogiya" No 5, pp 129-132

Carried out field tests on the extermination of weeds in wheat fields with 2,4-DU /2,4-dichlorophenoxyacetic acid/, 2M-4Kn /2-methyl-4-chlorophenoxyacetic acid/ and DIMOK /dichloromagnathoxyacetic acid /2/ of

200T15

USSR/Biology (Agriculture) Nov/Dec 51
Chemistry - Herbicides (Contd)

domestic manuf. Found that these products were in no way inferior to imported 2,4-D and methoxone."

200T15

SNITKO, Yu. S.

17H

CA SMITKO, Yu. S.

Dynamics of the numbers of weeds in plantings treated with herbicides. I. K. Tsitovich and Yu. S. Smitko (Krasnodar Plant Expt. Station). *Doklady Akad. Nauk S.S.S.R.* 77, 449-52 (1951). 2,4-D (I), 2-methyl-4-chlorophenoxyacetic acid (II), and Na dinitro-*o*-cresoxide (III) give complete elimination of only the most sensitive weeds (*Imbrosia artemisiifolia*, *Xanthium strumarium*, *Capsella bursa-pastoris*, *Thlaspi arvense*, *Abutilon arvense*, and sunflower) when the herbicides are sprayed at a dosage of 0.75-1.5 kg./ha. in 500-1000 l. H₂O. Annuals, as *Chenopodium album* and *Amaranthus retroflexus*, when treated with the above dose of I, redevelop to 20-30% of the original population in about 1.5 months. *Polygonum convolvulus* and *P. arvense* redevelop but more weakly. Among the perennials, only *Cirsium arvense* failed to reestablish an above-ground growth in 2 months after the action of I or II. III is effective on the more sensitive weeds, but has poor activity on the perennials in comparison with I or II.

G. M. Kosolapoff

ACC NR: AP7006118

SOURCE CODE: UR/0209/67/000/001/0060/0063

AUTHORS: Snitkovskiy, A. (Candidate of geographical sciences); Sorochinskiy, M. (Candidate of geographical sciences); Pshenichner, B.

ORG: none

TITLE: The satellite searches for hurricanes

SOURCE: Aviatsiya i kosmonavtika, no. 1, 1967, 60-63

TOPIC TAGS: meteorologic satellite, ^{LONG RANGE} weather forecasting, storm, heat radiation, meteorologic research facility

ABSTRACT: Meteorologic satellites are put into orbits of 600--800 km to relay information and advance warning on the formation and location of hurricanes and cyclones. The satellites also relay information on the distribution of solar energy for long-range weather forecasting and on the distribution of the ultraviolet sector of the solar spectrum for determining ozone content and for studying the optic properties of the atmosphere. Kosmos-122 measures atmospheric radiation, radiation from the earth, elements of radiation balance, and radiation in ranges of 0.3--30 microns and 8--12 microns. Cameras on board take infrared pictures on day and night sides of the earth. Computers reduce the data for a global chart showing distribution of radiation intensity. Plans call for launching additional weather satellites which

Card 1/2

ACC NR: AP7006118

can be maneuvered to designated positions by signals (Polet-1 and Polet-2). Orig. art. has: 1 sketch and 1 photograph.

SUB CODE: 2204/

SUBM DATE: none

Card 2/2

ACC NR: AT6032990

SOURCE CODE: UR/2546/66/000/149/0097/0101

AUTHOR: Snitkovskiy, A. I.

ORG: Central Institute of Forecasts (Tsentral'nyy institut prognozov)

TITLE: Kinetic energy distribution in an intensively deepening cyclone ¹²⁻

SOURCE: Moscow. Tsentral'nyy institut prognozov. Trudy, no. 149, 1966. Rezul'taty ispytaniy razlichnykh sposobov kratkosrochnykh prognozov pogody (Results of analyses of various short-range weather forecasting methods), 97-101

TOPIC TAGS: atmospheric physics, cyclone energy, cyclogenesis, atmospheric kinetic energy, high wind, *CYCLONE, WIND VELOCITY*

ABSTRACT: At 0300 hr on 29 September 1963, a poorly defined wave disturbance appeared on an Arctic front over the southwestern part of the Black Sea. A slight drop in pressure preceded the warm front. On 29 September, the pressure dropped 2.3 mb in 3 hr, and a 1013-mb cyclone appeared at the peak of the wave disturbance. The pressure in the cyclone dropped to 951 mb by 1500 hr on 1 October, then the pressure at the center of the cyclone began to rise. While deepening, the cyclone travelled 2600 km from the Black Sea to Syktyvkar. Ground-level wind speeds behind the cold front reached 25-40 m/sec (55-88 mph).

Card 1/3

ACC NR: AT6032990

and contributes to the increase in the kinetic energy at ground level; this leads, in time, to rising winds at ground level, even at the beginning of the cyclone. [WA-50; CBE No. 12]

SUB CODE: 04/ SUBM DATE: .none/ ORIG REF: 001/

Card 3/3

ACC NR: AT6032990

A study was made of the kinetic energy in different parts of the cyclone and its changes in time, from the appearance of the wave until the cyclone had filled at ground level, with measurements made at ground level and on the 850-, 700-, 500-, 300-, and 200-mb surfaces at 0300 and 1500 hrs Moscow time. These values were calculated in knots per unit mass, then averaged for areas of 1500 x 1500 and 500 x 500 km². The network was a grid of 1500 km on each side (7 x 7 points per step of 250 km, subdivided into 9 smaller squares of 500 x 500 km²). The wind speeds on the 850-, 700-, 500-, 300-, and 200-mb surfaces are assumed to be equal to geostrophic wind speeds. The center of each square was superposed on the crest of the wave or the center of the cyclone at the surface when obtaining data on pressures and the geopotential needed to calculate wind speeds on the isobaric surfaces. Wind speeds were calculated by finite-difference formulas, and all calculations of the kinetic energy were run on a high-speed computer.

Analysis of the data showed that most of the change in kinetic energy in the middle and upper troposphere occurred in the first few 12-hr periods after the cyclone appeared at ground level; this makes it reasonable to assume that during cyclogenesis, part of the energy at high levels is transferred to lower levels

Card 2/3

L 62972-65 EWT(1)/FCC GW

ACCESSION NR: AT5016799

UR/2546/65/000/146/0053/0062

AUTHOR: Snitkovskiy, A. I.

TITLE: The distribution of energy along a vertical and its relation to the evolution and movement of cyclones

SOURCE: Moscow. Tsentral'nyy institut prognozov. Trudy, no. 146, 1965. Regional'nyye zakonomernosti i prognoz gidrometeorologicheskikh yavleniy (Regional regularities and forecasting of hydrometeorological phenomena), 53-62

TOPIC TAGS: cyclone, climatology, meteorology, weather forecasting, atmosphere, atmospheric movement

ABSTRACT: The distribution and time variation of kinetic, potential, and internal energy in cyclones are studied. For this purpose a column of the atmosphere from the surface of the earth to the 200-millibar surface was selected. Energy calculations were conducted for basic aerological periods of observation (0300 and 1500 hours, Moscow time). Observations began with the moment of cyclone apparition at the earth's surface and terminated either with the cyclone's disappearance or after the cyclone had reached a developed condition. In all, ten cyclones were observed during 1962 and 1963 in the European territory of the SSSR. In each instance the kinetic energy was computed over an area 1500-km square, with the center of the
Card 1/2

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12,55

L 62972-65

ACCESSION NR: AT5016799

cyclone corresponding to the center of observation. Working formulae were: 1) energy relative to unit mass $K_{ex} = \frac{v^2}{2}$, where v is the wind speed at selected millibar levels, given in meters/second by $v = 1,146 \frac{\partial p}{\partial n}$ where $\frac{\partial p}{\partial n}$ is the pressure gradient in millibars at 500 km, 2) mean layer temperature $T = \frac{H_p - H_{p_0}}{67,4424 \lg \frac{p_0}{p}}$,

where H_p and H_{p_0} are the geopotentials of isobar surfaces p and p_0 , and 3) potential energy $\Pi = p_1 z_1 - p_2 z_2 + (\kappa - 1) / \kappa$, where $\kappa = \frac{c_p}{c_v}$: the ratio of heat capacitance at constant pressure to heat capacitance at constant volume. A plot is made of the change of kinetic energy in an observed cyclone. Test data revealed that internal energy decreases rapidly with increased height above the earth. Potential energy increases during cyclone development at low levels and generally decreases at higher levels. Several equations describing the redistribution and movement of cyclone energy are developed. Orig. art. has: 1 figure, 20 equations, and 4 tables.

ASSOCIATION: Tsentral'nyy institut prognozov (Central Forecasting Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: ES

NO REF SOV: 007

OTHER: 001

Card 2/2 *llc*

ACC NR: AT6032990

SOURCE CODE: UR/2546/66/000/149/0097/0101

AUTHOR: Snitkovskiy, A. I.

ORG: Central Institute of Forecasts (Tsentral'nyy institut prognozov)

TITLE: Kinetic energy distribution in an intensively deepening cyclone

SOURCE: Moscow. Tsentral'nyy institut prognozov. Trudy, no. 149, 1966. Rezul'taty ispytaniy razlichnykh sposobov kratkosrochnykh prognozov pogody (Results of analyses of various short-range weather forecasting methods), 97-101

TOPIC TAGS: atmospheric physics, cyclone energy, cyclogenesis, atmospheric kinetic energy, high wind, *CYCLONE, WIND VELOCITY*

ABSTRACT: At 0300 hr on 29 September 1963, a poorly defined wave disturbance appeared on an Arctic front over the southwestern part of the Black Sea. A slight drop in pressure preceded the warm front. On 29 September, the pressure dropped 2.3 mb in 3 hr, and a 1013-mb cyclone appeared at the peak of the wave disturbance. The pressure in the cyclone dropped to 951 mb by 1500 hr on 1 October, then the pressure at the center of the cyclone began to rise. While deepening, the cyclone travelled 2600 km from the Black Sea to Syktyvkar. Ground-level wind speeds behind the cold front reached 25-40 m/sec (55-88 mph).

Card 1/3

ACC NR: AT6032990

A study was made of the kinetic energy in different parts of the cyclone and its changes in time, from the appearance of the wave until the cyclone had filled at ground level, with measurements made at ground level and on the 850-, 700-, 500-, 300-, and 200-mb surfaces at 0300 and 1500 hrs Moscow time. These values were calculated in knots per unit mass, then averaged for areas of 1500 x 1500 and 500 x 500 km². The network was a grid of 1500 km on each side (7 x 7 points per step of 250 km, subdivided into 9 smaller squares of 500 x 500 km²). The wind speeds on the 850-, 700-, 500-, 300-, and 200-mb surfaces are assumed to be equal to geostrophic wind speeds. The center of each square was superposed on the crest of the wave or the center of the cyclone at the surface when obtaining data on pressures and the geopotential needed to calculate wind speeds on the isobaric surfaces. Wind speeds were calculated by finite-difference formulas, and all calculations of the kinetic energy were run on a high-speed computer. Analysis of the data showed that most of the change in kinetic energy in the middle and upper troposphere occurred in the first few 12-hr periods after the cyclone appeared at ground level; this makes it reasonable to assume that during cyclogenesis, part of the energy at high levels is transferred to lower levels

Card 2/3

ACC NR: AT6032990

and contributes to the increase in the kinetic energy at ground level; this leads, in time, to rising winds at ground level, even at the beginning of the cyclone. [WA-50; CBE No. 12]

SUB CODE: 04/ SUBM DATE: .none/ ORIG REF: 001/

Card 3/3

ACC NR: AT7006723

SOURCE CODE: UR/2546/66/000/158/0003/0010

AUTHOR: Snitkovskiy, A. I.

ORG: none

TITLE: Energy distribution in the region of a cyclone at various stages of its development

SOURCE: Moscow. Tsentral'nyy institut prognozov. Trudy. no. 158, 1966. Sinopticheskaya meteorologiya (Synoptic meteorology), 3-10

TOPIC TAGS: kinetic energy, ~~internal energy~~, wind, cyclone, ATMOSPHERIC GEOPOTENTIAL, GEOSTROPHIC WIND

ABSTRACT: The author has examined the distribution and change with time of the kinetic, potential, and internal energy in cyclones, from the earth's surface to the 200-millibar level. Ten cyclones of 1962 and 1963 in European SSSR were selected for computations. Energies were computed for points at intersections 250 km apart on a square grid 1500 km on a side. The geostrophic wind was used for computing kinetic energy. The internal and potential energies were computed for a vertical column of air of unit cross section, and were computed separately for layers limited by the principal isobaric surfaces (200 and 300, 300 and 500, 500 and 700, 700 and 850 millibars), and also for the total column from the earth to the 850-millibar level. Maps were then plotted to show energy distribution at four different stages of cyclonic development. The shifting of energy highs may be seen on these maps. It

Card 1/2

ACC NR: AT7006723

was found that as a cyclone develops at the earth's surface to the maximal stage, an essential factor in increasing the kinetic energy in the lower layer of the atmosphere is transfer of energy from the upper layers, chiefly through internal friction. The various changes in energies for the different stages of cyclonic development and for different levels are discussed and compared with values when no cyclone is developing. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 04/ SUBM DATE: none/ ORIG REF: 002

Card 2/2

ACC NR: AT7006732

SOURCE CODE: UR/2546/66/000/158/0085/0089

AUTHOR: Snitkovskiy, A. I.

ORG: none

TITLE: The relation of kinetic energy to precipitation

SOURCE: Moscow. Tsentral'nyy institut prognozov. Trudy, no. 158, 1966.
Sinopticheskaya meteorologiya (Synoptic meteorology), 85-89

TOPIC TAGS: weather forecasting, kinetic energy, atmospheric pressure, atmospheric precipitation

ABSTRACT: This paper examines the relation of the kinetic energy at different pressure surfaces to the amount of precipitation at the earth's surface. Twenty-eight cyclones of the cold months (November to February) observed in European SSSR during 1962--63 were selected for study. Choice of the cold months eliminated to a great extent the effect of convection on the amount of precipitation. Kinetic energy was computed, according to a method previously proposed by the author, for the 850-, 700-, 500-, 300-, and 200-millibar surfaces in different parts of the cyclone. Precipitation data were taken for each day at the hours of 7 a.m. and 7 p.m. local time. The coefficient of correlation and the correlation ratio were then calculated for the various levels, averaged over areas of different size (500 x 500 km and 1500 x 1500 km). Correlation improved appreciably with increase in size of area being

Card 1/2

ACC NR: AT7006732

averaged. Comparison of the Laplacian of the pressure with amount of precipitation indicated acceptable correlation. It was found that the values of kinetic energy at the different levels have a linear relationship. This is indicated by the high value of the correlation coefficient and by the fact that the correlation ratio differs but little from the correlation coefficient. The author suggests that good correlation between kinetic energy and precipitation and between values of kinetic energy at different pressure levels may be obtained by using sufficiently large areas for averaging and large time intervals. Orig. art. has: 1 figure and 2 tables.

SUB CODE: 04/

SUBM DATE: none/

ORIG REF: 001/

OTH REF: 002

Card 2/2

SOV/137-59-3-5795

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 121 (USSR)

AUTHOR: Snitkovskiy, M. M.

TITLE: On the Strength of Cast-iron Welds and on Methods of Their Testing
(K voprosu o prochnosti i metodike ispytaniy svarnykh soyedineniy
chuguna)

PERIODICAL: Nauchn. tr. Odessk. in-ta inzh. morsk. flota, 1958, Nr 17, pp
50-55

ABSTRACT: Strong cast-iron welds may be achieved only if a proper combination of several factors is observed; in addition to metallurgical and metallographic considerations, these factors should also include considerations on the operating conditions of the metal deposited. A method is described whereby the strength of a cast-iron weld operating under complex stress conditions may be evaluated with an accuracy sufficient for all practical purposes by means of testing of special specimens consisting of a metal strip with a milled slot in the center having a V-shaped cross section and a length of 35-40 mm. Preparatory to testing, holes 6 mm in diameter are drilled along the edges of the slot. A strip intended for testing on a 30-ton

Card 1/2

On the Strength of Cast-iron Welds and on Methods of Their Testing SOV/137-59-3-5795

tension-testing machine is 300 mm long, 85 mm wide, and 17 mm thick. The slot, which simulates a crack, is welded under conditions identical to those which would be encountered in repairing an actual working part. The strength of a weld thus tested may be evaluated by determining a nominal value of σ_b therefor; the quality of a cast-iron weld is considered satisfactory if its nominal σ_b value is equal to 80% of the σ_b of the material of the strip.

G. K.

Card 2/2

34 / 1 100 110 114
SNITKOVSKIY, M., assistant

Repair of "Gants-Endrashik" 216-310 engine crankcase and of 6DR
30/50 engine blocks by means of a tightening device. Mor. flot 18
no.2:21 F '58. (MIRA 11:2)

1.Odesskiy institut inzhenerov morskogo flota.
(Marine engines--Maintenance and repair)

SNITKOVSKY, M. M., Cand Tech Sci (diss) -- "Investigation of a tie-bar method, and experience in using it in the repair of cast-iron parts". Odessa, 1960. 14 pp (Min Higher and Inter Spec Educ Ukr SSR, Odessa Polytech Inst), 250 copies (KI, No 14, 1960,133)

SNITKOVSKIY, M.M., inzh.; SILAYEV, I.I., inzh.

Changes in the microhardness of phosphorus compound inclusions
in gray cast iron at from 20 to 300^o temperatures. Metalloved.
1 term. obr. met. no. 5:42-45 My '60. (MIRA 13:12)

1. Odesskiy institut inzhenerov morskogo flota.
(Cast iron--Metallography) (Metals at high temperatures)

SNITKOVSKIY, M.M., inzh.

Effect of hardening on the wear resistance of gray pearlitic cast
iron. Metalloved. i term. obr. met. no.5:32-34 My '61.

(MIRA 14:5)

(Cast iron--Hardening)

STAROSEL'SKIY, A.A., dotsent; SNITKOVSKIY, M.M., assistant; PASHKOV, A.P.,
assistant.

Wear resistance of some gray pearlitic cast irons in connection
with joining them in friction pairs. Izv.vys.ucheb.zav.; mashinostr.
no.7:95-100 '61. (MIRA 14:9)

1. Odesskiy institut inzhenerov morskogo flota.
(Cast iron--Testing)

SNITKOVSKIY, M.M., assistant, SELAYEV, I.I., inzh.

Mechanism of the wear of gray phosphorous cast iron caused by friction. Izv.vys.ucheb.zav.; mashinostr, no.10:32-36 '61.
(MFA 14-12)

1. Odesskiy institut inzhenerov morskogo flota.
(Cast iron--Testing)

IVANOV, S.A., dotsent; SILAYEV, I.I., inzh.; SNITKOVSKIY, M.M., inzh.

Causes of seam failure in expanding welded boiler tubes. Stal'
22 no.1:72-73 Ja '62. (MIRA 14:12)

1. Odesskiy institut inzhenerov morskogo flota.
(Boilers, Water tube--Welding)

L 18918-63 EWT(d)/EWP(q)/EWT(m)/EWP(k)/BDS AFFTC/ASD Pf-4

JD/HW

ACCESSION NR: AP3006603

S/0129/63/000/009/0019/0022 64

AUTHORS: Snitkovskiy, M. M.; Yegorov, N. V.; Golomazyuk, I. A. 63

TITLE: Increase in strength of R18 steel by swaging 4

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 9, 1963, 19-22

TOPIC TAGS: . swaging, cutting tool , R18 steel, austenite grain, carbide eutectic, metal stamping, austenization

ABSTRACT: Authors examined the effect of swaging upon the stability of cutting tools made out of R18 steel. The tools were swaged in a stamp with a conical die. After swaging, they were face-ground to a depth of 1-2 mm in order to remove the surface crust. Temperature and heating time varied. The effect of austenite grain growth and carbide eutectic upon the stability of the swaged cutting tools were examined.

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L 18918-63

ACCESSION NR: AP3006603

Authors found that swaging at a pressure of about 7000 kg/cm² increases the stability of cutting tools made out of R18 steel by 40-50%. Grain growth does not reduce the observed effect. Combining of the stamping and heat treatment operations greatly simplifies the technology of cutting tool production. This has a great practical significance in the mass production of cutting tools with complex shapes (milling cutters, drills, cutting tools, etc). The wear resistance during swaging is augmented on account of an increase in the dispersion of the submicrostructure. In contrast to austenitization, swaging brings about a volumetric change of the R18 steel's properties. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: Odesskiy institut inzhenerov morskogo flota
(Odessa institute of merchant marine engineers)

SUBMITTED: 00 DATE ACQ: 03Oct63 ENCL: 00

SUB CODE: ML NO REF SOV: 005 OTHER: 000

Card 2/2

1. The first part of the document is a list of names and titles of the members of the committee. The names are listed in alphabetical order and include the following: [illegible]

2. The second part of the document is a list of the names and titles of the members of the committee who have been appointed to the various subcommittees. The names are listed in alphabetical order and include the following: [illegible]

3. The third part of the document is a list of the names and titles of the members of the committee who have been appointed to the various subcommittees. The names are listed in alphabetical order and include the following: [illegible]

ACCESSION NR: AP4028998

S/0126/64/017/003/0400/0407

AUTHORS: Perkas, M. D.; Snitsar', V. I.

TITLE: The influence of alloying elements on iron-nickel alloys martensite hardness in heated

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 3, 1964, 400-407

TOPIC TAGS: iron-nickel alloy, martensite, alloying element, Ti, Al, Mn, Nb, Zr, Mo, martensite hardness, martensite aging, metal structure, Vickers hardness, phase composition, elasticity modulus

ABSTRACT: The influence on martensite aging of Ti, Al, Mn, Nb, Zr, and Mo additions to iron-nickel alloys was investigated. Experimental 5-kg ingots containing 1.0-2.0 wt % of alloying elements were cast and forged into rods 20 x 10 mm and into disks 14 mm in diameter. Martensitic structure was produced by air cooling of specimens. Their hardness (Vickers) and modulus of elasticity were determined after tempering and aging at various temperatures. The effect of adding alloying elements to material with 16.5-18.0% Ni at various temperatures is shown in Fig. 1 of the Enclosures. The same effect produced on material with 8.0%

Card 1/82

ACCESSION NR: AP4028998

Ni by addition of Ti and Al (separately and jointly) may be seen in Fig. 2. It was determined that martensite hardening increases with the increase of nickel content and disappears below 2.0% Ni. Joint addition of several elements serves to strengthen the α -phase. The process of hardening ceases at about 500C and is reversed at higher temperatures. The variation of the α -phase strength was found to be related to the number of defects in the original structure, and increased with the number of defects. The modulus of elasticity was determined by measuring the changes in the resonance frequencies of longitudinal oscillations. The changes in the modulus became apparent at 350C, with the maximum being reached at 500C (see Fig. 3 of the Enclosures). For comparison, Fig. 3 also shows the change of hardness with temperature. Orig. art. has: 9 graphs.

ASSOCIATION: Institut metallovedeniya i fiziki metallov TsNIICHM (Institute of Metallurgy and Physics of Metals, TsNIICHM)

SUBMITTED: 13May63

DATE ACQ: 27Apr64

ENCL: 03

SUB CODE: ML, PH

NO REF SOV: 003

OTHER: 004

Card 2/52

SNITSAR, Ya.Ye., inzhener.

Planning and building compartment dams on bedrock foundations.
Gidr.stroi 23 no.7:41-42 '54. (MLBA 7:11)
(Dams)

SNITSAR, Ya.Ye., inzhener.

Construction of a pressure tunnel of a small hydroelectric power plant on the Smotrich River. Gidr.strei.25 no.5:48-49 Je '56.
(Smotrich River--Hydroelectric power Stations) (MLRA 9:9)

SNITSAR, YA. YE.

98-7-9/20

AUTHOR: Snitsar, Ya. Ye., Engineer

TITLE: The Siphon Lock on a Spillway Dam (Sifonnyy zatvor vodoslivnoy plotiny)

PERIODICAL: *Gidrotekhnicheskoye Stroitel'stvo*, 1957, No 7, pp 35-37 (USSR)

ABSTRACT: The proposed lock has 2 working positions one for periods of low water with a curved hinged lock and a siphon for periods of high water. The curved surface of the lock forms a siphon, which divides the flow going over the dam into 2 parts: the lower stream, which flows through the siphon, and the upper streams, which flows over the conventional spillway. The separation of the stream utilizes the ejection force of the upper stream acting upon the discharge capacity of the siphon, and enabling the disposal of floating obstacles, past the siphon into the tail race. The hinge of the locking device is located on a line with the equivalent force of horizontal water pressure, and corresponds to the center of gravity of the lock. Further rising of the water level brings the lock into the second working position, and water starts to flow over the dam, creating a vacuum in 2 places. The most effective vacuum action occurs at the head or at the beginning of the straight part of the lower section.

Card 1/2

The Siphon Lock on a Spillway Dam

98-7-9/20

For this reason the length of the straight part of the lock may equal the height of the siphon pipe. Completed hydraulic computations show that the use of siphon locks increases the discharge capacity of spillways by 20%. This increase may be higher at dams with permanent water pressures. There are 4 figures.

AVAILABLE: Library of Congress

Card 2/2

SNITSAR, Ya.Ye. [Snitsar, IA,IE.]

Hydrodynamics method for designing a flat blanket and toe with
drains. Dop. AN URSR no.6:620-625 '58. (MIRA 11:9)

1.Giprosel'elektro. Predstavil akademik AN USSR G.N. Savin [H.M.
Savin].

(Dams)

UTROBIN, Yevgeniy Nikolayevich; SAVVATEYEV, V.A., kand. ekon.
nauk, dots., red.; SNITSARENKO, A.A., red.

[Benefits of the mechanization and automation of produc-
tion] Chto daet mekhanizatsiia i avtomatizatsiia proiz-
vodstva. Novosibirsk, Novosibirskoe knizhnoe izd-vo,
1961. 35 p. (MIRA 18:7)

ZANIN, Vadim Ivanovich; ISAYEV, Ye.N., kand. ekon. nauk, otv. red.;
SNITSARENKO, A.A., red.; YELISTRATOVA, Ye.M., tekhn. red.

[Working time and labor productivity] Rabochee vremia i
proizvoditel'nost' truda. Novosibirsk, Izd-vo Sibirskogo
otd-nia AN SSSR, 1963. 114 p. (MIRA 16:10)
(Labor productivity) (Time study)

SOMINSKIY, V.S., doktor ekon. nauk, prof., red.; PATRUSHEV, V.D.,
otv. red.; BLOUSOVA, V.S., red.; PCTEMKIN, P.I., red.;
SNITSARENKO, A.A., red.; CVCHINNIKOVA, T.K., tekhn. red.

[Economic problems of mastering new enterprises] Ekonomi-
cheskie voprosy osvoeniia novykh predpriatii. Pod obshchei
red. V.S.Sominskogo. Novosibirsk, Izd-vo Sibirskogo otd-
niia, 1963. 231 p. (MIRA 16:11)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Institut eko-
nomiki i organizatsii promyshlennogo proizvodstva.
(Industrial management)

KOROVILA, Zinaida Pavlovna; KOL'NIKOV, Grigoriy L'vovich;
POTEMKIN, P.I., kand. ekon. nauk, otv. red.;
SHITSARENKO, A.A., red.

[Overall improvement in planning in industry] Kompleksnoe
sovershenstvovanie planirovaniia v promyshlennosti, Novo-
sibirsk, Red.-izdatel'skii otel Sibirskogo otd-niia AN
SSSR, 1964. 44 p. (MIRA 17:9)

МЕРИД В., Valentin Andreyevich; АБРАМВИЧ, Д.И., doktor geogr.
nauk, otv. red.; ЧИТОВАРЕНКО, А.А., red.

[Kamen' Hydroelectric Power Station on the Ob' River and
the irrigation of the Kulunda Steppe] Kamenskaia GES na
Obi i oroshenie Kulundy. Novosibirsk, Red.-izd. otdel
Sibirskogo otd-niia AN SSSR, 1964. 58 p. (MIId 17:8)

POTEMKIN, Petr Ivanovich; SOMINSKIY, V.S., prof., otv. red.;
SHITSARENKO, A.A., red.

[Essays on the methods of evaluating the projected efficiency of new enterprises] Ocherki o metodakh otsenki proektnoi effektivnosti novykh predpriatii. Novosibirsk, Red. tsd. otdel Sibirskogo otd-niia AN SSSR, 1964. 68 p.
(MIRA 17:12)

ZUDINA, Lyudmila Nikolayevna; ISAYEV, Ye.N., kand.ekon.nauk,
otv.red.; SNITSARENKO, A.A.,red.

[Organization of work in Kuznetsk Basin coal mines] Or-
ganizatsiia truda na ugol'mykh shakhtakh Kuzbassa. No-
vosibirsk, Red.-izd. otdel Sibirskogo otd-niia AN SSSR,
1964. 73 p. (MIRA 17:12)

BAKROVSKIY, Aleksandr Stepanovich; BOKUCHAYEV, G.A., editor. Inzh.
nauk, otv. red.; GITSARENKO, A.A., red.

[The working class of Western Siberia during the years of
the first five-year plan] Rabochnii klass Zapadnoi Sibiri
v gody pervoi piatiletki. Novosibirsk, Fed.-izm. otdel
Sibirskogo otdeleniia AN SSSR, 1967. 116 p. (MIRA 18:1)

ARKHIPOV, Stanislav Anatol'yevich; MATVEYEVA, Ol'ga Vladimirovna; PUMINOV, A.P., kand. geol.-mineralog. nauk, otv. red.; SNITSARENKO, A.A., red.

[Quaternary of the southern margin of the Yenisey Depression.]
Antropogen iuzhnoi okrainy Eniseiskoi depresii. Novosibirsk, 1964. 127 p. (Akademiia nauk SSSR. Sibirskoe otdelenie. Institut geologii i geofiziki. Trudy, no.29)

(MIRA 17:12)

1. Institut geologii i geofiziki Sibirskogo otdeleniya AN SSSR (for Puminov).

GOSTREM, Runar Viktorovich; ZINOV'YEV, Gennadiy Stepanovich;
SNITSARENKO, A.A., red.

[Tunnel diodes and their applications] Tunnel'nye diody
i ikh primeneniye. Novosibirsk, Red.-izd. otdel Sibir-
skogo otd-niia AN SSSR, 1964. 130 p. (MIRA 18:1)

SWEIN, I.H., st. nauchn. sotr., kura. tekhn. nauk, otv. red.;
MIL'SHIN, A.A., red.

[Radio communication systems and high-frequency remote control in the mining industry] 'Radiosvyaz' i vysokochastotnaya telemechanika v gornoi promyshlennosti. Otv. red. I.H. Svein. Novosibirsk, Izd. Isa. otdel. direktora sgd-nia AN SSSR, 1964. 173 p. (MIRA 17:8)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Institut gornogo dela.

MATVEYEVA, F.A., kand. tekhn. nauk, otv. red.; MELEKHOVA, T.F.,
nauchn. sotr., zam. otv. red.; KVIATKOVSKAYA, K.K.,
kand. tekhn. nauk, red.; KOSHLYAK, L.L., kand. tekhn.
nauk, red.; PLEKHANOVA, Ye.A., nauchn. sotr., red.;
SMITSA:ENKO, A.A., red.

[Prospects of the development of the ceramic industries
of Siberia and of the Far East; materials] Perspektivy
razvitiia keramicheskoi promyshlennosti Sibiri i Dal'nego
Vostoka; materialy. Novosibirsk, Red.-izd. otdel Sibirsko-
go otd-niia AN SSSR, 1964. 183 p. (MIRA 17:11)

1. Soveshchaniye po khimii i tekhnologii keramiki i per-
spektivam razvitiya keramicheskoy promyshlennosti Sibiri
i Dal'nego Vostoka. Novosibirsk, 1962. 2. Khimiko-
metallurgicheskii institut Sibirskogo otdeleniya AN SSSR
(for Matveyeva). 3. Gosudarstvennyy nauchno-issledovatel'-
skiy institut stroitel'noy keramiki (for Kvyatkovskaya,
Koshlyak).

SOBOLEVA, Ariadna Dmitriyevna; TSELLARIUS, Yu.G., kand. med. nauk,
otv. red.; SNITSARENKO, A.A., red.

[Pathological anatomy of the lungs in leukemia] Patologi-
cheskaia anatomia legkikh pri leikoze. Novosibirsk, Red.
izd. ot del Sibirskogo otd-niia AN SSSR, 1964. 229 p.
(MIRA 17:8)

NEK'SHIKOVA, Z.I.; SHITSARENKO, A.A., red.

[Technical and economic indices in the potash industry and prospects for the expansion of production and consumption of potash fertilizers during the period ending in 1970] Tekhniko-ekonomicheskie pokazateli v kaliinoi promyshlennosti i perspektivy rosta proizvodstva i potreblaniia kaliinykh udobrenii na period do 1970 goda. Novosibirsk, Red.-izd. otdel Sibirskogo otd-niia AN SSSR, 1965. 8 p. (MIRA 18:5)

.NITSARENKO, A.A., red.

[Methods of controlling ice at hydroelectric power stations in Siberia] Metody bor'by s ledovymi zatrudneniyami na gidrostantsiyakh Sibiri. Novosibirsk, Red.-izd. otdel Sibirskogo otd-niia AN SSSR, 1965. 95 p.

(MIRA 18:5)

1. Akademiya nauk SSSR, Sibirskoye otdeleniye. Sibirskiy nauchno-issledovatel'skiy institut energetiki.

PETROV, D.F., doktor biol. nauk, otv. red.; SMITSARENKO, A.A.,
red.

[Breeding of microbes] Seleksiia mikrobov. Novosibirsk,
Redaktsionno-izdatel'skii otdel SO AN SSSR, 1965. 134 p.
(MLR 18:9)

1. Akademiya nauk SSSR. Sibirskoye otdeleniye. Laborato-
riya tsitologii rasteniy i apomiksisa.

ZYBIN, Yu.P.; AKULOVA, T.Ye.; SNITSARENKO, L.G.; UL'YANITSKIY, V.A.

Mercury resistance transmitter for measuring large deformations
in materials. Trudy Inst. mash. Sem. po teor. mash. 19 no.76:26-33
'59. (MIRA 13:3)

(Strain gauges)

L 3381-66 EWT(m)/EWP(j)/T RM

ACCESSION NR: AP5022093

UR/0138/65/000/008/0042/0044

44 678.06:685.314.33.002.2 44

AUTHOR: Tokareva, T. Ye.; Snitsarenko, L. G.; Volkova, N. A.; Bakshat, O. V.;

Zel'dich, E. I.; Kheyfets, F. M. 44

TITLE: Compounding and technology for manufacturing winter-proof boots

50
46
8

SOURCE: Kauchuk i rezina, no. 8, 1965, 42-44

TOPIC TAGS: rubber chemical, antifreeze, synthetic material, butadiene styrene rubber, filler, plasticizer, thermoelasticity, special purpose clothing, 44
rubber/SKMS-10 rubber

ABSTRACT: Formulations and technology for making frost-resistant boots which retained their elasticity at -50C were worked out and introduced commercially. Formulations for all parts except the tricot-backed boot tops were based on frost resistant rubber SKMS-10, and natural rubber was used in formulation for fabric application. The antifreeze effectiveness of dibutylphthalate, dibutylsebacinate, MVP oil, "plasticizer" oil and transformer oil was evaluated. The first two compounds gave the best frost-resistance at -50 C, and formulations containing dibutylphthalate had the greatest resistance to aging and became brittle below

Card 1/2

L 3381-66

ACCESSION NR: AP5022093

-65C . Different types of carbon black had little effect on frost-resistance. Manufacturing technology for making frost-resistant regular and fisherman's boots is analogous to that for making ordinary molded boots. Orig. art. has: 2 tables

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovykh i lateksnykh izdeliy (Scientific Research Institute for Rubber and Latex Products); Zavod "Krasnyy bogatyr" (Krasnyy Bogatyr Plant)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT, IE

NR REF SOV: 005

OTHER: 000

Card 2/2 *md*