S/020/61/137/002/011/020
B103/B215

AUTHORS: Znamenskiy, G. N., Gamali, I. V., and Stender, V. V.

TITLE: Peculiarities of electrodeposition of metals from extremely pure solutions

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 2, 1961, 335-337

TEXT: The authors describe experiments on the electrodeposition of the electronegative metals zinc and manganese from extremely pure solutions. They found that the chemically pure salts usually used for studying the kinetics of such processes, do not guarantee the required experimental purity, not even when they have been recrystallized. Small amounts of organic impurities in the solution hamper the determination of the influence of surface-active admixtures on the structure of the cathodic deposit, and on the value of cathodic polarization. Therefore, the authors used extremely pure $ZnSO_4$ solutions produced as follows: metallic zinc contained 10^{-5}% of admixtures and was produced by sublimation in a nitrogen atmosphere,

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Peculiarities of electrodeposition...

following the method of the Gipronikel' Institute. Chemically pure sulfuric acid was distilled. Water was boiled in potassium permanganate, and then distilled three times, but 1/3 (first portions) of the distillate was not used. The solution thus obtained was boiled again, and then for a long while exposed to current from platinum electrodes. By using standard concentrations (Zn 60 g/l, H_2SO_4 100 g/l) at 20°C, the authors obtained from this solution a current output of zinc up to 60% at low current density (1 a/m^2), and up to 99% at 5 a/m^2. Zinc, however, was intensively dissolved already at 30 a/m^2 in an electrolyte of chemically pure $ZnSO_4$ which had been recrystallized three times. The electrode potential of high-purity zinc without current or with weak current is shifted by 25-30 mv toward negative values (as compared to the potential of the conventional Ц0 (TsO) electrolytic zinc). Only glass parts can be used in the electrolytic cell when using high-purity solutions. Plastics (viniplast, organic glass, polyethylene) change the structure of deposited zinc. Crystals become irregular and small. On the basis of these results, the authors worked out a method of

measuring the active surface of zinc, which gives well reproducible results, and is also applicable to other metals (Ref. 5,V. V. Stender, G. N. Znamenskiy, Nauchn. dokl. vyssh. shkoly, ser. khim., 1, 169 (1959)). For similar experiments with manganese, the authors used an electrolyte of 50 g/l of manganese (as chloride), and 110 g/l of ammonium chloride. Manganese was dissolved at pH >1. The solution was purified with manganese sulfide which was obtained from a previously purified manganese chloride solution and ammonium sulfide. Ammonium sulfide was obtained by absorption of hydrogen sulfide by an ammonia solution in water distilled twice. H_2S was obtained from chemically pure sodium sulfide previously purified from arsenic. After purification of sulfide, the manganese electrolyte was electrolytically treated in a glass vessel at a current density of 20-50 a/m^2. In the vessel, there was an anodic glass cell with a glass diaphragm, a platinum anode, and a cathode of pure aluminum. The catholyte was constantly stirred. Anodic gases were sucked off. Manganese hydroxide which was deposited in the catholyte and oxidized to dioxide by atmospheric oxygen, adsorbed all sorts of admixtures from the electrolyte. After filtration, the solution was subjected to another electrolytic treatment. This process was repeated

Peculiarities of electrodeposition...

three times (altogether for 200-220 hr). Aluminum hydroxide obtained by anodic dissolution of A-00 (A-00) aluminum in a pure manganese chloride solution at a current density of 10 a/m^2, was then added to the solution. Finally, the solution was filtered with a glass filter. From this solution the authors deposited manganese at 20°C, a pH of 7, and a current density of only 10 a/m^2. At 2000 a/m^2, the current output of manganese was 90%. All manganese deposits were of clear crystalline structure, even when suspended particles of manganese hydrates were added to the catholyte. The authors hold the opinion that imperfect crystalline deposits of manganese, or the absence of deposits at low current densities are due to admixtures in the electrolyte. The authors found that the crystallization of zinc and manganese in pure electrolytes does not essentially differ from the electrocrystallization of silver (A. T. Vagramyan, Ref. 8, Elektroosazhdeniye metallov - Electrodeposition of Metals -, Izd. AN SSSR, 1950). They state that the kinetics of this process and the action of admixtures in extremely pure electrolytes should be studied. There are 2 figures and 7 references: 5 Soviet-bloc and 2 non-Soviet-bloc. The

Peculiarities of electrodeposition...

reference to the English-language publication reads as follows: Ref. 2: O. M. Bocklis, B. Conway, Trans. Farad. Soc., 45, 989 (1949).

ASSOCIATION: Dnepropetrovskiy khimiko-tekhnologicheskiy institut im. F. E. Dzerzhinskogo (Dnepropetrovsk Institute of Chemical Technology imeni F. E. Dzerzhinskiy)

PRESENTED: October 15, 1960 by A. N. Frumkin, Academician

SUBMITTED: May 9, 1960

Card 5/5

S/080/62/035/001/007/013
D258/D304

AUTHOR: Gamali, I. V. and Stender, V. V.

TITLE: Hydrogen overvoltage on manganese

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no.1, 1962, 127-132

TEXT: This work was carried out because of the lack of adequate information available on the hydrogen overvoltage developing during the electrodeposition of Mn from aqueous solutions. The purity of the electrolyte, used in the present work, was acceptable on obeying the following conditions: (a) Mn was deposited on Al at room temperature at a C. D. of 10 amp/m^2; (b) the yield of Mn per current used at 1000 amp/m^2 was 90% and more; (c) Mn deposited in the form of large crystals and was not oxidized in air after drying. The evolution of hydrogen was investigated in solutions of $(NH_4)_2SO_4$ (0.25 N, 1.0N, 3.0N and 5.2 N); Na_2SO_4 (1 N); and H_2SO_4 (0.05 N and 0.1 N). The measurements were conducted in closed, H-shaped vessel, through which purified hydrogen could be passed;

Card 1/[illegible]

Hydrogen overvoltage on manganese

the direct method of measurement against a thermostatted calomel electrode was employed. The electrode regions were separated by means of porous glass diaphragms. A platinum tablet served as the anode. This set-up served for measuring the potentials of hydrogen evolution as a function of current density. The plots of the hydrogen evolution potential against the log of current density are shown in Figs. 1 and 3. From these and other results it can be seen that the form of the curves is not influenced by the concentration of $(NH_4)_2SO_4$, the temperature or by pH. All curves exhibit at low C. D's a sudden fall towards the Mn dissolution potential. The tangent of the straight section of the curve, in the case of Na_2SO_4 and H_2SO_4 solutions, is equal to 0.12 and thus near its theoretical value. The coefficient a in Tafel's equation is 1.31 at 25°C in the case of hydrogen evolution on Mn in 0.1 N H_2SO_4; its value changes to 1.19 in solutions of $(NH_4)_2SO_4$ and the corresponding tangent changes according to whether the solution is acidic ($\tan\alpha$ = 0.16 at pH 6.5) or basic ($\tan\alpha$ = 0.18). The latter

Card 2/04

Hydrogen overvoltage on manganese

value was determined also for Cd and Zn in the same conditions, thus showing that $\tan\alpha$ depends only on the conditions of electrolysis. The temperature coefficient of overvoltage was 1.8 mV/°C throughout. The more negative evolution potentials in Na_2SO_4 solutions (as compared with solutions of $(NH_4)_2SO_4$ are consistent with the assumption of A. N. Frumkin and coworkers (Ref. 12: "Kinetika elektrodnykh protsessov" (The Kinetics of Electrode Reactions), MGU, 1952), on the existence of a new discharge mechanism of hydrogen ions, capable of lowering the hydrogen overvoltage:

$$BH^+ + e \rightarrow B + H_{ads}; \quad B + H^+ \rightarrow BH^+$$

The same explanation is given by V. S. Bagotskiy and I. Ye. Yablokova (Ref. 13: Trudy soveshchaniya po elektrokhimii, Izd. AN SSSR, M., 57 (1953)) for the observed lowering of hydrogen overvoltage on mercury in solutions containing NH^+_4 ions. Finally, the authors consider the possibility that NH_3 formed on the cathode

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Hydrogen overvoltage on manganese

might dissolve any present hydrates of Mn, thus adding to the favorable effect of NH^+_4 ions on the electrodeposition of this metal. There are 4 figures and 21 references: 15 Soviet-bloc and 6 non-Soviet-bloc. The references to the English-language publications read as follows: R. Dean, The Electrolytic Manganese and its Alloys, N. Y. (1952); E. Newbery, J. Chem. Soc., 105, 2419,(1914); 109, 1051, (1916); A. N. Campbell, J. Chem. Soc. 123, 2323,(1923).

SUBMITTED: June 28, 1961

Card 4/4

GAMALI, I.V.; STENDER, V.V.

Action of some impurities and addition agents on overvoltage for hydrogen liberation on manganese. Zhur.prikl.khim. 35 no.11:2436-2439 N '62. (MIRA 15:12)
(Hydrogen) (Overvoltage) (Manganese plating)

GAMALI, I.V.; DANILOV, F.I.; STENDER, V.V.

Size correspondence in the electrodeposition of manganese.
Zhur. prikl. khim. 37 no.2:337-342 F '64.
(MIRA 17:9)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut.

STENDER, V.V.; GAYEV, I.D.

Preparation of electrolytic manganese. Trudy [illegible] 2:439:
147-152 '64. [illegible] 17:10)

DOMASHOVA, A.A., otv.red.; POPOVA, L.I., red.; GAMALITSKAYA, N.A., red.; SOROMBAYEVA, N.V., red.izd-va; ANOKHINA, M.G., tekhn.red.

[Materials of the First Coordinating Conference of Mycologists of the Central Asian Republics and Kazakhstan, 1955] Materialy Pervogo koordinatsionnogo soveshchaniya mikologov respublik Sredney Azii i Kazakhstana. Frunze, Izd-vo Akad.nauk Kirgizskoi SSR, 1960. 182 p. (MIRA 13:9)

1. Koordinatsionnoye soveshchaniye mikologov respublik Sredney Azii i Kazakhstana. 1st, 1955. 2. Institut botaniki AN Kirgizskoy SSR (for Gamalitskaya).
(Soviet Central Asia--Mycology)

DOMASHOVA, A.A.; GAMALITSKAYA, N.A.

New species of fungi from the central Tien Shan. Bot. mat. Otd. spor. rast. 15:74-80 Ja '62. (MIRA 15:10)
(Tien Shan—Fungi)

GOLOVIN, P.N.; GAMALITSKAYA, N.A.

New genus of the family Erysiphaceae. Bot. mat. Otd. spor. rast. 15:91-93 Ja '62. (MIRA 15:10)
(Kabakto Mountains--Mildew)

EL'CHIBAYEV, Adol'f Aydushevich; GAMALITSKAYA, N.A., otv. red.

[Edible mushrooms of Kirghizistan] S"edobnye griby Kirgizii. Frunze, Izd-vo AN Kirg.SSR, 1964. 44 p. (MIRA 17:5)

GAMALITSKAYA, Natal'ya Antonovna; TARBINSKIY, S.P., otv. red.

[Micromycetes of the southwestern part of the Central Tien Shan] Mikromitsety iugo-zapadnoi chasti TSentral'nogo Tian'-Shania. Frunze, Izd-vo AN Kirg.SSR, 1964. 172 p. (MIRA 17:5)

GAMALITSKIY, V.A.

Mechanizing the conveying and delivery of feeds at a swine-fattening farm. Biul.tekh.-ekon.inform. no.10:62-66 '58. (MIRA 11:12)

(Swine breeding)

GAMALITSKIY, V.A.

Mechanized removing of manure from hog-fattening houses. Sbor. nauch.-tekh. inform. po elek. sel'khoz. no.7:15-19 '59. (MIRA 13:9)

(Swine houses and equipment)
(Farm manure)

GAMALITSKIY, V.A., inzh.

Use of mobile electric machinery with flexible power supply lines in stockyards and dairy barns. Nauch. trudy VIESKH 11:52-65 '62. (MIRA 16:3)

(Dairy barns--Electric equipment)
(Stockyards--Electric equipment)

GAMAN, B.A. [Haman, B.O.]

Using electric prospecting for the investigation of slides.
Geol. zhur. 20 no. 5:70-74 '60. (MIRA 14:1)
(Landslides) (Electric prospecting)

GAMAN, B.A.

Nomogram for calculating the coefficients of a four-point setup with arbitrarily arranged electrodes. Geofiz.sbor.no. 5:66-67 '63. (MIRA 17:5)

1. Kiyevskaya geofizicheskaya razvedochnaya ekspeditsiya.

GAMAN, B.A.

Forecasting the water potential of crystalline basement rocks according to the data of combined profiling. Geofiz. sbor. no.7: 155-159 '64. (MIRA 17:11)

1. Kiyevskaya geofizicheskaya razvedochnaya ekspeditsiya tresta "Ukrgeofizrazvedka."

GAMAN, B.A.

Possibility of evaluating the specific resistance of the rocks of a crystalline basement in the presence of the effect of infinite resistance. Geofiz. sbor. no.9:88-90 '64.

(MIRA 18:6)

1. Kiyevskaya geofizicheskaya razvedochnaya ekspeditsiya tresta "Ukrgeofizrazvedka".

GAMAN, B.O. [Haman, B.O.]

Using stepwise curvatures of vertical electric logging graphs in prospecting for water-bearing areas in crystalline rocks. Nauk. zap.Kyiv.un. 16 no.14:233-238 '57. (MIRA 13:4)
(Water, Underground) (Prospecting, Electric)

SHAINSKIY, A.M. [Shainskyi, O.M.]; GAMAN, B.O. [Haman, B.O.]

Using the electric method in prospecting for water contained in Cretaceous marls of the Lvov trough. Geol. zhur. 19 no.4:103-107 '59. (MIRA 13:1)

(Lvov Province--Marl) (Electric prospecting)

GAMAN, M.S., tekhnik

Supply of 380 v a.c. power to industrial electric trucks.
Prom.energ. 18 no.1:29 '63. (MIRA 16:4)
(Industrial electric trucks)

GAMAN, Nicolae, prof. (Ploiesti)

Geographical reading hall of our school. Natura Geografie 13 no.3:71-75 My-Je '61.

GAMAN, V.I.

USSR/Electricity - Dielectrics G-2

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1242

Author : Presnov, V.A., Gaman, V.I.

Inst : Siberian Physical-Technical Institute, Tomsk.

Title : Dependence of the Electric Conductivity of Glass on the Electric Field Intensity.

Orig Pub : Zh. tekhn. fiziki, 1957, 27, No 5, 936-939

Abstract : A formula is derived, characterizing the electron conductivity in a strong electric field.

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USSR/Electricity - Dielectrics

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1242

where n_0 is the total concentration of the cations in the glass, the average distance between the cations, the frequency of the natural oscillations of the cations, q the charge of the cations, E the electric field intensity, U the difference in potential energy of the ion in regular and irregular states, and U the energy of activation.

The formula derived is in good agreement with the corresponding empirical equation (obtained by Pool):

e E, where 3q /2kT. It follows therefore that at a temperature of 40° C, in the case of silicate glass, theor 1.7 x 10 cm/v, which is in good agreement with the values of exp, obtained by various investigators (exp 1.7 -- 2.5 x 10 cm/v).

Card 2/2

AUTHOR PRESNOV, V.A., GAMAN, V.I.,

TITLE On the Connection Between the Electrical Properties of Crystals and the Parameters of the Crystal Lattice.
(O svyazi elektricheskikh svoystv kristallov s parametrami kristallicheskoy reshetki -Russian)

PERIODICAL Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 1, pp 67-69 (U.S.S.R.)

ABSTRACT The paper under review computes, on basis of rough calculation, the dependence of the electric resistance of crystals on the parameters of the lattice. In presence of a strong electric field the mean energy of the electron-taking into consideration the interaction with the phonon gas-amounts to $\epsilon \sim mv^2 \sim eEl(v/a) \sim eE(l/a)\sqrt{(kT/m)}$. In this context, m denotes the mass of the electron, k the Boltzmann constant, T the absolute temperature, E the electric field intensity, l the free length of path of the electron, a the velocity of propagation of the phonons (in the case under consideration, one thinks of the beginning of the acoustic branch of the oscillations). The electrical breakdown of the crystal takes place when the energy of the electrons is higher than or equal to the width of the prohibited zone. Therefore the condition of breakdown may be written in the following form: $eE_{du}(l/a)\sqrt{(kT/m} \sim u_o$.

In this context, u_o stands for the width of the forbidden zone inthe energy spectrum of the crystal. Then the paper under review lists an expression for the velocity of propagation of the phonons and substitutes it into the condition of breakdown. Thus we obtain for NaCl the

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On the Connection Between the Electrical Properties of [illegible] Crystals and the Parameters of the Crystal Lattice.

breakdown field-intensity $E_{du}(NaCl) \sim 1.92 \cdot 10^6$ V/cm. This value, arrived at by computation, is in good agreement with the experimental value. Thenthe paper under review proceeds to list an expression for the coefficient of the quasi-elstic condition and substitutes it into the formula for the breakdown field-intensity. Thus we obtain, after modification of all constants, $E_{du} \sim 30.85\, n^{1/2} U^{1/2} u_o / r_o \sqrt{2(M_1 M_2)}$.

In this context, U denotes the energy of the crystal lattice per ion pair, r_o the lattice constant, M_1 and M_2 the masses of the particles constituting the crystal, whereas n has different values depending on the data listed by different authors. The curve $E_{du} = F(u_{du})$ must be straight line; certain experimental data are more or less in agreement with this assumption. The electrical resistance of crystals and the critical field strength (at which lattice constant, and on the mass of the particles constituting the crystal.
(1 reproduction and 1 chart).

ASSOCIATION Siberian Physical-Technological Institute, State University Tomsk.
PRESENTED BY IOFFE A.F., [illegible]ember of the Academy.
SUBMITTED 17.12.1956
AVAILABLE Library of Congress.
Card 2/2

Sibirskiy fiziko-tekhnicheskiy inst. pri Tomskom gosudar. universitety im. V.V. Kuybysheva. Pred. akad. A. F. Ioffe

GAMAN, V.I.

20-5-33/48

AUTHORS: Gaman, V. I. and Krasil'nikova, L. M.

TITLE: Polymorphous Transformations of Silica in Silicate Glass (K voprosu o polimorfnykh prevrashcheniyakh kremnezema v silikatnykh steklakh)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 116, Nr 5, pp. 838 - 840 (USSR)

ABSTRACT: According to modern conceptions glass consists of various domains which are connected with one another and have no phase separation limits. A part of these domains consists on the whole of silica. In the inner of these domains there are sections with a high degree of order. The first form the amorphous component, the latter - the crystallites. However, the presence of crystallites in a noticeable quantity is doubted. All experimental proofs of their existence have one fault: there is no possibility to determine quantitatively the mentioned components of the glass. In the present paper the attempt was made to determine beside proving the existence of the crystallites also their quantitative content in glass. Final conclusions: 1.) By the investigation of the temperature dependence of the coefficient on Pul' it was shown that in the borosilicate- and technical glasses polymorphous temperature trans-

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Polymorphous Transformations of Silica in Silicate Glass

formations occur. 2.) The binding of the free silica of the glasses by metal oxides leads to the vanishing of the polymorphous transformations. 3.) One succeeded to fix thermographically the polymorphous transformations, however, only in glasses which before had been exposed some time to a temperature of from 600 to 700°. 4.) The sensitivity of the thermal method has turned out to be insufficient for the fixing of polymorphous transformations in not preheated glasses. The investigation of the temperature dependence of the coefficient facilitates to determine their existence also in such glasses. There are 3 figures, and 5 references, all of which are Slavic.

ASSOCIATION: **Physical-Technical Institute, Tomsk State University im. V.V. Kuybyshev**
(Fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete im. V. V. Kuybysheva)

PRESENTED: May 15, 1957, by A. A. Lebedev, Academician

SUBMITTED: May 15, 1957

AVAILABLE: Library of Congress

GABAL, V.I., Cand Phys-Math Sci--(diss) "Study of the electric properties of solid dielectrics in ~~powerful~~ strong electrid fields." Tomsk, 1958. 8 pp (Min of Higher Education USSR. Tomsk State U im V.V. Kuybyshev), 100 copies (KL,25-58,106)

PRESNOV, V.A.; GAMAN, V.I.

Electric conductivity of glass and its dependence on the strength of an electric field. Izv. vys. ucheb. zav.; fiz. no.2:92-94 '58. (MIRA 11:6)

1.Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V.V. Kuybysheva.
(Glass--Electric properties)

AUTHOR: Gaman, V. I. SOV/139-58-4-26/30

TITLE: Investigation of the Electric Conductivity of Glasses in Intensive Electric Fields (Issledovaniye elektroprovodnosti stekol v sil'nykh elektricheskikh polyakh)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Fizika, 1958, Nr 4, pp 158-162 (USSR)

ABSTRACT: Paper presented at the Inter-University Conference on Dielectrics and Semiconductors, Tomsk, February, 1958. Poole (Ref 1) and numerous other authors have shown that the electric conductivity of glass in strong electric fields does not comply with the Ohm law and from a certain critical field strength onwards the electric conductivity increases with increasing field strength according to the law:

$$\sigma = \sigma_0 e^{\alpha E}, \qquad (1)$$

where σ - electric conductivity in a strong field;
σ_0 - electric conductivity in a weak field;
E - the electric field potential;
α - coefficient.

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Investigation of the Electric Conductivity of Glasses in Intensive Electric Fields

The aim of the work described by the author of this paper was to establish the temperature dependence of the Poole coefficient α and to elucidate the causes of its jump-like change in the temperature range where polymorphous transformations of the silica take place. The experiments have proved that in presence of a high voltage polarisation the Poole coefficient α of glasses is either independent of the temperature or increases slightly with increasing temperature. In the temperature ranges which correspond to the polymorphous transformations of various modifications of free silica, the coefficient α shows maxima. Thereby, with decreasing silica content in the glass the magnitudes of these maxima decrease until complete cessation. From a certain current intensity onwards, 10^{-6} to 10^{-5} A, the coefficient α increases relatively sharply with increasing temperature. The magnitude of the critical field strength E_{cr} either does not depend on the temperature at all or decreases with increasing temperature; in the temperature range of polymorphous transformations of the silica, the temperature dependence curve of E_{cr}

SOV/139-58-4-26/30

Investigation of the Electric Conductivity of Glasses in Intensive Electric Fields

shows a minima. The results of measuring the temperature dependence of the Poole coefficient α and of the potential of the critical field indicate that the glass contains ordered micro-zones of silica which are susceptible to polymorphous transformations.
Acknowledgments are made to V. A. Presnov under whose guidance this work was carried out.
There are 5 figures and 8 references, 7 of which are Soviet, 1 English.

ASSOCIATION: Sibirskiy Fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuybysheva (Siberian Physico-Technical Institute at the Tomsk State University imeni V. V. Kuybyshev)
SUBMITTED: March 10, 1958

Card 3/3

GAMAN, V. I. (SFTI)

"The temperature course of the pool factor in the case of silicate - and boron silicate glasses is to a considerable extent determined by the temperature dependence of the polarization potential in the case of the existence of a high-voltage polarization"

Report presented at a Conference on Solid Dielectrics and Semiconductors, Tomsk Polytechnical Inst., 3-8 Feb. 58.
(Elektrichestvo, '58, No. 7, 83-86)

GAMAN, V.I.; PERKAL'SKIY, V.A.; KALLESTINOV, G.V.

Effect of a strong field in germanium p-n junctions. Izv.vys.ucheb. zav.;fiz. no.2:3-9 '60. (MIRA 13:8)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V.V. Kuybysheva.
(Semiconductors) (Electric fields)

GAMAN, V.I.

Effect of temperature on the Poole effect in silicate and borosilicate glasses. Izv.vys.ucheb.zav.;fiz. no.2:129-133 '60. (MIRA 13:8)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete im. V.V. Kuybysheva.
(Glass—Electric properties)

Gaman, V. I.

AUTHOR: Syritskaya, Z. M.

S/072/60/000/03/021/023
B003/B008

TITLE: 3rd All-Union Conference on the Vitreous State

PERIODICAL: Steklo i keramika, 1960, Nr 3, pp 43-46 (USSR)

ABSTRACT: The 3rd All-Union Conference on the Vitreous State was held in Leningrad at the end of 1959. It was organized by the Institut khimii silikatov AN SSSR (Institute of the Chemistry of Silicates AS USSR), Vsesoyuznoye khimicheskoye obshchestvo imeni D. I. Mendeleyeva (All-Union Chemical Society imeni D. I. Mendeleyev) and Gosudarstvennyy opticheskiy institut imeni S. I. Vavilova (State Optical Institute imeni S. I. Vavilov). More than 100 reports on the structure of glass, investigation methods of the vitreous state, the mechanism of vitrification and physicochemical and technical properties of glasses were delivered. The Conference was opened by Academician A. A. Lebedev. [illegible]. At the 5th meeting, 9 reports dealt with the investigation results of sodium-boron-silicate glasses. A. A. Appen and Can' Fu-Si, "Boron and Alumoboron Anomaly of the Properties of Silicate Glasses"; Ye. I. Galant, "On the Coordination Numbers of Aluminum and Boron in Some Glasses"; S. P. Zhdanov reported on structural changes in boron-silicate glasses; Ye. A. Poray-Koshits and S. P. Zhdanov reported on some controversial problems concerning the structure of boron-silicate glasses and their porous products; Ye. A. Poray-Koshits and N. S. Andreyev, "Submicroscopic Inhomogeneities in the Structure of Complex Glasses". The 15 reports at

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the 6th meeting dealt with the electric properties of glasses. L. M. Belyavskaya reported on the structure determination of glass with the aid of an inhomogeneous electric field; N. N. Vereshchagin and V. I. Odelevskiy, "Structure and Properties of Some Oxide Glasses In the Light of the Polymer-theory of the Vitreous State"; R. L. Myuller reported on the agility and the degree of dissociation as functions of the ionic and atomar composition of the glass; V. I. Odelevskiy reported on the nature of dielectric losses in glasslike and crystalline aluminosilicates; V. P. Petrosyan, "Investigation of the Dielectric Polarization and the Losses in Phosphate Glasses"; V. A. Presnov, V. I. Gaman and L. M. Krasil'nikov reported on investigations of the conductivity of glasses in electric high-tension fields, K. K. Yevstrop'yev on the diffusion of Na^{22} and K^{42} in some silicate glasses, V. A. Ioffe, I. B. Yanchevskaya and G. I. Khvostenko on electric properties of crystalline and glasslike aluminosilicates. O. V. Mazurin spoke on his studies which were carried out under the supervision of Professor K. S. Yevstrop'yev at the Kafedra stekla LTI imeni Lensoveta (Chair for Glass of the Leningrad Technological Institute imeni Lensovet) in the report: "The Dependence of the Electroconductivity of Glasses on the Chemical Composition". V. A. Kharitonov, O. V. Mazurin and N. N. Zubkova gave investigation results on the specific electroconductivity of glasses of the system $SiO_2 - B_2O_3 - BaO$ in the tem-

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perature range of from 400-1300° and on the influence of additions of aluminum- and zinc oxide on the electric conductivity of these glasses. At the 7th meeting, 6 reports dealt with glasses as semiconductors, 9 with the coloring of glasses and the influence of radiation and 4 reports with technical properties of glasses. V. A. Ioffe and G. I. Khvostenko, "Electric Properties of Some Semiconductor Glasses". B. T. Kolomiyets, N. A. Goryunova and V. P. Shilo reported on methods for the production of chalcogenide glasses, on some of their general properties and on the limits of the vitreous state in the systems $Tl_2Se - As_2Se_3$, $Tl_2Se - Sb_2Se_3$, $Sb_2Se_3 - As_2Se_3$, Tl - As - Se. B. T. Kolomiyets and B. V. Pavlov reported on the optical absorption in a number of binary chalcogenide systems. B. T. Kolomiyets, T. N. Mamontova and G. V. Nazarova reported on the electron conductivity of chalcogenide glasses. A. A. Vaypolin, Ye. A. Poray-Koshits, "Radiographic Investigation of the Structure of Vitreous Arsenic Chalcogenides". V. V. Tarasov and V. A. Romanovskiy reported on the chain structure of the vitreous arsenious sulphide determined by them with calorimetric measurements. K. P. Azarov reported on structure and properties of ferrous boron glasses and

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(37)

88057

S/139/60/000/006/025/032
E201/E491

9.4300 (1143, 1155)

AUTHORS: Gaman, V.I. and Perkal'skis, B.Sh.

TITLE: The Dependence of the Impact Ionization Coefficient on the Electric Field Intensity in Semiconductors

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No.6, pp.157-160

TEXT Wolff (Ref.1) obtained an expression for the impact ionization coefficient α assuming that electrons lose energy only by interactions with optical lattice vibrations. Wolff considered also for the effect of impact ionization on the electron velocity distribution function. Groschwitz (Ref.2) used an electron velocity distribution function which allows for electron interactions only with acoustic lattice vibrations. In weak fields, Groschwitz's expression for α was found to agree with experiment better than Wolff's expression. Wolff's formula was better in strong fields. The present paper considers impact ionization on the assumption of electron interactions with both optical and acoustic vibrations. The

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E8057

S/139/60/000/006/025/032
E201/E491

The Dependence of the Impact Ionization Coefficient on the Electric Field Intensity in Semiconductors

authors use the electron velocity distribution function derived by Chuyenkov (Ref 3). Two expressions are deduced for the ionization coefficient: one valid in fields up to 5000 V/cm in germanium and 27000 V/cm in silicon (similar to Groschwitz's equation); the other valid in fields greater than 5×10^5 V/cm The second expression agreed with the experimental values for silicon, as shown in Fig.1, where the continuous line is the experimental dependence and the dashed line represents the second expression derived in this paper. There are 1 figure and 5 references: 2 Soviet and 3 non-Soviet.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V.Kuybysheva (Siberian Physicotechnical Institute at Tomsk State University imeni V.V.Kuybyshev)

SUBMITTED: October 22, 1959

Card 2/2

9,4300 (1137, 1138, 1143)

S/139/60/000/005/014/031
E201/E191

AUTHOR: Gaman, V.I.

TITLE: Avalanche Breakdown in P--N Junctions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No. 5, pp 82-87

TEXT: The author derives an expression for the avalanche breakdown voltage (denoted by U_{np}) in terms of carrier densities. The treatment deals both with abrupt and with linear-gradient p--n junctions. The experimental (curve 1) and theoretical (curve 2) dependences of the breakdown voltage on the difference (N) between donor and acceptor densities are plotted in Fig. 1 for abrupt p--n junctions in silicon. Both dependences can be described by

$$U_{np} = kN^{-0.66\pm0.01}$$

where k is different for curves 1 and 2. Curve 2 (theoretical) gave values of the breakdown voltage three times higher than the experimental ones, because of various simplifying assumptions in theoretical calculations. The theoretical expressions for the

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S/139/60/000/005/014/031
E201/E191

Avalanche Breakdown in P--N Junctions

breakdown voltage and the dependence of the avalanche multiplication factors on voltage were very similar for abrupt and linear-gradient junctions.
There are 1 figure and 4 references: 3 Soviet and 1 English.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V. Kuybysheva (Siberian Physico-Technical Institute at Tomsk State University imeni V.V. Kuybyshev)

SUBMITTED: November 24, 1959

Card 2/2

PHASE I BOOK EXPLOITATION SOV/5035

Vsesoyuznoye soveshchaniye po steklobraznomu sostoyaniyu. 3d, Leningrad, 1959.

Stekloobraznoye sostoyaniye; trudy Tret'yego Vsesoyuznogo soveshchaniya Leningrad, 16-20 noyabrya 1959 (Vitreous State; Transactions of the Third All-Union Conference on the Vitreous State, Held in Leningrad on November 16-20, 1959) Moscow, Izd-vo AN SSSR, 1960. 534 p. Errata slip inserted. 3,200 copies printed. (Series: Its: Trudy)

Sponsoring Agencies: Institut khimii silikatov Akademii nauk SSSR. Vsesoyuznoye khimicheskoye obshchestvo imeni D.I. Mendeleyeva and Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova.

Editorial Board: A.I. Avgustinik, V.P. Barzakovskiy, M.A. Bezborodov, O.K. Botvinkin, V.V.Vargin, A.G. Vlasov, K.S. Yevstrop'yev, A.A. Lebedev, M.A. Matveyev, V.S. Molchanov, R.L. Myuller, Ye.A. Poray-Koshits, Chairman, N.A. Toropov, V.A. Florinskaya, A.K. Yakhkind; Ed. of Publishing House: I.V. Suvorov; Tech. Ed.: V.T. Bochever.

PURPOSE: This book is intended for researchers in the science and technology of glasses.

COVERAGE: The book contains the reports and discussions of the Third All-Union Conference on the Vitreous State, held in Leningrad on November 16-19, 1959. They deal with the methods and results of studying the structure of glasses, the relation between the structure and properties of glasses, the nature of the chemical bond and glass structure, and the crystallochemistry of glass. Fused silica, mechanism of vitrification, optical properties and glass structure, and the electrical properties of glasses are also discussed. A number of the reports deal with the dependence of glass properties on composition, the tinting of glasses and radiation effects, and mechanical, technical, and chemical properties of glasses. Other papers treat glass semiconductors and soda borosilicate glasses. The Conference was attended by more than 500 delegates from Soviet and East German scientific organizations. Among the participants in the discussions were N.V. Solomin, Ye. V. Kuvshinskiy, Yu.A. Gastev, V.P. Pryanishnikov, Yu. Ya. Gotlib, O.P. Mchedlov-Petrosyan, G.P. Mikhaylov, S.M. Petrov, A.N. Lazarev, D.I. Levin, A.V. Shatilov, N.T. Ploshchinskiy, A.Ya. Kuznetsov, E.V. Degtyareva, S.V. Byurganovskaya, A.A. Kalenov, M.M. Skornyakov, P.Ya. Bokin, E.K. Keller, Ya.A. Kuznetsov, V.P. Pozdnev, R.S. Shevelevich, Z.G. Pinsker, and O.S. Molchanova. The final session of the Conference was addressed by Professor I.I. Kitaygorodskiy, Honored Scientist and Engineer, Doctor of Technical Sciences. The following institutes were cited for their contribution to the development of glass science and technology: Gosudarstvennyy opticheskiy institut (State Optical Institute), Institut khimii silikatov AN SSSR (Institute of Silicate Chemistry, AS USSR), Fizicheskiy institut AN SSSR (Physics Institute AS USSR), Fiziko-tekhnicheskiy institut AN SSSR (Physicotechnical Institute AS USSR), Institut fiziki AN BSSR, Minsk (Institute of Physics, Academy of Sciences, Belorusskaya SSR, Minsk), Laboratory of Physical Chemistry of Silicates of the Institut obshchey i neorganicheskoy khimii AN BSSR, Minsk (Institute of General and Inorganic Chemistry, Academy of Sciences, Belorusskaya SSR, Minsk), Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High Molecular Compounds, AS USSR), Gosudarstvennyy institut stekla (State Institute for Glass), Gosudarstvennyy institut steklovolokna (State Institute for Glass Fibers), Gosudarstvennyy institut elektrotekhnicheskogo stekla (State Institute for Electrical Glass), Sibirskiy fiziko-technicheskiy institut, Tomsk (Siberian Physicotechnical Institute, Tomsk), Leningradskiy gosudarstvennyy universitet (Leningrad State University), Moskovskiy khimiko-tekhnologicheskiy institut (Moscow Institute of Chemical Technology), Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institut imeni Lensovet), Belorusskiy politekhnicheskiy institut Minsk (Belorussian Polytechnic Institute, Minsk), Novocherkasskiy politekhnicheskiy institut (Novocherkassk Polytechnic Institute), and Sverdlovskiy politekhnicheskiy institut (Sverdlovsk Polytechnic Institute). The Conference was sponsored by the Institute of Silicate Chemistry AS USSR (Acting Director - A.S. Gotlib), the Vsesoyuznoye khimicheskoye obshchestvo im. D.I. Mendeleyeva (All-Union Chemical Society imeni D.I. Mendeleyev), and the Gosudarstvennyy ordena Lenina opticheskiy institut imeni S.I. Vavilova (State "Order of Lenin" Optical Institute imeni S.I. Vavilov). The 15 resolutions of the Conference include recommendations to organize a Center for the purpose of coordinating the research on glass, to publish a new periodical under the title "Fizika i khimiya stekla" (Physics and Chemistry of Glass), and to join the International Committee on Glass. The Conference thanks A.A. Lebedev, Academician, Professor, and Chairman of the Organization Committee; Ye.A. Poray-Koshits, Doctor of Physics and Mathematics, Member of the Organizational Committee; and R.L. Myuller, Doctor of Chemical Sciences, Member of the Organizational Committee. The editorial board thanks G.M. Bartenev, M.V. Vol'kenshteyn, L.I. Demkina, D.P. Dobychin, S.K. Dubrovo, V.A. Ioffe, and B.T. Kolomiyets. References accompany individual reports.

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GAMAN, V.I.; PERKAL'SKIS, B.Sh.

Effect of the electric field intensity in semiconductors on the impact ionization coefficient. Izv. vys. ucheb. zav.; fiz. no.6:157-160 '60. (MIRA 14:3)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V. Kuybysheva.

(Ionization) (Semiconductors)

L 18994-63 EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3 Pq-4 WH/JD/JG

ACCESSION NR: AT3002454 S/2935/62/000/000/0207/0211

72
69

AUTHOR: Gaman, V. I.; Sirotkin, A. A.; Stenina, V. M.

TITLE: Effect of As-S-I low-melt glass on current-voltage characteristics of silicon p-n junctions [Conference on Surface Properties of Semiconductors, Institute of Electrochemistry, AN SSSR, Moscow, 5-6 June, 1961]

SOURCE: Poverkhnostnyye svoystva poluprovodnikov. Moscow, Izd-vo AN SSSR, 1962, 207-211

TOPIC TAGS: low-melt glass, current-voltage characteristic, semiconductor, silicon, silicon junction

ABSTRACT: Experimental studies are described of alloyed Si junctions hot-coated with 24% As, 67% S, 9% I glass. The dielectric constant of the glass was 6.5, its $tg\delta$ was $(4.5-0.4) \times 10^{-3}$ at 30-10,000 cps. Al was alloyed into n-Si with a resistivity of 10-15 ohms.cm. The junctions were dipped into the glass melt at 250-300C for 1 min, then aged for 30-50 hrs at 130-150C, then subjected

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L 18994-63

ACCESSION NR: AT3002454

3

to tropical humidity for 75 hrs, and finally went through 3 thermal 70-min cycles -60+130C. Reverse current-voltage characteristics were determined at various stages of the above treatment. It was found that the glass acted as a getter absorbing contaminants from the surface of the junctions; that the glass was moisture-resistant and that its dielectric loss was low. "In conclusion, the authors wish to thank B. V. Makarkin for measuring the dielectric characteristics of the glass." Orig. art. has: 4 figures and 1 formula.

ASSOCIATION: Tomskiy gosudarstvenny*y universitet im. V. V. Kuyby*sheva (Tomsk State University)

SUBMITTED: 00 DATE ACQ: 15May63 ENCL: 00

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

Card 2/2

9,4 300 (3005, 1143, 1150)

S/139/61/000/002/011/018
E032/E414

AUTHOR: Gaman, V.I.

TITLE: On the Law of Increase of the Reverse Current in Germanium p-n Junctions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1961, No.2, pp.110-113

TEXT: It is known that the reverse current through a p-n junction begins to increase at large voltages. Measurements carried out by the present author and V.A.Perkal'skiy and G.V.Kallestinov (Ref.2) showed that under certain conditions the reverse current varies with the applied voltage in accordance with the formula

$$I = cV^{1/4}e^{-\frac{c_1}{V^{1/4}}}, \qquad (1)$$

where c and c_1 are constants for given specimens. However, it was found that in many cases this relation is not satisfied. In order to elucidate the effects responsible for the form of the reverse characteristic, the present author has investigated selected plane triodes of type П1 (P1). The collector

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characteristics of the triodes were obtained using voltage pulses 10 to 30 sec long. It was found that the collector characteristics of these triodes are very similar to those of diodes ДГ-Ц22 (DG-Ts22). Thus, for example, Fig.2 shows the reverse current-voltage characteristic and the collector current change (ΔI) for the П1Е (P1E) triode at 18°C. Analogous curves for the П1Б (P1B) triode at 20°C are shown in Fig.3. It is argued that ionization by collision, giving rise to current carrier multiplication, is due to surface effects. This occurs for voltages not exceeding 0.9 of the breakdown voltage. At higher reverse voltages, the increase in the current is due to volume rather than surface effects. Fig.4 shows the reverse volt-ampere characteristic of the П1Ж (P1Zh) triode and the ДГ-Ц27 (DG-Ts27) diode. There are 5 figures and 5 references: 1 Soviet and 4 non-Soviet.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V.V.Kuybysheva (Siberian Physicotechnical Institute at the Tomsk State University imeni V.V.Kuybyshev)

On the Law of Increase of ...

S/139/61/000/002/011/018
E032/E414

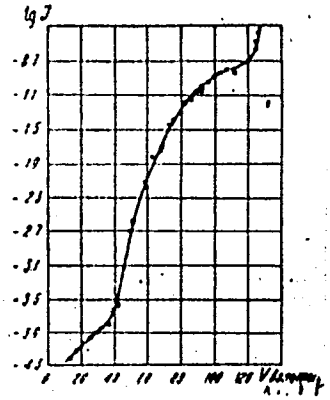

Fig.4.

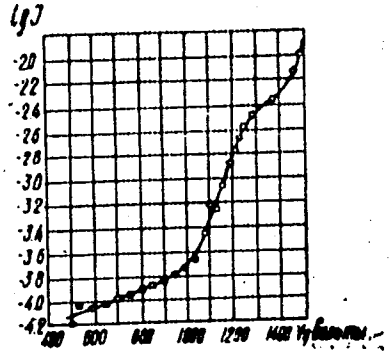

Fig.5.

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L 13057-63 EWT(l)/EWG(k)/EWP(q)/EWT(m)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3 Pz-4 AT/JD/IJP(C)

ACCESSION NR: AT3002988 S/2927/62/000/000/0101/0105

AUTHOR: Gaman, V. I.; Kaly*gina, V. M.

TITLE: Reverse current-temperature characteristic of germanium p-n junctions [Report of the All-Union Conference on Semiconductor Devices held in Tashkent from 2 to 7 October 1961]

SOURCE: Elektronno-dy*rochny*ye perekhody* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 101-105

TOPIC TAGS: germanium transistor, germanium transistor reverse current

ABSTRACT: The reverse branch of the current-voltage characteristic of industrial Ge diodes can be subdivided into 3 sections: (1) a low-voltage section where the reverse current slowly grows with bias; (2) a section corresponding to the voltages up to 0.9 of the breakdown voltage where the reverse current sharply increases; (3) an impact-ionization and breakdown section. Reverse characteristics and collector-current increments were measured for various emitter currents in a p-n-p In-Al alloy special Ge transistor. Effect of temperature on the collector current, for various collector voltages, was measured within -160 +22C range; at higher collector voltages, the collector current passes

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L 13057-63
ACCESSION NR: AT3002988

through a minimum which lies in the negative temperature range. It was found that, at room temperature, the reverse current reaches its steady-state value in 30 microsec; at low temperatures it is still far short of its ultimate value and hence changes sharply with the voltage-pulse duration. Curves illustrating the above relationships are presented in the article. Orig. art. has: 3 figures and 3 formulas.

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences SSSR) Akademiya nauk Uzbekskoy SSR (Academy of Sciences UzSSR) Tashkenskiy gosudarstvenny*y universitet (Tashkent State University)

SUBMITTED: 00 DATE ACQ: 15May63 ENCL: 00

SUB CODE: 00 NO REF SOV: 004 OTHER: 007

Card 2/2

L 12819-63 EWP(q)/EWT(m)/BDS AFFTC JD

ACCESSION NR: AT3003015 S/2927/62/000/000/0254/0258

54

AUTHOR: Presnov, V. A.; Gaman, V. I.; Sirotkin, A. A.

TITLE: Effect of a low-melt glass coating on the characteristics of silicon p-n junctions [Report at the All-Union Conference on Semiconductor Devices, Tashkent, 2-7 October, 1961]

SOURCE: Elektronno-dy*rochny*ye perekhody* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 254-258

TOPIC TAGS: silicon transistor, silicon junction

ABSTRACT: Excessive surface leakage currents in silicon p-n junctions cause parameter instability and other undesirable effects. Theoretically, these currents can be suppressed by coating the silicon with a low-melt glass. Two types of glass were investigated experimentally: As - S - I and As - S - Tl; they melted at 500-600C. Their ε and $\operatorname{tg}\delta$ at 9.24×10^9 cps are reported in the article. Al-n-silicon junctions were coated with glass, measured, then subjected to -60 +130C cycle three times, and measured again. The results were inconclusive: some specimens exhibited increase, some decrease in the reverse currents; in other specimens the

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L 12819-63
ACCESSION NR: AT3003015

reverse currents did not change. Tl-glass coated D808 stabilitrons showed deterioration of characteristics. The results are discussed and partly attributed to chemisorbed molecules on the surface of silicon. Orig. art. has: 2 figures, 5 formulas, and 2 tables.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 15May63 ENCL: 00

SUB CODE: PH, GE NO REF SOV: 002 OTHER: 009

Card 2/2

PRESNOV, V.A.; GAMAN, V.I.

Interuniversity scientific and technological conference on semiconductor physics (surface and contact phenomena). Izv. vys. ucheb. zav; fiz. no.1:176-177 '63. (MIRA 16:5)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni V.V.Kuybysheva.
(Semiconductors—Congresses)

ACCESSION NR: AR4034481 S/0058/64/000/003/E053/E053

SOURCE: Ref. zh. Fiz., Abs. 3E419

AUTHORS: Gaman, V. I.; Gitel'son, G. M.; Perkal'skis, B. Sh.

TITLE: Effect of a strong field and temperature dependence of inverse current of alloyed germanium junctions

CITED SOURCE: Izv. Leningr. elektrotekhn. in-ta, vy*p. 51, 1963, 19-24

TOPIC TAGS: germanium junction, alloyed germanium junction, pn junction, collector current increment, inverse current, inverse characteristics, surface state filling, carrier multiplication

TRANSLATION: The static inverse characteristics of the p-n junction and the increment of the collector current (ΔI) for a given emitter current were investigated in Ge transistors, while the temperature

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ACCESSION NR: AR4034481

dependence of the inverse current I_3 was investigated in diodes. A decrease in the inverse current with time is observed in the static measurements, and the time of establishment of the inverse current increases with decreasing temperature (T). This is connected with the filling of the slow surface states, which increases the negative surface charge and leads to a decrease in the multiplication on the surface. This also explains why ΔI is smaller in the static mode than in the pulsed mode. An investigation of the temperature dependence of I_3 shows that the $I_3(T)$ curve has a maximum in the region of below-zero temperatures, at voltages close to breakdown. The increase in I_3 is attributed to multiplication of the carriers on the p-n junction surface at low temperatures. The reason for the appearance of the maximum on the $I_3(T)$ curve remains unclear. G. Stepanov.

DATE ACQ: 10Apr64 , SUB CODE: PH ENCL: 00

Card 2/2

PRESNOV, V.A., prof., otv. red.; GAMAL', V.I., dots., otv. red.; ALEKSEYEVA, Z.M., assistent, otv. red.

[Surface and junction effects in semiconductors] Poverkhnostnye i kontaktnye iavleniia v poluprovodnikakh. Tomsk, Izd-vo Tomskogo univ., 1964. 505 p. (MIRA 18:1)

1. Tomsk. Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel'skiy institut.

L 64293-65 EWP(e)/EWT(m)/EWP(i)/EWP(b) GS/WH

ACCESSION NR: AT5020458 UR/0000/64/000/000/0131/0138

AUTHOR: Sirotkin, A. A.; Gaman, V. I.(Docent); Mikhaylova, T. G.; Presnov, V. A. (Professor)

TITLE: Using inorganic glasses for the protection of semiconductor devices

SOURCE: Mezhvuzovskaya nauchno-tekhnicheskaya konferentsiya po fizike poluprovodnikov (poverkhnostnyye i kontaktnyye yavleniya). Tomsk, 1962. Poverkhnostnyye i kontaktnyye yavleniya v poluprovodnikakh (Surface and contact phenomena in semiconductors). Tomsk, Izd-vo Tomskogo univ., 1964, 131-138

TOPIC TAGS: germanium semiconductor, glass, telluride, selenide, inorganic oxide, sulfide, protective coating, glass coating

ABSTRACT: The authors studied the use of low-melting chalcogenide glasses of various compositions and systems for protecting standard open semiconductor devices of Soviet manufacture. Some of the electrophysical properties of these glasses were studied. The resistivity of these glasses at room temperature lies within the range from 10^{13} to 10^{16} Ω·cm depending on the glass composition. The resistivity drops sharply with an increase in temperature being reduced by 4-5 orders of magnitude at 120-180°C. There are two methods for applying glass coatings to the semi-

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L 64293-65

ACCESSION NR: AT5020458

conductor devices: a) immersion of the semiconductor device in the glass melt; b) vaporization of a glass film in vacuum. Experiments with the immersion method showed a reduction or no change in the reverse current, with good waterproofing qualities. This method is not applicable to germanium semiconductor devices since the melting point of the glass is considerably higher than that of the material for the rectifying contact. Therefore the method of precipitation of glass vapors in vacuum was used for these devices. Glasses containing selenium were the best in quality and had the best adhesion properties. It may be possible to create a glass coating with a coefficient of expansion close to that of the semiconductor device by adding germanium to the glass composition. This would eliminate thermal stresses caused by rapid changes in temperature during coating of the device. Orig. art. has: 5 figures, 1 table.

ASSOCIATION: none

SUBMITTED: 060ct64 ENCL: 00 SUB CODE: MT, EC

NO REF SOV: 004 OTHER: 007

Card 2/2

L 01288-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/GS

ACCESSION NR: AT5020459 UR/0000/64/000/000/0139/0146

AUTHOR: Gaman, V. I. (Docent); Kalygina, V. M.

TITLE: Relaxation of reverse currents in germanium and silicon *p-n* junctions

SOURCE: Mezhvuzovskaya nauchno-tekhnicheskaya konferentsiya po fizike poluprovodnikov (poverkhnostnyye i kontaktnyye yavleniya). Tomsk, 1962. Poverkhnostnyye i kontaktnyye yavleniya v poluprovodnikakh (Surface and contact phenomena in semiconductors). Tomska, Izd-vo Tomskogo univ., 1964, 139-146

TOPIC TAGS: semiconductor research, germanium semiconductor, silicon semiconductor, electron recombination, carrier lifetime, relaxation process

ABSTRACT: Reverse current-voltage characteristics were studied in industrial germanium and silicon diodes as a function of the duration of an applied voltage pulse. As the pulse duration is initially increased to approximately 10-20 usec, the current falls sharply, and a gradual increase in current is then observed. It is assumed that reverse current relaxation is due to the following process. When a reverse bias is applied to the *p-n* junction, the concentration of holes in the *n*-semiconductor close to the volume charge region is reduced from the equilibrium value to

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ACCESSION NR: AT5020459

0

some new value. Thus there is a reduction in the volume component of the reverse current. Consideration must also be given to the effect which the fringe field of the *p-n* junction has on the concentration of holes in the surface layer of the *n*-semiconductor close to the volume charge region. The fringe field is the field which is generated close to the *p-n* junction by the difference in potentials between the *n*- and *p*-region. Solomon's calculations showed that the fringe field has two components: one component perpendicular to the surface of the semiconductor and close to the volume charge region may reach high values of the order of 10^4-10^5 v/cm. The second component is directed along the surface of the semiconductor and is insignificant in value. The perpendicular component of the fringe field corresponds to the field which would be created by a negatively charged plate close to the semiconductor. When a reverse voltage is applied to the *p-n* junction, the perpendicular component of the fringe field in the surface layer close to the volume charge region causes an excess concentration of holes since they are pulled out of the volume in a time of the order of 10^{-8} sec. This excess concentration then begins to decrease. A part of the holes passes into the *p*-semiconductor and a part recombines on the surface. The total reverse current is equal to the sum of the volume and surface components. An analysis of the experimental data showed that the variation in reverse current as a function of voltage pulse length follows an exponential law. The

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ACCESSION NR: AT5020459

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time constant for reverse current decay in germanium *p-n* junctions at low reverse voltages is equal to the effective lifetime of the minority carriers. The effective lifetime depends on the voltage at the *p-n* junction, which is an indirect confirmation of the fringe field hypothesis. For silicon *p-n* junctions, the relaxation time of the reverse current is considerably greater than the effective lifetime of the minority carriers. This may apparently be explained by the existence of capture centers on the silicon surface. Orig. art. has: 6 figures, 1 table.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni V. V. Kuybysheva (Siberian Physicotechnical Institute at the Tomsk State University)

44,55

SUBMITTED: 060ct64 ENCL: 00 SUB CODE: SS

NO REF SOV: 001 OTHER: 006

gp

Card 3/3

L 6741-65 EWT(1)/EWG(k)/EWT(m)/T/EWP(q)/EWP(b) Pz-6 IJP(c)/SSD/AFWL/ASD(a)-5
ESD(gs)/ESD(t)/RAEM(t) AT/JD
ACCESSION NR: AP4043875 S/0139/64/000/004/0138/0142

63
62

AUTHOR: Gaman, V. I.

TITLE: On the question of relaxation of reverse currents of germanium and silicon pn junctions

SOURCE: IVUZ. Fizika, no. 4, 1964, 138-142

TOPIC TAGS: pn junction, hole conduction mechanism, reverse current, carrier density, relaxation time, germanium, silicon

ABSTRACT: The author solves the equation for the distribution of hole density in a p-n junction under reverse bias by first solving the continuity equation in the nonstationary case for a planar p-n junction with unlimited n-region, although the results apply also to a limited n-region. It is assumed that the reverse current is essentially due to holes flowing from the n-region into the p-region. Solution of the equation shows that the observed time variation of

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ACCESSION NR: AP4043875

the reverse current in a p-n junction following application of reverse bias is due to establishment of a definite hole density distribution in the n-region of the junction. After the lapse of a certain time following application of the voltage, the reverse current decreases exponentially in time, and approaches the stationary value. The exponential nature of the reverse current agrees well with experiment. Orig. art. has:1 figure and 16 formulas.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuyby*sheva (Siberian Physicotechnical Institute at the Tomsk State University)

SUBMITTED: 23Mar63

ENCL: 00

SUB CODE: EC, NP NR REF SOV: 004 OTHER: 003

Card 2/2

L 64288-65 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h) IUP(c) JD/JS/AT

ACCESSION NR: AT5020460 UR/0000/64/000/000/0147/0155

AUTHOR: Gaman, V. I. (Docent); Kalygina, V. M.

TITLE: The nature of reverse currents in germanium and silicon p-n junctions

SOURCE: Mezhvuzovskaya nauchno-tekhnicheskaya konferentsiya po fizike poluprovodnikov (poverkhnostnyye i kontaktnyye yavleniya). Tomsk, 1963. Poverkhnostnyye i kontaktnyye yavleniya v poluprovodnikakh (Surface and contact phenomena in semiconductors). Tomsk, Izd-vo Tomskogo univ., 1964, 147-155

TOPIC TAGS: semiconductor theory, germanium semiconductor, silicon semiconductor, temperature dependence

ABSTRACT: Reverse characteristics of germanium and silicon p-n junctions are studied in pulse and static conditions. Square voltage pulses were used varying from 2 to 240 μsec with a prf of 50 cps. Germanium and silicon diodes were studied as well as diffusion junctions and p-n junctions produced by fusion of aluminum to n-silicon with a resistivity of 10-15 Ω·cm. The results show that reverse currents in germanium p-n junctions at room temperature and below increase with voltage according to the formula $I = A^n$ where A is some constant. At room tempera-

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L 64288-65

ACCESSION NR: AT5020460

ture, n is usually of the order of unity or less. The value of n increases with a reduction in temperature, reaching values of 2-4. At higher temperatures, the formula $I = Be^{cV^{1/2}}$ must be used, where B and c are constants for the given specimen. The experimental data showed that 50-90% of the reverse current is due to the surface component. Deviations from the classical theory are explained by the fringe field effect (R. Solomon, *J. of Appl. Phys.*, 31, 10, 1791, 1960). Typical experimental curves for reverse current as a function of temperature are shown in fig. 1 of the Enclosure. Orig. art. has: 2 figures, 16 formulas.

ASSOCIATION: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete im. V. V. Kuybysheva (Siberian Physicotechnical Institute at the Tomsk State University)

SUBMITTED: 06Oct64 ENCL: 01 SUB CODE: SS, EM

NO REF SOV: 006 OTHER: 005

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L 64288-65

ACCESSION NR: AT5020460

ENCLOSURE: 01

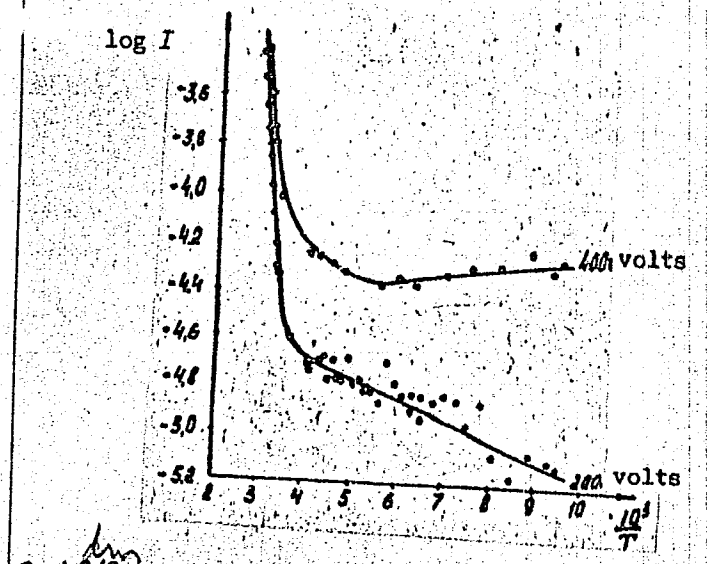

Fig. 1. Reverse current in a DG-Ts 22 diode as a function of temperature at different voltages.

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L 39411-65 EWT(l)/EEC(k)-2/T/EEC(b)-2/EWA(h) Pm-4/Pz-6/Peb/Pj-4 IJP(c)
ACCESSION NR: AP5006053 AT S/0139/65/000/001/0050/0056

AUTHOR: Gaman, V. I.

TITLE: Transients in semiconductor diodes with thin base

SOURCE: IVUZ. Fizika, no. 1, 1965, 50-56

TOPIC TAGS: pn junction, semiconductor diode, transient current, recombination rate, rectification, minority carrier, carrier density distribution

ABSTRACT: The article deals with highly asymmetrical narrow junctions in diodes, in which the n-type part has high resistivity, so that generation and recombination of carriers in the space-charge region can be neglected. The results are applicable to an equal degree to diodes with p-type base. The transients produced in such a diode by application of a unit-step forward bias voltage or by a jumplike change in the current in the circuit are analyzed by solving the continuity equation for the hole flow through the junction. The recombination rate on the non-rectifying contact is assumed arbitrary. It is shown that following application of a unit-step voltage the direct current component decreases exponentially from an initial

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ACCESSION NR: AP5006053

maximum value to a stationary value. This holds when the internal resistance of the voltage source and the load resistance are much lower than the resistance of the p-n junction. If the load resistance is much larger than the diode resistance, then the current in the circuit will also experience a jump, from zero to some value determined by the external resistance. The results obtained make it possible to determine the recombination rate on the non-rectifying contact if the volume lifetime of the minority carriers if the diode base is known. "The author is sincerely grateful to senior scientists V. A. Chaldyshev and A. P. Vyatkin, and to scientist A. A. Sirotkin for valuable advice made during the discussion of this article." Orig. art. has: 25 formulas.

association: Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosuniversitete imeni V. V. Kuybysheva (Siberian Physicotechnical Institute, Tomsk State University)

SUBMITTED: 16Jul63 ENCL: 00 SUB CODE: SS, IE

NR REF SOV: 003 OTHER: 001

me

Card 2/2

GAMAN, V.I.

Transients in semiconductor diodes in the presence of an electric field in the base. Izv. vys. ucheb. zav.; fiz. 8 no.2:73-77 '65.
(MIRA 18:7)

1. Sibirskiy fiziko-tekhnicheskiy institut imeni Kuznetsova.

GAMAN, V.I.

Transients in junction diodes due to penetrating d.c. pulses. Izv. vys. ucheb. zav.; fiz. 8 no.6:27-34 '65.

(MIRA 19:1)

1. Sibirskiy fiziko-tekhnicheskiy institut imeni V.D. Kuznetsova. Submitted February 7, 1964.

L 15549-66 EWT(1)/EEC(k)-2/T/EWA(h) IJP(c)
ACC NR: AP6002078 SOURCE CODE: UR/0139/65/000/006/0027/0034

AUTHOR: Gaman, V. I.

ORG: Siberian Physicotechnical Institute im. V. D. Kuznetsov (Sibirskiy fiziko-tekhnicheskiy institut)

TITLE: Transient processes in planar diodes on passage of a dc pulse

SOURCE: IVUZ. Fizika, no. 6, 1965, 27-34

TOPIC TAGS: semiconductor diode, pn junction, volt ampere characteristic

ABSTRACT: The author analyzes the transients occuring in a planar highly asymmetrical diode with limited base at high injection levels. The conductivity of the p-region is assumed much higher than that of the n-region of the p-n junction. An infinite recombination rate on the nonrectifying contact is assumed. The differential equations for the voltage buildup on the diode following sudden application of direct current, and the voltage decay after switching the current off

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L 15549-66

ACC NR: AP6002078

are derived and analyzed. The results show that the voltage on the space-charge region and Dember voltage drop increase with time, tending to a stationary value, while the ohmic voltage drop on the base decreases with increasing time. When the voltage is switched off, the decay is approximately linear. Methods of experimentally investigating the transients are briefly described and it is reported that the theoretical results give for the transient voltage values higher than experiment, owing to the approximate nature of the solution. Orig. art. has: 2 figures and 41 formulas.

SUB CODE: 09 SUBM DATE: 07Feb64/ ORIG REF: 002/ OTH REF: 002

Card 2/2

L 09371-67 EWT(1) IJP(c) AT
ACC NR: AT6023409 SOURCE CODE: UR/0139/66/000/003/0029/0034

AUTHOR: Gaman, V. I.; Kalygina, V. M.; Agafonnikov, V. F.

ORG: Siberian Physicotechnical Institute im. V. D. Kuznetsov (Sibirskiy fiziko-tekhnicheskiy institut)

TITLE: Determination of the effective lifetime of minority carriers from the plot of voltage buildup across a p-n junction

SOURCE: IVUZ. Fizika, no. 3, 1966, 29-34

TOPIC TAGS: minority carrier, carrier lifetime, pn junction, electron recombination, junction diode, temperature dependence

ABSTRACT: This is a continuation of an earlier analysis (Izv. vuzov SSSR, Fizika, no. 1, 1965) of the transient arising in the voltage across a p-n junction in response to a jumplike change in current. The present article is aimed at determining the rate of surface recombination at the diode base and the recombination rate on the non-rectifying contact by measuring the time development of this transient. The tests were made on a batch of diodes with thick and thin bases and with non-rectifying contact of small and large area. The diameters of the rectifying contacts for the diodes with thick base were of the order of the diffusion length of the initial germanium (1.3 - 1.6 mm). The n-germanium diodes were produced by a standard procedure. The apparatus for the measurement consisted of a square-wave generator to apply the signal and a pulsed voltmeter (with or without amplifier). The time dependence of the volt-

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L 09371-67
ACC NR: AP6023409

age was plotted by using pulses of different duration (from tenths of a microsecond to hundreds of microseconds) and measuring the corresponding voltage drop. The same apparatus was also used to determine the temperature dependence of the effective lifetime of the carriers in the diode base. The procedure was essentially based on the transient produced when the diode is switched over from the neutral into the conducting state by a current pulse. Tables of corresponding recombination rates and carrier lifetimes and a plot of the temperature dependence of the effective lifetime are presented. The results are close to those obtained earlier by others. Orig. art. has: 4 figures, 9 formulas, and 3 tables.

SUB CODE: 20/ SUBM DATE: 01Jul64/ ORIG REF: 006/

Card 2/2 LC

ACC NR: AP6013271 SOURCE CODE: UR/0413/66/000/008/0070/0070

INVENTOR: Sirotkin, A. A.; Gaman, V. I.; Presnov, V. A.

ORG: none

48 B

TITLE: Glass. Class 32, No. 180770 [announced by the Siberian Physicotechnical Scientific Research Institute at the Tomsk State University im. V. V. Kuybyshev (Sibirskiy fiziko-tekhnicheskiy nauchno-issledovatel' skiy institut pri Tomskom gosudarstvennom universitete im. V. V. Kuybysheva)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 8, 1966, 70

TOPIC TAGS: glass, silicon, thermal expansion, thermal expansion coefficient

ABSTRACT: An Author Certificate has been issued for a glass containing SiO_2, B_2O_3, Na_2O, and Al_2O_3. To ensure the production of glass with the coeffieicnt of thermal expansion close to the coefficient of thermal expansion of silicon, the components are taken in the following quantities (weight %): SiO_2, 34.65—49.35; B_2O_3, 42.18—46.66; Na_2O, 5.8—6.4; Al_2O_3, 2.38—2.63. [Translation] [NT]

SUB CODE: 11,20/SUBM DATE: 01Jul63/

Card 1/2 UDC: 666.112.7:666.117.3

Card 2/2 hs

"APPROVED FOR RELEASE: 09/17/2001 CIA-RDP86-00513R000614210007-0

SURNAME, Given Names

Country: Rumania

Academic Degrees:

Affiliation: -not given-

Source: Bucharest, Igiena, Vol IX, No 4, Sep-Oct 1961, pp 345-353.

Data: "Remarks on Certain Aspects of Chronic Oxycarbonism in the Presence of Irritant Gases and High Temperatures."

Authors:

TAT, Mircea, -Dr.-
KELINER, Stefan, -Dr.-
GAMANESCU, Stefan, -Pharmacist.-
LALICI, Sofia, -Engineer.-
TUDOR, Gheorghe, -Hygienist.-

GPO 931643

GAMANITSYNA, V. [redacted]

Brick factory built by a machine-tractor station. Sel'. stroi. 12 no.7:21 Jl '57. (MLRA 10:8)

1. Starshiy inzhener Altayskogo krayevogo upravleniya sel'skogo khozyaystva.

(Altai Territory--Brick industry)
(Machine-tractor stations)

GAMANKOV, T.T.; MITYUROV, B.N.

Organizing school workshops in general schools. Politekh. obuch. no.6:25-32 Je '57. (MIRA 12:4)
(Schools--Furniture, equipment, etc.) (Technical education)

BELAVTSEVA, Ye. M.; GAMARGALIYEVA, K. Z.; KITAYGORODSKIY, A. I.; VLASOV, A. V.

"Staining Method used for graft polymer investigation by electron microscope."

report submitted for 3rd European Conf on Electron Microscopy, Prague, 2 Aug to 3 Sept 1964.

Inst Organo-Element Compounds, AS USSR, All Union Artificial Fibre Research Inst, Moscow.

GAMARNIK, M.I.; ORLOVSKIY, S.N.

For a different attitude toward the industry's transportation system. Sakh.prom.29 no.7:9-11 '55. (MLRA 9:1)

1.Vinnitskiy sakhsveklotrest.
(Railroads--Track)

GAMARNIK, M.N.; SHOR, I.Ya.

Bone fractures due to neurotrophic disorders as a result of nerve root trauma in spinal puncture. Vest. rent. i rad. 33 no.6:73-74 N-O '58. (MIRA 12:1)

1. Iz 2-y gorodskoy bol'nitsy g. Bel'tsy (glavnyy vrach R.S. Rabinovskaya) i Respublikanskogo rentgenotsentra (nauchnyy rukovoditel' - kand. med. nauk N.Ya. Mil'man).

(FRACTURES, etiol. & pathogen.
neurotrophic disord. due to nerve root trauma in spinal puncture (Rus))
(SPINAL PUNCTURE, compl.
nerve root trauma causing neorotrophic disord. of bones & fract. (Rus))
(BONE AND BONES, innerv.
neurotrophic disord. causing fract. after nerve root trauma in spinal puncture (Rus))

ASTROZHNIKOV, Yu. V., kand. med. nauk.; GAMARNIK, M.N.

Problem of omental bursitis. Sov. med. 23 no.3:39-41 Mr '59. (MIRA 12:4)

1. Iz khirurgicheskogo (zav. Yu. V. Astrozhnikov) i rentgenologicheskogo (zav. S. S. Koyfman) otdeleniya Pervogo bol'nichnogo ob"yedineniya (glavnyy vrach L. Ya. Marmor) g. Bel'tsy.

(OMENTUM, dis.
bursitis (Rus))

GAMARNIK, M.N.; GRINBERG, I.M.; LERNER, I.O.; SHMULEVICH, P.I.

Retropneumoperitoneum. Zdravookhranenie 4 no. 1:27-30 Ja-F '61.
(MIRA 14:2)

1. Iz 1-oy bol'nitsy g. Bel'tsy (glavnyy vrach - L.Ya. Marmor) i 2-oy bol'nitsy g. Kishineva (glavnyy vrach - L.Kh. Pinskiy).
(PNEUMOPERITONEUM, ARTIFICIAL)

GAMARNIK, R.G.; ISMAYLOV, R.G., dots., kand.tekhn.nauk, red.; ABDULZADE, N.G., tekhn. red.

[Dehydration and demulsification of oils at oil fields] Obezvozhivanie i deemul'satsiia neftei na promyslakh. Pod red. R.G.Ismailova, Baku, Aznefteizdat, 1951. 87 p. (MIRA 15:7)
(Oil fields—Production methods)

diagrs., tables

"Ispol'zovannaya literatura": p. 86

GAMARNIK, Ya.M., inzh.

Using large heat-resistant and reinforced concrete blocks in constructing industrial furnaces. Nov.tekh.mont.i spets.rab.v stroi. 22 no.1:21-24 Ja '60. (MIRA 13:5)

1. Angarskoye upravleniye tresta Soyuzteplostroy.
(Furnaces) (Precast concrete construction)

VLASOV, Aleksey Fedorovich; GAMARNIK, Yevgeniy Yefimovich; BOLIN, Ivan Sergeyevich; KONONOV, D.R., red.

[Drying foundry molds and cores by means of infrared gas burners] Sushka liteinykh form i sterzhnei gazovymi gorelkami infrakrasnogo izlucheniia. Leningrad, 1964. 20 p. (MIRA 17:11)

GAMARNIK, Ye.Ye.

Flameless burners for drying molds and cores made of mixtures based on water glass. Biul.tekh.ekon.inform.Gos.nauch.-issl.inst.nauch.i tekh.inform. 17 no.10:31-33 O '64. (MIRA 18:4)

GAMARNIK, Ye.Ye.

Perlitic mixes for the risers in steel casting. Biul. tekh.-ekon. inform. Gos. nauch.-issl. inst. nauch. i tekh. inform. 18 no.2: 57-58 F '65. (MIRA 18:5)

USSR/Medicine - Ventilation Jan 50
Sanitation

155T43 "Picking Air Intake Locations for the Ventilation of Working Units at Enterprises Refining High Sulfur Content Petroleum," E. Ye. Gamarnikov, Cen Sci Res Sanitation Inst imeni Erisman, 4 pp

"Gig i San" No 1

Tests vertical distribution of hydrogen sulfide at subject enterprises to determine proper locations for ventilation intakes. Location depends on direction of prevailing winds, speed of winds, and distance between working units. In bad conditions intakes

[redacted] 155T43

USSR/Medicine - Ventilation (Contd) Jan 50

should be at height of 18-20 meters, and when placed in direction of prevailing winds height can be reduced to 12-15 meters. Air from lower points can be used for installations where a great deal of heat is generated and more frequent air exchange is necessary.

155T43

GAMARNIKOV, YE. Ye. [redacted]

GAMAR'YAN, L.F., inzh.; KOCHKIN, D.A., inzh.

Construction of the crossing of the 500 kv. Bratsk-Irkutsk power transmission line and a 220 kv. overhead power transmission line and a Moscow route. Energ.stroi. no.30:77-79 '62.

(MIRA 16:2)

1. Glavnoye upravleniye po stroitel'stvu i montazhu vysokovol'tnykh elektrosetey i podstantsiy Urala i Sibiri Ministerstva stroitel'stva elektrostantsiy SSSR.

(Electric lines—Overhead)

GAMAR'YAN, L.F., inzh.

Construction of a 500 kv. power transmission line between the Bratsk Hydroelectric Power Station and Irkutsk. Energ. stroi. no.31:79-85 '62. (MIRA 16:7)

1. Glavnoye upravleniye po stroitel'stvu i montazhu vysokovol'tnykh elektrosetey i podstantsiy Urala i Sibiri Ministerstva stroitel'stva elektrostantsiy SSSR.
(Electric power distribution)

GAMASKHURDIA, R. R.

KUTATELADZE, K. S.; GAMASKHURDIA, R. R.

Metals- Foundry, Materials Mar 52

"Influence of Mica and Feldspar on Sand Scorching," R. R. Gamsakhurdia, Engr, K. S. Kutateladze, Cand Tech Sci, Tbilisi Polytech Inst, Litey Proizvod No 3, p 28

PA 212T94

L 1702-66 EWT(d)/EWP(e)/EWT(m)/EPF(c)/EWP(v)/EWP(t)/EWP(k)/EWP(h)/EWP(z)/EWP(b)/EWP(l) IJP(c) JD/HW

ACCESSION NR: AP5020777 UR/0226/65/000/008/0103/0107

AUTHOR: Pozin, Yu. M.; Vogman, M. Sh.; Gamaskin, Ye. I.; Bondarenko, O. I.

TITLE: Producing an electrode strip from cadmium oxide by rolling powder compositions in rollers

SOURCE: Poroshkovaya metallurgiya, no. 8, 1965, 103-107

TOPIC TAGS: electrode, rolling mill, cadmium oxide, nickel compound, powder metallurgy

ABSTRACT: The general method for preparing the powder composition is as follows: cadmium oxide is mixed successively with solar oil and with a solution of nickel sulfate and is then passed through a 0.5x0.5 mm sieve and mixed with an aqueous solution of polyvinyl alcohol and then passed again through the same sieve. The finished electrode has dimensions of 35x70x1.9±0.2 mm, a weight of 15.0±0.5 grams, a porosity of 30%, and contains 1.9-2.1 grams cadmium/cm^3. The present article considers methods of producing continuous electrode strips with better characteristics (thinner with a higher volumetric cadmium content, that is, more dense). The rolling unit did not differ from the standard type. To

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L 1702-66
ACCESSION NR: AP5020777

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increase the friability of the composition, the cadmium oxide, before mixing with the other components, was rolled on rollers with a diameter of 60 mm, ground in a ball mill, and then passed through a 5x5 mm sieve. 10-20% of an aqueous solution of sodium-carboxy methyl cellulose was introduced into the composition, which was then dried to a residual moisture content of 3.0%. It is established that additions of nickel hydroxide and sodium-carboxymethyl cellulose improve the pressability of the composition. The strip can be obtained with different thicknesses and densities. The article also considers various mechanical methods for rolling and for cutting the strip into individual electrodes. Orig. art. has: 3 figures and 2 tables

ASSOCIATION: Nauchno-issledovatel'skii akkumulyatornyi institut (Scientific Research Institute for Accumulators)

SUBMITTED: 06Aug64 ENCL: 00 SUB CODE: MM

NR REF SOV: 003 OTHER: 000

Card 2/2