

OKSMAN, I.M., professor, zavednyushchiy; KOSTYLEV, M.V., direktor.

Receptors in the dentin in human teeth. Stomatologiya no.3:11-16 '53.
(MLA 6:7)

1. Kafedra ortopedicheskoy stomatologii Molotovskogo meditsinskogo stomatologicheskogo instituta (for Oksman). 2. Molotovskiy meditsinskiy stomatologicheskiy institut (for Kostylev).
(Teeth)

DEMNER, L.M.; OKSMAN, I.M., professor, zavednyushchiy; VASILOV, S.I., dotsent, zavednyushchiy; KOSTYLEV, M.V., direktor.

Preparation of dental bridges from stainless steel without soldering.
Stomatologiya no.3:53-54 '53. (MLRA 6:7)

1. Kafedra ortopedicheskoy stomatologii Molotovskogo meditsinskogo stomatologicheskogo instituta (for Demner and Oksman). 2. Kafedra fiziki Molotovskogo meditsinskogo stomatologicheskogo instituta (for Vasilov and Demner). 3. Molotovskiy meditsinskiy stomatologicheskiy institut (for Kostylev).
(Teeth, Artificial)

OKSMAN, I.M.

OKSMAN, I.M., professor; YASHINA, A.I., kandidat meditsinskikh nauk.

Innervation of pericementum. Stomatologiya no.2:3-7 Mr-Apr '54.
(MLRA 7:4)

1. Iz kafedry ortopedicheskoy stomatologii stomatologicheskogo
fakul'teta Molotovskogo meditsinskogo instituta.
(Teeth) (Nerves)

OKSMAN, I.M., professor (Kazan')

Diagnosis of functional disorders in misalignment of teeth.

Stomatologiya, no.6:47-51 N-D '55.

(MLRA 9:5)

(MALOCCLUSION, compl.

mastication disord., diag.)

(MASTICATION

disord., caused by malocclusion, diag.)

OKSMAN, Isaak Mikhaylovich

[Maxillofacial prosthesis] Cheliustno-litsevaia ortopediia.
Moskva, Medgiz, 1957. 246 p. (MIRA 12:3)
(PROSTHESIS)

OKSMAN, I.M., professor

Our objection in connection with N.I. Agapov's article on the
"Determination of the masticatory function of teeth in man." Stomato-
logia 36 no.3:69-70 My-Je '57. (MIRA 10:9)
(MASTICATION) (TEETH)

OKSMAN, I.M.

Development and status of orthopedic stomatology in the U.S.S.R.
Stomatologiya 36 no.5:47-51 S-D '57. (MIRA 11:1)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - prof. I.M.
Oksman) Kazanskogo meditsinskogo instituta (dir. - dotsent R.A.
Vyasselev)
(MOUTH--SURGERY)

OKSMAN, I.M., prof.; SHIGABUTDINOV, Sh.S.

Plastic luminescent stomatological spatula. Kaz.med.zhur. 40
no.1:90-91 Ja-P '59. (MIRA 12:10)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - prof.I.M.
Oksman) Kazanskogo meditsinskogo instituta.
(SPATULA)

OKSMAN, I.M.

Maxillary phantoms for practical lessons on splinting and maxillo-dental prosthetics. Stomatologiya 40 no.2:94-96 Mr-Apr '61.
(MIRA 14:5)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - prof. I.M. Oksman), Kazanskogo meditsinskogo instituta (direktor - dotsent R.A.Vyaselev).

(DENTAL PROSTHESIS, STUDY AND TEACHING)



OKSMAN, I.M., prof.; POGODINA, A.A., kand.med.nauk

Present-day methods of treating anomalies of the maxillo-dental system.
Stomatologiya 40 no.3:72-81 My-Je '61. (MIFA 14:12)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - prof. I.M.Oksman)
Kazanskogo meditsinskogo instituta (dir. - dotsent R.A.Vyaselev).
(ORTHODONTIA)

OKSMAN, I.M., prof.

Selecting a method for the fixation of loose teeth in paradentosis.
Stomatologiya 40 no.4:65-67 JI-Ag '61. (MIRA 14:11)

1. Iz kafedry ortopedicheskoy stomatologii (zav. - prof. I.M.Oksman),
Kazanskogo meditsinskogo instituta (dir. R.A.Vyaselev).
(GUMS—DISEASES) (ORTHODONTIA)

OKSMAN, I.M.

Basic scientific trend of the Department of Orthopedic
Stomatology during 1958-1964. Nauch. trudy Kaz. gos. med.
inst. 14:511-512 '64.

Regeneration of the hard tissues of a tooth following a trauma.
Ibid.:513-514. (MIRA 18:9)

1. Kafedra ortopedicheskoy stomatologii (zav. - prof. I.M.
Okzman) Kazanskogo meditsinskogo instituta.

OKSMAN, I.M., prof.; KNUBOVETS, Ya.S., dotsent

Manuals and textbooks on orthopedic stomatology. Vop.
obshchei stom. 17:113-116 '64.

(MIRA 18:11)

OKSMAN, I.M., prof.

Report on the activity of the board of the society for 1963.
Vop. obshchego stoma. 17:117-118 '64.

(MIRA 18:11)

OKSMAN, I.M., prof.; ZALYALYUTDINGVA, S.Z.; OGOREL'TSEVA, A.D.

State of orthopedic stomatological service in the Tatar A. S. S. R.
Vop. obshchei stom. 17:125-128 '64.

(MIRA 18:11)

KOPEYKIN, Vadim Nikolayevich; KHUBOVETS, Yakov Samuilovich;
KURLYANDSKIY Veniamin Yur'yevich; OKSMAN, Isaak
Mikhaylovich; KALONTAROV, D.Ye., kand. med. nauk, red.;
KOROLEV, A.V., tekhn. red.

[Technique of prosthodontics] Zuboproteznaia tekhnika. [By]
V.N.Kopeikin i dr. Moskva, Izd-vo "Meditsina," 1964. 343 p.
(MIRA 17:4)

OKSMAN, M. I.

OKSMAN, M.I.

Subscribers' telegraph exchange of small capacity. Vest.svyazi
14 no.7:3-4 J1 '54. (MLRA 7:7)

1. Inzhener Glavnogo upravleniya telegrafnoy svyazi.
(Telegraph--Apparatus and supplies)

OKSMAN, M.I.; MEL'NIK, S.O.

Use of facsimile apparatus for eliminating mistakes in processing
telegrams. Vest. svyazi 23 no.3:21-23 Mr. '63. (MIRA 16:3)

1. Starshiy inzh. Glavnogo upravleniya mezhdugorodnoy telegrafno-
telefonnoy svyazi Ministerstva svyazi SSSR (for Oksman).
2. Starshiy
inzh. laboratorii Tsentral'nogo telegrafa SSSR (for Mel'nik).
(Telegraph) (Phototelegraphy)

OKSMAN, M.I.

ROZENTAL', A.S., kandidat meditsinskikh nauk; OKSMAN, M.I., vrach.

Fungous flora of Ismail, Kirovograd, Mokolayev, Odessa, Kher-
son and Khmel'nitskiy Provinces. Vest.van. i derm. no.3:53
My-Je '55. (MLRA 8:10)

1. Iz Odesskogo kozhno-venerologicheskogo instituta imeni
Glavcha

(UKRAINE--FUNGI, PATHOGENIC)

OKSMAN, T.M.

Effect of curarelike substances in combined anesthesia on the
antitoxic function of the liver. Khirurgiia 35 no.3:66-71
Mr '59. (MIRA 12:8)

1. Iz kafedry fakul'tetskoy khirurgii (zav. - prof. I.S.Zhorov)
sanitarno-gigiyenicheskogo fakul'teta I Moskovskogo ordena
Lenina meditsinskogo instituta imeni I.M.Sechenova.

(LIVER, eff. of drugs on
musc. relaxants in anesth. on antitoxic
funct. (Rus))

(MUSCLE RELAXANTS, eff.
on antitoxic funct. of liver in anesth. (Rus))

OKSMAN, T. M. Cand Med Sci -- "The antitoxic function of the liver and the blood
sugar in certain ^{types} ~~organs~~ of anesthesia." Mos, 1960 (2nd Mos State Med Inst
im N. I. Pirogov). (KL, 1-61, 209)

-412-

OKSMAN, T.M.

Changes in the blood sugar during combined anesthesia with the
use of various curarelike substances (muscle relaxants). Khirurgia
36 no.7:76-79 Ja '60. (MIRA 13:12)
(BLOOD SUGAR) (MUSCLE RELAXANTS)
(ANESTHESIA)

KIRPATOVSKIY, I.P.; OKSMAN, T.M.; SHUVAYEV, V.V.

Technique of the replantation of an extremity in dogs. Trudy
1-go IMI 42:25-29 '65.

Intravital lympho- and vasography in a replanted extremity;
preliminary report. Ibid.:44-48 (MIRA 19:2)

1. Laboratoriya po peresadke organov i tkanyam IMI.

KIRPATOVSKIY, I.D.; KES'KH, T.M.; LYKOVA, N.A.

Vascular anastomoses in the autotransplantation of an extremity.
Trudy 1-go MGU 42:38-43 '65. (MFA 19:2)

1. Laboratoriya po peresadke organov i tkaney ANU SSSR.

OKHMAN, T.M.; SIDOVAY-V, V.V.; BEEKER, A.I.

Regional perfusion in autotransplantation of an extremity;
preliminary report. Trudy 1-go IMN 42:153-159 '65.

(MIRA 19:2)

1. Laboratoriya po peresadke organov i tkaney AMN BSSR.

OKSMAN, T.M.

Transplantation of an extremity under prolonged hypothermia;
preliminary report. Trudy 1-go MMI 42:160-168 '65. (MIRA 19:2)

1. Laboratoriya po peresadke organov i tkaney AMN SSSR.

CA

3

Breakdown of compressed gases in unhomogeneous fields. B. M. Hekberg and Ya. A. Okunan. *J. Phys.* (U. S. S. R.) 3, 39-46 (1941) (in English); cf. C. A. 36, 4354. — Breakdown in an unhomogeneous elec. field, both with neg. and with pos. points, was investigated in C₆H₆, air, N and sulfur hexafluoride. The position of the max. on the voltage vs. pressure curve has been detd. for different gaps of geometrical similarity, with pos. point. The position of the max. accord. with the transition from the beginning of corona to breakdown was shown not to satisfy the law of similarity. Consequently, the mechanism of this transition is accord. with some elementary process not obeying the similarity law. Cumulative ionization is considered to be this process. It was noticed that in N, with neg. point polarity, a disappearance of the breakdown is observed with increasing voltage in the region of the deviation from the similarity law. This phenomenon is probably connected with the effect of space charge formed near the neg. point. E. H. Rathmann.

COMP. ELEMENTS		PROCESSES AND PROPERTIES INDEX		MATERIALS INDEX	
Breakdown of compressed gases in a nonuniform field. B. M. Hekberg and Ya. A. Akhmanov. <i>J. Tech. Phys.</i> (U. S. S. R.) 11, 1058-66(1941).—One electrode is a sphere (diam. 10, 18, 30, 50 and 40 mm.), the other a needle with a spherically polished end; the diam. of the needles, equal to that of the terminal half-sphere, are, resp., 0.8, 0.75, 1.0, 1.5, 2.0 mm. Breakdown potentials are plotted in terms of the product pd, where p = pressure of the gas, d = diam. of the needle, for carbon dioxide, air, nitrogen and sulfur hexafluoride. In each expt., the diam. of the sphere is 20 times that of the needle, and the distance between the "point" of the needle and the sphere is made proportional to the dimensions of the electrodes; in all expts. made with each gas, the set of geometrical conditions is thus similar. The potentials are up to 75 kv. (1) In CO_2, with the needle pos., the curves of the break-		down potential U in terms of pd coincide in their initial portion; U then shows a max., followed by a low and again a rise; from the max. on, the curves corresponding to different although similar sets of geometrical conditions separate. The same sepa. after an initial coincidence is observed with the needle as the neg. electrode; in the latter case, there are no max. and min., only a steady rise of U with pd. The max. occurring with a pos. needle is displaced in the direction of higher pd and higher x with increasing d (and proportional increase of all the geometrical dimensions). (2) Analogous observations are made in air. However, a second max. appears at low pd, but only with large dimensions ($d = 1.0$ mm.). The regular maxima, at higher pd, behave in the same way as in CO_2. The curves for the neg. needle are analogous to those found with CO_2. (3) In nitrogen, the first curves obtained with a neg. needle likewise show a max. (around 40 kv.) which, however, is unstable; this phenomenon is observed only with thin needles. (4) SF_6 gives results analogous to the observations made with the other gases.		N. Thon	
ASB-31.4 METALLURGICAL LITERATURE CLASSIFICATION					
1940-1949					
1950-1959					
1960-1969					
1970-1979					
1980-1989					
1990-1999					

01511800, 12, 11

555.215: 546.863.221 671.397.931.2 2438
Semiconducting Photoconductive Layers
for Photoreduction Television Tubes
Ya. A. Oleson, Radiotekhnika i Elektronika, 1958, vol. 1, No. 10, pp. 1340-1342. The experimental determination of the characteristics of Si_3N_4 layers for use in vidicon-type tubes is described and results are presented graphically.

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NY

AUTHOR
TITLE

VERTSNER, V.N., GORBUNOV, B.V., OKSMAN, Ya.A.

56-5.2/55

PERIODICAL

Structural Peculiarities of Sb_2S_3 -layers
(Strukturnyye osobennosti vernistoy surmy. Russian)

ABSTRACT

Zhurn. Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 5, pp 957 - 961
(U.S.S.R.)

The structural investigations of a thin, photo-sensitive antimony-sulphur layer by the "electrographic" method showed that this layer consists mainly of amorphous Sb_2S_3 , a thin oxide skin of cubic Sb_2S_3 -crystals, and perhaps also of some metallic antimony.

Heating of the sublimates causes growing of the crystals. The crystallites forming on the surface during the oxide phase have a different orientation which depends on the temperature of the base upon which they were precipitated.

The phenomenon of photosensitivity of the Sb_2S_3 -layer is probably not bound to the crystallization of the principal quantity of the antimony, but due to the processes responsible for the oxide phase.
State Optical Institute

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AVAILABLE

Library of Congress

Card 1/1

AUTHORS: Oksman, Ya.A. and Yenifanov, M.V.

SOV/109-3-12-9/13

TITLE: On the Problem of Sluggishness of the Photo-conductive Tubes of the Vidicon Type (K voprosu ob inertsiionnosti foto-rezistivnykh trubok tipa "Vidikon")

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 12, pp 1501 - 1515 (USSR)

ABSTRACT: The inertia observed in photo-conductive tubes is of two kinds. The first type of inertia is usually ascribed to the incomplete discharge of a picture element by the electron beam, while the second is due to the relaxation of the photo-effect in the material of the target. The inertia effects were investigated experimentally and the results of the experiments and their interpretation are given in this paper. The equipment used in the experiments is shown in the block schematic of Figure 1. The basic unit of the equipment was an amplifier, comprising a balanced input stage, a modulator and oscillator operating at 110 kc/s, an AC amplifier and a phase detector. The investigated samples were in the form of glass plates which were coated with a transparent layer of platinum and then given a coating of antimony sulphide. The samples were placed in a special holder so that the surface of the semi-

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On the Problem of Sluggishness of the Photo-conductive Tubes of the Vidicon Type

conducting layer was in contact with a drop of mercury, which served as an electrode. The platinum layer was used as the second electrode. The sample was illuminated through the glass. In order to investigate the relaxation of the photo-conductivity, the samples were illuminated by regular light pulses having a frequency of 1 cps. The resulting curves of the increase and fall of the photo-current are given in Figure 2. The experimental points shown in the figure were taken by the partial time method (Ref 12); the curves correspond to the illuminations of 100 Lux and 25 Lux. Further experimental results are given in Figure 3, which represent the charging and discharging currents of the target; the full curves were taken in complete darkness, while the dashed curves were measured at an illumination of 50 Lux. From these experimental data, it is concluded that the photo-conductive target can be represented by an equivalent circuit consisting of a two-stage RC network. This is shown in Figure 4. The operation of the target can be simulated by either of the two equivalent circuits shown in Figures 6. The simpler of the circuits comprises two switches, K_1 and K_2 .

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the yet K_1 simulates the switching, while K_2 simulates the illumination of a picture element (increase in conductivity). This circuit comprises also resistance r which represents the internal resistance of the beam, and an RC network which is switched on for duration T_1 and switched off for a time T_2 ; T_1 and T_2 represent the switching time and the duration of a frame, respectively. The operation of the photo-conductive tube can be represented more accurately by the second circuit of Figure 6, which consists of two RC networks. By employing the first circuit of Figure 6, it can be shown that the signal produced by the tube at the end of the n -th switching cycle is given by Eq (11) where the quantities ρ and γ are defined by the equations on p 1508. When $n \rightarrow \infty$, the signal reaches a stationary value which is expressed by Eq (12). The switching inertia of the tube can be defined as a ratio of the signal after the n -th cycle to the stationary signal and this is expressed by

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On the Problem of Sluggishness of the Photo-conductive Tubes of the Vidicon Type

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Eq (13). The same type of analysis can be done for the second circuit of Figure 6 but the mathematics becomes very involved. It is shown, however, that the value of the stationary signal is given by Eq (16), while the switching inertia is approximately expressed by Eq (17). The parameter in Eq (17) is defined by Eqs (14). The number of cycles necessary to reach the stationary value of the signal can be approximately expressed by Eq (20). This equation was employed to represent the transient processes as a function of the number of cycles; the results are shown graphically in Figures 7; the first curve corresponds to the case when the illumination results in an increase of the space charge, while the second curve corresponds to the decrease in the space charge. These results were confirmed experimentally by means of a model consisting of a two-stage RC network, furnished with the necessary switches; the curve obtained from this model are shown in Figure 9. From the experimental results obtained, it is concluded that the transient processes in photo-conductive tubes can be explained if it is assumed

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On the Problem of ~~Suggestiveness of the~~ Photo-conductive Tubes of the
Vidicon Type

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that: 1) the high-resistance layer of the semi-conductor contains a space charge whose magnitude depends on the illumination and, 2) the lifetime of the carriers is shorter than the transient time of the diffusion-drift equilibrium. There are 9 figures and 13 references, 5 of which are English, 2 German and 6 Soviet.

SUBMITTED: April 10, 1957

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OK-SMAU, YA.A.

34(4)

ИЗДАНИЕ I ПОД НАПРАВЛЕНИЕМ СОВЕТОВ

Академия наук Украинской ССР. Институт физики

Фотопроводимости и оптико-электронных явлений в полупроводниках; I. оптико-электронные явления в полупроводниках, E. Kiyev, 20-26
 1957 г. (Photoconductivity and Optoelectronic Phenomena in Semi-
 and Optoelectronic Phenomena in Semiconductors....) Kiyev, 1957. 403 p.
 4,000 copies printed.

Additional Sponsoring Agency: Академия наук СССР, Президиум,
 Комиссия по полупроводникам.

Ed. of Publishing House: I. V. Kislina; Tech. Ed.: A. A. Matveychuk;
 Resp. Ed.: V. Ye. Lashchyn, Academician, Ukrainian SSR, Academy
 of Sciences.

PURPOSE: This book is intended for scientists in the field of semi-
 conductor physics, solid state spectroscopy, and semiconductor
 devices. The collection will be useful to advanced students in
 universities and institutes of higher technical training
 specializing in the physics and technical application of semi-
 conductors.

CONTENTS: The collection contains reports and information bulletins
 (the latter are indicated by asterisks) read at the First All-
 Union Conference on Optoelectronic Phenomena in Semiconductors.
 and technology. A wide scope of problems in semiconductor physics,
 motive forces, optical properties, photoconductivity, photoelectro-
 photoresistors, the action of light and corpuscular radiations,
 the properties of thin films and coatings, semiconductor systems,
 etc. The materials were prepared for publication by E. I.
 Shymko, O. V. Snitko, K. B. Solpygo, A. P. Stechenko, and M. K.
 Sheynman. References and discussion follow each article.

Photoelectric and Optical Phenomena (Cont.)	SOV/3140	180
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Yurkin, V. I., Negative Photoconductivity of Selenium		191
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Kolomoys, B. T., and B. V. Pavlov, Displacement of the		
Edge of the Absorption Band in Vitreous Semiconductors of the		
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Yurkin, V. I., and A. M. Solov'yev, "Electromagnetic"		
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of the Composition of Lead Sulfide Photoresistors According		
to the Thickness of their Layers		312
Yurkin, V. I., B. V. Pavlov, and V. A. Syman,		
Structural Formulation of Photosensitive As_2S_3 Layers		

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AUTHORS: Oksman, Ya.A. and Tikhomirov, G.P. SOV/109-59-4-2-26/27

TITLE: Cathode Conductivity of Antimony Sulphide Films
(Katodoprovodimost' plenok sernistoy sur'my)

PERIODICAL: Radiotekhnika i Elektronika, 1959, Vol 4, Nr 2,
pp 344-346 (USSR)

ABSTRACT: The effect of the increase of the conductivity of fine dielectric and semi-conductor films, when subjected to electron bombardment, is used in the amplification of the photo-emission currents (Ref 1). This effect is known as the cathode conductivity. The effect is characterized by the fact that it is possible to obtain very high current gain. The aim of this work was to determine the limiting gain which can be obtained with films of antimony sulphide at the ambient temperature. The measurement of the gain was done by employing a demountable model of a vidicon tube (See Fig 1). The tube was operated in the regime of fast electrons, so that the potential of the investigated film was positive with respect to the base material of the signal plate. The targets were prepared as follows: a thin

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Cathode Conductivity of Antimony Sulphide Films

organic film was stretched over a ring and this was coated by a transparent layer of aluminum ; a layer of antimony sulphide, having a thickness of 1-2 μ , was then deposited on the aluminum film. An electron-optical system was fitted above the target so that the target could be illuminated from the rear side by a diffuse beam of fast electrons. The accelerating voltage V could be varied from 0 to 25 kV. All the measurements were done at the ambient temperature. The experimental results are shown in Fig 2 and 3. Fig 1 shows the dependence of the induced current on the intensity of the exciting current for various values of the accelerating potential. Fig 3 illustrates the amplification of the target as a function of the accelerating potential. From Fig 3 it is seen that the maximum amplification is higher than 600. This is more than can be obtained with films of selenium, arsenic sulphide or aluminum oxide (see Ref 2 and 3). It was

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Cathode Conductivity of Antimony Sulphide Films

also found that the inertia of the targets was of the order of 0.2 to 2 sec. There are 3 figures and 5 references of which 2 are Soviet and 3 English.

SUBMITTED: 27th February 1958

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82998

S/181/60/002/008/017/045
B006/B070

24.2600

AUTHORS: Oksman, Ya. A., Burlakov, A. V. 25

TITLE: Investigation of Photoconductivity of Powder Semiconductors
by Means of the Photodielectric Effect 25

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 8, pp. 1818-1828

TEXT: The purpose of the present work was to investigate the conditions in which the photodielectric effect may be brought in clear relationship with the photoconductivity of a semiconductor powder dispersed in a dielectric. A method is given that permits the determination of the phenomenological characteristics of the semiconductor. The photodielectric effect is in general a complex of phenomena in which the most important are: (a) a change in the number of polarization centers without current, (b) the photoconductivity (change in the number of free carriers), and (c) a new distribution of the volume charges in the individual grains, which is expressed as a structural or electrical inhomogeneity of the substance and is observed together with (b). ✓

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82998

Investigation of Photoconductivity of
Powder Semiconductors by Means of the
Photodielectric Effect

S/181/60/002/008/017/045
B006/E070

[Abstracter's note: Throughout the paper, these phenomena are denoted by "a", "σ", and "S", corresponding to "a", "b", and "c" of the abstract.] In the introduction, an equivalent circuit for the representation of the photoconductivity with the help of the complex of the photodielectric effect is described. The dielectric matrix, in which the semiconductor is dispersed (condenser), has a its equivalent an electric circuit in which the components of its conductivity may be represented by (1) and (2). The fundamental relations are then derived and the experimental method is described. The method of investigation of the photodielectric effect consists in a separation of the conducting components (or the components of the complex resistance) of the condensers investigated. Since these components have a phase displacement of $\pi/2$, they are separated by a phase sensitive circuit (ring - discriminator). The whole circuit for the investigation of the steady-state and kinetic laws of the photodielectric effect is given in Fig. 3, and is described. For a condenser filled with a mixture of CdSe powder and a resin of the type ПН-1 (PN-1), Fig. 4 shows a rise and fall of the conductivity for

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S/181/60/002/008/017/045
B006/B070

Investigation of Photoconductivity of
Powder Semiconductors by Means of the
Photodielectric Effect

impulse excitations (1, 5, 50, and 100 kc/sec), and Fig. 5 shows the
same for a condensor filled with a mixture of electroluminophosphores-
cent ZnS.Cu.Al with the resin PN-1^{*} (for 1, 10, and 80 kc/sec) at 20°C.
The effect of the processes "a" and "b" decreases with increasing
temperature and decreasing frequency. There are 5 figures and 7
references: 1 Soviet, 3 US, 2 British, and 1 French.

SUBMITTED: December 28, 1959

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83009

5/181/60/002/008/028/045
B006/B063

24.2600
AUTHORS:

Oksman, Ya. A. Burlakov, A. V.

TITLE:

The Photodielectric Properties of Polycrystalline Cadmium Selenide I. High Temperatures

PERIODICAL: Fizika tverdogo tela, 1960. Vol. 2, No. 8, pp. 1884 - 1888

TEXT: Following a previous paper (Ref. 1) which deals with the methods of studying and analyzing the photodielectric effect in powdered semiconductors, the authors describe studies performed with the same materials but at different frequencies and temperatures. The experimental material was divided into two parts since the photodielectric properties of polycrystalline cadmium selenide differ largely, depending on whether the investigations were carried out at low temperatures or above room temperature. This article only gives the results obtained between 20° and 108°C. The second part will deal with the low temperature range. As there is a relationship between the photodielectric effect and photoconductivity, it was possible to compare the results obtained with those of other authors. The authors first studied the influence of the concentra-

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The Photoelectric Properties of Poly-crystalline Cadmium Selenide. I High Temperatures

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S/181/60/002/008/028/045
B006/B063

tion of CdSe powder in a dielectric (in which it was dispersed) on the course of the dispersion curves. The results published in the present paper refer to a CdSe - resin mixture of a weight ratio of 1:5. Fig. 1 illustrates the quasi-steady change in the active conductivity, ΔG_p , between 1 and 200 cps for five temperatures. Fig. 2 shows the temperature dependence of dark conductivity and photoconductivity. Fig. 3 shows photoconductivity as a function of the excitation intensity at 20° and 35° C. Fig. 4 shows photoconductivity as a function of the wavelength of the exciting light per unit of incident energy at 20° and 70° C. The two curves practically coincide. The spectral characteristics have a peak at about 0.7 μ . The activation energy of electrical dark conductivity amounted to 0.69 ev (CdSe single crystals: 0.53 ev - Ref. 4). The dark conductivity of CdSe crystals depends on the manner of their activation. The value of $1.5 \cdot 10^{-8} \text{ ohm}^{-1} \text{ cm}^{-1}$ falls into the range of $10^{-6} - 10^{-9} \text{ ohm}^{-1} \text{ cm}^{-1}$ which was found in the paper of Ref. 4. The results obtained prove that in the range 20-108° C and below 200 kc/sec the

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The Photodielectric Properties of Poly-crystalline Cadmium Selenide. I. High Temperatures

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B006/B063

photodielectric effect in powdered CdSe is clearly determined by the "simple" photoconductivity. There are 4 figures and 8 references: 6 Soviet, 1 French, and 1 British.

SUBMITTED: January 13, 1960

Card 3/3

83556

S/020/60/134/001/007/021
B019/B060

9.4/77
26.2420
AUTHORS:

Oksman, Ya. A., Burlakov, A. V.

TITLE:

The Negative Photodielectric Effect 71

PERIODICAL:

Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 1,
pp. 77-80

TEXT: The authors studied steady rules and the relaxation of the photodielectric effect in a typical photoconductor (cadmium selenide). Above room temperature and at frequencies of up to 200 kilocycles, the effects observed could be ascribed to normal photoconductivity. On deep cooling of the samples, photoconductivity was found to drop with optical excitation. The samples examined consisted of a Cu disk onto which activated cadmium selenide powder had been applied with a resin. The activated layer was 0.2 mm thick after grinding. The samples were connected to a bridge circuit (Fig. 1), and were cooled in the dark to the temperature of liquid air. On a subsequent excitation with light, both active and reactive conductance changed as illustrated by the

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The Negative Photodielectric Effect

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diagrams of Fig. 2. A repetition of the excitation gave rise to an increase in the relaxation processes (Fig. 3). The increment of reactive conductance was positive in all cases. The most important result of the investigation under discussion is the discovery of a negative increment of active conductance in cooled samples, which had never been observed before. Apart from zinc sulfide phosphors, an analogous effect was detected in some other semiconductors. The results are qualitatively analyzed on the basis of the equivalent-circuit diagram of a photodielectric capacitor shown in Fig. 4. The authors conclude that when exciting cadmium selenide cooled in the dark, the deep traps are first filled and, thus, increase the active conductance. The subsequent filling of shallow traps causes a rise in capacitance and, thus, leads to a reduction in the active conductance of the sample. A further conclusion is that the deep traps are slowly devastated in the dark. These results are thoroughly discussed, and it is finally stated that the negative photodielectric effect described here supplies convincing evidence of the existence of relaxation polarization of the carriers trapped by shallow traps. There are 4 figures and 6 references: 2 Soviet, 3 French, and

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83556

The Negative Photodielectric Effect

S/020/60/134/001/007/021
B019/B060

1 German.

PRESENTED: April 5, 1960, by A. A. Lebedev, Academician

SUBMITTED: March 25, 1960

Card 3/3

20782

9.4300 (1145, 1147, 1155)

S/181/61/003/003/007/030
B102/B214

26.2421
AUTHORS:

Oksman, Ya. A., Burlakov, A. V., and Alekseev, Ye. B.

TITLE:

Photodielectric properties of polycrystalline CdSe at low temperatures

PERIODICAL:

Fizika tverdogo tela, v. 3, no. 3, 1961, 729-735

TEXT: The present paper is the continuation of two previous papers (Oksman, Burlakov, FTT, II, 1960, p. 1818 and p. 1884) in which methods have been discussed for the separation of the photoconductivity from the complex of phenomena causing a photodielectric effect, and where it has been shown that above room temperature and at frequencies ≤ 200 kc/sec, the photoconductivity is responsible for the photodielectric effect (ph. d. e.) in CdSe. The relaxation time which determines the frequency dependence of the Debye disper-

sion of the complex dielectric constant was determined to be $\tau = A e^{U/kT}$, where A is a constant and U the height of the barriers separating the equilibrium states of the localized carriers. A study has now been made of the steady and transient frequency dependences of ph. d. e. at the temperature

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B102/B214

Photodielectric ...

of liquid nitrogen and for a large range of frequencies, using the results obtained in the two papers mentioned above. First of all, the dependence of the conduction components of a photodielectric capacitor on the wavelength of the exciting light and the excitations intensity was determined. The samples and the apparatus were described in the previous papers. Fig. 1 shows the frequency dependence of the increment of the active conductivity of a photodielectric capacitor filled with a mixture of CdSe powder and polyester resin 7M-1 (PN-1) in the weight ratio 1:5. The figures beside the curves give the excitation intensity in % (100% = 5000 lux). The frequency is that of the applied potential. The curves were taken at room temperature. Fig. 2 shows the dependence of the increment of the active conductivity of the photodielectric capacitor on the wavelength of the exciting light at the temperature of liquid nitrogen; Fig. 3 shows the same dependence for the capacitive conductivity. Fig. 4 compares the dependences of the active and reactive components of the photodielectric capacitor on the excitation intensity at nitrogen temperature. At this temperature and at high frequencies, the ph. d. e. shows the following characteristics: 1) an increase of the excitation intensity at constant frequency lifts the stationary level of

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B102/B214

Photodielectric ...

the capacitive component of conductivity (ωC_p) and lowers that of the active component G_p . 2) With increasing frequency the steady increment G_p tends from a negative to a positive value. 3) The rate of growth of ΔG_p and of the decrease of ΔC_p with increasing frequency increases in the first stage of relaxation. 4) At high frequency and low excitation, the oscillogram $\Delta G_p(t)$ shows a smooth increase of the active component up to the steady-state

value. The active component of conductivity is given by $G_p = \frac{C_o^2}{(C+C_o)^2} \bar{\Sigma}$ and the reactive one by $\omega C_p = \omega \frac{CC_o}{C+C_o} + \frac{C_o^2}{(C+C_o)^3} \frac{\Sigma^2}{\omega}$, where C is the capacitance of

the semiconductor, C_o the capacitance of the passive dielectric, $\bar{\Sigma}$ the electrical conductivity of the semiconductor, and ω the angular frequency. The results of the investigation may be summarized as follows: 1) The ph. d. e. in polycrystalline CdSe at nitrogen temperature is caused by localized carriers. 2) Optical excitation in the region of maximum photoconductivity leads to consecutive filling of the local centers beginning with the lowest. Long or short wave radiation changes the concentration of the low-level carriers. 3) In the course of relaxation (after switching off the excitation),

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Photodielectric ...

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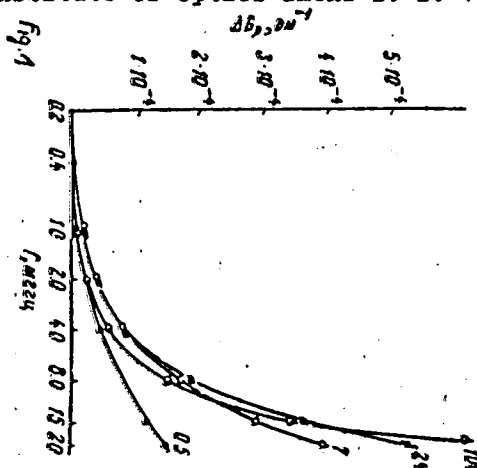
the nonequilibrium carriers fill the low-lying recombination centers. There are 6 figures and 6 references: 4 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S. I. Vavilova
Leningrad (State Institute of Optics imeni S. I. Vavilov,
Leningrad)

SUBMITTED: May 14, 1960

Fig. 1

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ALEKSANDROV, Ye.B.; OKSMAN, Ya.A.

Investigating the photodielectric effect at high frequencies.
Prib. i tekhn. eksp. 6 no.2:152-157 Mr-Ap '61. (MIRA 14:9)

1. Gosudarstvennyy opticheskiy institut.
(Dielectrics) (Photoelectricity)

11757

S/181/63/005/001/033/064
B102/B186

AUTHORS: Oksman, Ya. A., Kiseleva, M. N., and Martinson, B. M.
TITLE: Drift dispersion in the photodielectric effect in alloyed germanium

PERIODICAL: Fizika tverdogo tela, v. 5, no. 1, 1963, 220 - 223

TEXT: Carrier drift dispersion was studied with a gold-doped p-type Ge plate insulated from the plates of the photodielectric capacitor by teflon films. Photoconduction was excited by blackbody radiation (300°C) or by the light of an incandescent lamp. The light ($\lambda 1.8 - 9\mu$) was interrupted with a 400-cps frequency. The capacitor was connected in parallel with the oscillatory circuit. This method allows of studying the field effects exerted on volume processes. From measurements of the dark resistance it was found that the signal voltage $u_s \sim u \Delta \Sigma$, where u is the h-f circuit voltage and $\Delta \Sigma$ is the increase in active conductivity of the crystal. The nonlinearity of $u_s(u)$ indicates the field effect on $\Delta \Sigma$. In the case of long-wave excitation the $u_s(u)$ curves obtained at different frequencies (3.6, 10, 19.6 Mc) are similar in their course; they all show a tendency

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Drift dispersion ...

S/181/63/005/001/033/064
B102/B186

to saturation. With short-wave excitation the curves differ greatly. At 3.6 Mc u_s depends very little on u and is very weak. At 10 Mc u_s has a peak at about $u = 5v$, then it drops to the 3.6-Mc curve. At 19.6 Mc u_s rises to a broad and high maximum at about 15v and drops also to the 3.6-Mc curve. This common approach occurs at $\sim 40v$. These curves were obtained for a polished and etched specimen. If the specimen surface was ground the relations were similar but the maxima were lower and broader and the u_s -values approached each other already at 20 v. The difference between long-wave and short-wave excitation is explained by assuming the latter to generate minority carriers and to cause their drift. This field-induced counterflow of oppositely charged carriers depends in its effects greatly on the period of the voltage applied. If the period is long enough the carriers can accumulate near the crystal surfaces, thus raise the recombination rate and attenuate photoconductivity. From the position of the minima of the $u_s(u)$ curves, where the time of carrier flight, $d/E\mu$, equals the half-period of the h-f-field, the mobility μ can be calculated. For 10 Mc one obtains $5 \cdot 10^3 \text{ cm}^2 \text{ v} \cdot \text{sec}$. There are 3 figures.

Cart: 2/3

S/181/63/005/001/033/064
B102/B186

Drift dispersion ...

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S. I. Vavilova,
Leningrad (State Optical Institute imeni S. I. Vavilov,
Leningrad)

SUBMITTED: July 30, 1962

Card 3/3

OKSMAN, Ya.A.; SMIRNOV, V.N.; SHMANTSEV, Yu.V.

Photodielectric effect in alloyed germanium. Fiz. tver. tela
5 no.10:2885-2889 0 '63. (MIRA 16:11)

1. Gosudarstvennyy opticheskiy institut im. S.I. Vavilova, Lenin-
grad.

ACCESSION NR: AP4018387

S/0120/64/000/001/0180/0182

AUTHOR: Zablovskiy, E. Ye.; Oksman, Ya. A.

TITLE: Setup for studying the effect of light and (electric) field upon
semiconductors

SOURCE: Priory* i tekhnika eksperimenta, no. 1, 1964, 180-182

TOPIC TAGS: semiconductor, illuminated semiconductor, semiconductor in
electric field, electric field effect, polycrystalline phosphor, polycrystalline
phosphor admittance

ABSTRACT: A laboratory setup is described which permits measuring variations
in admittance of a semiconductor under the influence of light or electric field, or
their combined effect. The setup can be used for studying characteristics of
high-resistance semiconductors and blocked p-n junctions. The principal part of
the outfit, a double bridge (see Enclosure 1), permits applying two voltages

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ACCESSION NR: AP4018387

differing in frequency and amplitude to the specimen. If the test capacitor is of a nonlinear type, the application of a high-amplitude low-frequency voltage will offset the bridge balance. If relaxation of the nonlinear capacitor is fast, the bridge-diagonal signal can be amplitude-modulated by an exciting field. The low frequency (600 cps) is generated by a ZG-10 oscillator, and the high frequency (16 mc) by a GSS-6 oscillator. The above setup permitted suppressing the undesirable admittance component by 200 times within 0.5-200 mc; time resolution was 4×10^{-5} sec. A recordable increment of admittance was 0.01% of its balance value at 0.5 mc. Orig. art. has: 4 figures.

ASSOCIATION: Gosudarstvennyy opticheskiy institut (State Optical Institute)

SUBMITTED: 30Jan63

DATE ACQ: 18Mar64

ENCL: 01

SUB CODE: PH

NO REF SOV: 005 .

OTHER: 001

Card 2/2

ACCESSION NR: AP4028450

S/0181/64/006/004/1186/1191

AUTHORS: Kalyuzhnaya, G. A.; Oksman, Ya. A.; Smirnov, V. N.; Shmartsev, Yu. V.

TITLE: Investigation of photoconductivity in gallium phosphide by the noncontact method

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1186-1191

TOPIC TAGS: photoconductivity, gallium phosphide, high frequency method, temperature dependence, noncontact method

ABSTRACT: The authors measured the temperature dependence of photoconductivity in poorly conductive GaP. They also determined the spectral distribution of the photoconductivity at different temperatures. These relations are shown graphically in Fig. 1 on the Enclosure. A short-wave maximum is observed, associated with direct transitions. The photoconductivity is found to drop sharply at temperatures below 64K. It is concluded that the use of high-frequency methods for investigating photoconductivity is justified by the reproducibility of the results and by the agreements of these results with data from the literature. The method has led to refinement of several properties of GaP and, in particular has confirmed the

Cord

1/3

ACCESSION NR: AP4028450

existence of a supplementary short-wave maximum of photoconductivity due to the structure of the conduction band. The observed patterns do not yet allow construction of a completely reliable model of the processes taking place in GaP, however. For this, further investigations are necessary, especially on low-temperature decay of photoconductivity. Orig. art. has: 7 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad (Physicotechnical Institute AN SSSR); Gosudarstvennyy opticheskiy institut im. S. I. Vavilova (State Optical Institute)

SUBMITTED: 18Nov63

SUB CODE: EC, OP

NO REF SOV: 008

ENCL: 01

OTHER: 005

Card - 2/3

ACCESSION NR: AP4028450

ENCLOSURE: 01

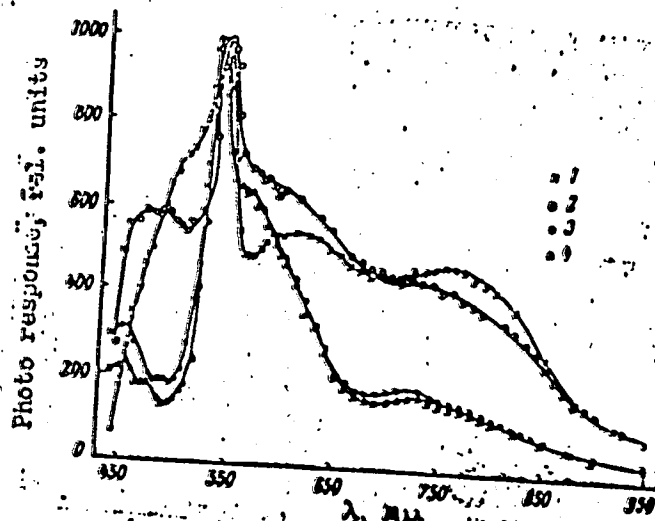


Fig. 1. Spectral distribution of photoconductivity in GaP at various temperatures

1,2- 214K; 3- 174K;
4- 96K; 1- modulated
light; 2-4- nonmodulated
light.

Card 3/3

ACCESSION NR: AP4041689

S/0181/64/006/007/1930/1938

AUTHORS: Oksman, Ya. A.; Zablcvskiy, E. Ye.

TITLE: Electric properties of electroluminors

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 1930-1938

TOPIC TAGS: luminor, electroluminescence, phosphorescent material, photoeffect, carrier mobility, conductivity

ABSTRACT: In order to reconcile some of the contradictions encountered in the explanation of the nature of internal electroluminescence of ZnS.Cu.Al electroluminors, the author used a double ac bridge method to study the electric properties of two series of such luminors, with the copper content varied over a wide range in each series. The series differed in the method of manufacture and in the grain size. The test procedure is described in detail. The conclusions are: 1. The conductance and susceptance of the tested luminors

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ACCESSION NR: AP4041689

are governed mostly by relaxation processes in the 1--20 Mc/sec band. 2. The photodielectric effect is quenched in all tested luminors, thus evidencing drift of the holes with an estimated mobility $5 \times 10^{-4} \text{ cm}^2/\text{V}\cdot\text{sec}$. 3. Application of fields that give rise to internal electroluminescence produces in polycrystalline phosphors a decrease in carrier density in the internal regions of the crystal (due to carrier capture by the crystalline surfaces), and an increase in the density with increase in field (due to the increase in the electron temperature). 4. The change in conductivity due to the exciting field offers evidence of low nonequilibrium-electron concentration in the electroluminor, compared with the case of photoexcitation, probably because of the low electron density. 5. The results of the observations, compared with the results of microscopic tests, can be reconciled with the internal-electroluminescence model proposed by A. G. Fischer (J. Electrochem. Soc. v. 109, 1043, 1962). Orig. art. has: 5 figures and 1 table.

Card 2/5

L 6705405

PL-10/Pa-6

ACCESSION NR: NP4044969

0101/64/006

AUTHORS: Dobrego, V. P.; Oksman, Ya. A.; Ry*vkin, S. M.; Smirnov, V. N.

TITLE: Jump conductivity and photodielectric effect in germanium

SOURCE: Fizika tverdogo tela, v. 6, no. 9, 1964, 2860-2861

TOPIC TAGS: germanium, photodielectric effect, jump conductivity, polarizability, single crystal, electric conductivity, photoelectric effect

ABSTRACT: In view of the fact that direct experiments with crystals have so far not demonstrated the existence of processes that change the polarizability of semiconductors upon illumination, the authors investigated the photodielectric effect (PDE) in single crystal germanium doped with antimony and compensated with copper at 4.2K. The purpose of the investigation was to study the processes

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L 6705-65

ACCESSION NR: AP4014000

ities of PDE under conditions when the electric conductivity is determined by the jump mechanism described by N. F. Mott and P. W. Twose (Advances in Physics, v. 10, No. 38, 107, 1961). The measurement procedure was described by the authors elsewhere (FTT, 2885, 1963). The various features of PDE that are deduced from these results are similar to those observed by others and give grounds for assuming that a carrier transport takes place at 4.2 K by jumps over the antimony levels. Several arguments are advanced in favor of the assumption that in compensated germanium crystals the PDE of the first kind (i.e., with change in the true polarization), does exist at helium temperatures and is due to jumps of the non-equilibrium carriers over the impurity levels. The question of the applicability of this mechanism to the photodipole effect in other semiconductors remains still open. Orig. art. has: 1 fig. and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe No. 15

Cord 2/3

L 6705-65

ACCESSION NR: AP4044469

(Physicotechnical Institute, AN SSSR): Gosudarstvennyy opticheskiy
institut im. S. I. Vavilova, Leningrad (State Optical Institute)

SUBMITTED. 18Apr64

ENCL:

SUB CODE: SS, OP

NR REF SOV: 005

OTHER

Card 3/3

L 22895-65 ENTIT 13-0000-2 13F00

ACCESSION NR: AP5003039

8/0051/65/019/001

AUTHOR: Okamen, Ya. A.; Zablovskiy, E. Ye.

TITLE: On the relaxation of non-equilibrium carriers in zinc-sulfide

SOURCE: Optika i spektroskopiya, v. 10, no. 1, 1965, 148-149

TOPIC TAGS: non-equilibrium carrier, zinc-sulfide optical material, photodielectric effect, lumino

ABSTRACT: The authors present results of experiments from which conclusions can be drawn concerning the nature of the phenomena contributing to localization of non-equilibrium current carriers in darkness, since the relaxation determines the different ability of luminors to store excitation in the form of a light sum or a residual change in complex conductivity. The factors contributing to the delocalization are connected with the mechanism of the photodielectric effect, the magnitude of which can be conveniently used to evaluate the kinetics of the decrease in the excitation. The measurements were made at a frequency at a field amplitude 10 V/cm. The test set-up and the sample preparation were described elsewhere (PTE, No. 1, 180, 1964; FTT, No. 2, 2818, 1964).

Cord 1/3

L 22895-65

ACCESSION NR: APSOC 1039

A study of the relaxation behavior of phosphors containing different concentrations and different thermal compositions have shown that as activator concentration, at both room temperature and nitrogen temperature, accompanied by the loss of the ability to store the light sum or the dark conductivity. The time of decrease of the excitation varies over a wide range. Arguments are advanced in favor of assuming that the photoluminescence effect in polycrystalline powders is due to jumps of carriers over the energy levels or traps, without participation of the bands. The dimensions of the regions within which a jump takes place depend on the concentration of the carriers and increase with increasing activator concentration. Recombination between holes and electrons, without participation of the bands, is possible in most cases when the activator is conjugated with the activator because it is possible to the electrons. This leads to high activator concentration, small light sum, and the absence of the photoluminescence effect. Consequently the difference in the ability of the luminor to store excitation can be attributed to differences in the type and distributions of the impurities. Orig. art. has: 1 figure and 1 table.

ASSOCIATION: None

Card 2/3

L 5448-66 EWT(1)/EWT(m)/ETC/ENG(m)/T/ENF(t)/ENF(b)/ENF(h) IJF(c) ERM/
ACCESSION NR: AP5017912 JD/JG/33/AT UR/0051/65/019/001/0149/0151

AUTHORS: Oksman, Ya. A.; Smirnov, V. N. 74
23
B

TITLE: High frequency electroluminescence of semiconducting crystals

SOURCE: Optika i spektroskopiya, v. 19, no. 1, 1965, 149-151 74
23
B

TOPIC TAGS: semiconductor crystal, zinc compound, optic material,
7 gallium compound, cadmium compound, electroluminescence, polarized
luminescence, luminescence crystal

ABSTRACT: Inasmuch as the impact electroluminescence of semiconduc-
tor crystals is frequently masked by secondary effects, the applied
radio pulses (18 Mc) with duration 10 -- 50 μ sec to unactivated single
crystals of Zs , $ZnSe$, GaP , $GaAs$, and polycrystalline plates of $CdTe$
in an electric field at liquid nitrogen temperature. The pulse repe-
tition frequency was 20 -- 200 cps. All the samples exhibited elec-
troluminescence, with near-exponential dependence of the brightness
amplitude on the amplitude of the applied pulses. The GaP and GaS
brightness waves duplicated the envelope of the radio pulse. In the

Card 1/2

UDC: 535.376

L 5448-66

ACCESSION NR: AP5017912

case of ZnSe , peaks were seen on the leading front of the pulses. Constant illumination did not influence the brightness waves of ZnSe and GaP , but strong electroluminescence quenching was observed for GaAs . Brighter spots were observed in some of the excited crystals under the microscope. The observed results are explained in terms of the charge polarization which limits the field in the crystal. It is concluded from all the data that the electroluminescence was of the intrinsic volume type, and is not connected with the field concentration. Orig. art. has: 3 figures

ASSOCIATION: None

SUBMITTED: 15Jan65

ENCL: 00

SUB CODE: 55, OP

NR REF SOV: 000

OTHER: 003

Card 2/2 *ML*

L 12105-66

ACC NR: AP6001663

for volume, and also the spectral distribution of HF electroluminescent emission. Observations of photoconductivity by a no-contact method revealed that the set-up time of photocurrent in the samples considered was in the order of several seconds, indicating a high concentration of traps. Orig. art. has: 2 figures.

SUB CODE: 07, 20 / SUBM DATE: 19May65 / ORIG REF: 002 / OTH REF: 003

Card 2/2

L 27207-66		EWT(1)/EWT(m)/ENP(t)/ETI		IJP(c)	JD
ACC NR:	AP6011568	SOURCE CODE: UR/0051/66/020/003/0499/0501			
AUTHORS: <u>Oksman, Ya. A.</u> ; <u>Smirnov, V. N.</u> ; <u>Smirnova, A. D.</u> ; <u>Tret'yakov, D. N.</u>					
ORG: none					
TITLE: High frequency <u>electroluminescence</u> of polycrystalline <u>gallium phosphide</u>					
SOURCE: Optika i spektroskopiya, v. 20, no. 3, 1966, 499-501					
TOPIC TAGS: gallium optic material, phosphide, electroluminescence, light excitation, luminescence center, <i>crystal</i>					
ABSTRACT: The authors present new experimental data which make it possible to make some assumptions concerning the mechanism of high frequency electroluminescence of powdered GaP. The powder was prepared from platelike GaF obtained by a method described by A. S. Borshchevskiy et al. (Izv. AN SSSR ser. fiz. v. 28, 985, 1964). The powdered crystals (grain dimension not larger than 50 μ) were mixed with malamine formaldehyde resin and deposited (0.3 mm layer) on a metallic electrode. The second electrode of the capacitor was a fine-mesh grid insulated from the layer with a mica linear 10 μ thick. The capacitor was immersed either in liquid nitrogen or in carbon tetrachloride at room temperature.					
Card	1/2	UDC: 535.376			

L 27207-66

ACC NR: AP6011568

0

The electroluminescence was excited by microwave pulses of 50 micro-seconds, with a repetition rate 50 -- 100 cps. The electroluminescence was registered through a window in the Dewar glass using a monochromator and photomultiplier. Alloying with zinc increased the electroluminescence intensity. The electroluminescence maximum was at 685 nm at 77K and 710 nm at 300K, in agreement with published data. The dependence of the electroluminescence brightness on the field intensity was proportional to a power-law function with exponents 2.5 -- 3.3, and the frequency dependence of the brightness was close to linear. It is concluded on the basis of the experimental data that the most probable mechanism of high-frequency electroluminescence of polycrystalline GaP is impact excitation of the lattice and of the centers, without participation on the part of the internal inhomogeneities of the crystal. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 29May65/ ORIG REF: 002/ OTH REF: 003

Card

2/2 *CE*

L 43681-66 EWT(1)/EWT(m)/EWT(1)/EWT LJP(c) JD/JG
ACC NR: AP6015459 (A) SOURCE CODE: UR/0181/66/008/005/1428/1433

AUTHOR: Borshchevskiy, A. S.; Oksman, Ya. A.; Smirnov, V. N.

ORG: none

TITLE: High frequency electroluminescence of gallium arsenide and gallium selenide

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1428-1433

TOPIC TAGS: electroluminescence, gallium arsenide, selenide, photoconductivity

ABSTRACT: Measurements were made of the internal HF electroluminescence of powdered polycrystalline GaAs and GaSe n-type specimens compensated by random impurities, e.g., oxygen, and in some cases, Ni and Co. Resistance of most compensated samples did not exceed 10 ohm·cm and the frequency and amplitude functions of the brightness luminescence of GaAs and GaSe were similar. The energy luminescence of GaAs reached 100 $\mu\text{W}\cdot\text{cm}^{-2}$ at 77°K; this is in agreement with the assumption regarding the shock nature of the excitation. Study of photoconductivity of GaSe with dc indicates that it is of a jump nature. The possibility of multistage ionization in semiconductors with a high density of point defects is discussed. The authors thank I. S. Aver'yanov, M. M. Mikhaylov and B. V. Korobitsyn for making the compensated polycrystalline GaAs samples available. Orig. art. has: 4 figures.

SUB CODE: 20/

SUBM DATE: 20Sep85/

ORIG REF: 012/

OTH REF: 41

Cord 1/1 mjs

L 04671-67 EWT(1) IJF(c)

ACC NR: AP6024456

SOURCE CODE: UR/0181/65/008/007/2001/2010

AUTHOR: Oksan, Ya. A.; Smirnov, V. N.

ORG: none

TITLE: High-frequency electroluminescence of semiconducting crystals

SOURCE: Fizika tverdogo tela, v. 8, no. 7, 1966, 2001-2010

TOPIC TAGS: semiconductor crystal, electroluminescence, electric polarization, impact ionization, conduction band, electron density, luminor

ABSTRACT: This is a continuation of earlier work by the authors (FTT v. 8, 1452, 1966 and earlier) dealing with excitation of electroluminescence in insulated semiconducting crystals by means of a high-frequency field. The present article reports observation of high-frequency electroluminescence in semiconductors of type $Al^{III}B^{VI}$, $A^{III}B^{VI}$, and $Al^{III}B^{VI}$, with conductivities from 10 to $10^{-12} \text{ ohm}^{-1} \text{ cm}^{-1}$ and an investigation of the character of the laws governing the high-frequency electroluminescence. By solving the two-dimensional problem of distribution of the field in the semiconductor crystal, the authors determine the influence of the charge polarization on the distribution of the field in the isolated crystal, and the nature of the electroluminescence under the assumption that the ionization is by impact and that the decisive role is played by the charge polarization in the formation of the internal field in the crystal. A model is assumed in which the conductivity of the crystal is determined only by the electron density in the conduction band, the radiation is produced by recombi-

Cord 1/2

ACC NR: AP6024456

nation of the electron with nonequilibrium holes, the number of free electrons produced by the ionization is small compared with their equilibrium concentration, and the nonequilibrium electron density is determined only by the thermal generation and drift. The character of the frequency and amplitude dependence of the brightness of the high-frequency internal electroluminescence, and the influence exerted on this brightness by the dimensions of the crystals and the conductivity, as predicted by this model, agree with the experimentally obtained values. A comparison is made of the high-frequency internal electroluminescence and the Destriau effect, observed in zinc-sulfide luminors, and evidence showing that the two effects are different is presented. Orig. art. has: 5 figures and 17 formulas.

SUB CODE: 20/

SUBM DATE: 04Oct65/

ORIG REF: 005/

OTH REF: 002

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Cord 2/2

ACC NR: AP6019284

SOURCE CODE: GE/0030/66/015/002/X105/X108

AUTHOR: Zhitar, V.; Oksman, Ya.; Radautsan, S.; Smirnov, V.

ORG: Institute of Applied Physics, Academy of Sciences, MSSR; Kishinev Polytechnical Institute

TITLE: Some photodielectric and luminescent properties of new semiconducting single crystals of the $Zn_3In_2S_6$ phase

SOURCE: Physica status solidi, v. 15, no. 2, 1966, X105-X108

TOPIC TAGS: semiconductor single crystal, semiconductor conductivity, luminescent crystal, sulfide, indium compound, zinc sulfide, photoelectric property, forbidden zone width, photoconductivity

ABSTRACT: Basic differences are shown to exist between the properties of $Zn_3In_2S_6$ crystals and those of $ZnIn_2S_3$. Earlier studies of this new semiconductor phase of the $ZnS-In_2S_3$ system have been reported by the authors (*Izv. Akad. Nauk MSSR*, 2, 9, (1965)). The photodielectric and luminescent properties of the crystals were studied in order to determine the width of the forbidden zone and the position of extrinsic levels. The width of the forbidden zone (2.76-2.82 eV) determined by the photodielectric method agreed with measurements made by optical absorption methods. The optical quenching spectrum of the photoconductivity and the spectral distribution of the pho-

Cord 1/2

ACC NR: AP6019284

toluminescence were also measured at temperatures of 295°K and 77°K. Quenching maxima occurred at 604 and 550 nm and photoluminescence maxima at 1.83 and 2.06 ev. Orig. art. has: 3 figures.

SUB CODE: 20,11/

SUBM DATE: 25Apr66/

ORIG REF: 008/

OTH REF: 002

Card 2/2

OKSMAN, Ya.B.; BABAYEV, A.; BOGUSH, G.; DOLINA, Ye.; KOVINEV, B.; MIRNYI, G.;
RUBEO, Stelio(Italiya); SING, Ramkhandr (Indiya); SOMOV, Yu.; KHARSH,
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Torfovi bolota Ukrain's'koho Polissia; zahal'nyi kharak-
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OXSNER, A.M., professor.

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KORSHIKOV, O.A.; ROLL, Ya.V., redaktor; OKSNER, A.M., doktor biologicheskikh nauk, redaktor; TOPACHEVS'KIY, O.V., kandidat biologicheskikh nauk, redaktor; KRIVENKO, V.V., redaktor; SIVACHENKO, E.K., tekhnredaktor.

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