

3183h
S/194/61/000/010/054/082
D256/D301

Selenium photo-cells...

photo-cells shows a linear increase up to about 10,000 L and above this value the linearity breaks down. The photo-emf characteristics show at low light intensities of 10-15 L a linear rise saturating at 1000 L. The photo-cells have coinciding spectral characteristics and a maximum in the region 0.56-0.58 microns. Increasing the temperature from zero to 100°C the photo-emf shows a practically linear decrease, with a highest value of $\Delta V/\Delta t$ for CdTe-0.002 V/°C, and lowest for CdSe-0.001 V/°C. The temperature dependence of the photo-current is different for different layers, for CdSe in the region 0-100°C the photo-current is practically independent of temperature, while for CdS the current at 100°C is 30% higher than at 20°C. In samples of CdO layers the photo-current reaches its maximum at 25°C; for CdTe at 60°C and then decreases and at 100°C its value is respectively ~ 75% and ~ 50% of the maximum value. ✓
11 references. [Abstracter's note: Complete translation]

Card 2/2

ABDULLAYEV, G.B.; GASIMOV, R.B.; BAKIROV, M.Ya; NASIROV, Ya.N.

Heat-resistant selenium photocells. *Izv.AN Azerb.SSR.Ser.fiz.-
mat.i tekhnauk no.5:79-84 '60.* (MIRA 14:4)

(Photoelectric cells) (Selenium)

33690

S/058/61/000/012/081/083

A058/A101

24,2600 (1114, 1138, 1147)

AUTHORS: Bakhyshov, A. E., Abdullayev, G. B.

TITLE: Some characteristics of selenium rectifying photoelectric cells

PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1961, 421, abstract 12Zh177
("Dokl. AN AzerbSSR", 1961, v.17, no. 1, 9-12, Azerb. summary)

TEXT: The effect of electric fields and of light on the photocurrent generated by x-rays in rectifying photoelectric cells interlaminated with Tl_2Se , TlS , Tl_2S , $InSe$, $CdSe$ and CdS was investigated under both photodiode and rectifying operating conditions. Light intensity was selected so that photocurrent I_1 generated by the light would be of the order of photocurrent I_x generated by the x-rays. It was established that under joint action of x-rays and light rays, total current $I = I_x + I_1$. It was found that selenium rectifying photoelectric cells are 800 times more sensitive to x-rays under photodiode operating conditions than under rectifying operating conditions [Editor's note: something is missing in the original text.] device in which the receiver simultaneously [Editor's note: something is missing in the original text.] photocurrent I_f is proportional to x-ray line intensity F . For high voltages $I_f = \alpha F^\alpha$, where $\alpha < 1$. The experimental results pertaining to the variation of photocurrent with x-ray intensity for constant applied voltage are interesting from the standpoint of x-ray dosimetry.

+

9,4160

S/058/62/000/006/051/136
A061/A101

AUTHORS: Abdullayev, G. B., Gasymov, R. B., Bakirov, M. Ya.

TITLE: Selenium photocells with GaSe layer

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 25, abstract 60212
("Dokl. AN AzerbSSR", 1961, v. 17, no. 8, 677 - 680, Azerb. summary)

TEXT: The photocells under consideration have been produced with a p-n junction formed on the contact of Se and GaSe. The presence of the latter was proved by electron diffraction. Apart from the principal maximum (0.56μ), these photocells display an additional maximum at 0.44μ , the relative magnitude of which depends on the thickness of metallic Ga applied to the Se film.

Ya. Oksman

[Abstracter's note: Complete translation]

Card 1/1

S/137/62/000/002/001/1'
A006/A101

AUTHORS: Shakhtakhtinskiy, M. G., Kuliyeu, A. A., Abdullayev, G. B.

TITLE: Investigating the tension of saturated vapors of some selenides by the radio-isotope method

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 2, 1962, 5, abstract 2A20 (V sb. "Vopr. metallurgii i fiz. poluprovodnikov", Moscow, AN SSSR, 1961, 38-42)

TEXT: The investigation was carried out by the Knudsen method. A schematic diagram of the device is given. With the aid of this device it is possible to determine the vapor tension at various temperatures without disturbing the vacuum. For a synthesis of selenides, Se, Tl and Sb of 99.99% purity were placed into a quartz ampoule which was evacuated to 10^{-4} mm Hg. Each compound was prepared twice with active Se^{75} , Tl^{204} or Sb^{124} . Vapor tensions of compounds $TlSe$, Tl_2Se and Sb_2Se_3 , measured over both components, have equal values, i.e. during evaporation of these substances, there is no dissociation in the solid phase. The same agreement of values is observed for Tl_2Se up to $200^\circ C$. It is supposed that Tl_2Se_3 dissociates according to the scheme $Tl_2Se_3 \rightarrow Tl_2Se \uparrow + 2Se$

Card 1/2

Investigating the tension of saturated ...

S/137/62/000/002/001/144
A006/A101

Vapor tension p as a function of temperature T is described by the following equations: for Tl_2Se $l_{gp} = -(5880.9/T) + 9.8052$; for $TlSe$ $l_{gp} = -(6742.2/T) + 12.443$; for Tl_2Se_3 $l_{gp} = -(7425.5/T) + 9.2481$; for Sb_2Se_3 $l_{gp} = -(6432.3/T) + 8.7906$. Calculation of sublimation heats for the aforementioned compounds yields the following values in kcal/g-mole: Tl_2Se 26.905; $TlSe$ 30.845; Tl_2Se_3 33.972, Sb_2Se_3 29.589. ✓

T. Kolesnikova

[Abstracter's note: Complete translation]

Card 2/2

24.5300

39130
S/058/62/000/006/070/136
A061/A101

AUTHORS: Abdullayev, G. B., Bashshaliyev, A. A., Aliyev, S. A., Aliyev, M. I., Kerimov, I. G.

TITLE: On the heat conductivity of antimony sulfide, selenide, and telluride

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 17, abstract 6E144
("Izv. AN AzerbSSR. Ser. fiz.-matem. i tekhn. n.", 1961, no. 5, 55 - 63, Azerb. summary)

TEXT: The heat conductivity (λ) of Sb_2S_3 , Sb_2Se_3 , and Sb_2Te_3 has been measured in the temperature range of 80 - 400°K. For all these compounds, above 200 - 250°K, the temperature dependence of the lattice contribution to λ is observed to deviate from the $\lambda \sim 1/T$ law by a sharp rise of λ . The photon heat conductivity is considered by the authors to be the cause of this phenomenon.

L. Filippov

[Abstracter's note: Complete translation]

Card 1/1

ALIYEV, B.D.; ABDULLAYEV, G.B.; ALIYEV, G.M.; KERIMOV, I.G.

Electric properties of selenium with a gallium admixture. Dokl.
AN Azerb. SSR 17 no. 3:191-196 '61. (MIRA 14:5)

1. Institut fiziki AN AzerbSSR.
(Selenium--Electric properties)

MOVLANOV, Sh.; ABDULLAYEV, G.B.; BASHSHALIYEV, A.; KULIYEV, A.; KERIMOV, I.

Some properties of antimony telluride single crystals. Dokl. An.
Azerb. SSR 17 no.5:375-379 '61. (MIRA 14:6)

1. Institut fiziki, sektor fiziki i matematiki Akademii nauk
Tadzhikskoy SSR.
(Antimony telluride)

33678

S/058/61/000/012/048/083

A058/A101

26. 2421

AUTHORS: Aliyev, B. D., Abdullayev, G. B., Aliyev, G. M., Kerimov, G. I.

TITLE: Electric properties of gallium-doped selenium

PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1961, 359. abstract 12E481
(Dokl., AN AzerbSSR, 1961, v. 17, no. 13, 191 - 196 Azerb. summary)

TEXT: The effect of gallium-doping on the electric conductivity σ and thermo-emf α of Se was investigated. Doping with up to 0.125 wt % Ga causes σ of Se to increase almost 160 times, after which σ slowly decreases with increasing Ga content. α of specimens with different Ga content was measured in the range 20° - 200°C. The sign of α always points to p-type conductivity. The temperature dependence of hole mobility μ_p for different Ga content is plotted. In specimens containing 0.125 wt % Ga, μ_p at first decreases sharply, then remains constant. In the rest of the specimens, μ_p increases with temperature.

B. Ol'khov

[Abstracter's note: Complete translation]

Card 1/1

X

GELLER, I.Kh.; ABDULLAYEV, G.B.; KOCHIN, S.I.; ALIYEV, M.G.

Selenium rectifiers involving a higher current density.
Izv. AN Azerb.SSR.Ser.fiz.mat. i tekhn. nauk no.4:51-63
1961.

(MIRA 14:12)

(Electric current rectifiers)
(Selenium)

GELLER, I.Kh.; ABDULLAYEV, G.B.; KOCHIN, G.I.; ALIYEV, M.G.

Rectifying selenium elements suited to currents of higher density.
Izv. AN Azerb. SSR. Ser.fiz.-mat. i tekhnauk no.5:65-73 '61.

(Electric current rectifiers) (Selenium) (MIRA 15:2)

30956

24.7700(1160, 1164, 1385)

S/576/61/000/000/013/020
E036/E162

AUTHORS: Akhundov, G.A., Abdullayev, G.B., Aliyeva, M.Kh., and Efetdinov, G.A.

TITLE: Preparation and investigation of the semiconducting materials AgTe, Ag₂Se, SnTe and CdTe

SOURCE: Soveshchaniye po poluprovodnikovym materialam. 4th. Voprosy metallurgii i fiziki poluprovodnikov; poluprovodnikovyye soyedineniya i tverdye splavy. Trudy soveshchaniya. Moscow, Izd.-vo AN SSSR, 1961. Akademiya nauk SSSR. Institut metallurgii imeni A.A. Baykova. Fiziko-tekhnicheskiy institut. 104-106

TEXT: To explain the properties of thin films of binary compounds deposited on various substrates it is necessary to investigate the bulk properties. In this paper the investigation of thermal and electrical conductivities and the structure of the following compounds are reported: Ag₂Te, Ag₂Se, SnTe and CdTe. These compounds were obtained by fusing together the components, which had been weighed to an accuracy of 2×10^{-4} g. The synthesis was carried out by heating slowly to a temperature

Card 1/5

+

Preparation and investigation of ...

³⁰⁹⁵⁶
S/576/617000/000/013/020
EO36/E162

4

somewhat above the melting point of the refractory component in an evacuated (10^{-4} mm Hg) quartz ampoule. This temperature is maintained for about two hours and then further slow heating up to the melting point of the compound takes place. This final temperature is maintained for eight hours. Homogenisation is achieved by maintaining a temperature about 200° above this point for two hours. After this the material is annealed at $700-800^{\circ}\text{C}$ for several hours and slowly cooled to room temperature. The material was uniform, Ag_2Te and Ag_2Se being n-type whilst SnTe and CdTe were p-type. X-ray and electron diffraction gives the following results: 1) Ag_2Te has a hessite structure containing excess Ag. 2) Ag_2Se has the naumannite structure (β -phase), and appears from electron diffraction evidence to maintain this during vaporisation. 3) SnTe has a cubic lattice ($a = 6.285 \text{ \AA}$) and does not dissociate during evaporation. 4) CdTe has a sphalerite structure with $a = 6.41 \text{ \AA}$, and does not dissociate during evaporation. Electron diffraction shows the condensed material to be a mixture of polycrystals and orientated single crystals. Thin layers ($\sim 0.5 \mu$) are obtained by depositing on glass

Card 2/5

Preparation and investigation of ... ³⁰⁹⁵⁶ S/576/61/000/000/013/020
E036/E162

substrates in a vacuum of 10^{-4} mm Hg. The densities were 8.08, 7.50, 6.02 and 5.57 g/cm³ for Ag₂Te, Ag₂Se, SnTe and CdTe respectively. Gold bands are deposited on the thin layers to facilitate conductivity measurements. The room temperature conductivities of 38 and 257 Ω^{-1} cm⁻¹ of Ag₂Te and Ag₂Se were an order less than the bulk values. This is explained by the enhanced importance of the high resistance grain boundaries in the thin layers. The temperature dependence of the conductivity of Ag₂Te (curve 1) and Ag₂Se (curve 2) is shown in Fig.1, where the conductivity in Ω^{-1} cm⁻¹ is plotted against $10^3/T$, where T is the temperature in °K. Similar curves are obtained for large samples. The sharp change in conductivity is due to a polymorphic transformation. The results show that the β modifications of Ag₂Te below 150° and Ag₂Se below 140° are semiconducting with activation energies of 0.13 and 0.09 eV. Above the polymorphic transformation temperature the conduction is metallic. This change corresponds to a change in the bonding from covalent to polar. The thermal conductivities have not been reported in the literature and are given in Fig.2, as a function of temperature.

Card 3/5

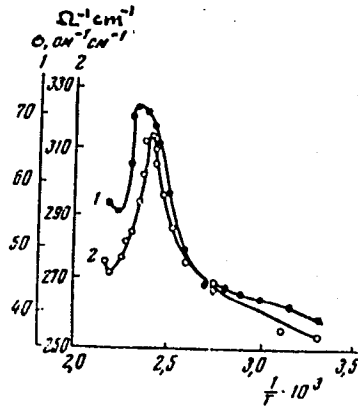
Preparation and investigation of ...

30956
S/576/61/000/000/013/020
E036/E162

Ag₂Te and Ag₂Se have minima at 140 and 150°, corresponding to the polymorphic transformation.

There are 2 figures and 2 non-Soviet-bloc references.

Fig.1



Card 4/5

33112

S/638/61/001/000/039/056
B108/B138

9.2150 (1020, 1159, 1331)

AUTHORS: Abdullayev, G. B., Akhundov, G. A.TITLE: Investigation of diffusion processes in selenium rectifiers
by means of radioactive isotopesSOURCE: Tashkentskaya konferentsiya po mirnomy ispol'zovaniyu
atomnoy energii. Tashkent, 1959. Trudy. v. 1. Tashkent,
1961, 252-256

TEXT: The authors studied the diffusion of thallium, tin, and indium in polycrystalline selenium; cadmium, tin, and thallium in a cadmium-tin alloy, and of thallium and selenium in Tl_2Se . The radioactive isotopes Tl^{204} , $Sn^{113-123}$, In^{114} , and Se^{75} were used, successive thin layers were removed from the initially 99.994% pure selenium. The diffusion coefficients in selenium between 50 and 200°C are

$$D_{Tl \rightarrow Se} = 1.38 \cdot 10^{-6} \exp(-0.35/kT) \text{ cm}^2/\text{sec}$$

$$D_{Sn \rightarrow Se} = 4.78 \cdot 10^{-8} \exp(-0.39/kT) \text{ cm}^2/\text{sec}$$

Card 1/3

Investigation of diffusion ...

33112
S/638/61/001/000/039/056
B108/B138

$$D_{\text{In} \rightarrow \text{Se}} = 5.15 \cdot 10^{-6} \exp(-0.39/kT) \text{ cm}^2/\text{sec}.$$

The low activation energies indicate that the atoms or ions of Tl, Sn, and In are located in the hexagonal Se lattice and diffuse through the interstitial sites. The temperature dependence of the diffusion coefficients of Cd, Sn, and Tl in a Cd-Sn alloy between 50 and 170°C are

$$D_{\text{Cd} \rightarrow \text{Cd-Sn}} = 4.43 \cdot 10^{-8} \exp(-0.20/kT) \text{ cm}^2/\text{sec}$$

$$D_{\text{Sn} \rightarrow \text{Cd-Sn}} = 5.92 \cdot 10^{-7} \exp(-0.29/kT) \text{ cm}^2/\text{sec}$$

$$D_{\text{Tl} \rightarrow \text{Cd-Sn}} = 6.30 \cdot 10^{-4} \exp(-0.60/kT) \text{ cm}^2/\text{sec}.$$

Activation energy increases with rising melting point, and also with atomic radius (linearly). It is suggested that a thin Tl_2Se layer forms on the upper electrode of selenium rectifiers with Tl impurities, and that it acts as a p-n junction in contact with the selenium. From a special investigation of rectifiers with a Tl_2Se layer on various upper-electrode backings, the temperature dependences of the diffusion coefficients were found to be

Card 2/3

33112

Investigation of diffusion ...

S/638/61/001/000/039/056
B108/B138

$$D_{Tl \rightarrow Tl_2Se} = 1.17 \cdot 10^{-3} \exp(-0.61/kT) \text{ cm}^2/\text{sec}$$

$$D_{Se \rightarrow Tl_2Se} = 2.25 \cdot 10^{-5} \exp(-0.58/kT) \text{ cm}^2/\text{sec}.$$

These data permit the suggestion that diffusion of Tl and Se in Tl_2Se proceeds through the sites of the tetragonal lattice. There are 6 figures and 2 non-Soviet references. The reference to the English-language publication reads as follows: Nijland, L. M., Phil inp Rev. Repts, 9, 4, 1954

ASSOCIATION: Institut fiziki AN AzSSR (Institute of Physics AS
Azerbaydzhanskaya SSR)

Card 3/3

813.

S/058/62/000/002/029/053
A061/A101

24.7500 (1454, 1482)

AUTHORS: Aliyarova, Z. A., Abdullayev, G. B.

TITLE: A study of the diffusion of some elements in selenium

PERIODICAL: Referativnyy zhurnal, Fizika, no. 2, 1962, 23, abstract 2E220
(Tr. Tashkentsk. konferentsii po mirn. ispol'zovaniyu atomn. energii, 1959. T. 1. Tashkent, AN UzSSR, 1961, 255 - 259)

TEXT: The effect of Br and Cd impurities on the diffusion of Fe and S in Se, as well as on Se self-diffusion was investigated. The method used was that of atoms tagged with the radioactive isotopes S^{35} , Fe^{59} , and Se^{75} . The diffusion coefficients were determined by taking off layers from cylindrical Se samples. It was established that S has the highest rate of diffusion (10^{-9} cm/sec). For the other elements it amounts to $\sim 10^{-11}$ cm/sec. The rate of diffusion is very sensitive to the presence of impurities in Se. The activation energy of diffusion depends on the Br and Cd concentration considerably. The phenomena observed are explained by the fact that impurities in different concentrations occupy different sites in the Se lattice. x

[Abstracter's note: Complete translation]

Card 1/1

20103

S/181/61/003/002/001/050
B102/B204

26.7231

AUTHORS: Abdullayev, G. B., Aliyev, M. I., and Akhundova, S. A.

TITLE: The effect of thallium upon the thermal conductivity of polycrystalline selenium

PERIODICAL: Fizika tverdogo tela, v. 3, no. 2, 1961, 326-327

TEXT: The investigation of the thermal conductivity of amorphous and crystalline selenium at high and low temperatures had already formed the subject of several papers (Refs.1-4); also the thermal conductivity of amorphous and crystalline selenium, which contained iodine-, chlorine-, bromine-, bismuth- or lead impurities was investigated (Refs.5-9). In order to study the effect produced by thallium upon the thermal conductivity of selenium, specimens were produced which contained 0.01%, 0.02%, 0.1, 0.5, 0.75, 1, and 1.5% by weight of thallium. The specimens were produced by melting 99.996% pure selenium with Tl_2Se in ampoules at a pressure of the order of 10^{-4} mm Hg. after which they were cooled; the specimens were of cylindrical form and had a diameter of 16 mm and a

Card 1/2

20103

S/18/61/003/002/01/000
3102/B204

The effect of thallium upon....

height of 8×10^{-3} mm. All specimens were subjected to thermal treatment for one hour, at first at 110 and then at 210°C. The thermal conductivity of the specimens obtained was measured under steady thermal conditions by means of a device having a guard ring and a sensitive semiconductor thermocouple (Refs. 8 and 10) within the temperature range of from 20 to 90°C. The temperature dependence of the thermal conductivity of all specimens was linear within the range investigated (Fig. 1) corresponding to the equation $\lambda = \lambda_0 - \alpha T$. The temperature coefficient of the thermal conductivity α depended, just like λ , on thallium concentration, where a minimum occurs within the concentration range of 0.05% (Fig. 2). The results obtained may be explained by assuming that the effect produced by thallium on the thermal conductivity of selenium is due to two mechanisms: on the one hand, thallium creates additional phonon scattering centers, which leads to a decrease of thermal conductivity, and on the other, it is increased due to an effect produced by thallium upon the crystal grain size. In the case of small impurity concentrations, the first-mentioned mechanism obviously predominates, in the case of greater concentrations, however, the latter predominates, the thermal

Card 2/3

20103

The effect of thallium upon...

S/181/61/003/002/001/050
B102/B204

conductivity of selenium as a function of thallium concentration shows a minimum. [Full translation]. There are 2 figures and 10 references: 9 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Azerbaydzhanskiy gosudarstvennyy universitet im. S. M. Kirova (Azerbaydzhan State University imeni S. M. Kirov). Institut fiziki Akademii nauk Azerbaydzhanskoy SSR (Institute of Physics of the Academy of Sciences of the Azerbaydzhanskaya SSR)

SUBMITTED: February 17, 1960 (initially) and October 6, 1960 (after revision) X

Card 3/3

24,7700

37082
Z/019/62/019/005/001/001
D006/D102

AUTHORS: Aliyev, G.M., Abdullayev, G.B., Barkinkhoyev, Kh.G., et al.

TITLE: Electrical properties of pure selenium

PERIODICAL: Přehled technické a hospodářské literatury. Energetika a elektro-
technika, v. 19, no. 5, 1962, 199, abstract # E 62-2671. Maruzalar
Dokl. 7, no. 7, 1961, 569-573

TEXT: The author starts from the proven fact that the concentration of holes in selenium decreases and mobility increases with increasing temperature. This phenomenon does not conform with the semiconductor theory. The conducted experiments show that this discrepancy is closely related to the chemical purity of selenium. Diagrams show the curves of the dependence of electrical conductivity of Se (99.994%), Se (99.996%) and Se with small admixture of Mg and Si. These curves demonstrate that the decrease of electric conductivity with increasing temperature depends on the degree of purity. The dependence of thermoelectric force on temperature was also verified. The original article contains 4 figures and 16 references. [Abstracter's note: Complete translation/.

Card 1/1

33677

S/058/61/000/012/046/083
A058/A101

9,4346 (1003, 1143, 1150)

AUTHORS: Talibi, M. A., Abdullayev, G.

TITLE: Concerning a correlation between the ionization-potential activation energy of impurities and the radius of the impurity atom in semi-conductors

PERIODICAL: Referativnyy zhurnal, Fizika, no. 12, 1961, 357, abstract 12E459 (Dokl. AN AzerbSSR, 1961, v. 17, no. 2, 97 - 103, Azerb. summary)

TEXT: The effect of doping Se with Ga, Pb, Ag, Fe and Si on the electric properties of Se and of selenium p-n junctions was investigated. It was demonstrated that the higher the first ionization potential of the impurity (I) and the smaller its atomic radius (r), the lower is the temperature at which impact ionization appears. At constant temperature, the lower I and the greater r, the lower is the voltage at which impact ionization appears. With decreasing atomic number and impurity concentration, the impurity activation energy ΔE rises (with the exception of Ga). ΔE is inversely proportional to the difference between I and r of Se and those of the impurity. According to the data in the literature, the registered correlation extends to a number of impurities in Ge and Si, while in

Card 1/2

Concerning a correlation between...

S/058/61/000/012/046/083
A058/A101

binary semiconductor compounds of metals with elements of the same group. ΔE of the compound is directly proportional to the difference between I and r of the components. Binary compounds of the selenides and sulfides are an exception: They evince reverse proportionality between the same parameters. The registered correlation holds for a number of ternary semiconductor compounds.

V. Lev

[Abstracter's note: Complete translation.]

Card 2/2

ABDULLAYEV, G.B.; BASHSHALIYEV, A.A.; ALIYEV, S.A.

Heat conductivity of solid solutions $Sb_2S_3-Sb_2Se_3$. Dokl.
AN Azerb. SSR 17 no.10:877-879 '61. (MIRA 14:12)

1. Institut fiziki AN AzSSR.
(Solutions, Solid—Thermal properties)
(Antimony sulfides)
(Antimony selenide)

AEDULLAYEV, G. B.

90

PHASE I BOOK EXPLOITATION

30V/6176

Konobeyevskiy, S. T., Corresponding Member, Academy of Sciences
USSR, Resp. Ed.

Deystviye vadernykh izlucheniv na materialy (The Effect of
Nuclear Radiation on Materials). Moscow, Izd-vo AN SSSR,
1962. 383 p. Errata slip inserted. 4000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye tekhnicheskikh nauk; Otdeleniye fiziko-matematicheskikh nauk.

Resp. Ed.: S. T. Konobeyevskiy; Deputy Resp. Ed.: S. A. Adasinskiy; Editorial Board: P. L. Gruzin, G. V. Kurdyumov, B. M. Levitskiy, V. S. Lyashenko (Deceased), Yu. A. Martynyuk, Yu. I. Pokrovskiy, and N. P. Pravdyuk; Ed. of Publishing House: M. G. Makarenko; Tech. Eds: T. V. Polyakova and I. N. Dorokhina.

Card 1/14

90

The Effect of Nuclear Radiation (Cont.)

SOV/6176

PURPOSE: This book is intended for personnel concerned with nuclear materials.

COVERAGE: This is a collection of papers presented at the Moscow Conference on the Effect of Nuclear Radiation on Materials, held December 6-10, 1960. The material reflects certain trends in the work being conducted in the Soviet scientific research organization. Some of the papers are devoted to the experimental study of the effect of neutron irradiation on reactor materials (steel, ferrous alloys, molybdenum, avial, graphite, and nichromes). Others deal with the theory of neutron irradiation effects (physico-chemical transformations, relaxation of internal stresses, internal friction) and changes in the structure and properties of various crystals. Special attention is given to the effect of intense γ -radiation on the electrical, magnetic, and optical properties of metals, dielectrics, and semiconductors.

Card 2/14

| | |
|--|----------|
| The Effects of Nuclear Radiation (Cont.) | SOV/6176 |
| Pravdyuk, N. F., V. A. Nikolayenko, and V. I. Korpukhin. Change in Lattice Parameters of Diamond and Silicon Carbide During Irradiation | 184 |
| Abdullayev, G. B., and M. A. Talibi. On One Method of Using Cadmium Sulfide Photoresistors in Recording X- and Y-ray Dosimeter | 189 |
| Konobeyevskiy, S. T., B. M. Levitskiy, L. D. Panteleyev, K. P. Dubnovin, V. I. Kutaytsev, and V. N. Konev. X-Ray Examina- tion of Transformations in Copper-Tin Alloy Under Neutron Irradiation | |
| Levitskiy, B. M., and L. D. Panteleyev. X-Ray Examination of the Relaxation of Internal Microstresses in Cold-Worked Metals Under Neutron Irradiation | 209 |
| Konobeyevskiy, S. T., N. F. Pravdyuk, Yu. I. Pokroyskiy, and V. I. Vikhrov. Effect of Neutron Irradiation on Internal Friction in Metals | 219 |

Card 9/14

ABDULLAYEV, G.B., red. (Baku); BAGDATLISHVILI, D., red. izd-va;
IBRAGIMOV, M., tekhn. red.

[Transactions of the Conference on Impact Ionization and the
Tunnel Effect in Semiconductors]Trudy Soveshchaniia po udar-
noi ionizatsii i tunnel'nomu efektu v poluprovodnikakh, 1960.
Baku, Izd-vo Akad.nauk Azerbaidzhanskoi SSK, 1962. 165 p.
(MIRA 15:8)

1. Soveshchaniye po udarnoy ionizatsii i tunnel'nomu efektu v
poluprovodnikakh, Baku, 1960.
(Semiconductors--Congresses)

L 11047-63

EWI(1)/EWG(k)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3 Pz-4 AT/IJP(C)

ACCESSION NR: AT3002972

S/2927/62/000/000/0005/0012

68
67

AUTHOR: Abdullayev, G. B.; Bakirov, M. Ya.; Gasy*mov, R. B.; Bakhy*shov, A. E.

TITLE: Investigating the nature of p-n junction in selenium photocells^{AS}
[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, 5-12

TOPIC TAGS: selenium photocell, p-n junction of photocell

ABSTRACT: Although selenium photocells have been widely used, many physical phenomena transpiring in them are not entirely clear. Experiments have shown that the junction is formed at the contact of two different semiconductors (e.g., Se and CdSe); the theory of such junctions has been developed. The article describes experimental studies of the p-n junction in and aging of selenium photocells. Also attempts to create a highly sensitive and stable photocell by coating Se with an electron-type semiconductor are reported. Photocurrent and photo-emf of Se coated with Al, Cu, Zn, Ga, Ag, Cd, In, Sn, Au, Hg, Pb, Bi were measured. Effects of thermal and electrical forming on the photocell characteristics were investigated.

Card 1/2

L 11047-63

ACCESSION NR: AT3002972

It was found that aging of selenium photocells is due to excessive thickening of the selenide coating (over the optimum thickness of 5×10^{-5} cm). Four sets of artificial n-layer electrodes, Se-GaSe, Se-InSe, Se-CdSe, and Se-HgSe, were investigated in detail. Current-voltage, sensitivity spectral distribution, and illumination characteristics were determined for the above combinations (curves given), as well as all pertinent electrical and photoelectrical data (tabulated). With a solar-radiation intensity of 10 milliwatt per sq cm, current up to 3 ma per sq cm, and emf 0.6 v (efficiency about 1 per cent, were obtained for Se-CdSe combination. It is concluded that, in the selenium photocells, the p-n junction can be obtained by coating selenium with a thin layer of an electron-type semiconductor. Orig. art, has: 5 figures, 5 formulas, and 1 table.

ASSOCIATION: Akad. nauk SSSR(Academy of Sciences SSSR); Akad nauk UzSSR(Academy of Sciences UzSSR); Tashkentskiy gosuniversitet im. V. I. Lenina (Tashkent State University)

SUBMITTED: 00

DATE ACQ: 15May63

ENCL: 00

SUB CODE: 00

NO REF SOV: 010

OTHER: 003

kes|ur
Card 2/2

L 11195-63

ENT(1)/ENG(k)/BDS/EEC(b)-2--AFFTC/ASD/ESD-3--

Pz-4--AT/IJP(C)

ACCESSION NR: AT3002973

S/2927/62/000/000/0012/0017

AUTHOR: Abdullayev, G. B.; Talibi, M. A.

TITLE: Correlation in semiconductors between the activation energy and the ionization potential and atomic radius [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, 12-17

TOPIC TAGS: selenium rectifier, activation energy, ionization potential, atomic radius

ABSTRACT: Studying the effect of strong field on p-n transition in impurity-type selenium rectifiers is important as it may permit controlling the electrical and thermal characteristics of these rectifiers. The authors investigated reverse current-voltage characteristics of selenium rectifiers containing Ga, Pb, Ag, Fe, and Si as impurities at the liquid-nitrogen temperature. Also the effect of temperature (-80 to +20C) on the cutoff current of the above rectifiers was determined. Experimental data is compared with the published data of other researchers, and the following conclusion is drawn: the closer ionization potential

Card 1/2

L 11195-63

ACCESSION NR: AT3002973

and atomic radius of the impurity to those of the semiconductor proper, the higher is the activation energy of the impurity in the semiconductor. Orig. art. has: 2 figures and 6 tables.

ASSOCIATION: Akad. nauk SSSR (Academy of Sciences SSSR); Akad. nauk UzSSR (Academy of Sciences UzSSR); Tashkentkiy gosuniversitet im. V. I. Lenina (Tashkent State University)

SUBMITTED: 00

DATE ACQ: 15May63

ENCL: 00

SUB CODE: 00

NO REF SOV: 010

OTHER: 006

1s/WY
Card 2/2

S/081/62/000/008/012/057
B166/B101

AUTHORS: Abdullayev, H. B., Aliyev, M. H.

TITLE: Tagged atom study of electrochemical processes near the electrode in selenium

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 6, 1962, 65, abstract 6B466 (Tr. In-ta fiz. AN AzerbSSR, v. 10, 1960, 25-29)

TEXT: A thin Se coating (50 μ) containing pure Se (99.996 %) and an impurity of either radioactive Br (0.05 % by weight) or Se and applied to a bismuthized Al backing was polarized in double-distilled H₂O. With anodic polarization a stable increase in current with time is observed; this is the result of H₂SeO₃ formation and acidification of the solution. With cathodic polarization the current passes through a minimum before reaching a steady value. Under these conditions the Se does not dissolve, but the Br impurity goes over into the electrolyte. It is inferred that cathodic treatment of the surface of the Se leads to leveling out of the surface layer and to the removal of acceptor impurity centers from it. [Abstracter's note: Complete translation.]

L 2730-66 EWT(m) GS
ACCESSION NR: AT5023798

UR/0000/62/000/000/0189/0193

33
B41

AUTHOR: Abdullayev, G. B.; Talibi, M. A.

TITLE: Method of using cadmium sulfide photoresistances in a recording x- and gamma-
ray dosimeter 19

SOURCE: Soveshchaniye po probleme Deystviye yadernykh izlucheny na materialy.
Moscow, 1960. Deystviye yadernykh izlucheny na materialy (The effect of nuclear
radiation on materials); doklady soveshchaniya. Moscow, Izd-vo AN SSSR, 1962, 189-193

TOPIC TAGS: cadmium sulfide, photoresistance, radiation dosimeter, x ray measurement,
gamma detector

ABSTRACT: The article describes a possible method of using cadmium sulfide photo-
resistances as sensing elements in a recording x- and gamma ray dosimeter including an
MOM-3 tube megohmmeter. Single-crystal photoresistances produced by the Institut fiziki
AN USSR (Institute of Physics, AN Ukr. SSR) were employed in the experiments. The
dosimeter circuit permits a continuous successive recording of the intensities or rates of
radiations directed on the working surface of each individual photoresistance. The proposed
Card 1/2

L 2730-66
ACCESSION NR: AT5023798

dosimeter was tested with a large number of photoresistances on URS-70, GUT-S0-400-1, and RUM-3M units; the dose rate varied from 3 to 2000 roentgen/min. The use of CdS crystals in combination with MOM-3 as the dosimeter presents a number of advantages, since the calibrated resistances of the instrument cover a wide range. This permits measurements over a wide radiation intensity range and the plotting of calibration curves for various photoresistances but the same MOM-3. The recalibration of the scale of MOM-3 from resistance units to dose rate units is discussed in terms of the relationship between the resistance and the intensity of the current passing through an x-ray tube with various anodes (tungsten, molybdenum, iron, copper). Orig. art. has: 4 figures, 1 table, and 2 formulas.

ASSOCIATION: None

SUBMITTED: 18 August 62

ENCL: 00

SUB CODE: NP

NO REF SOV: 007

OTHER: 002

Card 2/2

37920

26,2532
24,7700

S/181/62/004/005/019/055
B125/B104

AUTHORS: Guseynov, G. D., Akhundov, G. A., and Abdullayev, G. B.

TITLE: Electrical and thermoelectrical properties of TlSe single crystals

PERIODICAL: Fizika tverdogo tela, v. 4, no. 5, 1962, 1206-1212

TEXT: Electrical conductivity, Hall effect, and thermo-emf of TlSe single crystals in the range 80-570°K were measured by a d-c compensation method. Electrical conductivity and Hall effect were measured with molybdenum probes, and the thermo-emf with the copper branches of thermocouples. The probes and thermocouples were contained in an externally cooled, evacuated glass tube (10⁻³ mm Hg) with inserted quartz tube. The Hall emf measured in fields of 1,800-10,000 oe varied from 0.02 to 13 mv. Figs. 4a and 4b show the measured temperature dependence of electrical conductivity and Hall effect in the range 80-570°K for specimens of 1,4,28,130, and 1700 ohm-cm at 20°C (curves 1-5). In these specimens, intrinsic conductance arises at 240, 180, 60, -35, and -65°C. Below these temperatures, specimens 1-3 behave like metals, whereas 4 and 5 behave like

Card (1/4) 3

Electrical and thermoelectrical ...

S/181/62/004/005/019/055
B125/B104

semiconductors over the entire temperature range. The temperature dependence of electrical conductivity is chiefly determined by the carrier concentration. With rising temperature the Hall constant R decreases sharply in the range of intrinsic conductance without losing its positive sign. The forbidden-band widths determined from the temperature dependence of conductivity and Hall constant are similar for the specimen with the highest resistivity. The Hall mobility μ of specimens 1-4, determined by simultaneous measurement of σ and R , reaches a maximum at $\sim 100^\circ\text{K}$ and decreases as $\mu \propto T^{-3/2}$ with rising temperature. The Hall mobility of specimen 5 decreases monotonely as the temperature rises from 100 to 570°K . The absolute value of the emf α decreases in the range of intrinsic conductance with rising temperature. From 170°K downward α rapidly increases with decreasing temperature. This abnormal increase in the specimens with the highest resistivities indicates the entrainment of carriers by phonons. The effective carrier masses were calculated from α and R and found to be $m_n^* = 0.3 m_0$ and $m_p^* = 0.6 m_0$. The temperature dependence of the forbidden-band width (in eV) is given by $\Delta E = 0.57 - 3.9 \cdot 10^{-4} T$. There are 6 figures. The most important English-language reference is: P. Fielding, G. Fisher and E. Mooser. J. Phys. Chem. Card 2/3

Electrical and thermoelectrical ...

S/181/62/004/005/019/055
B125/B104

Sol., 8, 434, 1959.

ASSOCIATION: Institut fiziki AN AzSSR, Baku (Institute of Physics AS
AzSSR, Baku)

SUBMITTED: November 9, 1961 (initially)
December 25, 1961 (after revision).

Fig. 4: Temperature dependence of electrical conductivity (a) and Hall constant (b) for TlSe single crystals.

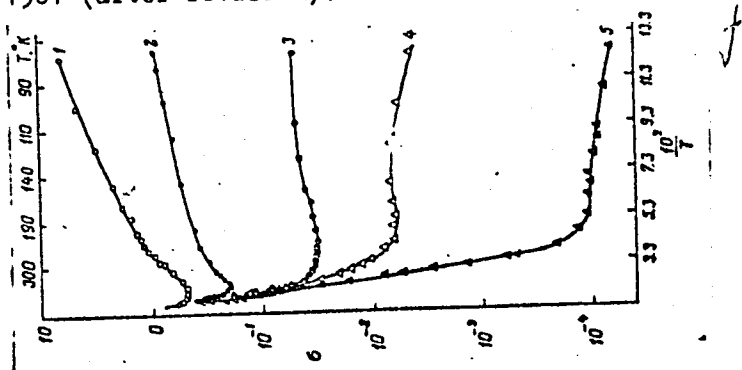


Fig. 4a

Card 3/4 2

S7275/63/000/003/012/021
A052/A126

AUTHORS: Abdullayev, G.B., Manafli, E.I., Talibi, M.A.

TITLE: On the effect of some impurities on the impact ionization mechanism in selenium rectifiers

PERIODICAL: Referativnyy zhurnal, Elektronika i yeye primeneniye, no. 3, 1963, 22, abstract 3B137 (Tr. Soveshchaniya po udarn. ionizatsii i tunnel'n. efektu v poluprovodnikakh, 1960. Baku, AN AzerbSSR, 1962, 83 - 86)

TEXT: The effect of Ga, Pb, Ag, Fe and Si impurities on the inverse branches of volt-ampere characteristics of selenium valves was investigated in the temperature range from room temperature to -196°C . At low temperatures a "freezing" of thermal oscillations of the lattice takes place. A thermal background weakening makes it possible to investigate more accurately the physical processes conditioned by impurities. It is shown that in the negative temperature range the inverse current temperature dependence changes considerably with the change of the kind of impurity. The rate of inverse current growth with temperature and voltage is determined by the

Card 1/2

On the effect of some impurities ...

S/275/63/000/003/012/021
A052/A126

value of the 1st ionization potential of impurity atoms. The lower the value of the 1st ionization potential of the impurity atom the higher the rate of inverse current growth. The dependence of the conductivity of the sample on cutoff voltage is conditioned by impact ionization leading to the ionization of impurities. An increase of ionized impurity concentration in Se leads to a decrease of the p-n junction thickness. There are 6 references.

L.B.

[Abstracter's note: Complete translation.]

Card 2/2

S/233/62/000/006/006/008
E010/E420

AUTHORS: Abdullayev, G.B., Bakirov, M.Ya., Gasymov, R.B.

TITLE: A study of the effect of thickness of p- and n-layers on characteristics of selenium photocells

PERIODICAL: Akademiya nauk Azerbaydzhanskoy SSR. Seriya fiziko-matematicheskikh i tekhnicheskikh nauk, no.6, 1962, 63-68

TEXT: A selenium photocell consists of a metallic backing, a layer of polycrystalline selenium and an upper electrode. The thickness of semiconductors, such as selenium, is one of the main factors affecting characteristics of photocells. Selenium with a purity of 99.99999% was applied to an aluminum plate and $\sim 0.1 \mu$ thick cadmium layer served as the upper electrode. These photocells were subjected to illumination of 5000 lux intensity at 20°C . The generated photo-emf V and photocurrent I were measured. A linear growth of the series resistance R with increasing thickness of selenium layer is observed. Both photo-emf and photocurrent values pass through a maximum at 50μ thickness of selenium layer and then decrease. The effect of thickness of

Card 1/2

A study of the effect ...

S/233/62/000/006/006/008
E010/E420

an n-layer on the efficiency of selenium photocells was also determined in order to study the nature of their ageing. A layer of n-type CdSe was applied to the surface of crystalline selenium. Measurements of the variation of photo-emf, V , and photocurrent, I , with thickness of the n-layer show that the optimum value of the latter is about 5×10^{-5} cm. Hence the nature of the ageing process of photocells is explained: the n-layer of CdSe increases with time on account of diffusion of Se into the Cd layer and this leads to the deepening of the p-n junction resulting in the reduced efficiency of the photocells. There are 5 figures.

Card 2/2

ABDULLAYEV, G.B.; BAKIROV, M.Ya.; GASIMOV, R.B.

Effect of the thickness of p and n-films on the characteristics of
selenium photocells. Izv. AN Azerb. SSR. Ser. fiz.-mat. i tekhn.
nauk no.6:69-73 '62. (MIRA 16:6)
(Photoelectric cells) (Selenium)

40546
S/249/62/018/001/001/003
1017/1217

20.2420
AUTHORS: Mekhtiyev, R. F., Abdullayev, G. B, and Akhundov, G. A.

TITLE: The technique of growing single crystals of GaSe and the investigation of some of their properties

PERIODICAL: Akademiya nauk Azerbaydzhanskoy SSR. Doklady, v. 18, no. 1, 1962, 11-15

TEXT: A review is given of ten papers on the influence of Ga and Tl on the electrical conductivity of Se, on the photoelectric properties of Ga and other selenides, and on the preparation of GaSe single crystals. A new method is proposed for the preparation of GaSe single crystals. The molten components in stoichiometric proportions are heated in a quartz ampule at 600° for 20 hours. The mixture is heated to 1060°C (GaSe melts at 960°) for ten hours, then cooled slowly to room temperature. The X-ray patterns of the synthesized GaSe are identical with those described in the literature. A special apparatus for gradual cooling is described. The temperature is lowered first at the rate of 2°C per hour until complete solidification, then at 6°C per hour down to 900°C, and finally 25°C per hour down to 500°C. At all stages a constant temperature gradient is maintained. Heating can be regulated without disturbing the furnace or the sample. The crystals obtained are 10 mm in diameter and 10 cm long. For both vertical and horizontal positions of the ampule, the plane of growth was (001). At room temperature, the specific resistance and the concentration of holes and

Card 1/2

The technique of growing...

S/249/62/018/001/001/003
1017/1217

their mobility for GaSe crystals are $\rho = 19 \text{ ohm.cm}$, $n = 2.10^{16} \text{ cm}^3$, $u = 16 \text{ cm}^2/\text{sec}$, respectively. The spectral distribution of photoconductivity was measured at 300 and 78°K. Values of ΔE were 1.87 and 1.98 eV at room temperature and liquid nitrogen temperature, respectively. The maximum photoconductivity shifts toward shorter wavelengths with decreasing temperature. The dependence of optical density on wave length is shown. There are 4 figures.

ASSOCIATION: Institut fiziki (Institute of Physics)

SUBMITTED: November 12, 1961

X

Card 2/2

S/249/62/018/004/001/003
1040/1240

AUTHORS Akhundov, G. A and Abdullayev, G. B

TITLE: TlSe point diodes

PERIODICAL Akademiya nauk Azerbaydzhanskoy SSR Doklady, v 18, no 4, 1962, 11-13

TEXT. This communication gives the results of experiments on the synthesis and rectifying characteristics of TlSe with *n*-type conductivity. Four previous papers have dealt with the physical properties of TlSe crystals with *p*-type conductivity. Single crystals of *n*-type TlSe were obtained from *p*-type TlSe by addition of 0.1 wt % Ge and Sn to the melt. They were grown by vertical and horizontal zone melting. Rectification at a point was studied by means of electrolytically sharpened probes made of 0.15 mm tungsten wire. The probe was attached to the polished crystal face, at 90° to the C plane, opposite the Au or Sn base electrode. The voltage and current were observed on the oscillograph screen at 50 cps and photographed under direct current. The samples were 1 × 2 × 2 mm parallelepipeds. It was found that the supply of voltage at the point contact is associated with shape effects. The passage of a larger direct current improves the direct characteristic without impairing the inverse. These diodes are rather stable but not very good. There are 4 figures and 1 table.

ASSOCIATION Institut fiziki (Institute of Physics)

SUBMITTED. February 10, 1962

Card 1/1

S/249/62/018/007/001/001
D256/D308

347000

AUTHORS: Talibi, M.A. and Abdullayev, G.B.

TITLE: A method of estimating the width of the forbidden band in some semiconducting 3-component compounds

PERIODICAL: Akademiya nauk Azerbaydzhan SSR, Doklady, v. 18, no. 7, 1962, 17-21

TEXT: The binary groups of the 3-component compounds investigated by Goodman (Goodman, C.H.L., Phys. and Chem. of Solids, 6, no. 4, 305, 1958) and obtained by substitution of one of the components by an element belonging to the same group of the periodic table, are considered. Following the previously reported observation by the authors (Abdullayev and Talibi, Trudy Vsesoyuznogo Soveshchaniya po P-n perekhodam v poluprovodnikakh, Tashkent, 1961, in print), that the difference of the ionization potentials and the atomic radii of the components can be useful for the estimation of the width of the forbidden band, it is shown that a direct correlation exists between the width of the forbidden band and the difference

Card 1/2

S/249/62/018/007/001/001
D256/D308

A method of estimating ...

ence of the ionization potentials. An attempt is made to estimate the widths of the forbidden bands in some analogue three-component compounds, assuming that the observed correlation does not depend upon the position of the substituted element in the periodic table.

ASSOCIATION: Institut fiziki (Institute of Physics)

SUBMITTED: January 12, 1962

Card 2/2

Study of monocrystalline n-TlSe and its rectifying properties.
G. A. Akhundov, G. B. Abdulayev, I. G. Aksianov.

(Not presented).]

Electro-physical properties of monocrystalline TlSe. G. A. Akhundov,
G. B. Abdulayev, G. D. Guseynov, N. Kh. Aliyeva.

[Investigation of the electrical properties of germanium telluride.
G. B. Abdulayev, V. B. Antonov, Ya. N. Nasirov.

On studies of and some properties of monocrystalline GaTe and GaS.
G. A. Akhundov, G. B. Abdulayev, N. A. Gasanova, F. I. Ismailov.

[Investigation of some physical properties of the monocrystalline
compounds CuSbS_2 and CuSbSe_2 . G. B. Abdulayev, R. Kh. Nani, Ya. N.
Nasirov, T. G. Osmanov.

Report presented at the 3rd National Conference on Semiconductor Compounds,
Kishinev, 16-21 Sept 1963

5

Some properties of binary semiconducting compounds and generalized moment. M. S. Saidov (10 minutes).

Experimental investigation of the energetic structure of zones of semiconducting compounds. V. V. Sobolev (10 minutes).

Investigation of the thermal conductivity of doped gallium arsenide. M. I. Aliev, G. G. Achmedli.

Concerning the thermal conductivity of solid solutions of $Sb_2S_3-Sb_2Se_3$. G. B. Abdulanov, A. A. Bashmaliev.
(Presented by M. I. Aliev--10 minutes).

Report presented at the 3rd National Conference on Semiconductor Compounds, Kishinev, 16-21 Sept 1963

ALIYEV, M.I.; ABDULLAYEV, G.B., prof., red.; DEMENT'YEVA, Ye.,
red.izd-va; IBRAGIMOV, M., tekhn. red.

[Thermal conductivity of semiconductors] Teploprovodnost'
poluprovodnikov. Baku, Izd-vo AN Azerb.SSR, 1963. 145 p.
(MIRA 16:10)

(Semiconductors--Thermal properties)

ACCESSION NR: AR4041540

S/0137/64/000/004/1001/1001

SOURCE: Ref. zh. Metallurgiya, Abs. 412

AUTHOR: Abdullayev, G. B.; Movlanov, Sh.; Shakhtakhtinskiy, M. G.; Kuliyeu, A. A.

TITLE: Investigation of solubility of selenium and mercury in solid tellurium and their influence on electrical properties of tellurium

CITED SOURCE: Izv. AN TadzhSSR. Otd. geol. -khim. i tekhn. n., no. 2 (11), 1963, 13-22

TOPIC TAGS: selenium, mercury, tellurium, solubility, electrical property, retrogradation, electrical conductivity

TRANSLATION: Studies solubility of Se in Te (in interval 320-400°) and Hg in Te (in intervals 270-440°). Solubility of Hg in Te increases with increase of temperature and attains maximum ($4 \cdot 10^{20}$ atoms per cubic centimeter) at 370°

Card 1/2

ACCESSION NR: AR4041540

and then drops, and at 440° becomes equal to 1.10^{20} atoms per cubic centimeter. Solubility of Se in Te is greater than solubility of Hg in Te. In temperature dependence of solubility of Hg in Te there is observed retrogradation, which is absent in the system Te--Se. There are measured electrical conductivity of alloys Te-Se and Te-Hg in interval from -190° to -150° and the Hall effect at liquid nitrogen and room temperatures. It is found that Hg with a content of ~1% significantly increases electrical conductivity of Te, and Se almost does not change it. Bibliography: 24 references.

SUB CODE: IC, GC

ENCL: 00

Card 2/2

ABDULLAYEV, G.B.; BAKIROV, M.Ya.; TALIBI, M.A.; GASIMOV, R.B.

Selenium photoelements with saturation current. Izv. AN
Azerb. SSR.Ser. fiz.-mat. i tekhn. nauk no.3:7 .83 '63.
(MIRA 16:11)

ACCESSION NR: AP4005130

S/0249/63/019/008/0009/0013

AUTHORS: Abdullayev, G. B.; Aliyev, G. M.; Barkinkhoyev, Kh. G.

TITLE: Effect of gallium impurities on the thermal conductivity of hexagonal selenium

SOURCE: AN AzerbSSR. Doklady*, v. 19, no. 8, 1963, 9-13

TOPIC TAGS: selenium thermal conductivity, selenium, thermal conductivity, hexagonal selenium, gallium impurity effect, gallium impurity, gallium, amorphous selenium, metallic impurity, selenium valve, Ioffe formula, phonon mechanism, absorption coefficient, crystalline selenium, nonmetallic impurity, crystal lattice, metallic gallium impurity, selenium doping, phonon scattering

ABSTRACT: The influence of metallic gallium admixtures on the heat conductivity λ of crystalline selenium in the temperature interval of 85-450K has been studied. Cylindrical crystal agglomerates of pure selenium with 0, 0.25, 0.50, 1.0, 2.0, 3.0 and 4.0 wt % were tested. Their diameters were 10-12 mm and their lengths 10-13 mm. Tests were conducted under static conditions. To avoid radiation heat losses, lateral surfaces of the specimens were coated with india ink and carbon black. It

Card 1/3

ACCESSION NR: AP4005130

was found that at 299K λ reached its maximum for the 1% admixture. A study of temperature- λ relations for 3 samples brought out the existence of minima in the 300-330 K range. The electron component of λ was estimated to be on the order of 10^{-8} - 10^{-10} cal/cm sec degree. The phonon theory of heat conductivity indicates that for the Debye temperatures and above, λ is inversely proportional to T:

$$\lambda = a \frac{1}{T} \frac{\text{кал}}{\text{см} \cdot \text{сек} \cdot \text{град}} \quad (1)$$

The present experiments confirmed this theory for T between the temperatures of liquid nitrogen and room temperature (with coefficient a varying from 0.75 to 0.98 for different samples). At higher temperatures (350K) an increase in λ , reaching 25-30% at 409K, was observed. This increase is attributed to the photon mechanism and to heat being conducted by electromagnetic radiation. The authors thank O. G. Kerimov, director of the heat laboratory, for his interest and valuable suggestions. Orig. art. has: 3 graphs, 1 table, and 3 equations.

ASSOCIATION: Institut fiziki AN AzerbSSR (Institute of Physics AN AzerbSSR)

SUBMITTED: 23May63

DATE ACQ: 20Jan64

ENCL: 00

Card 2/3

ACCESSION NR: AP4005130

SUB CODE: PH

NO REF SOV: 015

OTHER: 004

Card 3/3

ABDULLAYEV, G.B., doktor fiz.- matem. nauk; TALIBI, M.A., kand. fiz.-
matem. nauk

Conference on the Study of Selenium and Tellurium, held in Baku.
Vest. AN SSSR 33 no.10:113-114 O '63. (MIRA 16:11)

ALIYEV, B.D.; ABDULLAYEV, G.B.; ALIYEV, G.M.

Effect of bismuth impurities on the heat conductivity and self-diffusion
of selenium. Trudy Inst. fiz. AN Azerb. SSR 11:5-10 '63.

(MIRA 16:4)

(Selenium--Thermal properties)

(Bismuth)

ISKENDERZADE, Z.A.; ABDULLAYEV, G.B.; AKHUNDOV, G.A.

Some results of electrolytic cadmium deposition on a selenium plate.
Trudy Inst. fiz. AN Azerb. SSR 11:11-18 '63. (MIRA 16:4)
(Cadmium plating)

ABDULLAYEV, G.B.; ANTONOV, V.B.; NANI, R.Kh.; NASIROV, Ya.N.

Some properties of CuSbSe_2 single crystals. Trudy Inst. fiz. AN Azerb.
SgR 11:42-45 '63. (MIRA 16:4)
(Copper-antimony-selenium alloys) (Crystallography)

ABDULLAYEV, G.B.; ALIYEV, G.M.; BASHSHALIYEV, A.A.; KERIMOV, I.G.

Heat conductivity of some compounds of the type $A^{III}B^V$. Trudy Inst. fiz.
AN Azerb. SSR 11:46-51 '63. (MIRA 16:4)
(Semiconductors--Thermal properties)

ABDULLAYEV, G.B.; ALIYEV, G.M.; BARKINKHOYEV, Kh.G.

Thermal conductivity of selenium. Fiz. tver. tela 5 no.12:3614-3615
D '63. (MIRA 17:2)

1. Institut fiziki AN AzerbSSR, Baku.

ABDULLAYEV, G.B.; ALEKPEROVA, Sh.M.; TALIBI, M.A.; BEKIROV, M.Ya.; GASIMOV, R.B.

Saturation currents in selenium p-n junctions. Dokl. AN Azerb. SSR 19
no.1:9-12 '63. (MIRA 16:4)

1. Institut fiziki AN AzSSR.
(Junction transistors)

ACCESSION NR: AP4027709

S/0233/63/000/006/0083/0086

AUTHORS: Abdullayev, G.B.; Nani, R.Kh.; Nasirov, Ya.N.

TITLE: Investigation of the physical properties of ternary semiconductor compounds. II. Certain properties of CuSbS sub 2 monocrystals

SOURCE: AN AzerbSSR. Izvestiya. Seriya fiz.-matem. i tekhn. nauk, no. 6, 1963, 83-86

TOPIC TAGS: semiconductor, ternary compound, physical property, CuSbS sub 2, monocrystal, polycrystal, preparation, thermoelectric property, synthesis, thermoelectromotive force, energy of activation, zone melting, heat conductivity, electric conductivity

ABSTRACT: Samples of CuSbS₂ polycrystals and monocrystals were prepared and their thermoelectric properties investigated. CuSbS₂ was prepared by elementary synthesis, and heating with agitation at 1500K for 8-10 hours under 10⁻⁴ mm Hg. vacuum. The material, remelted at 1200K, was uniform with no traces of crystals and showed semiconductor properties. Its electric conductivity increases from 0.08 to 7.0 ohm⁻¹ cm⁻¹ with an increase in temperature from room

Card 1/2

ACCESSION NR: AP4027709

temperature to 700K while its thermoelectromotive force decreases with temperature from 950 to 120 microvolts/°K from room temperature to 700K. The energy of activation of the polycrystalline material is $\Delta E = 0.24$ ev. CuSbS_2 monocrystals were obtained by zone melting under 2 atmospheres argon with supplementary heating in the non-melting zone to 10-15K below the melting temperature of the compound. For the monocrystals at room temperature, electric conductivity is $0.024 \text{ ohm}^{-1} \text{ cm}^{-1}$ and thermo e.m.f. is 1200 microvolts/°K. Melting temperature is 535C. It was specifically determined that the electric conductivity increases with temperature (E in the 300-500K range = 0.8 ev.), and that the thermo e.m.f. drops with an increase in temperature; monocrystals and polycrystals follow essentially the same relationship. It was further found that the heat conductivity decreases from 80 to 300K and then increases; its minimum is at room temperature. Orig. art. has: 1 table and 4 figures.

ASSOCIATION: None

SUBMITTED: 00

DATE ACQ: 17Apr64

ENCL: 00

SUB CODE: PH

NR REF SOV: 005

OTHER: 002

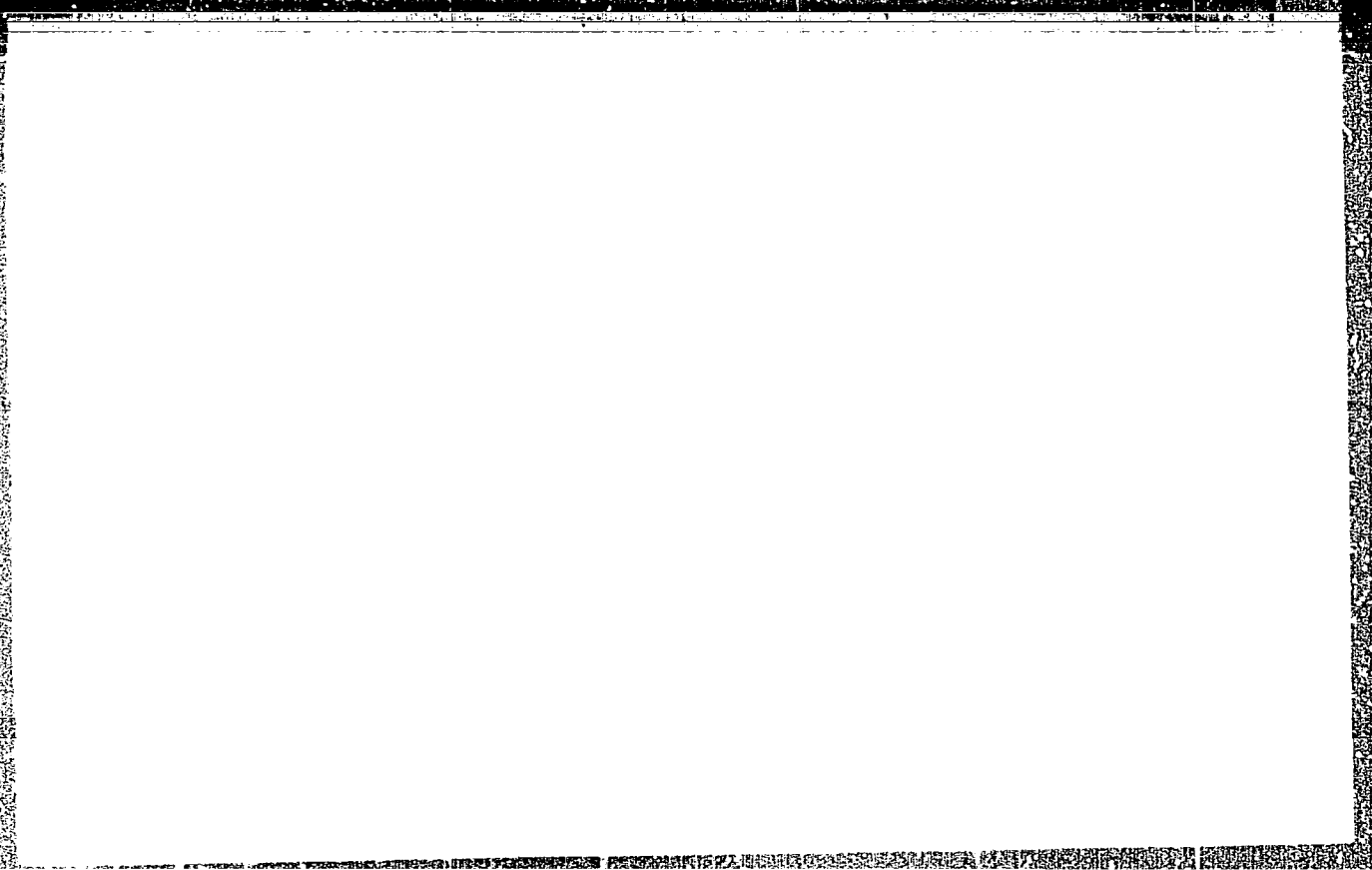
Card 2/2

AKHUNDOV, G. A.; ABDULLAYEV, G. B.; GUSEYNOV, G. D.; MEKHFIYEV, R. F.; ALIYEVA, M. Kh.

"Preparation and investigation of A III B VI single crystals."

paper submitted for Intl Conf on Physics of Semiconductors, Paris, 19-24 Jul 64.

"APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120002-5



APPROVED FOR RELEASE: 04/03/2001 CIA-RDP86-00513R000100120002-5"

"APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R000100120002-5

APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R000100120002-5"

ABDULLAYEV, G.B.; SALAYEV, E.Yu.

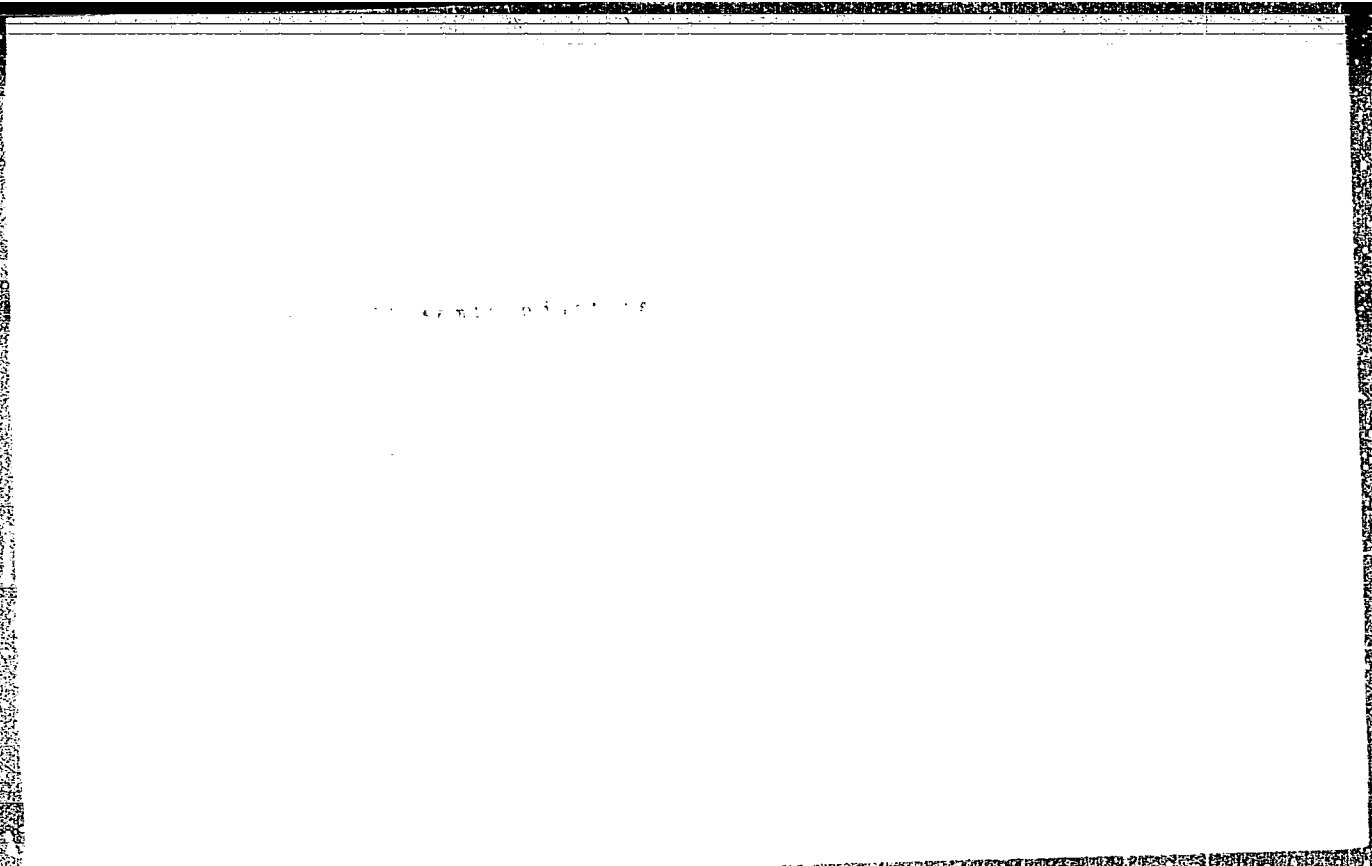
Development of physics in Azerbaijan. Izv. AN Azerb.SSR.Ser.fiz.-tekh.1
mat. nauk no.3:19-30 '64. (MIRA 17:12)

ABDULLAYEV, G.B.; ISKENDER-ZADE, Z.A.; DZHAFAROVA, E.A.

Capacitive and inductive properties of silicon diffusion diodes. Izv.
AN Azerb.SSR, Ser.fiz.-tekh.i mat. nauk no.3:81-88 '64. (MIRA 17:12)

"APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R000100120002-5



APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R000100120002-5"

and theoretical value of the coefficient of thermal emf at low tempera-
ture was explained as a space charge effect. The experimen-

APR 4 1962

ASSOCIATION: none

SUBMITTED: 00

NO REF SOV: 007

ENCL: 00

SUB CODE: 55

THESE: 000

Card 3/3

L 1121-66 EWT(m)/ETC/ENG(m)/ENP(t)/ENP(b) IJP(c) RIDW/JD/GS
ACCESSION NR: AT5020474 UR/0000/6A/000/000/028A/0289

AUTHORS: Abdullayev, G. B. Bakirov, M. Ya. Gasymov, R. B. 60

TITLE: Investigation of surface contact phenomena in selenium in contact with certain metals 55, 27

SOURCE: Mezhvuzovskaya nauchno-tekhnicheskaya konferentsiya po fizike poluprovodnikov (poverkhnostnyye i kontaktnyye yavleniya). Tomsk, 1962. 55
Poverkhnostnyye i kontaktnyye yavleniya v poluprovodnikakh (Surface and contact phenomena in semiconductors). Tomsk, Izd-vo Tomskogo univ., 1964, 284-289 55

TOPIC TAGS: selenium, photocell, photo current, photodiode, photoconductive cell, group VI element, contact potential, cadmium, indium, mercury, gallium, lead, zinc 27 27 27 27 27 27

ABSTRACT: The mechanism of the aging process in selenium photocells was studied. Cells made of Se and the metals Cd, In, Hg, Ga, Pb, and Zn were investigated. Electron-diffraction photographs of the binary contact between Se and the various metals showed it to consist of the selenides CdSe, InSe, HgSe, GaSe, PbSe and ZnSe. The sensitivity of photocells was determined as a function of the time and temperature and is shown graphically in Fig. 1 on the Enclosure. The effect of the depth of a deposited p-n junction on the response of Se photocell is shown in Fig. 2 on the Enclosure. It is concluded that the aging process consists of the growth of an
Card 1/4

L 1121-66

ACCESSION NR: AT5020474

n-layer on the surface of the photocell. Orig. art. has: 4 graphs and 2 equations. ①

ASSOCIATION: none

SUBMITTED: 06Oct64

ENCL: 02

SUB CODES: EC

NO REF SOV: 006

OTHER: 003

Card 2/4

L 1121-66
ACCESSION NR: AT5020474

ENCLOSURE: 01

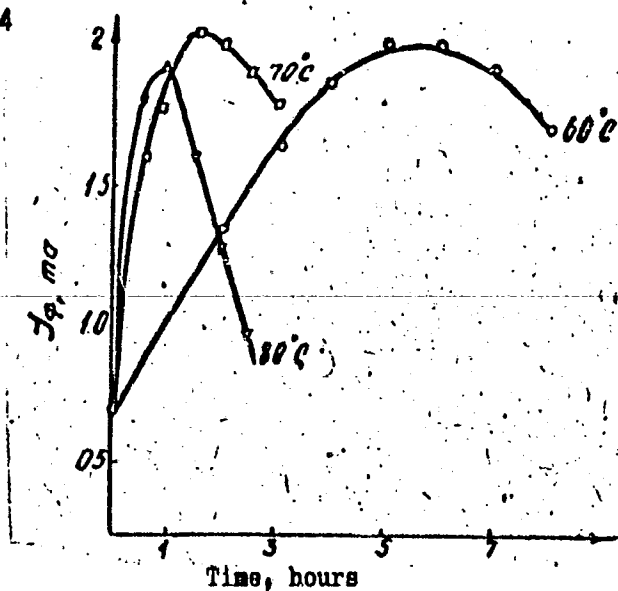


Fig. 1. Sensitivity of Se photocell as a function of temperature and time
Card 3/4

ACCESSION NR: AP4028423

S/0181/64/006/004/1018/1022

AUTHORS: Abdullayev, G. B.; Aliyev, G. M.; Barkinkhoyev, Kh. G.; Askerov, Ch. M.; Larionkina, L. S.

TITLE: Electrical properties of crystalline and liquid selenium after deoxygenation

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1018-1022

TOPIC TAGS: electric conductivity, selenium, deoxygenation, thermoelectromotive force, solid liquid study

ABSTRACT: The authors measured the electrical conductivity and the thermoelectromotive force of three samples of Se in the temperature interval 293-773K. The samples were characterized by the following impurity concentrations: $10^{-3}\%$, $10^{-4}\%$, and $10^{-5}\%$ for the three samples, respectively. Measurements were made on all three samples before deoxygenation (ordinary Se) and on samples 1 and 3 after deoxygenation. Different jumps in conductivity were observed during fusion of all three samples of ordinary Se. The activation energy of electrical conductivity was found to be 2.05 ev for liquid Se of this type. In the solid phase, the thermoelectromotive force of sample 1 ordinary Se declined with increase in temperature. During

Card 1/2

that Cu₂S and HgSe or Cu₂S and CdS. Direct current was used for the measurements,

ACCESSION NR: AP4042524

S/0109/64/009/007/1281/1286

AUTHOR: Abdullayev, G. B.; Iskender-Zade, Z. A.; Dzhafarova, E. A.;
Akhundov, G. A.

TITLE: Effect of electrothermal treatment on the properties of silicon diodes

SOURCE: Radiotekhnika i elektronika, v. 9, no. 7, 1964, 1281-1286

TOPIC TAGS: semiconductor, silicon diode, semiconductor diode, silicon diode
electrothermal treatment

ABSTRACT: The variation of a reverse current in Si diodes as a result of the prolonged application of a d-c reverse voltage at an elevated temperature was experimentally studied. An Si diode was held for 6 hrs at a reverse voltage of 150 v and a temperature of 448K; its initial reverse current of 2.8 ma dropped to a stable value of 0.9 ma with no variation in the forward current. The effect of temperature on the reverse current was also studied. It was found that the

Card 1/2

ACCESSION NR: AP4039227

S/0249/64/020/002/0027/0031

AUTHORS: Abdinov, D. Sh.; Abdullayev, G. B.; Aliyev, G. M.

TITLE: The effect of antimony admixture on density, heat conductivity, and microhardness of selenium

SOURCE: AN AzerbSSR. Doklady*, v. 20, no. 2, 1964, 27-31

TOPIC TAGS: antimony, selenium, recrystallization, selenium heat treatment

ABSTRACT: The effect of antimony admixtures on the physical properties of selenium was studied. The samples consisted of antimony and selenium powders mixed in various proportions. These powders were poured into quartz ampules which were evacuated to 10^{-4} mm Hg and sealed. In this state the samples were heated in an oven at 350C for 8 hours and cooled to room temperature. At this stage the samples were amorphous. The measurements of their heat conductivity and density were made before they were replaced in the ampules and allowed to crystallize at 90, 130, and 180C for one hour and at 210C for 60 hours. After each crystallization period the relation between the physical properties of every sample and its antimony content was studied. The variation of the heat conductivity coefficient of selenium with

Card 1/4

ACCESSION NR: AP4039227

respect to antimony concentration at 20-22C is shown in Fig. 1 of the Enclosures, where the conductivity is seen to increase during the transition from the amorphous to the crystalline state. It decreased with the increase in antimony content to 0.125%, beyond which point it started rising. This behavior was explained by the hypothesis of V. N. Lange and A. R. Regel' (FTT, v. 1, no. 4, 1959) which states that small quantities of antimony distort the crystalline lattice of selenium, while larger amounts of antimony have the opposite effect. The variation in the microhardness, thermal conductivity, and density of crystalline selenium with respect to the antimony content is shown in Fig. 2 of the Enclosures. The microhardness minimum also occurred at 0.125% antimony content. In order to check the accuracy of the experimental results, the variation of selenium properties was calculated according to the formula derived by A. V. Ioffe and A. F. Ioffe ("DAN SSSR", 1954, v. 98, No. 5). The theoretical and experimental data correlated closely. Orig. art. has: 1 table, 2 figures, and 3 formulas.

ASSOCIATION: Institut fiziki (Institute of Physics)

SUBMITTED: 19Jul63

DATE ACQ: 05Jun64

ENCL: 02

SUB CODE: SS GC

NO REF SOV: 010

OTHER: 002

Card 2/4

ACCESSION NR: AP4039227

ENCLOSURE: 01

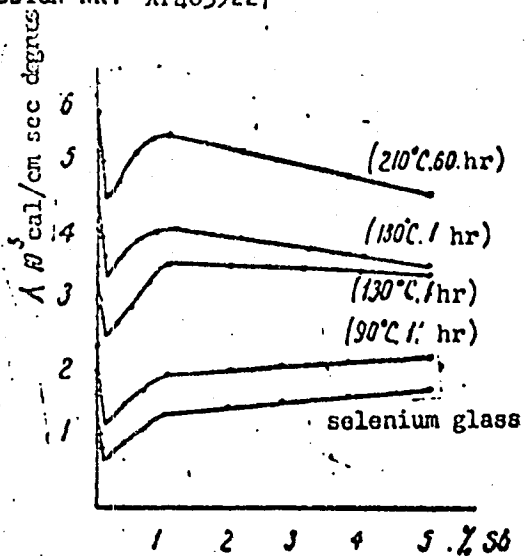


Fig. 1. Relation between heat conductivity of selenium and the antimony content.

Card 3/4

ACCESSION NR: AP4039227

ENCLOSURE: 02

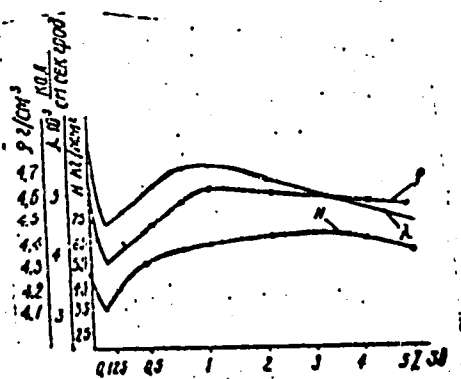


Fig. 2. Relation of microhardness (H), heat conductivity (λ), and density (ρ) of selenium to the antimony

Card 4/4

ACCESSION NR: AP4041486

S/0249/64/020/003/0017/0021

AUTHOR: Abdullayev, G. B., Dzhafarova, E. A., Iskender-Zade, Z. A.

TITLE: The effect of additional charged centers on the capacitance of the p-n transitions in silicon

SOURCE: AN AzerbSSR. Doklady*, v. 20, no. 3, 1964, 17-21

TOPIC TAGS: semiconductor, silicon, p-n transition, p-n transition capacitance, silicon capacitance, silicon impurity, charged center, dielectric permeability, capacitance voltage dependence, barrier capacitance

ABSTRACT: The authors first point out that the capacitance of the p-n transition at backward voltages greatly exceeding the contact potential difference is determined by the volume charge of the excess ion donors in the n-zone and ion acceptors in the p-zone. Hence, on theoretical grounds, the relationship between the barrier capacitance and voltage is determined by the distribution of electrically active impurities, capacitance being proportional to $V^{-1/3}$ with a linear distribution of impurities ($N_D - N_A = ax$) and to $V^{-1/2}$ with a homogeneous distribution of impurities ($N_D - N_A = \text{constant}$), but being highly dependent on voltage if the distribution of impurities is exponential. Experimental data relating capacitance to voltage at various temperatures (17-85C) showed that, following a slow initial decrease with

Card 1/4

ACCESSION NR: AP4041486

increasing voltage, capacitance is proportional to $V^{-1.4}$ in the voltage range 6-90 volts, becoming proportional to $V^{-1/3}$ in the range 90-400 volts. This anomalous dependence of capacitance on voltage in the range 6-90 volts was especially pronounced at higher temperatures and could be correlated with the anomalous behavior of the volume charge width in the same voltage interval. However, as shown in the Enclosure, the anomaly disappeared after electrical treatment of the silicon (200 v at 175C for 6 hours). The authors conclude that the anomalously high capacitance of silicon in the low voltage range is due to an irregular distribution of positively charged impurities, which are eliminated by electrical treatment. Orig. art. has: 3 figures and 4 formulas.

ASSOCIATION: none

SUBMITTED: 24Dec63

ENCL: 02

SUB CODE: SS

NO REF SOV: 008

OTHER: 002

2/4

Card

ACCESSION NR: AP4041486

ENCLOSURE: 01

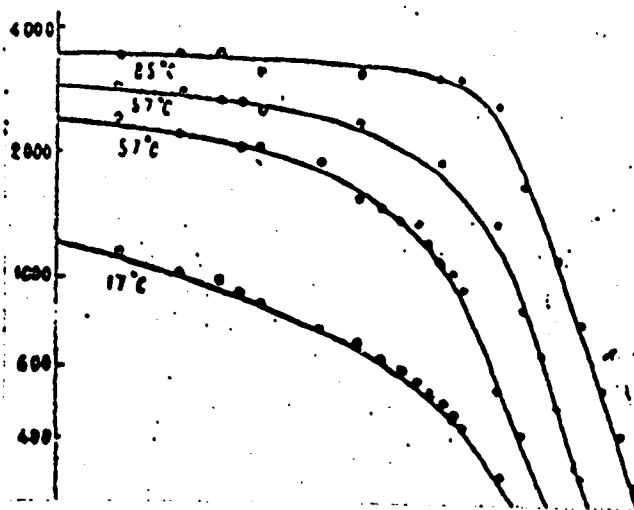


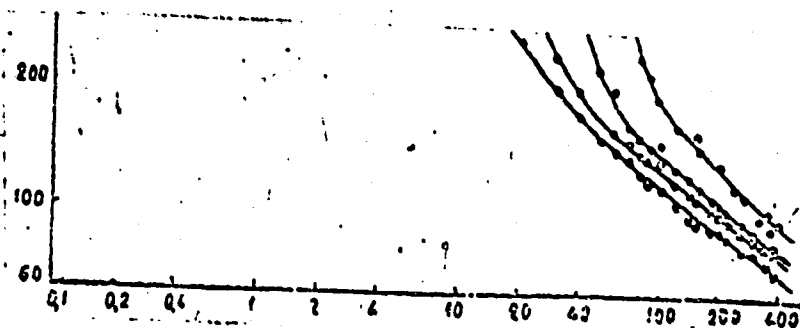
Figure 1

Card 3/4

ACCESSION NR: AP4041486

ENCLOSURE: 02

Continuation of Figure 1.



Relationship between barrier capacitance in pF and backward voltage, before (curve 1) and after (curve 2) electrical treatment at 67C.

Card 4/4

ABSTRACT: The authors point out that the main phenomena observed in selenium have not yet been fully explained, especially the nature of the hole conductivity, the carrier mobility, the crystallization

L 32850-05

ACCESSION NO: AP5004757

0

"APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R000100120002-5

APPROVED FOR RELEASE: 04/03/2001

CIA-RDP86-00513R000100120002-5"

ACCESSION NR: AP4041385

S/0048/64/028/006/1096/1099

AUTHOR: Abdullayev, G.B.; Nani, R.Kh.; Nasirov, Ya.N.; Osmanov, T.G.

TITLE: Investigation of some physical properties of copper antimony sulfide and copper antimony selenide single crystals /Report, Third Conference on Semiconductor Compounds held in Kishinev 16 to 21 Sep 1963/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v.28, no.6, 1964, 1096-1099 .

TOPIC TAGS: semiconductor, semiconductor property, copper compound, antimony compound, sulfur compound, selenide compound, single crystal study

ABSTRACT: $CuSbS_2$ and $CuSbSe_2$ were synthesized, single crystals were grown, some physical properties of the materials were measured, and the results are presented graphically. The reagents were spectroscopically pure sulfur, electrolytic copper, 99.999% selenium, and "grade Su-000" antimony. Synthesis was by melting in vacuo with mechanical vibration. The melt was cooled slowly to 1500°K and held at that temperature for 8 to 10 hours. The ingots were homogenized by remelting at 1200°K. Single crystals were produced by zone refining in an argon atmosphere with the use of an auxiliary heater. Eighteen to twenty passes were made at 12 mm/hour. X-ray

Card 1/3

ACCESSION NR: AP4041385

diffraction studies showed the resulting specimens to be single crystals with somewhat distorted structure due, possibly, to the anisotropy of the thermal expansion coefficient. The electric conductivity, thermal conductivity, thermal emf and Hall coefficient were measured over various temperature ranges between 80 and 700°K. It was possible to measure the Hall coefficient of the sulfide only at room temperature because of the low mobility of the current carriers. The electric conductivity of both compounds increased with increasing temperature over the complete range investigated. The activation energy in the sulfide was 0.25 eV below 500°K and 0.75 eV above this temperature. In the selenide the activation energy was 0.16 eV below 350°K and 0.43 eV above 400°K. The slope of the resistivity-temperature curve for the selenide was very small between 350 and 400°K. The increase of activation energy at the higher temperatures was not observed in the polycrystalline materials. The thermal emf of both compounds decreased monotonically with increasing temperature. The thermal conductivity of both materials decreased with increasing temperature at low temperatures and increased with increasing temperature at high temperatures. The minimum occurred at 273°K for the sulfide and 300°K for the selenide. The behavior at low temperatures is ascribed to Cu-Sb ordering, and that at high temperatures to energy transport by electron-hole pairs. The compound with the lower molecular weight had the greater thermal conductivity, in accord with the views

Card 2/3

ACCESSION NR: AP4041385

of L.S.Stil'bans, B.A.Yefimova and L.M.Stavitskaya (Fiz.tverdogo tela,1,1325,1959).
The mobility of the current carriers in the selenide was proportional to $T^{-3/2}$ at
the lower temperatures and to $T^{-5/2}$ at the higher. Orig.art.has: 9 figures and 1
table.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: 88, IC

NR REF SOV: 008

OTHER: 003

Card 3/3

[The main body of the document contains extremely faint and illegible text, likely a technical report or document. The text is mostly obscured by noise and low contrast.]

8656-55

moacceptors are believed to result from thermal stresses. This series
is confirmed by x-ray diffraction patterns. The thermal emf was
measured at various temperatures and was found to be
considerably higher than theoretical values. The
resistance of the type 8656-55

1

our court is...