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Optoelektron Photo Converter

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Abstract: An optoelectronic photo converter is a HELIO optoelectronic device based on electro-optical phenomena. The device is an energy-efficient, high-quality and compact optoelectronic system in the field of instrumentation in the field of information and measurement technology of solar engineering. Optoelectronic photo converter allows you to control technological processes, product quality remotely, without affecting (disrupting) the technological process. The device can operate independently at the expense of renewable energy sources in all types of automatic measurement and control systems of science and technology, without the need for a special source of energy. The power supply of the device can be adapted to work by means of light, heat and magnetic effects of solar radiation.

Key words: Optoelectronic photo converter, polarization, solar battery, flat thin veil.

1. INTRODUCTON

With the help of an optoelectronic photo converter, it is possible to measure events in the environment with high accuracy by measuring and controlling parameters such as light absorption, double refraction, polarization, and the electrical constant of the environment. The different processes and phenomena observed in solids (including semiconductors) are related to the different types of defects and inhomogeneities they contain and their nature in the solid. In particular, defects and inhomogeneities in semiconductor thin films cause unusual phenomena and processes that are not observed in their crystals. This situation is unique to any semiconductor material. For the future development of the field, it is necessary to discover new semiconductor materials, to study their photoelectric, magnetoelectric and other properties.

2. LITERATURE REVIEW

The optoelectronic photo converter consists of four parts. The first part of it forms a closed electrical circuit consisting of a hetero photoelement and a photo generator. The device receives the energy it needs for itself from solar radiation. Solar radiation itself also dissipates heat with a stream of light. There is a heat effect for the device. To obtain a light flux free from it, a high-potential electric field with a large potential is required for the operation of the polarized beam-operated part (III) of the device. This field is obtained from light (3) by means of an electric field-generating element (II). The introduction of an electro-optical system powered by polarized light into the device increases its sensitivity and measurement accuracy several times. The use of a non-current electric field in the device provides high energy savings. It can be applied to all areas of the measuring and control system, which works remotely from the device and equipment.

3. METHODOLOGY

Through the optical window, which receives special solar radiation from the protective housing of the optoelectronic photo converter, natural external light is converted into parallel rays by means of an optical system (1). The electric signals pass through the "photo generator" through the electrical wires of the closed circuit block (I), where the solar radiation is "free" from the effects of heat in the radiation composition and is converted into two simple streams of light. One of them (2) is sent to a polarizing (P) polaroid system to obtain a polarized flat wave. The poly aroid consists of a thin

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celluloid membrane into which thin crystals of hepatitis are embedded. Ger apatite dichroism consists of a very strong body. On its 0.1 mm thick plate, ordinary light is completely absorbed. In the process of making a poly aroid, the hepatitis crystals are placed in exactly the same direction. Therefore, by breaking the light in two, the celluloid membranes absorb one of the refracted rays and transmit the other. Currently, poly aroid curtains are produced mainly in the form of wide ribbons. A poly aroid dielectric has a magnetic permeability m = 1 for it therefore the optical anisotropy of a dielectric crystal according to Maxwell's electromagnetic field theory is mainly determined by its dielectric constant ($n=\sqrt{\varepsilon}$). The flat (4) polarized light generated by the polyaroid (P) is sent to a sample of optically active medium (OFM) selected for inspection. The second light (3) from the photo generator (S2, 3) is sent to the OFM sample to generate a strong electric field that gives artificial optical anisotropy to a photoreceptor AE (anomalous high-voltage generator) operating in the longitudinal OMS model of part (II) of the device. The anomalous high photovoltaic field generated in it is transferred to the OFM placed between the polarizer (P) analyzer (A). As a result, the absorption index (n) of the OFM dielectric (semiconductor) in a strong electric field affects the full optical, electric magnitude (parametric) with different types of dielectric properties, such as dielectric constant e, absorption coefficient æ, because the dielectric is polarized by its electric field. depending on the absorption and hesitation of light in it ($n=\sqrt{\varepsilon}$). The optical anisotropy generated by the electric field (EM) in a dielectric is the EM of the plane of polarization of the flat polarized light (5) passing through it. is a certain angle (a) proportional to the voltage. The luminous flux corresponding to the angle of rotation (a) passes through the analyzer (A) (6) and forms a corresponding photo couple (or photocurrent) in the circuit of the output (measurement-control) block (IV). Depending on the photocurrent size of the output-control-measuring block (IV), information about the OFM-dielectric (type, property of the dielectric) can be obtained. A microammeter (E) or an electrometer-type capacitor voltmeter can be used to adjust the output circuit current.

4. RESULTS AND DISCUSSION.

The structure of an optoelectronic photo converter

The block diagram of the device design is shown in Figure 1. It consists of four parts (I, II, III, IV)

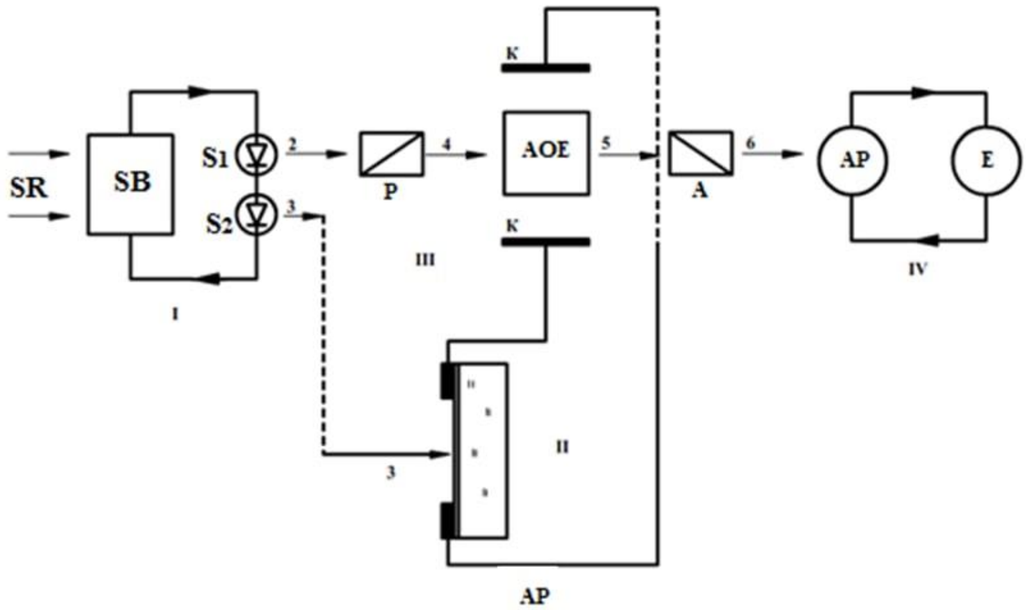

Fig. 1 Block diagram of optoelectronic photo converter.

SR - solar radiation;

SB- Solar batteries;

S1 and S2 - LEDs;

P- polarizing prism (polyaroid);

A-analyzer;

AP-anamal photocell;

E-electrometer;

OAE- optically active environment.

1 parallel beam of sunlight; 2,3- rays without heat effect; 4 polar beams; 5 information carrier polar beam; 6 Polarized plane beam;

The first (I) part consists of a closed circuit consisting of a solar cell (QB) and light emitting diodes S1 and S2. The solar cell acts as the power source of the circuit. Its electrical load is LEDs S1 and S2. The second (II) part consists of an electrical circuit consisting of a generator-type photodetector (AE1) and a (flat) capacitor (KK The third part (III) consists of a polarizer (P), an analyzer (A) and an optically active medium (OFM). Part IV (IV) consists of an element (AE) that converts information into an electrical signal and an electrometer (E). Almost all elements of the device are made of thin semiconductor metal membranes. The optoelectronic photo converter has a light-insulating dielectric body. It has a transparent mirror that receives solar radiation, (IR, KN, BN) for the optical field of light.

Almost all the elements included in the design of the device presented in the article are made in the form of a flat thin curtain. Vacuum evaporation is used to make the curtain. For this reason, the vacuum device VUP-4 VUP-5 was chosen as the preparation technique. The air in the vacuum vessel must be at least 10^{-5} mm.sim.ust. diluted to The first block (I), which directly receives solar radiation, consists of a generator-type photoreceptor element and a photo generator (S_1 and S_2) in the form of longitudinal epitaxial thin films (GFE). GFEs consisting of such heterojunctions are used to obtain semiconductor compounds consisting of atoms with different volatiles. The upper epitaxial septum forms the first transverse epithelial septum while the apex of the septum sits on the base, while the posterior epitaxial septum is in a position corresponding to the velocity [2]. The result is a hetero photo cell (GFE) solar cell (QF) without breaking the single vacuum process system [3]. The thin BJE semiconductor membrane of the generator-type photodetector (AE) in the second and fourth parts of the device is transferred to the base of a thin table (special televement glass) by anisotropic oblique evaporation in vacuum in a special technological mode [4]. High resistance (>10^9 ohms), non-homogeneous content and structure, and ultra-longitudinal multilayer SMS system are formed in thin films obtained by anisotropic tilting (evaporation). At least 10^5 layers (microcrystals) of such thin polycrystalline BJE thin films are located in each "ohm" length, each of which acts as a "microelementary" photocell. As a result of anisotropic illumination of these micro photocells, a photo E. Yu. K is formed in each of them in the order of kt / q. Longitudinal SMS series (kt / q) accumulate, creating an anomalous high photo voltage.

- mass (2): 100 ÷ 300g
- Geometric dimensions (mm): 5 × 5 × 10
- light intensity that the device can do 2 •10- 3 ÷ 10- 4 Vt /cm 2
- for the resistance voltage at the load contour (IV) 10 12 ÷ 10 14 **Ω**.
- loading circuit (IV) nig current resistance 5 ÷ 10 ohms.
- can be set to steady and pulse mode.
- All elements can be designed to be flat in the form of a polycrystalline thin film.
- receives energy from the renewable (natural) energy sources that support the operation of the device. is a GTFP integrator used in the output block and works in summator mode. The number of micro photoelements in it reaches 105 in the longitudinal direction.
- can differentiate dielectric media according to four parametric characteristic quantities (æ, n, e, a).

If we pay attention to the similarity of the optoelectronic photo converter in its physics, principle of operation and structure, we can cite the inventions published in the works [2,5,6,7,8,9] as one of the closest devices to it. However, since some of them are based on discrete elements, they cannot be used in microelectronic circuits to simplify the project. They were based on the principles of galvanic separation of optoelectronics. However, energy savings are not at the level of demand [10]. This is because the discrete elements used in them require a special power supply to operate. In particular, the working wave range of the projects presented in the works [5,6,7] is limited. It is not universal in operating mode [11], it can only operate on a pulsed signal. However, there are degradation cases that reduce the efficiency and quality of device elements [12]. They do not have the ability to counteract the negative effects of solar radiation on heat.

5. CONCLUSION

The optoelectronic photoconverter consists of four parts. Its first part is a closed electrical circuit consisting of a heterophotocell and a photogenerator. The device gets the energy it needs from solar radiation. The sun's radiation itself transmits heat with the flow of light. There is a heat effect for the device. In order to get a free light stream from it, the polarized light processing part (III) of the device needs a high potential high stable electric field to operate. This field is obtained from light (3) by means of an electric field generating element (II). The introduction of an electro-optical system working with polarized light into the device increases its sensitivity and measurement accuracy several times. The use of an electric field instead of a current in the device ensures high energy efficiency. It can be applied to all areas of the measurement and control system, which is independent of the device and technology.

Reference

1. Исмоилов М. М. ПОВЫШЕНИЕ ЭФФЕКТИВНОСТИ СИСТЕМ СОЛНЕЧНОГО ТЕПЛОСНАБЖЕНИЯ С ПЛОСКИМИ СОЛНЕЧНЫМИ КОЛЛЕКТОРАМИ: ОСНОВНЫЕ РЕЗЕРВЫ И ВОЗМОЖНЫЕ ПУТИ ИХ РЕАЛИЗАЦИИ //CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES. – 2022. – Т. 3. – №. 12. – С. 79-84.

2. Исмаилов М. М. РАЗРАБОТКА ЭНЕРГОЭФФЕКТИВНОГО СОЛНЕЧНОГО КОЛЛЕКТОРА //CENTRAL ASIAN JOURNAL OF MATHEMATICAL THEORY AND COMPUTER SCIENCES. – 2022. – Т. 3. – №. 12. – С. 207-210.

3. Исмоилов М. М. On the issue of increasing the efficiency of flat solar collectors in heat supply systems by optimizing their operating parameters //European Journal of Emerging Technology and Discoveries. – 2023. – Т. 1. – №. 7. – С. 4-7.

4. Ismailov M. M. THE EFFECT OF MULTIPLICITY OF CARRIER CIRCULATION ON THE EFFICIENCY OF SINGLE-CONTOUR THERMOISIPHON SYSTEMS OF SOLLOR HOT-WATER SUPPLY //GOLDEN BRAIN. – 2023. – Т. 1. – №. 1. – С. 371-373.

5. M.R. Madaminov. (2023). EXPERIMENTAL STUDY OF OPERATING MODES OF AN UNINTERRUPTIBLE POWER SUPPLY SOURCE USING A WIND GENERATOR AS THE PRIMARY SOURCE. International Journal of Advance Scientific Research, 3(10), 125–131.

6. M.R.Madaminov. (2023). Classification and operating modes of backup energy supply sources of mobile networks . Best Journal of Innovation in Science, Research and Development, 2(12), 32–38. Retrieved from https://www.bjisrd.com/index.php/bjisrd/article/view/1045

7. A.X.Abdusamatov. (2023). Обнаружение Повреждений В Электрически Обесточенных Линиях Электропередачи. Diversity Research: Journal of Analysis and Trends, 1(6), 62–69. Retrieved from https://academiaone.org/index.php/2/article/view/239

8. A.X.Abdusamatov. (2023). MATHEMATICAL MODEL OF THE THROUGHPUT OF AN IP NETWORK SWITCHING NODE WITH A NON-CONSTANT AMOUNT OF SPACE IN THE

ROUTER RAM. International Multidisciplinary Journal for Research & Development, 10(10), 186–193. Retrieved from https://www.ijmrd.in/index.php/imjrd/article/view/147

9. A.X.Abdusamatov. (2023). RADIATION-STIMULATED ANNEALING BY GAMMA QUANTUM OF LEDS BASED ON AlGaAs HETEROSTRUCTURES SUBJECT TO OPERATIONAL FACTORS. Best Journal of Innovation in Science, Research and Development, 2(12), 269–275. Retrieved from https://www.bjisrd.com/index.php/bjisrd/article/view/1111
10. D.R.Komilov. (2023). HYBRID INVERTERS FOR GREEN POWER PLANTS. Best Journal of Innovation in Science, Research and Development, 2(12), 39–42. Retrieved from http://www.bjisrd.com/index.php/bjisrd/article/view/1046
11. D.R. Komilov. (2023). APPLICATION OF ZIGBEE TECHNOLOGY IN IOT. International Journal of Advance Scientific Research, 3(09), 343–349. https://doi.org/10.37547/ijasr-03-09-54
12. I. Makhmudov. (2023). EQUIPMENT AND TECHNOLOGIES USED TO IMPLEMENT APPLIED TV TASKS AT THE PRESENT STAGE OF DEVELOPMENT. International Journal of Advance Scientific Research, 3(10), 293–299. https://doi.org/10.37547/ijasr-03-10-45
13. M. M. Tillaboev. BESTJOURNAL OF INNOVATION INSCIENCE, RESEARCH ANDDEVELOPMENTISSN: 2835-3579Volume:02Issue:12|2023. In protected areasdangers elimination methods.
14. Халилов, М. М. (2023). СНИЖЕНИЕ ВЕРОЯТНОСТИ ПОТЕРЬ С ПОМОЩЬЮ КОДИРОВАНИЯ СИГНАЛА В ВОЛОКОННО-ОПТИЧЕСКИХ ЛИНИЯХ СВЯЗИ. European Journal of Interdisciplinary Research and Development, 22, 60-66.
15. MM Khalilov (2023). EFFECTS OF THE INTERACTION OF CHLORINE WITH PbS SURFACE AND THEIR EFFECT KINETIC PARAMETERS OF STRAIN-SENSITIVE FILMS. Best Journal of Innovation in Science, Research and Development, том 2, №2, стр. 229-236.
16. Khalilov, M. M. (2023). Effect of Heat Treatment on the Photosensitivity of Polycrystalline PbTe Films AND PbS. Al-Farg’oniy avlodlari, 1(4), 218-221.
17. Халилов М. М. (2023). ВЛИЯНИЕ УСЛОВИЙ ПОЛУЧЕНИЯ НА ЭЛЕКТРОФИЗИЧЕСКИЕ ПАРАМЕТРЫ ПЛЕНОК ТЕЛЛУРИДА СВИНЦА. Наука и Мир, № 1 (113), стр.28-31.
18. Shohbozjon Ergashev. (2023). OPTOELECTRONIC CONVERTERS BASED ON APV ELEMENTS. European Journal of Emerging Technology and Discoveries, 1(6), 1–4. Retrieved from https://europeanscience.org/index.php/1/article/view/265
19. Ш. У. Эргашев. (2023). ОПТРОНЫ С ТОНКОЙ ПЛЕНКОЙ НА БАЗЕ ПОЛИКРИСТАЛЛИЧЕСКИХ ОДНОПОЛЫХ ПОЛУПРОВОДНИКАХ. European Journal of Interdisciplinary Research and Development, 19, 69–73. Retrieved from https://ejird.journalspark.org/index.php/ejird/article/view/774
20. Shohbozjon Ergashev. (2023). ANOMALOUSLY HIGH DIOTOVOLTAIC EFFECT IN THIN FILMS OF GALLIUM ARSENIDE. International Journal of Advance Scientific Research, 3(09), 143–149. https://doi.org/10.37547/ijasr-03-09-24
21. L.R. Dalibekov. (2023). INNOVATIVE APPLICATIONS OF APV ELEMENTS IN OPTOELECTRONICS. International Journal of Advance Scientific Research, 3(10), 286–292. https://doi.org/10.37547/ijasr-03-10-44
22. С. Ш. Хусанова. (2023). ИСПОЛЬЗОВАНИЕ ЕМКОСТНОГО ДАТЧИКА ДЛЯ ОПРЕДЕЛЕНИЯ ТЕМПЕРАТУРЫ ТЕЛА. European Journal of Interdisciplinary Research and Development, 20, 188–194. Retrieved from https://ejird.journalspark.org/index.php/ejird/article/view/826

23. S.Sh. Khusanova. (2023). NETWORK ASPECTS OF IP TELEPHONY. International Journal of Advance Scientific Research, 3(10), 221–232. https://doi.org/10.37547/ijasr-03-10-36
24. S.Sh. Khusanova. (2023). PHASE SHIFT KEYING DETECTION USING DIRECT TRANSFORM METHOD. International Journal of Advance Scientific Research, 3(10), 212–220. https://doi.org/10.37547/ijasr-03-10-35
25. G.F. Joraeva. (2023). USING THE AFN-EFFECT IN GETTING AN ELECTROSTATIC FIELD FROM WIND ENERGY. International Journal of Advance Scientific Research, 3(10), 278–285. https://doi.org/10.37547/ijasr-03-10-43
26. G.F. Joraeva. (2023). NEW METHODS FOR DETERMINING CLASSIC AREAS OF MICROPARAMETERS FOR ANOMALIC PHOTOVOLTAGE ELEMENTS. American Journal of Technology and Applied Sciences, 17, 73–77. Retrieved from https://www.americanjournal.org/index.php/ajtas/article/view/1423
27. O. S. Rayimjonova. (2023). MATHEMATICAL MODELS OF HALF-RING PHOTORESISTIVE CONVERTERS OF VANE TURNING ANGLES. European Journal of Emerging Technology and Discoveries, 1(7), 1–3. Retrieved from https://europeanscience.org/index.php/1/article/view/273
28. O.S. Rayimjonova. (2022). INVESTIGATION OF CLUSTER-TYPE INHOMOGENEITY IN SEMICONDUCTORS. American Journal of Applied Science and Technology, 2(06), 94–97. https://doi.org/10.37547/ajast/Volume02Issue06-15
29. Komilov, A. O. (2018). Alternative sources of electricity premiere in the systems of telecommunications.
30. Комилов, А. О. (2018). ОЦЕНКА ВЕТРОЭНЕРГЕТИЧЕСКОГО ПОТЕНЦИАЛА. МР Қодирхонов Масъул муҳаррир ўринбосари: Илмий бўлим бошлиғи Б. Уринов, 2.
31. Komilov, A. O. (2018). Power of network photoelectric power stations.
32. Komilov, A. O. (2018). Selection of the composition and structure of the energy complex. Математическое и информационное моделирование: сборник научных трудов.–Тюмень, 2018.–Вып. 16.
33. U.U.Iskandarov. (2022). ANALYZES THE MEANING OF THE APPLICATION TESTING SOFTWARE OF THE FIBRE OPTICAL SYSTEMS. International Journal of Advance Scientific Research, 2(12), 121–124. https://doi.org/10.37547/ijasr-02-12-17
34. U.U. Iskandarov. (2023). ANALYSIS OF THE THEORETICAL APPROACH TO THE EXTENDED RANGE OF THE OPTICAL FIBRE WITH THE REDUCTION OF "WATER PEAK". International Journal of Advance Scientific Research, 3(10), 270–277. https://doi.org/10.37547/ijasr-03-10-42
35. У.У. Искандаров. (2023). ПРОБЛЕМЫ СИСТЕМНОЙ ОПТИМИЗАЦИИ ИНТЕРФЕРОМЕТРИЧЕСКОГО ПРОЦЕССА ПРИ ФОРМИРОВАНИИ И ОБРАБОТКИ АКУСТИЧЕСКИХ СИГНАЛОВ ДИСТАНЦИОННОГО ЛАЗЕРНОГО МИКРОФОНА. European Journal of Interdisciplinary Research and Development, 22, 52–59. Retrieved from http://www.ejird.journalspark.org/index.php/ejird/article/view/889
36. Umarovich, I. U. (2023). COMARASION APPROACH TO THE SEVERAL PROTOCOLS OF RADIO INTERFACES OF LTE TECHNOLOGY. International Journal of Advance Scientific Research, 3(10), 117-124.
37. Тажибаев, И. Б. (2021). ПРИНЦИПЫ ПОСТРОЕНИЯ РАДИОПРИЕМНИКОВ С ЦИФРОВОЙ ОБРАБОТКОЙ СИГНАЛА. Scientific progress, 2(6), 755-760.
38. Tajibayev, I. B. . (2023). PHOTONCRYSTALINE FIBER FOR LOAD MEASURING. Best Journal of Innovation in Science, Research and Development, 2(12), 293–297. Retrieved from https://www.bjisrd.com/index.php/bjisrd/article/view/1115