Estimation of Multi-Crystalline Photovoltaic Cell using Solar Spectrum of Five Different Bands

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Abstract: PVC (Photovoltaic Cell) is a semiconductor device; generally it is PN type semiconductor device. PVC plays a vital role in the generation connected with electricity. There are three types of PVC, mainly organic, inorganic and hybrid. Mostly customers complain that their PVC is not creating electricity with greater speed and efficiency. Another problem is related with the PVC is its weight time as well as less presence under sunlight in the hours of daylight. The aim of this study is always to address the aforementioned problems related to PVC. Our team proposes two main solutions with this Respect to the effects of artificial light on a replacement of the sunlight is the use of solar spectrum on solar cells for strong light with wavelength providing and second one is Plano-convex lens to concentrate on the yellow light bulb in a dark room to improve the rate of photon emission. It passes then describes the installation of solar energy technique simulation in addition to execution and as well as gave some predictions around the future electricity generated improves.
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Introduction

The primary objective of PV (Photovoltaic) solar cells and innovative business year is to reduce the expenditure of PV cells and modules to a level that will be aggressive with regular methods to create electricity. One approach to achieve that to expand the master completely changes the materials and PV device. Progress has been significant growth recently in strengthening the productivity of the bulk of the main PV materials and device [1][2]. Basically, there are two ways to deal with the development of solar cell production: (1) choice of semiconductor material with slits appropriate electricity. To match the solar spectrum and provides optical and electrical characteristics and Help (2) innovative design tool which enables a more convincing collection charge and use as well as the better of the solar spectrum through a single and multi-link approach. Solar technology is the primary soul regarding life in the world. Solar radiation is often a direct source for the production regarding heat, Frost and strength. In subsistence Use PV change solar radiation into energy photovoltaic electricity unoccupied impact intended. The radiation energy of PV unoccupied effect planned [3]. In case solar radiation falls on the semiconductor material, the collection of a charge bearer will rise when diverged from the condition without luminance. Occurrence exchanged photons and electrons strengthen energy outlet holes which can be used for current conduction. It is vital that the electric field is in semiconductors, electrons and holes disconnect from to each other [4][5]. This type of field PN junction is gained, Hardware may use this impact is known as a photovoltaic cell (solar cell). This panels everything changes driven solar radiation into DC (Direct Current) [6] [7]. Solar cell is a semiconductor diode. PN junction is part of the silicon insubstantial cuts in some quantity below the surface of the metal connections and afternoon with both sides. [8]. Just when solar radiation falls on the cell electrons and free holes occur. PN junction electric field and sends contrast converse facets electrons towards the N layer which turns into a negative core on the photovoltaic unit and holes of P layer, which is turns into a positive shaft. The anxiety in the electricity contacts is created and begins to transmit to a mechanism [7]. The hole is related to improve in water and other free electrons hold up accessible. Are you aware that free-electron products running for the "P" type to some PN junction. Caused by the PN junction will be the electron move or current of electricity go free [8]. GaAs (Gallium Arsenide) are widely-used within PVC in a very commercial range; ultra-high proficiency is preceding 30%. Although both gallium arsenide components are electrically fair, n-sort (As) has a good amount of electrons in addition to p-type (Ga) offers holes overabundance, sandwiching these components with each other it will cause a PN junction on their interface, thereby making a field. There are two real classes regarding photovoltaic cells (a) Inorganic photovoltaic or PV unit (IPV) in addition to (b) Natural and OPV (Organic Photovoltaic Model).There are few different types of photovoltaic units that can be changed via IR

(Infrared) or ultraviolet electricity [9][10]. The point where these polymers absorb photon of a good energized point out where electron simply leaves its position is made that gap will attract other free electrons in [11].There are three types of PV cell: Mono-crystalline, poly-crystalline or Multi-crystalline and amorphous. We are now using as a part of the inorganic photovoltaic cell in different bands of the prism yellow, blue, green, red and orange band of solar spectrum in a dark room with the help of the yellow bulb [12]. There are two PVC layers above it is the solar spectrum on solar cells for the solid light up with five different bands and second is the Plano-convex lens. Solar spectrum focuses daylight in a day that will improve the emission rate of photon. Essentially all bands applied on PVC solar spectrum to improve the rate of photon emission. This method is simple, cheap and easily installed in PVC [13][14][15][16].

Methodology

The motivation behind this study is to put solar panels inorganic efficient use two different technologies is one solar spectrum in a dark room with the help of a yellow bulb and the other one is a Plano-convex lens. There are two layers over PVC one is solar spectrum and Plano-convex lens. Solar spectrum strengthens the light signal (and we are using five different ranges of solar spectrum and every band has a different wavelength and frequency) while gathering light from the lens coverage area.

In other words the electricity and thereby increase the photon emission rate is concentrated. There is a mathematical relationship between the open-circuit voltages as follows.

$$V_{oc} = \frac{KT}{q} \ln\left(\frac{I_L}{I_0}\right)$$

Whereas K is Boltzmann constant which is K=1.38e, T is total temperature which is T=300K I_L is Current supplied by solar cell, and I_0 = the reverse saturation current.

Following the given tables show the efficiency of five different band of solar spectrum which we have taken the reading of solar spectrum with the help of Plano-convex lens and uses of artificial resources of yellow bulb.

In Table 1 show the reading of red band of solar spectrum. There are two layers of PVC, one is a Plano-convex lens and second one is solar spectrum that will enhance the rate of photon emission. Table 1 and Fig. 1 show the efficiency of red band:

Table 1: Reading about the Solar Spectrum with Bulb Light Solar Cell with Plano Convex Lens for Red Band of Mono-Crystalline PVC

No.	Current (Ma)	Voltage (V)
1.	0.005	3.18
2.	0.004	3.15
3.	0.004	3.14
4.	0.002	3.11
5.	0.001	3.10

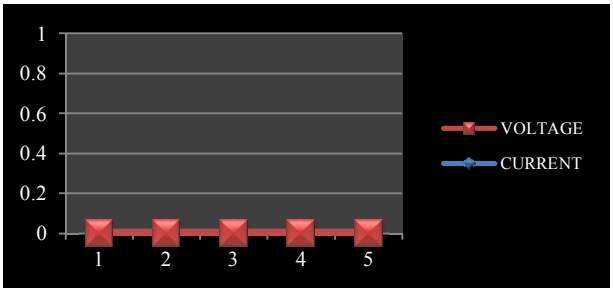

Fig.1. Show the Strength of PVC with the Help of Solar Spectrum of Red Band

In Table 2 show the reading of yellow band of solar spectrum. There are two layers of PVC, one is a Plano-convex lens and second one is solar spectrum that will enhance the rate of photon emission. Table 2 and Fig. 2 show the efficiency of yellow band:

Table 2: Reading about the Solar Spectrum with Bulb Light Solar Cell with Plano Convex Lens for Yellow Band of Mono-Crystalline PVC

No.	Current (mA)	Voltage (V)
1.	0.004	4.08
2.	0.003	4.07
3.	0.002	4.05
4.	0.001	4.02
5.	0.001	4.01

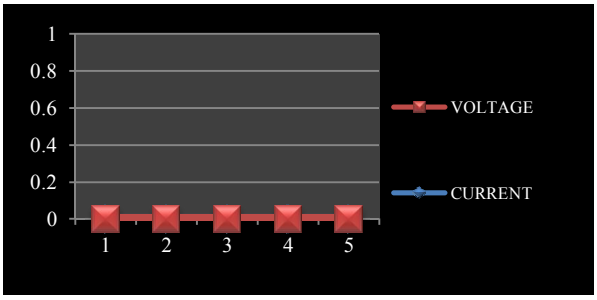

Fig 2. Show the Strength of PVC with the Help of Solar Spectrum of Yellow Band

In Table 3 show the reading of blue band of solar spectrum. There are two layers of PVC, one is a Plano-convex lens and second one is solar spectrum that will enhance the rate of photon emission. Table 3 shows the efficiency of blue band:

Table 3: Reading about the Solar Spectrum with Bulb Light Solar Cell with Plano Convex Lens for Blue Band of Mono-Crystalline PVC

No.	Current (mA)	Voltage (V)
1.	0.003	5.41
2.	0.002	5.40
3.	0.002	5.39
4.	0.001	5.37
5.	0.001	5.36

In Table 4 show the reading of green band of solar spectrum. There are two layers of PVC, one is a Plano-convex lens and second one is solar spectrum that will enhance the rate of photon emission. Table 4 Show the efficiency of green band:

Table 4: Reading about the Prism with Bulb Light Solar Cell with Plano Convex Lens for Green Band of Mono-Crystalline PVC

No.	Current (mA)	Voltage (V)
1.	0.003	3.89
2.	0.002	3.88
3.	0.002	3.85
4.	0.001	3.81
5.	0.001	3.79

In Table 5 show the reading of orange band of solar spectrum. There are two layers of PVC, one is a Plano-convex lens and second one is solar spectrum that will enhance the rate of photon emission. Table 5 shows the efficiency of red band:

As you can see that the strength of current is same in Tables 3-5 and voltage are different. So we are now utilizing and merge the reading of voltage for all of Tables 3-5 of voltage as shown in Fig. 4.

Table 5: Reading about the Solar Spectrum with Bulb Light Solar Cell with Plano Convex Lens for Orange Band of Mono-Crystalline PVC

No.	Current (mA)	Voltage (V)
1.	0.003	3.94
2.	0.002	3.93
3.	0.002	3.91
4.	0.001	3.87
5.	0.001	3.85

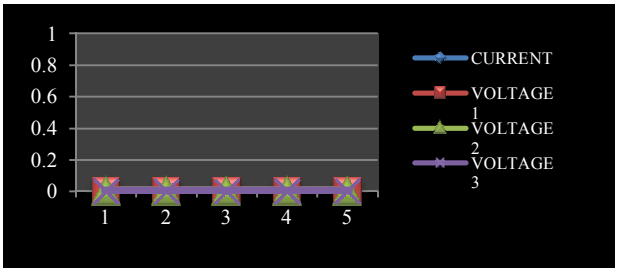

Fig. 3. Show the Strength of PVC with the Help of Solar Spectrum of Red, Blue and Green Band

Process of Photon Rate of Emission

Our teams propose the PVC interpolation system to increase the rate of photon emission, and calculate the current and voltage to control the electricity. Interpolation system is as follows:

A. For Red Band with Plano-Convex Lens

Interpretation about the solar spectrum with bulb luminosity with Plano convex lens for Redland for current (mA):

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Red Band for voltage (V):

Table 5: Efficiency of PVC Red Band Of Solar Spectrum

	Algorithm-I. Efficiency Of PVC Red Band Of Solar Spectrum									
Time	Mille (Amp)					Mille (V)				
1	0.005					3.18				
		-0.001					-0.03			
2.	0.004		0.001			3.15		0.02		
		0.00		-0.003			-0.01		-0.04	
3.	0.004		-0.002		0.006	3.14		-0.02		
				0.003						0.08
		-0.002					-0.03		0.04	
4.	0.002		0.001			3.11		0.02		
		-0.001					0.01			
5.	0.001					3.10				

B. For Yellow Band with Plano-Convex Lens

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Yellow Band for current (mA):

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Yellow Band for voltage (V):

Table 6: Efficiency of PVC Yellow Band Of Solar Spectrum

Algorithm-II. Efficiency Of PVC Yellow Band Of Solar Spectrum										
Time	Mille (Amp)					Mille (V)				
1.	0.004					4.08				
		-0.001					-0.01			
2.	0.003		0			4.07		-0.01		
		-0.001		0			-0.02		0	
3.	0.002		0		0.001	4.05		-0.01		0.03
		-0.001		0.001			-0.03		0.03	
4.	0.001		0.001			4.02		0.02		
		0.00					-0.01			
5.	0.001					4.01				

C. For Blue Band with Plano-Convex Lens

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Blue Band for current (mA):

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Blue Band for voltage (V):

Table 7: Efficiency of PVC Blue Band Of Solar Spectrum

	Algorithm-III. Efficiency Of PVC Blue Band Of Solar Spectrum									
Time	Mille (Amp)					Mille (V)				
1.	0.003					5.14				
		-0.001					-0.01			
2.	0.002		0.001			5.40		0		
		0.00		-0.002			-0.01		-0.01	
3.	0.002		-0.001		0.004	5.39		-0.01		0.03
							-0.02		0.02	
		-0.001		0.002		5.37		0.01		
4.	0.001		0.001				-0.01			
		0.00				5.36				
5.	0.001									

D. For Green Band with Plano-Convex Lens

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Green Band for current (mA):

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Green Band for voltage (V):

Table 8: Efficiency of PVC Green Band Of Solar Spectrum

	Algorithm-Iv. Efficiency Of PVC Green Band Of Solar Spectrum									
Time	Mille (Amp)					Mille (V)				
1.	0.003					3.89				
		-0.001					-0.01			
2.	0.002		0.001			3.88		-0.02		
		0.00		-0.002			-0.03		0.01	
3.	0.002		-0.001		0.004	3.85		-0.01		0.02
			-0.001				-0.04		0.03	
		-0.001		0.002		3.81		0.02		
4.	0.001		0.001				-0.02			
		0.00				3.79				
5.	0.001									

E. For Orange Band with Plano-Convex Lens

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Orange Band for current (mA):

Interpretation about the solar spectrum with bulb luminosity on PVC with Plano convex lens for Orange Band for voltage (V):

Table 9: Efficiency of PVC Orange Band Of Solar Spectrum

Algorithm-V. Efficiency Of PVC Orange Band Of Solar Spectrum										
Time	Mille (Amp)					Mille (V)				
1.	0.003					3.94				
		-0.001					-0.01			
2.	0.002		0.001			3.93		-0.01		
		0.00		-0.002			-0.02		-0.01	
3.	0.002		-0.001			3.91		-0.02		0.05
					0.004		-0.04		0.04	
		-0.001		0.002		3.87		0.02		
4.	0.001		0.001				-0.02			
		0.00				3.85				
5.	0.001									

Result and Discussion

As we know that our research area focuses the Enhancement of photon rate of emission in photovoltaic cell. We are working In-Organic PV cell in many different techniques of solar spectrum as you can see that our proposed method is cheap and easily install to any other PVC and this is one of the key point of our success. As we know that mono-crystalline are a slice from single crystal cell and one unit of mono-crystalline consume huge energy as compared to other Photovoltaic cell. After this research work we get to know that solar spectrum is more efficient and create more free electrons or electricity as compared to other techniques and enhance more photon rate of emission due to the process of photon cloning. So our proposed method is more efficient as compared to regular method. The logic at the back of this experiment is the focus of sunlight of more photon absorption through solar spectrum result more photon enhanced due to photon cloning process and creates electricity.

Conclusions

This study explores the importance of the concentrated sunlight and photovoltaic cell of solar spectrum. PVC helps to absorb more photons per unit of time and produce more electric current. Our proposed system is simple and easy to install on any other solar cell. This will be one of the factors conducting in our investigation .The analysis reveals that the result interpolation yellow blub with five bands are: yellow [Current: 0.001 and voltage: 0.03], blue [Current: 0.004 and voltage: 0.09], red [Current: 0.006 and voltage: 0.08] and orange [current: 0.004 and voltage: 0.05] units. [Current: 0.004 and Voltage: 0.02] green the basis for this implementation of yellow bulb, in fact more retention photons through the glass are especially the free electrons or electricity is concentrated. More experiments are underway in brief our research will create a dynamic inorganic photovoltaic cell, which come on top of our PVC is proposed.

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