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Journal Name:	<u>British Journal of Mathematics & Computer Science</u>
Manuscript Number:	Ms_BJMCS_31714
Title of the Manuscript:	Study the Important Parameters Affecting Performances of P3HT:PCBM Organic Solar Cells
Type of the Article	Original Research Article

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	Below are some of the comments: Authors should write PCBM, PSS, PEDOT, P3HT etc in full form first before using abbreviation. No details on sample preparation and organic solar cell fabrication. Experimental method is fundamental for the reproducibility of the experiment and must be stated in clear and detailed form. Subsection 2.3: Authors wrote that the deposited P3HT:PCBM was annealed at 130 °C for 30 min. Any particular reason for the chosen annealing temperature and time? Equation 6: What is N_A? Avogadro's number? Subsection 2.3: Effect of solvent annealing The sentence "Solar cells employ the slow-solvent-vapor treatment blend films as the active layer exhibit the enhanced power conversion efficiency that of as-cast and fast thermal annealing blend films." How? What solvent was used? Page 4 Line 109: "...observed for the G-PEDOT:PSS devices due to improved charge collection compared to PEDOT:PSS devices." How? What is G-PEDOT? Fig. 2 shows the absorption spectra of	Comment 1 Abbreviations PCBM: [6,6]-phenyl-C61-butyric acid methyl ester PEDOT:PSS: poly(3,4-ethylenedioxythiophene)-poly(styrene-sulfonate) P3HT: poly(3-hexylthiophene) ITO: Indium Tin Oxide Comment 2 Sample preparation: P3HT:PCBM are dissolved in chlorobenzene with ration (1:0.8). Then spin coated onto glass in order to measure the absorption of the films obtained. Experimental detail for the fabrication of the cells ITO was etched and cleaned, then the PEDOT:PSS was deposited onto ITO substrate, then the a solution of P3HT:PCBM was spin coated . Finally, a cathode of Aluminum was deposited by thermal evaporation under vacuum. The final solar cells were annealed. Comment 3 The efficiency of device is highly dependent on drying time annealing temperature. The drying process was proved to effectively affect the self-organization of P3HT: PCBM aggregation. We choose 130°C and 30 min for annealing temperature in order to show the difference between cells annealed and cells without annealing. Comment 4. Na : doping concentration of acceptor It is not Avogadro number Comment 5 Solvent annealing is the time taken by the solvent to dry after the spin coating process. Under solving annealing conditions



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	P3HT:PCBM layers for different temperatures. But there is no explanation/discussion about the figure. Can the authors discuss the spectra obtained? Page 4 Line 121 & 122: “..higher performances are obtained when the concentration of the blend is 70 mg/ml...” Not clear regarding the concentration of the blend. What could be the reason behind higher performance? The word “crystallinity” is wrongly spelled as ‘cristallinity’.	the polymer is seen to be ordered. Devices with ordered structure show higher efficiency. Solvent annealing is better than thermal annealing (before evaporation the cathode the P3HT:PCBM layer dried for example 2 h in the glove box without thermal annealing in order to obtain homogenous morphology of the layer). the sample are prepared using chlorobenzene as solvent. <u>Comment 6</u> G-Pedot is a pedot doped with ethylene glycol The electrical conductivity of PEDOT:PSS films can be increased by more than two order of magnitudes by spin-coating a compound containing one or more polar groups—such as ethanol, methoxyethanol, 1,2-dimethoxyethane, and ethylene glycol EG)—onto the films When the PEDOT:PSS films were modified with ethylene glycol (G-PEDOT) the sheet resistance decreased. Which contribute to improve transport of the carrier of charge. Alcoholic solvents enhance the conductivity as it is discussed in reference [13] highly conductive (443 S/ cm) and transparent (89%) PEDOT/PSS thin films with thickness of 93 nm [14] was prepared as shown in figure.
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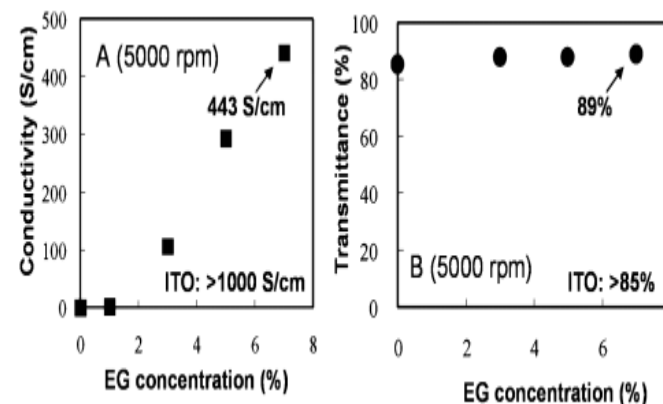


Figure 3. Plots of electrical conductivity (A) and visible-light transmittance (B) of the PEDOT/PSS thin films against concentration of (ethanol glycol) EG in the PEDOT/PSS dispersion used for the spin-coating [14]

[13] Yu-Sheng Hsiao, Wha-Tzong Whang, Chih-Ping Chenb and Yi-Chun Chen . High-conductivity poly(3,4 ethylenedioxythiophene):poly(styrene sulfonate) film for use in ITO-free polymer solar cells J. Mater. Chem., 2008, 18, 5948–5955 .

[14] Hu YAN, Toshihiko JO, and Hidenori OKUZAKI, Highly Conductive and Transparent Poly(3,4-ethylenedioxythiophene)/Poly(4 styrenesulfonate) (PEDOT/PSS) Thin Films. Polymer Journal, Vol. 41, pp. 1028–1029, 2009

Comment 7

Discussion of figure absorption spectra as function of temperature

Thermal annealing improves the solar cells parameters. The absorption spectra after annealing all the layers show a



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	Plagiarism issue: This manuscript has similarity index of 49 % based on turnitin software.	peaks at different wave lengths which originates from the highly crystalline P3HT domains . <u>Comment 8</u> The solar cell performance parameters improved with increasing PCBM concentration in the blends. The improvement in the photocurrent and solar cell performance with increasing PCBM concentration in the blends may be attributed to the following: 1. the increase in the photoactive p-n heterojunction sites and, therefore, charge separation, 2. the increase in the electron transport throughout percolated pathways produced in the solar cell active layer. 3. When the concentration increases the thickness of the active layer is increased and the performances are good. <u>Comment 9</u> Cristallinity: we can replace it with the crystalline structure. <u>Comment 10</u> Plagiarism issue As I am in the field of organic solar cells, the expression that I have used are scientific expression used for studied the organic solar cells. I inform you that we have realized and characterized the cells as function of concentration and thermal annealing. And I have used some references to improve the discussion of the results. In my manuscript submitted, when the sentences are extracted from another article, the references are cited between brackets [].
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		<i>I have corrected and modified the manuscript, I have added some results and some references.</i> Thank you for your comments; I hope that you will satisfy when reading our responses. If there is other comments please contact me. <u>Comment references</u> ▪ [15]_I inform that the results inserted in this manuscript it will not published in Indian institute of management, Indor or in other journal. ▪ UMMTO : I am a PHD student at UMMTO university. ▪ Concerning the references that you have subjected, I inform you that there are some references that I have not seen before the redaction of this article.
<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments		