***Editorial comments:*** *•****NOTE: Please download this version of the Microsoft word document (File name: 54923\_R1\_071116) for any subsequent changes. Please keep in mind that some editorial changes have been made prior to peer review.***

*•Please keep the editorial comments from your previous revisions in mind as you revise your manuscript to address peer review comments. For instance, if formatting or other changes were made, commercial language was removed, etc., please maintain these overall manuscript changes.*

Author’s reply:

We would like to express our sincere gratitude to you for carefully reviewing our work. We agree with all your comments and have revised the manuscript accordingly. We have replied to each of the comments from the editor and reviewers in this letter. Our manuscript was checked for language a professional editing service, for which we have additionally submitted a proofreading certificate. Thank you for carefully reviewing our article.

*•Formatting: References – Please format references according to JoVE style. DOI are missing, and the volume is not formatted correctly.*

Author’s reply:

We have revised the reference section to conform to JoVE’s guidelines, and had it checked by a professional editing service.

*•Please copyedit the manuscript for numerous grammatical errors, some of which are indicated below. Such editing is required prior to acceptance and should be performed by a native English speaker.  
-Title – Should be “solar cells based on a Ti-alkoxide”  
-Line 41 – “a typical, organic thin film bulk-heterojunction (BHJ) solar cells” – singular/plural error  
-Line 43 – “as an alternative materials”  
-Line 49 – “as some solvents such as fullerene derivatives” – please clarify  
-Line 51 – “solve” should be “dissolve”  
-Line 78 – “in metal oxide system”  
-Line 83 – “metal alkoxide do have not”  
-Please correct “in the dark condition” to be both clear and grammatically correct at each occurrence (6 total). Is this done in the dark or are solutions otherwise protected from light?  
-3.2.1, 6.1, Materials table – “cotton tail” – This is a rabbit. Likely you mean “cotton ball” or swab.  
-8.1 – “by the Ti alkoxide and PFO-DBT using same methods” – multiple errors  
-Line 257 – Please clarify “the good surface interaction”.  
-Line 258 – “uncovered without the lid”*Author’s reply:  
Our manuscript was corrected using a professional editing service, for which we have additionally submitted a proofreading certificate.

*•Additional detail is required:  
-1.2.3 – Is this dropped onto the area not protected by the tape? Is the solution removed prior to removing the tape? If so, how? (Removal of the tape seems out of order.)  
-2.2 – Please clarify “in the dark condition”. What dark condition? This is likely not grammatically correct. Is the solution clear after 20 min or is the solution stirred for an additional 20 min after becoming clear?  
-3.1.1 – How is this different from 2.2? Does this mean that after the solution has been cooled, it needs to be reheated? At what temperature is the ITO heated?  
-3.1.3 - How much is a few drops?  
-5.1 – How are these cut? Please clarify how spreading and covering with epoxy are different. Are two different epoxies used?  
-6.1 – How is the attachment of the supporting electrode performed? Please provide a citation if no detail is provided.*  
Author’s reply:We have added more detailed information to clarify these points. *•Discussion: How does this method differ from the conventional, solvent method? Please clarify and include independent citations when discussing significance. Please also discuss the limitations of the method.*Author’s reply:We have added the limitations of our method to the “Discussion” section. Moreover, we have included independent citations concerning conventional methods to facilitate comparison with our method.

*•If your figures and tables are original and not published previously, please ignore this comment. For figures and tables that have been published before, please include phrases such as “Re-print with permission from (reference#)” or “Modified from..” etc. And please send a copy of the re-print permission for JoVE’s record keeping purposes.*Author’s reply:  
We have added the phrase “This figure is modified from Ref. #" to the legends. Moreover, we have obtained permission from the publisher so that the figures may be published in JoVE. We already have included a copy of the re-print permission as requested. *•JoVE reference format requires that the DOIs are included, when available, for all references listed in the article. This is helpful for readers to locate the included references and obtain more information. Please note that often DOIs are not listed with PubMed abstracts and as such, may not be properly included when citing directly from PubMed. In these cases, please manually include DOIs in reference information.*Author’s reply:  
We have revised the reference section to conform to JoVE’s guidelines, and had it checked by a professional editing service.

*•IMPORTANT: Please copy-edit the entire manuscript for any grammatical errors you may find. The text should be in American-English only. This editing should be performed by a native English speaker (or professional copyediting services) and is essential for clarity of the protocol and the manuscript. Please thoroughly review the language and grammar prior to resubmission. Your JoVE editor will not copy-edit your manuscript and any errors in your submitted revision may be present in the published version.*Author’s reply:Our manuscript was corrected using a professional editing service, for which we have additionally submitted a proofreading certificate.

*•NOTE: Please include a line-by-line response letter to the editorial and reviewer comments along with the resubmission.*Author’s reply:  
We have agreed with and replied to each of the comments from the editor and reviewers in this letter. Thank you for carefully reviewing our article.

***Reviewers' comments:******Reviewer #1:*** *Manuscript Summary:  
The authors showed the fabrication of the fully printable BHJ solar cells using Ti-alkoxides as the electron acceptors, and control the morphology of the active layers through the molecular bulkiness of the Ti-alkoxides. They demonstrated that using the molecular bulkiness can be applicable to other hybrid solar cells systems. The protocol of the experiment is clear and logical, and is appropriate for publication in Journal of Visualized Experiments pending revision to address the following issues.  
  
Major Concerns:  
In this manuscript, the authors have fabricated the control devices by using the PFO-DBT/[60]PCBM blend as active layer, and mentioned that the Ti-alkoxides could be an air-stable electron acceptor to obtain highly air-stable solar cells compared with PCBM based devices. The authors should provide the evaluation of the air-stability of the Ti-alkoxides based devices.*Author’s reply:  
We would like to express our sincere gratitude to you for carefully reviewing our work. Currently, we have checked the superiority by a short-term air-stability test. Subsequently, we started a long-term test. Especially, the light-incident test will require a very long time. Therefore, we are still continuing to collect data from the air-stability test. Upon completion of the air-stability test, we will investigate the internals of the solar cell by various empiric tests to further determine the stability of the Ti-alkoxide system. Therefore, in the near future, when we have new conclusions about the stability of the Ti-alkoxide system, we will submit a new paper. Thank you for carefully reviewing our article.

*Minor Concerns:  
The energy levels of the Ti-alkoxides based acceptors and PFO-DBT should be provided, since the energy levels of the donor and acceptor can have significant influence on the voltage values of the solar cells and charge separation between the donor and acceptor.*Author’s reply:  
Thank you for carefully reviewing our article. We agree with your comment. We have included the HOMO-LUMO levels in the revised article. Moreover, we indicated references regarding the energy levels of the materials.

*Additional Comments to Authors:  
No comments.****Reviewer #2:*** *Manuscript Summary:  
N/A  
  
Major Concerns:  
A. In my knowledge, the key process is spin coating process with heat.  
More specific explanations are needed.  
The temperature and temperature gradient will be changed, corresponding to conditions.  
For example, the volume of the dropped precursor solution, before spin coating process.  
What is the real temperature of substrates, before dropping process?  
What is the temperature of substrates, when you use the drier?  
B. The solar cell with Ti isopropoxide shown 8 times higher JSC.  
You mentioned that this originates from the morphology.  
How can you assume that other conditions are same? (for example, electrical propertis of Ti alkoxides, and chemical damages between solvent and polymers)*Author’s reply:  
Thank you for carefully reviewing our article. We agree with your comment. The temperature of the substrate surfaces are 55–70 °C. The substrate is placed on the stage, which was heated by a heat gun. The temperature of substrate was measured by thermography. The volume of precursor solution is 0.5 ml by using a 1-mL spuit. This amount can cover the ITO surface on the substrate. We have added more detailed information regarding this experiment. Moreover, the temperature of our experiment room is maintained at 25 °C. Therefore, the drying temperature is 20–30 °C. When we used these conditions for the experiment, we obtained reproducible performance and phase separation structure of the solar cells. We would like to express our sincere gratitude to you for carefully reviewing our work.

*Minor Concerns:  
More specific process to prepare Ti alkoxides should be mentioned. Did you purchase (Sigma?) or prepare by yourself?*Author’s reply:Thank you for your comment. We purchased Ti(IV) isopropoxide, Ti(IV) ethoxide, Ti(IV) butoxide, and a Ti(IV) butoxide polymer from Sigma-Aldrich.

*Additional Comments to Authors:  
N/A****Reviewer #3:*** *Manuscript Summary:  
This paper used a Ti alkoxide layer as the electron acceptor for bulk-heterojunction solar cells.  
  
Major Concerns:  
The power conversion efficiency was very low. The reviewer concerns about the practical applicability of the proposed method in solar cell assembly.*Author’s reply:Thank you for carefully reviewing our article. We agree with your comment. One of the reasons for the low device performance was that we did not use buffer layers. However, in this study, we focused on controlling the phase-separation structure; therefore, we did not insert buffer layers so that we could evaluate the simplest system. In future, we plan to implement the fabrication of highly efficient solar cells based on a technique that would enable us to control the phase-separation structure reported in this article using buffer layers.

*Minor Concerns:  
N/A  
  
Additional Comments to Authors:  
N/A*