

ARTICLE REVIEW
REPORT



GOLDEN RESEARCH THOUGHTS

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ORIGINAL ARTICLE

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IMPROVING THE EFFICIENCY OF POLYMER
SOLAR CELLS BY INCORPORATING GOLD
NANOPARTICLES AND NANOCLUSTERS
DECORATED MULTI-LAYER GRAPHENE

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ABSTRACT

We demonstrate efficiency improvement in polymer solar cells (PSCs) by $\sim 22\%$ through incorporating Au nanoparticles (NPs) into solar cells. Our theoretical result shows that the absorption enhancement at the active layer is attributed to plasmon resonances with strong near field distributions penetrated into absorption polymers. These findings can be applied to design high-efficiency metallic NPs-incorporated PSCs. A thin layer of ultraviolet-ozone (UVO) treated gold (Au) is introduced on multi-layer graphene (MLG) to enable the MLG as an effective anode for polymer solar cells (PSCs).

Article Indexed in



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REVIEW OF THE ARTICLE

Improving The Efficiency Of Polymer Solar Cells By Incorporating Gold Nanoparticles And Nanoclusters Decorated Multi-layer Graphene

Sheelendra Kumar Yadav

Introduction:

Title was well framed and representative of the study area. Our theoretical result shows that the absorption enhancement at the active layer is attributed to plasmon resonances with strong near field distributions penetrated into absorption polymers. The abstract was complete and essential details were presented. Introduction was justifying. Importance of the area under study mentioned clearly in Introduction.

Reference to the Literature and Documentation:

The literature review was up-to-date. The number of references is appropriate and their selection was judicious.

Methodology:

Author described methodology in detail. A thin layer of ultraviolet-ozone (UVO) treated gold (Au) is introduced on multi-layer graphene (MLG) to enable the MLG as an effective anode for polymer solar cells (PSCs). Further analysis shows that UVO treated Au provides favorable band alignment at the MLG/polymer interface. Moreover, the improved interfacial contact and shortened UVO durations reduce the series resistance of PSCs significantly.

Presentation of Results:

Author presented data with the help of various graphs and figures. Tables, graphs, or figures were used judiciously and agree with the text. Advantages of incorporating NPs in individual layers can be utilized together to achieve larger increases of PSC performance and these findings can be applied to the design of high efficiency NP-incorporated PSCs in the future.

Scientific Conduct:

There are no instances of plagiarism. Ideas and materials of others are correctly attributed.

References:

Author mentioned references according to the need of the study.

SUMMARY OF ARTICLE

No.		Very High	High	Average	Low	Very Low
1.	Interest of the topic to the readers	✓				
2.	Originally & Novelty of the ideas		✓			
3.	Importance of the proposed ideas	✓				
4.	Timelines		✓			
5.	Sufficient information to support the assertions made & conclusion drawn			✓		
6.	Quality of writing (Organization, Clarity, Accuracy Grammer)		✓			
7.	References & Citation (Up-to-date, Appropriate Sufficient)		✓			

FUTURE RESEARCH SCOPE:

- 1.A Brief Review Of Graphene-based Material Synthesis And Its Application In Environmental Pollution Management
- 2.Graphene Hybrids: Synthesis Strategies And Applications In Sensors And Sensitized Solar Cells.
- 3.Combined Photothermal and Surface-Enhanced Raman Spectroscopy Effect from Spiky Noble Metal Nanoparticles Wrapped within Graphene-Polymer Layers.
- 4.Preparation and applications of platforms based on gold nanoparticles and graphene.

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CERTIFICATE OF PUBLICATION

This is to certify our Editorial, Advisory and Review Board accepted research paper of **Sheelendra Kumar Yadav** Topic:- **Improving The Efficiency Of Polymer Solar Cells By Incorporating Gold Nanoparticles And Nanoclusters Decorated Multi-layer Graphene** College:- **Asstt. Professor , Department of Physics , Chaudhary Charan Singh PG College,Heonra Etawah,UP, India.** The research paper is Original & Innovation it is done Double Blind Peer Reviewed. Your article is published in the month of **Aug.** Year 2015.



Authorized Signature

T. N. Shinde

T. N. Shinde
Editor-in-Chief

CERTIFICATE OF EXCELLENCE IN REVIEWING

This is to certify our Editorial, Advisory and Review Board accepted research paper of **Sheelendra Kumar Yadav** Topic:- **Improving The Efficiency Of Polymer Solar Cells By Incorporating Gold Nanoparticles And Nanoclusters Decorated Multi-layer Graphene** College:- **Asstt. Professor , Department of Physics , Chaudhary Charan Singh PG College,Heonra Etawah,UP, India.** The research paper is Original & Innovation it is done Double Blind Peer Reviewed. Your article is published in the month of **Aug.** Year 2015.



Authorized Signature

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