

















## 5. Conclusion

In conclusion, we have demonstrated an increased optical absorption of an organic BHJ solar cell that utilizes the LRPRs of Ag-NPs, and performed a device simulation to interpret the photocurrent enhancement mechanism via a 3-D cylindrical Ag-NPs FDTD model. The solar cell efficiency was increased as a function of Ag-NPs thickness, and at a thickness of 50Å, a 60% increase of the PCE was achieved with compared to a cell that does not have Ag-NPs. Therefore, the experimental and simulation results implied that the strong optical field intensity associated with a LSPR is responsible for enhanced exciton generation near the interface of Ag-NPs/PEDOT:PSS and the active layer. Finally, we have also discussed the electrical aspects of the fabricated plasmonic organic solar cells.

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