

Shielding versus Not Shielding: Protecting Organic Solar Cells from UV Degradation

Fountain, Herbert

Over the past few decades solar power production has dramatically accelerated in both mass quantity and solar energy harvesting efficiency. However economic constraints and geographic ties limit the practicality of a total solar based electrical power generating infrastructure. This has prompted developments in photo-electric technology which in turn has led to creation of the dye-sensitized organic based solar cell. Comparable to the silicon based cells organic or carbon based models are cheaper and easier to produce, as the necessary raw materials for construction are far more obtainable than their silicon counterparts. New technologies though have their flaws. As of now most carbon based cells can only convert energy for short periods of time. This is due to the easily degradable organic compounds within. The primary objective of my research is to demonstrate how said chemicals can be protected by the use of an ultraviolet light filtration system, so that organic models could possibly replace expensive silicon models cheaply and without mass negative production pollutants. Through original experimentation sufficient evidence was found to suggest the major reason for decomposition was in fact UV caused chemical degradation. Proving that, shielding an organic cell with a UV filter like polycarbonate thermosetting plastic can increase lifetime output, compared to a control cell.

Awards Won:

