

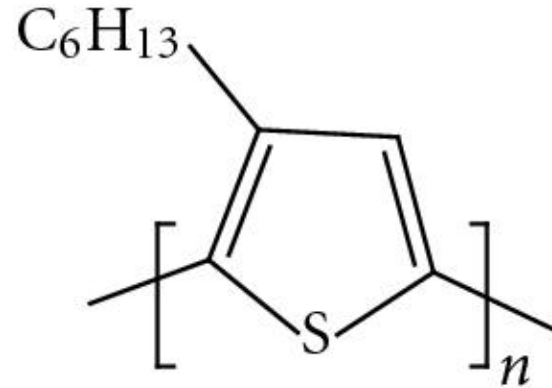
Benefits and Drawbacks of P3HT

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What is P3HT?

- Poly(3-hexylthiophene) is a polymer chain photovoltaic alternative to silicon solar cells.
- It is much more efficient than silicon in every way except one.

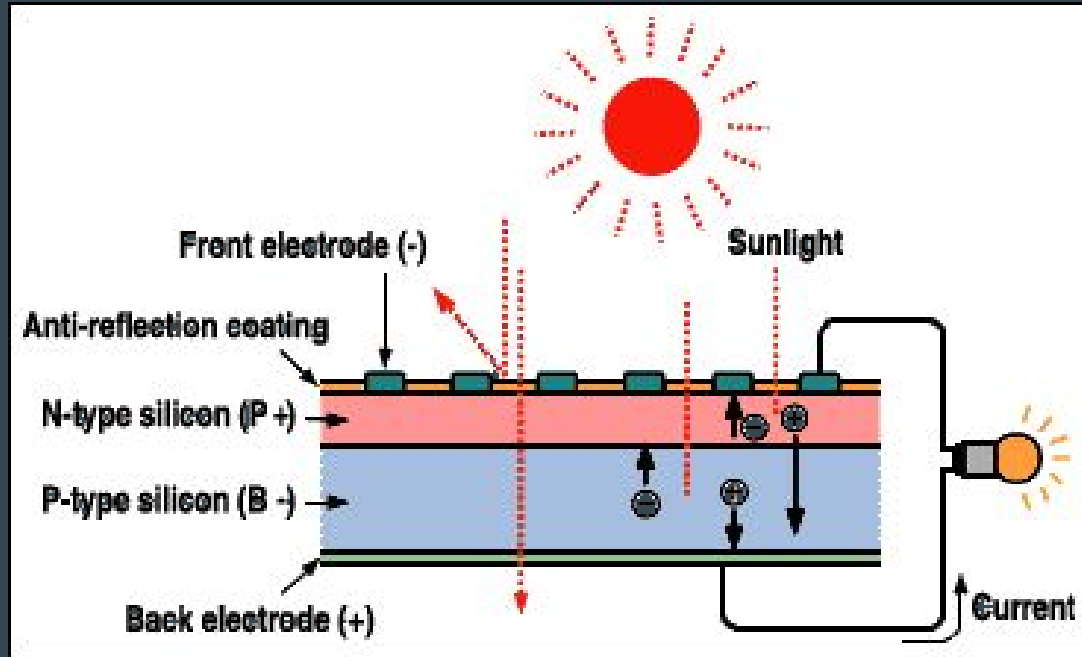


P3HT: Poly(3-hexylthiophene)

How do normal solar cells work?

1. Light strikes the solar cell
2. Electrons are removed from the atoms of the semiconductor material
3. The electrons move through the conductors at either end of the cell
4. An electric current takes place

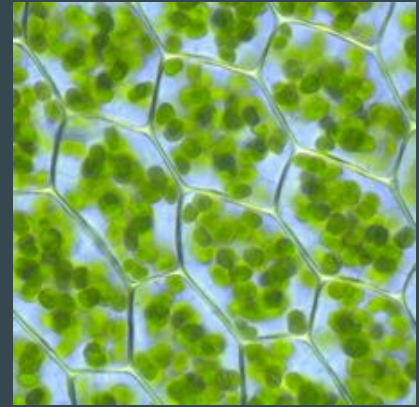
Ge, Weihao. *An Overview on P3HT:PCBM, the Most Efficient Organic Solar Cell Material so Far*. (n.d.): n. pag. 2009. Web. 29 Sept. 2015.



Carlé, J. E. (2014) Important Materials for the Active Layer in Organic Solar Cells. *PlasticPhotovoltaics.org*.

History behind P3HT

- Photovoltaic idea discovered in 19th century
- Officially started research in 1950's
- Initially researched organic dyes (chlorophyll)
- Plastic solar cells currently being researched for increased shelf and operating lifetime



What research has been done?

- Research has been done that suggests why P3HT is popular in the active layer of solar cells.
 - The active layer converts solar energy to electrical energy.
 - Cost and efficiency
- Due to its reactive properties with water vapor, it has a very short life span.
 - Research is also being done to solve this issue.
 - This is the only real drawback of this polymer.

"A New Form of Chlorophyll?" *Scientific American Global RSS*. N.p., n.d. Web. 20 Oct. 2015.

"Sharp Solar Cells Can Reach 60 Percent Efficiency." *SlashGear*. N.p., 20 June 2014. Web. 20 Oct. 2015.

Dang, M. T., Hirsch, L., Wantz, Guillaume. (2011) P3HT:PCBM, Best Seller in Polymer Photovoltaic Research. *Wiley Online Library*.

Benefits:

- Cost effective
- Better allocation of resources
- More energy efficient
- Higher physical durability
- Lightweight

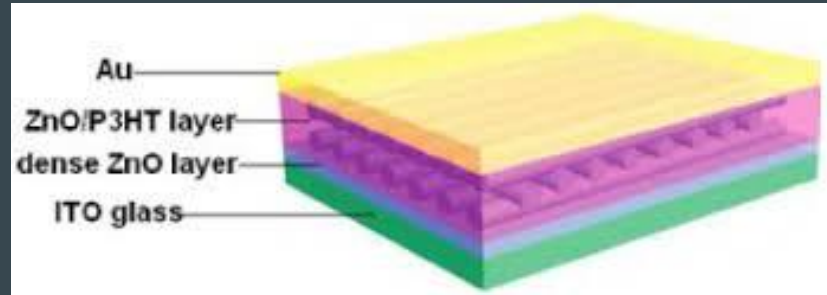
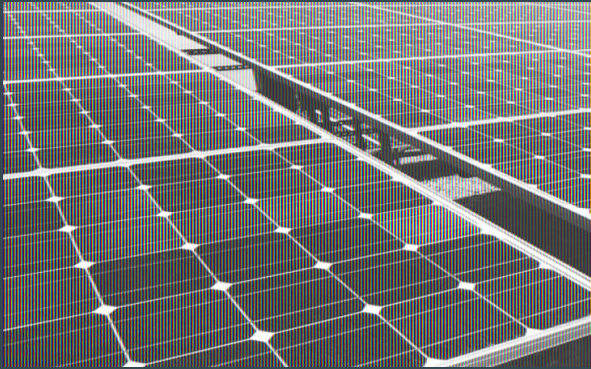
Drawbacks:

- Will degrade rapidly when exposed to water, including small amounts of water vapor present in air



The alternatives:

Normal silicon solar cells are what are commonly used today. Despite being less efficient and costing more money, they are much more durable than P3HT based cells. While P3HT is cheaper, it is not cheap enough to replace the cells every few years after they have decomposed.



Ge, Weihao. *An Overview on P3HT:PCBM, the Most Efficient Organic Solar Cell Material so Far*. (n.d.): n. pag. 2009. Web. 29

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