Literature study

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# Which dye can you use.

* ruthenium complex dye [1]
* Artificial chlorin-type sensitizers
* D-A-pi-A indoline dyes
* BODIPY series of dyes derived from C219
* Cyclometalated ruthenium sensitizers [2]

These materials are electron rich and have a good light absorption coefficient.

# Is there an alternative to the graphite layer

Alternative to an graphite layer:

And alternative to graphite is platinum, it has low resistance and high electrocatalytic activity for iodide but it is more costly then graphite [3]

# Do you have a proposal to improve the efficiency

* Combustion synthesized TiO2 [4]
* Hollow SnO2 as top layer for TiO2 layer: gives a lower resistance and faster diffusion constant causing less recombination in the material and a lower FF value. [5]

# Why exactly is TiO2 used, and not ZnO or SNO2?

TiO2 accepts electrons quicker from the dye, allowing for a higher current, it’s more chemically resistant, and cheaper.[6]

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[2] V. Sugathan, E. Jogn, et al, Recent improvements in dye sensitized solar cells: A review, Renewable and Sustainable Energy Reviews, 2015, Volume 52, 54-64

[3] P. Li, J. Wu, et al, High-performance and low platinum loading Pt/Carbon black counter electrode for dye-sensitized solar cells, Solar Energy, 2009, Volume 83, Issue 6, 845-849

[4] S. Umale, V. Sudhakar, et al, Improved efficiency of DSSC using combustion synthesized TiO2, Materials Research Bulletin, 2019, Volume 109, 222-226

[5] J. Chen, C, Li, et al, Hollow SnO2 microspheres for high-efficiency bilayered dye sensitized solar cell, RSC Advances, 2012, Issue 19, 7384-7387

[6] P. Tiwana, P. Docampo, et al, Electron Mobility and Injection Dynamics in Mesoporous ZnO, SnO2, and TiO2 Films Used in Dye-Sensitized Solar Cells, ACS Nano, 2011, 5(6), 5158-5166