

TITLE: Design and synthesis of carbocyanine based photosensitizers for use in dye-sensitized solar cells

AUTHOR: Tyler L. Dost

PRINCIPLE INVESTIGATOR: Maged Henary

In the search for clean, renewable power, solar power has long been considered as a prime source of energy. In recent years, dye-sensitized solar cells have emerged as a promising method to harvest light energy from the sun. In order for dssc's to compete with traditional solar cells, their conversion efficiency must be improved. In the interest of developing more efficient dssc's we have synthesized a set of novel carbocyanine dyes and tested their abilities as photosensitizers in TiO₂ photovoltaic cells.

Results and Conclusion: These compounds were purified using a combination of alumina gel open tubular column chromatography and solvent exchange. ¹HNMR, ¹³CNMR and mass spectroscopy were recorded to verify structure and purity of the compounds. The compounds were analyzed for current efficiency and J-aggregation.