Project Description Notes:

Measurement of the flux of a single element LED as a function of If that the integrating sphere could handle. Diode shows it’s linear. Flux emitted by the diode as a function of current. Want to run the photoreactor at a smaller volume, to not pump as much peroxide to maintain steady state. It would be good to not pump peroxide as you pump thew volume goes out, the methane gas was bubbling through and entraining water in the headspace and water getting in the lines. Smaller amount of peroxide. I don’t know if I could use the integrating sphere.

Photolysis of hydrogen peroxide and measure the kinetics. Methane to CO2 to formate. Compare those kinetics to when we are not pumping peroxide but just titania there. Heterogeneous vs Homogeneous reaction.

Condition 1: Water with a hydrogen peroxide solution, optically some absorption but small. Absorbance but no scattering

Condition 2: Absorbance and scattering with titania in the solution.

Pyrex: Cuts out higher energy UV. Flux of photons in the solution.

Build a constant current power supply that can provide a current at ~10mA. Build a box that could run 6 at the same time with adjusted fluxes. Build a LED lamp. Build a stick that has 4 LEDs and have a power supply that can run that. Could measure current with a computer chip/Arduino or with ammeter. The power supply with the h reels instrument that has a very expensive filament that needs to be controlled. Front panel meter from digikey, if the current is large, it might not be happy. Current sensing resistor and measure the voltage drop. And I precise resistors. Digital voltmeter. 1ohmn resistor and have a read out. Power supply design constraints.

Is it just me designing it. Could be used by Riley using this after I go grad school. Good for infrastructure.

Kubelka-Munk Units. Scattering vs Absorption for the titania particles. To put rates on a fundamental quantum yield basis. Programming things in a python code. – Theoretical Aspects.

Kinetics photolysis vs photocatalysts and put it on a quantum yield need to determine the photon flux or photon absorption.