Photoelectrolysis: A Study of Intensity and Hydrogen Production

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Purpose: The purpose of this project was to simulate different variations of daylight by varying the distance of an artificial light to a solar panel in order to produce hydrogen. Procedures: A chemical storage bottle was cut in half, and nickel electrodes were put in the bottom, parallel with each other. The bottle was then filled with 250mL of phosphate buffer solution. Graduated cylinders were also filled with buffer solution and then place over top of the nickel electrodes. The photoelectrolysis unit was connected to solar panel. Using a 100W light bulb 1m from the solar panel, intensity and the amount of hydrogen produced in 20 minutes were measured. These steps were then repeated at the distances: 0.75m, 0.50m, 0.25m. The procedure in its entirety was then repeated with 200W and 300W light bulbs. Three trials of the above procedures were then conducted. Conclusion: The intensity of the 300 watt light bulb was the highest at all distances with the highest average intensity of 1.140E-4 W/cm2. The 300 watt bulb also produced the most hydrogen every time with it's highest average output being 1.583mL. The reason it was able to produce so much was due to the higher wattage available. No overpotential was present in the circuit due to the lack of energy.

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