Photoelectrolysis: Increasing Efficiency of Solar Energy

Cramsey, John

Purpose: The purpose of this project is to see which amount of resistance will have the greatest affect on the efficiency of the electrochemical cell. Procedure: Six wires were cut to size with alligator clips attached. Batteries were joined into a series and were, along with the voltmeter and resistor, attached to the breadboard. Nickel test strips were positioned into Styrofoam. Phosphate buffer was added to the beaker. The nickel electrodes were connected to the circuit. The beaker was placed onto the stir plate. A tenth of a gram of cobalt was added. This was repeated four times. The phosphate buffer was changed. Two more trials were done. Three more resistors were put in place of current resistance and above procedures were conducted. Conclusion: It was hypothesized that the 10K ohms of resistance will produce the highest efficiency and the 500K will produce the lowest. This hypothesis was incorrect. While the 10K ohms of resistance produced a reaction, there was too much overpotential. The 50K ohms of resistance produced the greatest efficiency with the lowest overpotential. The 100K and 500K ohms of resistance reduced the current such that the hydrolysis reaction could not be produced.

Awards Won: