The Concentration Combination

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In the Concentration Combination experiment, the combination of luminescent solar concentration and solar water heating was investigated. The purpose of the experiment was to determine whether luminescent solar concentration (LSC) could be used in conjunction with solar water heating without either form of solar concentration hindering the performance of the other. The proposed hypothesis was that the two forms of solar concentration could, in fact, be combined without a hindrance in the performance of either form of solar concentration. In order to test this hypothesis, three solar concentrators were set up: a cylindrical luminescent solar concentrator, a solar water heater, and a combination of the two. These concentrators were tested for Amperage and temperature output at ten minute intervals. The cylindrical LSC had an average output of 8.2 Amps, the solar water heater output water was 33 degrees Celsius, and the combined concentrator had an average output of 4.03 Amps and 36 degrees Celsius. The data collected showed that, when combined with LSC, solar water heating showed an increase of 3 degrees Celsius, when compared to the separate solar water heater. However, the combined LSC produced an output that was almost half of that by the separate luminescent solar concentrator. Based on this data, the hypothesis was rejected. A possible follow up experiment could be to find out whether wrapping a one-way mirror around the combined solar concentrator would improve its output efficiency.

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