The Concentration Combination, Year II

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In the Concentration Combination: Year II, the efficiency of a spherical and a cylindrical luminescent solar concentrator- solar water heater (LSC-SWH) combination was investigated. The purpose was to determine whether the spherical or the cylindrical LSC-SWH combination was more efficient. The proposed hypothesis was that the spherical LSC-SWH would be more efficient. This was tested by creating two setups, a cylindrical LSC-SWH, and a spherical LSC-SWH. After being left in the sun for twenty minutes (for ten trials), the spherical concentrator had an average electrical output of 81.5 milliamps, and an average temperature increase of 0.075 degrees (Celsius) per liter per minute. The cylindrical concentrator had an average electrical output of 4.42 milliamps and 0.126 degrees (Celsius) per liter per minute. Based on this data, the hypothesis was rejected. Since the cylindrical solar water heater and spherical luminescent solar concentrator were found to be more efficient, a possible follow up experiment could be to test whether the combination of a cylindrical solar water heater and a spherical luminescent solar concentrator is more efficient than the electrical output of the spherical luminescent solar concentrator and the water heating output of a cylindrical solar water heater. This experiment has immediate applications; it can be used in places where hot water and electricity are not readily available, such as third-world countries, areas affected by natural disasters, and in mobile military bases that have no access to such resources.

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