

# Supplemental Worksheet for Experiment 19

Thames & Kosmos Fuel Cell Car & Experiment Kit Lab Manual - Page 70

## Splitting All of the Water in the Fuel Cell

This experiment will take a long time (6 - 8 hours), but the results are needed for experiment 20. The purpose of this experiment is to again determine the rate of hydrogen formation and to record how long it takes to use up all of the water in the fuel cell.

1. Set up the solar panel-fuel cell apparatus to split water again, complete with a multimeter to measure voltage. (See experiment 15 for cell set-up and fig. 100 on pg. 64 for voltage measuring diagram).
2. Get ready with a stop watch to start the timer as soon as bubbles are forming. Turn on the lamp to start the formation of hydrogen and record the time it takes to produce 6 ml, 12 ml, 18 ml, & 24 ml of hydrogen. When the voltage is stable (not changing), record that too. Do not stop the fuel cell!

Stable Voltage = \_\_\_\_\_ Volts

Amount of hydrogen	Time (sec.)	Rate of production
6 ml		6 ml / time =
12 ml		12 ml / time =
18 ml		18 ml / time =
24 ml		24 ml / time =
Find the average rate of production; add together and divide by 4 =		

3. Let the gas just bubble out of the tanks and keep the fuel cell going for a long while. Check on it every 20 minutes or so to see if either the bubbles slow down or the voltage increases.
4. As soon as the bubbles slow down or the voltage increases significantly, stop the timer and write down the total time to empty the fuel cell of water.

Total time to empty fuel cell = \_\_\_\_\_ sec.

5. Calculate the amount of gas produced from the fuel cell. To do this, take the average rate from the table above (ml/sec) times the total time (sec) = ml.