

THE OUTPUT AND APPLICATION OF FUEL CELLS

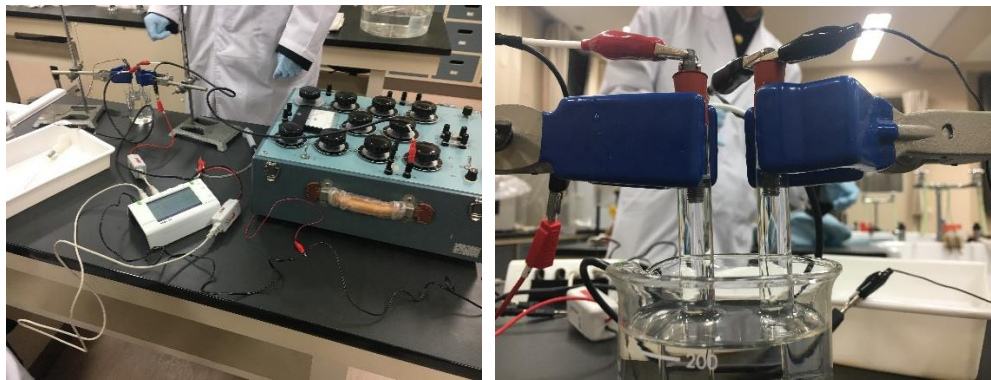
Kobe High School Sougourigaku-ka(Science Course) 1st grade Yuito Ueda Yui Asanoma Tomoka Sakaguchi Yuki Hattori

PURPOSE

Recently, fuel cells have been paid attention to as a new energy source. Fuel cells don't emit CO₂ and don't need huge equipment. So many people are expecting to apply it to various fields. This time, we inspected the output of fuel cells and set a new goal to make a fuel cell in an emergency.

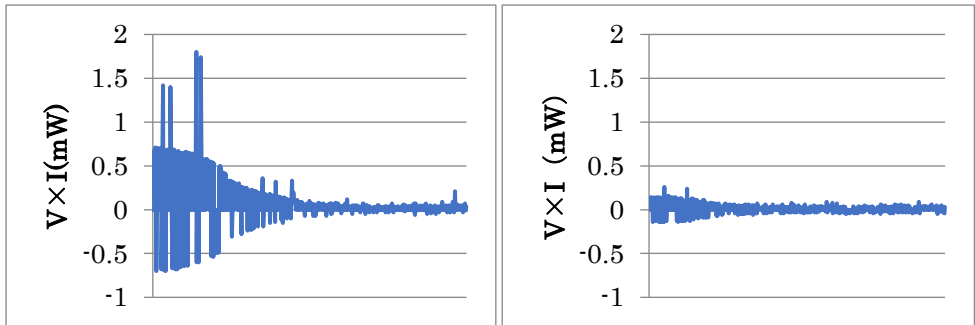
METHODS

We made an original experimental device and did some experiments. We compared some results by changing three conditions; concentration of solutions, the kind of solutions, and the surface area of the electrode in the solutions. We adjusted the surface area of the electrode in the solutions by changing the amount of gas we put in the test tube. We used air for oxygen and made hydrogen by ourselves. We measured current and voltage by lowering electrical resistance.

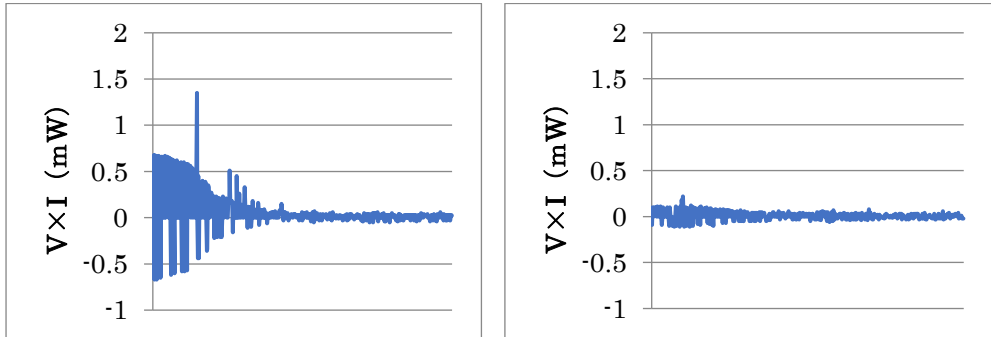


RESULTS

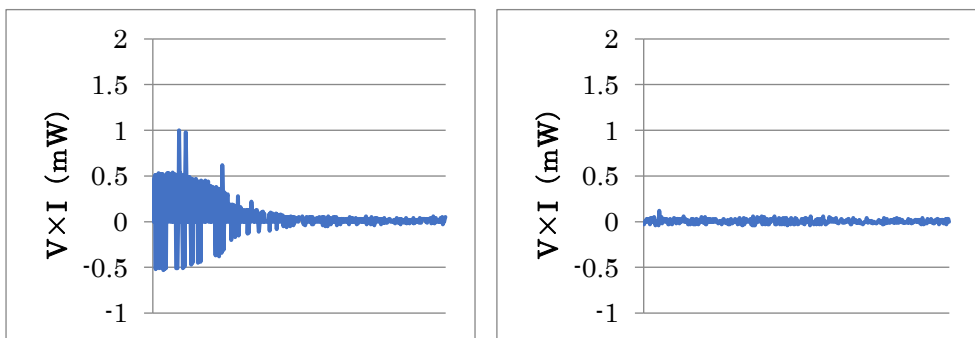
① KOH aq 0.5mol/L gas 1.4mL ② KOH aq 0.1mol/L gas 1.4mL



③ KOH aq 1.0mol/L gas 1.4mL ④ KOH aq 0.5mol/L gas 0.6mL



⑤ NaOH aq 0.5mol/L gas 1.4mL ⑥ A bathroom cleanser



CONSIDERATIONS

Comparison of concentration (①,②and③)

We cannot find a clear difference between the solution of 0.5mol/L and the solution of 1.0mol/L.

We can find a difference in the output between the solution of 0.1mol/L and the solution of 0.5mol/L.

→When the concentration of the solution is too low, equipment doesn't function as a fuel cell. However, when the concentration of the solution is enough, it doesn't affect the output.

Comparison on the kinds of solution (①,⑤and⑥)

We cannot find a difference in the output between the solution of KOH and that of NaOH. We cannot compare a bathroom cleanser with the others, for the result while using it is uncertain.

Comparison of the surface area of the electrode

(①and④)

We got the result that the more gas we put in: the smaller the surface of the area electrode in the solutions, the bigger the output we could get. However, we got some results that even when the amount of the gas was little, the output was big. Therefore, we need some additional experiments to verify our results.

As a whole

The output was too small. While the voltage rose to 0.5V, the current rose to only 3mA. This cannot be said to be practical.

There were unnatural values in almost all results, but we couldn't identify the sources of these errors. .

POINTS FOR IMPROVEMENT

- When we make the solutions for experiment, we should check the concentration of them, because the KOH powder and the NaOH powder might have been old.
- We should set some conditions, for example, temperature and timing for changing electrical resistance.
- We should think of how to deal with the bubbles.
- When we put a bathroom cleanser in the test tube, there were some bubbles in the test tube. So we couldn't get the right result.

