③(福島班)

Development of Useful Batteries for Disasters

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Abstract

We evaluated the performance of the binchotan battery. We conducted experiments at different power generation temperatures and electrolyte concentrations, and investigated changes in current values.

1　Introduction

We enjoy an affluent life through the use of electricity, but when a disaster occurs, the supply of electricity is interrupted. We have therefore focused our attention on air batteries, which can generate electricity using familiar materials, and began research on them.

2　Theory and Experiment

Batteries were prepared using cylindrical binchotan (3.0cm in diameter and 13.3cm in length), sodium chloride solution, kitchen paper, and aluminum foil, and battery performance was examined using a digital multimeter (CDM-16D). The current value was measured for 5 minutes.

<Experiment 1>

We compared currents generated at 4 different temperatures.

(2℃, 11℃, 21℃, 45℃)

<Experiment 2>

We compared currents generated using 3 different sodium chloride solutions.

(1M, 3M, 6.1M)

3　Results

Increasing the power generation temperature and the concentration of sodium chloride solution also increased the current value.

4　Discussion

The above results show that the concentration of the electrolyte has a greater effect on the current value than the temperature at the time of power generation. Therefore, if a disaster occurs at a time when the temperature is difficult to rise, simply increasing the concentration of the electrolyte can greatly improve the power generation efficiency.

5　Key words

Binchotan　Current value　Temperature　Concentration　Sodium chloride solution