

衛 慶碩

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伝導性ポリマーによる熱充電可能な電気化学セルの創成

## § 1. 研究成果の概要

We have demonstrated that the PEDOT/PSS film is an attractive electrode in thermoelectrochemical cells, as it shows an even lower charge transfer resistance than Pt. The PEDOT/PSS-based thermoelectrochemical cell (10 cm × 10 cm) uses to drive emitting diodes and Beacon for wireless communications by using body heat. We have fabricated the cells which work for a couple of months.

We have further studied three systems for the thermoelectrochemical cells this year. The first one is gel electrolyte based on polyvinyl alcohol. The flexible device gets a power output of 3  $\mu$ W at a temperature difference of 10K. We have found that using D<sub>2</sub>O as a solvent generally has a higher thermopower compared with H<sub>2</sub>O as a solvent. This is because of decreasing transportation entropy in D<sub>2</sub>O. In the last part, we study the thermoelectrochemical effect by using magnetic ion liquid as an electrolyte. Although the response to the magnetic field is not confirmed, the cell generates 80 nW/cm<sup>2</sup> at a temperature difference of around 10K. The thermopower of this system is strongly dependent on the solvents.