Wearable Sensor

Ultraflexible Temperature Sensors

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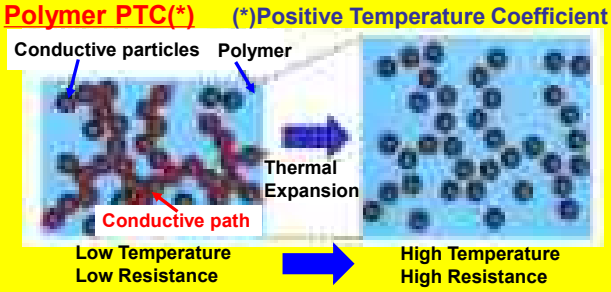
1. Introduction

We have developed a flexible and printable temperature sensor based on composites of semicrystalline acrylate polymers and graphite.

This temperature sensor is expected to find healthcare and welfare applications in devices for monitoring body temperature.

2. Key Features, Principle of the Invention, Structure of the Material

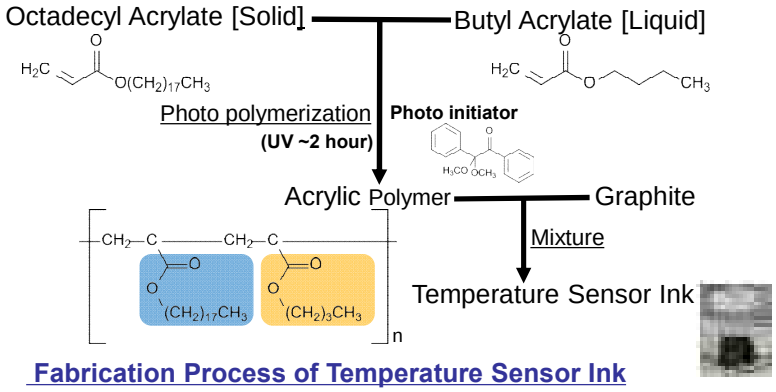
Polymer PTC(*) (*)Positive Temperature Coefficient



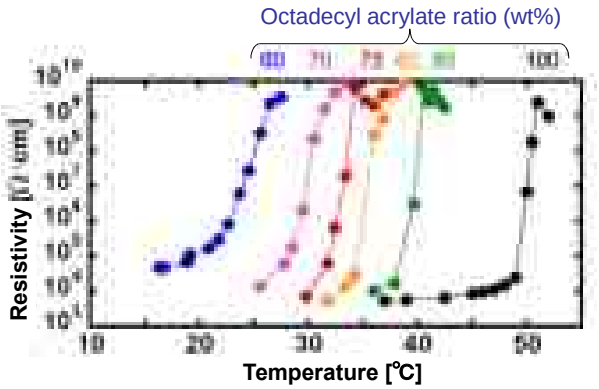
-The temperature sensor we have developed is used acrylic polymer mixed with graphite.

-Resistance value is increased by the thermal expansion due to the rise of temperature. (➔Polymer PTC)

-The sensor achieves a high sensitivity of 20mK and a high-speed response time of less than 100ms.



Fabrication Process of Temperature Sensor Ink

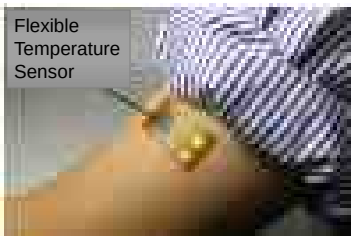


Controllability of Response Temparature

-Exhibit changes in resistivity by six orders at a change in temperature of 5℃.

-The response(target) temperature can be precisely controlled by altering the proportions of the two monomers.

3. A Printable, Flexible Sensor for Monitoring Body Temperature



- Printable (possible to manufacture in printing process)
- Flexible
  (possible to paste to the surface of the living body and the curved surface)
- Response Temperature: 25℃~50℃ (covering body temperature range)
- High-speed response time of less than 100ms
- High durability and repeatability: 1,800 times

4. Application Examples

-Healthcare and welfare applications for monitoring body temperature, for newborn infants or for patients in intensive care.

-Wearable electronic apparel application where the temperature sensor could be applied beneath fabric to measure temperature during sporting and other activities.

5. Patent Licensing Available

Patent No.: WO2015/119205 (JP, US, EP, KR, CN)

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