

Development of a Fluorescent Temperature Sensor Using Ruthenium Complex( $\text{Ru}(\text{phen})_3$ ) for Temperature Monitoring in Biological Processes

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In this work, ruthenium complex( $\text{Ru}(\text{phen})_3$ ) was doped onto polyacrylonitrile(PAN) nanoflower particles and immobilized into films consisting of ethyl cellulose(EC), polyurethane(D4), and hydrothane(HH), respectively, to measure temperature through fluorescence as a sensor membrane. The linear temperature range was set at 5 to 60 °C, which is mainly used in biological processes. Three temperature sensing membranes were compared to a sensing membrane fabricated with PAN as a supporting material. Our results demonstrate good potential for applications that monitor temperature changes in biological processes and measure the temperature of biological products.