

ABSTRACT

Among the various conducting polymers made from organic materials, polyaniline is a type of conducting polymer that has the properties of high stability, low cost of synthesis, and high electrical conductivity. Some applications of Polyaniline polymers are secondary type batteries, chemical sensors, polymer LEDs for electronic devices and other optoelectronic applications. In this research a tool will be made to monitor pH and temperature in the polymerization reaction process using a pH-4502C sensor and a DS18B20 temperature sensor integrated with the nodeMCU ESP8266 microcontroller using an internet connection, and the data results obtained from the sensor are displayed in an application called blynk. The polymerization method that is most common and easy to carry out in the polyaniline polymerization process is chemical oxidative polymerization. In this method, most researchers use freezing temperatures or ice to obtain a more conductive polymer. Therefore, a method is needed to control the constant solution temperature at 0-4 °C. This tool is equipped with a Styrofoam box to keep the temperature cold and ice cubes as a cooling agent to keep the temperature within the range of 0-4 °C. The system measures pH and temperature, and sends the data to Blynk and monitors it via a smartphone. The results of testing the accuracy of the pH-4502C sensor and the DS18B20 sensor obtained an accuracy rate of 99.783% for the pH-4502C sensor and 98.745% for the DS18B20 sensor. The system has been successfully created and is able to transmit real-time data via an internet connection, making it easier for users to monitor the polymerization reaction process remotely, and provide notifications if the temperature is not in the range of 0-4 °C. The results of polyaniline synthesis using the system have a dark green physical appearance similar to that in the literature.

Keywords : Blynk, NodeMCU, Polyaniline Polymerization, DS18B20 sensor, pH-4502C sensor.