The Design of Paper Based Colorimetric and Fluorescence Carbon Dioxide Sensors Adaptable to the Monitoring Process of Endotracheal Intubation

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The direct correlation of CO2 gas with the vital activities resulting from the cellular respiration has led to the development of many sensors for the detection of this gas throughout the history. The frequent use of CO2 sensors in everyday life, has led to the purpose of development of a useful and inexpensive CO2 sensor in this project. For this reason, the sensor is designed to work on paper, which is a reliable and effective surface to qualitatively measure CO2. Twenty three different indicators were selected by the catalog search to achieve the stated purpose. In laboratory, indicators were dissolved in mineral water and other substances in different properties and the prepared solutions were compared according to color changes. From these comparisons, it was determined that fluorescein and bromothymol blue were the most suitable indicators for CO2 detection and thus paper based colorimetric and fluorescence CO2 sensors were made with these indicators. An important example of the everyday use of CO2 sensors is the control devices developed to determine whether the endotracheal intubation process applied to the patient suffering from respiratory distress works correctly. Our secondary purpose in the project is to demonstrate the potential of our sensors to be adapted alternatively to those devices. Therefore, a prototype, endotracheal intubation control device was prepared. As a result of the experiment and the designed instrument, it was revealed that the colorimetric and fluorescence CO2 sensors formed with this research can be developed with further researches and used in those control devices.

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