

Title : Development of aza-BODIPY chemosensor for Arduino controlled colorimeter

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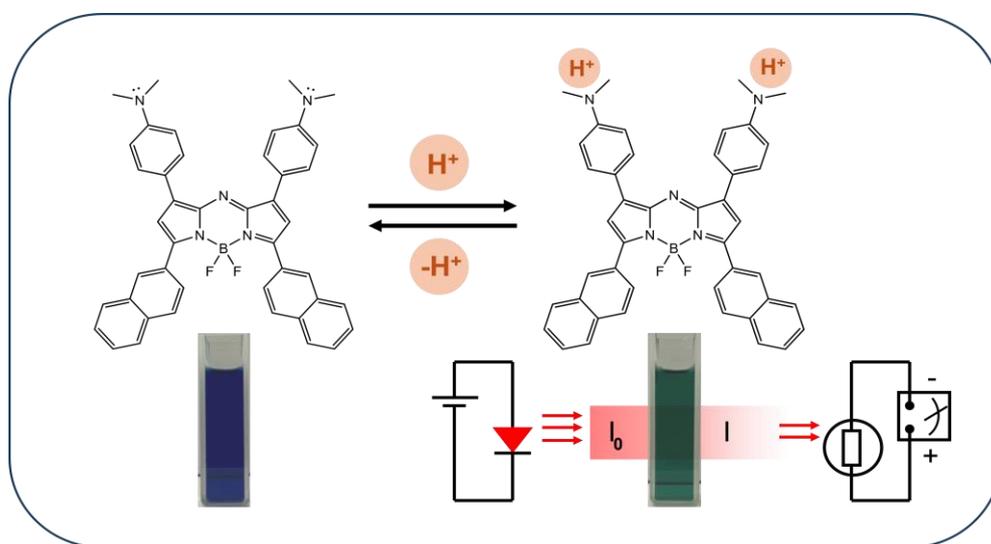
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ABSTRACT

In this research, the investigation of aza-boron dipyrromethene (aza-BODIPY) and its chemical sensor properties for selective ion detection was performed. The synthesis of aza-BODIPY compound NI4, which contains two dimethylaniline as well as two naphthyl groups, was carried out successfully. The NI4 solution exhibited absorbance at 624 nm. Upon the addition of hydrochloric acid solution, the color change and the appearance of a new absorption band were observed at 677 nm. The color change from blue to green could be easily observed by naked eyes. This change could be due to the inhibition of charge transfer between the dimethylaniline groups and the aza-BODIPY core. To verify this hypothesis, various spectroscopic techniques were employed, including UV-Visible spectroscopy, ¹H-Nuclear Magnetic Resonance (¹H-NMR), and Fourier Transform Infrared Spectroscopy (FTIR). Additionally, the custom-built Arduino-based colorimeter was developed and used to measure hydrochloric acid concentration based on the color change of the solution. The results were then compared with those obtained from a UV-Vis spectrophotometer. The limit of detection (LOD) for the UV-Vis spectrophotometer was found to be 0.4065 μM, while the LOD for the colorimeter was 11.2310 μM. The compound NI4 along with custom-made colorimeter demonstrated potential as a test kit prototype for H⁺ detection.



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