Short Communication

Development and Performance of an All-Solid-States pH Sensor Based on Modified Membranes

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In this study, we developed an all-solid-stated planar pH sensor with the help of magnetron sputtering technology and printed circuit board (PCB). The developed pH sensor consists of a working electrode, which employed antimony sensitive thin film and Nafion modification membrane, and an Ag/AgCl reference electrode, which was modified by graphene-chitosan membrane. Then, the performance of the pH sensor was investigated. The results demonstrate that the developed pH sensor has excellent features, including high sensitivity (54.5 mV/pH in the pH range from 4 to 9), short response time (about 20 s), and stability (less than 2 mV in 10 min period, and less than 2 mV/pH in a month.). Further, the developed pH sensor was applied in some common samples, such as coke, vinegar, mineral water, clay, peat, and vermiculite, and the measuring absolute error was less than 0.60 units, and the measuring relative error was about 10%. The pH sensor is low cost, high performance, and easy fabrication, is promising to popularize in laboratory and industrial.

Keywords: pH sensor; all-solid-stated; antimony film; Ag/AgCl reference electrode; modification

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