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Abstracts

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Sensing Performance of Calixarene Modified QCM Sensor towards Alcohol Vapors

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Abstract

In addition to the comfort that developing technology brings to our lives, the size of the pollution that this development gives to nature and the environment is rapidly increasing day by day. The wide usage of organic chemicals in the industry accelerates the release of them to the environment and causes a serious problem for human health. For this reason, urban air quality has become an important issue all over the world due to the rapid development of industrial applications. One of the chemical groups that cause chemical contaminations is Volatile Organic Compounds (VOCs), which are usually composed of carbon and hydrogen chemicals that can evaporate at normal room temperature. VOCs are used and released in many industrial processes, especially in chemical, petrochemical, pharmaceutical and cosmetic industries, as well as in many domestic activities. Among VOCs, some alcohol derivatives such as methanol, ethanol, and isopropyl alcohol are widely used as a solvent and raw material in industrial processes. In these chemical processes, they can escape atmosphere easily during the reaction due to their capability of high volatility. The increases in amount of these compounds in the atmosphere threat the all creatures. For this reason, high sensitively and rapidly detection of alcohol vapors has become a major concern for researchers to eliminate the adverse effects of it on both human and environmental health. Among many alcohol sensing methods, quartz crystal microbalance has drawn attentions due to high sensitivity, fast response, simplicity, low experimental cost, detectible mass changes at ng level. Calixarenes (n = especially 4, 6, and 8) are cyclic oligomer consist of phenolic units and are very well known as attractive excellent ionophores because they provide a unique three dimensional structure with almost unlimited derivatization possibilities. In our previous works, we have also synthesized some calixarene compounds and they has been investigated their sensing properties for volatile organic compounds. In this work, I have prepared amino morpholine functionalized calixarene derivative and examined its sensing property towards some alcohol vapors. The results showed that proposed sensing material exhibited good performance towards alcohol vapors.

Keywords: *air quality, calixarene, QCM sensor, volatile organic compounds.*
