

INTISARI

Deteksi Uap Analit N-Butanol Menggunakan *Quartz Crystal Microbalance* (QCM) Berlapis Nanofiber *Polyvinyl Acetate* (PVAc)

Quartz Crystal Microbalance (QCM) berlapis nanofiber *polyvinyl acetate* (PVAc) digunakan untuk mendeteksi uap butanol. QCM-PVAc sebagai sensor berhasil mendeteksi uap butanol. Hal ini dikarenakan adanya ikatan hidrogen antara uap analit dengan permukaan sensor. Analit butanol divariasikan konsentrasinya untuk melihat respon sensor. Dari hasil tersebut, didapatkan nilai sensitivitas sensor QCM berlapis nanofiber PVAc terhadap butanol sebesar $16,4 \pm 0,2$ Hz/(mg/L). Selain itu, didapatkan nilai *limit of detection* (LOD) dan *limit of quantification* (LOQ) dari sensor sebesar 0,078 mg/L dan 0,237 mg/L. Sensor juga memiliki waktu respon sebesar 67,56 s terhadap butanol. Untuk melihat selektivitas sensor, dilakukan pengujian terhadap analit lain, yaitu propanol, etanol, benzena, dan aseton. Respon sensor menunjukkan perubahan frekuensi yang besar terhadap butanol. Pada kasus ini, tekanan uap mempengaruhi karakteristik sensor QCM-PVAc. Dari hasil pengujian terhadap beberapa analit, sensor QCM-PVAc memiliki sensitivitas yang tinggi terhadap alkohol primer.

Kata-kata kunci : *quartz crystal microbalance* (QCM), *polyvinyl acetate* (PVAc), *limit of detection* (LOD), *limit of quantification* (LOQ), butanol, propanol, etanol, benzena, dan aseton.

ABSTRACT

Detection Vapor Of N-Butanol Analyte Using Quartz Crystal Microbalance (QCM) Coated With Polyvinyl Acetate (PVAc) Nanofiber

Quartz Crystal Microbalance (QCM) coated with Polyvinyl Acetate (PVAc) nanofiber is used to detect butanol vapor. The QCM-PVAc as a sensor has been successfully to detect butanol vapor. This detection caused by the hydrogen bond between the analyte vapor with the sensor surface. Butanol concentration is varied to see the sensor response. The results show that the QCM-PVAc sensitivity for butanol is $16,4 \pm 0,2$ Hz/(g/L). The limit of detection and the limit of quantification for butanol are 0,078 mg/L and 0,237 mg/L. The response time of sensor is 67,56 s. To see the sensor selectivity, sensor is tested with other analytes, i.e., propanol, ethanol, benzene, and acetone. Sensor response shows a large frequency shift to butanol. In this case, the vapor pressure of analyte affected the sensor characteristics of the QCM-PVAc. QCM-PVAc sensor have a high sensitivity to primary alcohol.

Keywords: *quartz crystal microbalance, polyvinyl acetate, limit of detection, limit of quantification, butanol, propanol, ethanol, benzene, and acetone.*