

## INTISARI

### FABRIKASI DAN KARAKTERISASI DETEKTOR ASAM ASETAT BERBASIS *QUARTZ CRYSTAL MICROBALANCE* YANG DILAPISI *POLYACRYLAMIDE*

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Asam asetat dikategorikan berbahaya bagi kesehatan dalam beberapa kasus. Sensor portabel dan sensitif sangat dibutuhkan untuk mendeteksi asam asetat. Tujuan penelitian ini adalah mengamati karakteristik *quartz crystal microbalance* (QCM) dilapisi *polyacrylamide* sebagai sensor asam asetat. Sensor disiapkan dengan melapiskan *1-dodecanethiol* menggunakan teknik *self-assembly monolayer* atau SAM diikuti secara berurutan dengan *glutaradehyde* dan *polyacrylamide*. Sensor menunjukkan stabil terhadap perubahan kelembaban dijangkauan (45-61) %RH. Penelitian juga menunjukkan bahwa sensor memiliki respon yang cepat mendekati 34 detik dan respon yang sensitif sebesar 12,92 Hz/(mg/L), serta mampu mendeteksi sampai 0,005 mg/L. Rata-rata respon stabil juga didapatkan sebesar (20,9±0,4) Hz yang diujikan selama 7 minggu untuk konsentrasi 1,75 mg/L. Penelitian lebih lanjut masih dibutuhkan untuk meningkatkan sensitivitas dan secara spesifik memilih polimer yang lebih selektif.

**Kata kunci:** *quartz crystal microbalance*, *polyacrylamide*, asam asetat, *self-assembly monolayer*.

## ABSTRACT

### FABRICATION AND CHARACTERIZATION OF DETECTOR ACETIC ACID BASED ON QUARTZ CRYSTAL MICROBALANCE COATED POLYACRYLAMIDE

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In some cases, acetic acid is categorized as hazardous to health. A high-performance sensor for detecting acetic acid is urgently required. This study aims to observe the characteristics of quartz crystal microbalance (QCM) coated with polyacrylamide as an acetic acid sensor. For this purpose, the sensor is coated with 1-dodecanethiol using self-assembled-monolayers, or SAM technique followed subsequently by glutaraldehyde and polyacrylamide (PAM). As results, the sensor is stable to humidity changes (45- 61) %RH, which is one of the basic prerequisites for a stable sensor. The sensor showed fast response time and high sensitivity of approximately 32 seconds and 12,92 Hz/(mgL<sup>-1</sup>), as well as being able to detect up to 0,05 mg/L. Average response is stable also obtained of (20,9 ± 0,4) Hz which is examined for seven weeks to 1,75 mg/L concentration. Further research is still needed to increase the sensitivity and specifically choose the polymer more selective.

**Keywords:** quartz crystal microbalance, polyacrylamide, acetic acid, self-assembly monolayer