Polyvinyl acetate film-based quartz crystal microbalance for the detection of benzene, toluene, and xylene vapors in air

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Sensitive Formaldehyde Detection with QCM Sensor Based on PAAm/MWCNTs and PVAm/MWCNTs

Feng, L., Feng, L., Li, Q.

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Quartz crystal microbalance-coated cellulose acetate nanofibers overlaid with chitosan
Abstract

Quartz Crystal Microbalance (QCM) is a mass detection sensor capable of measuring mass sensitivity at nanogram levels when based on a thickness shear mode piezoelectric crystal set at high frequencies.
These sensors detect with high accuracy while benefiting from simple geometry, low costs, and ease of fabrication. Researchers prefer piezoelectric crystal sensors to the recent methods of gas chromatography/mass chromatography (GC/MC), high pressure liquid chromatography and nuclear magnetic resonance (NMR), which are time-consuming and not cost-effective. Unlike conventional QCM sensors that are limited to a single-electrode structure - which minimizes their scope of detection - the Multichannel QCM (MQCM) incorporates multiple sensors fabricated on a single crystal wafer. Each sensor is selectively coated with a sensing material that promotes the adsorption of target vapours. One of the widely used application of QCM sensors is in Volatile Organic Compounds (VOC) detection. This paper imparts a critical overview of recent publications on the application of MQCMs with various sensing materials. © Published under licence by IOP Publishing Ltd.

**Indexed keywords**

**Engineering controlled terms**

Cost effectiveness; Crystal structure; Gas chromatography; High pressure liquid chromatography; Nuclear magnetic resonance; Petroleum prospecting; Piezoelectric materials; Piezoelectricity; Single crystals; Volatile organic compounds
Engineering main heading
Quartz crystal microbalances

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