

## Detection of Nanotoxic Material Using DNA Based QCM

**Authors :** Juneseok You, Chanho Park, Kuehwan Jang, Sungsoo Na

**Abstract :** Sensing of nanotoxic materials is strongly important, as their engineering applications are growing recently and results in that nanotoxic material can harmfully influence human health and environment. In current study we report the quartz crystal microbalance (QCM)-based, in situ and real-time sensing of nanotoxic-material by frequency shift. We propose the in situ detection of nanotoxic material of zinc oxide by using QCM functionalized with a target-specific DNA. Since the mass of a target material is comparable to that of an atom, the mass change caused by target binding to DNA on the quartz electrode is so small that it is practically difficult to detect the ions at low concentrations. In our study, we have demonstrated the in-situ and fast detection of zinc oxide using the quartz crystal microbalance (QCM). The detection was derived from the DNA hybridization between the DNA on the quartz electrode. The results suggest that QCM-based detection opens a new avenue for the development of a practical water-testing sensor.

**Keywords :** nanotoxic material, qcm, frequency, in situ sensing

**Conference Title :** ICABB 2016 : International Conference on Applied Biology and Biotechnology

**Conference Location :** Melbourne, Australia

**Conference Dates :** February 04-05, 2016