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HCG035-P05

Room:Convention Hall

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Method for the measurement of bacterial cell growth using Quartz Crystal Microbalance

Hitomi Torii¹, Hiroaki Takahashi¹, Masao Yamana¹, Tomoko Abe^{1*}

¹Tokyo Denki University

Rapid methods for bacterial detection are significant for food, industrial, clinical diagnostics, and environmental monitoring.

Recently, a quartz crystal has been used as a mass detector and has been applied to determine gases, ions, and some biomolecule (e.g., immuno-compounds). These studies are based on the fact that the resonant frequency change of the quartz crystal corresponds to mass change on the crystal surface.

In this study, we used a quartz crystal microbalance (QCM) as a transducer for the measurement of bacterial cell growth. As a result of the current experiment, both the dry cell weight and the living cell weight were linearly proportional to the frequency change in the range of 10^{-8} to 10^{-5} when our QCM sensor was used for the measurement. Namely, the measurement of bacterial cell weight is possible within this range using the sensor.

The aim of this study is to develop the device and method to monitor in real time cell growth of in situ environmental cultivation. This method will also be variable to analyze the behavior of microbes in the closed-ecosystem.

Keywords: Quartz Crystal Microbalance, Biosensor