ABSTRACT

Multifunctional Breathalyzer for Detection of Infectious Diseases

This document described a Multifunctional Breathalyzer especially for the point-of-care detection of infectious diseases through breath across different test platforms. Breathalyzer is a device to detect volatile organic compounds in breath (BVOCs) and has been heavily deployed for law enforcement, such as for the on-site estimation of blood alcohol content. Notably, the sensitive detection of BVOCs is also an emerging approach to diagnose human health because of the direct connection between BVOCs and the (bio)chemistries occurring in a human body. For instance, small chemical molecules, such as formaldehyde, butane, isoprene, pentane, have been used as recognition biomarkers for many diseases including tuberculosis, and colorectal and lung cancers. Compared to conventional bio-diagnostic methods such as blood sampling, breath-based diagnosis excels as a non-invasive method that can be performed frequently for real-time and rapid monitoring/screening even by non-medically trained personnel. Breath-based diagnosis is thus critical for pre-early disease identification, facilitating treatment and recovery.

FIGURE 1