Using Classes of Molecules to Identify Air Health

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Abstract

Chemical releases, whether intentional or accidental, can be hazards to people's health, both from airborne contaminants from system failures, as well as chemical metabolites from unhealthy individuals. Discrete classes of compounds and mixtures can be used to identify certain hazards in the air. Examples are BTEXs from oil and fuel leaks, organophosphate in chemical weapons, to metabolites from unhealthy individuals (i.e., ketones and aldehydes from respiratory distress, unsaturated hydrocarbons and aromatics from bacterial infections). Because of the complex nature of the environment, isolation of specific classes of compounds from the surrounding matrix can aid in making quick assessment as to the overall quality of the health of the environment. Here we introduce the concept of combining different substrate capture with membrane inlet to create a make-shift fast separation technique for rapid analysis. This is performed by dividing the cabin air into specific capture substrates based on chemical class, and then introducing these events into a highly sensitive and selective portable mass spectrometer. This novel instrument can sample and respond is real-time with less than a 15 second delay.

Biography - Guido Verbeck

Dr. Guido F. Verbeck, Chair and Professor of Chemistry and Biochemistry, is an expert is mass spectrometry, specifically instrument design and development. Dr. Verbeck received his PhD as a Proctor & Gamble fellow in chemistry at Texas A&M University. Dr. Verbeck has developed mass spectrometers and chemical instruments over the past 24 years, and has been a member of the analytical community for 28 years. His appointment is at the Augusta University where he continues to design novel ion optical devices for miniaturization, preparative, and analytical mass spectrometry, and is the Director for the Laboratory of Imaging Mass Spectrometry.

Keywords

Mass spectrometry, Air quality, VOCs, Fieldable