

Enriching Inlet

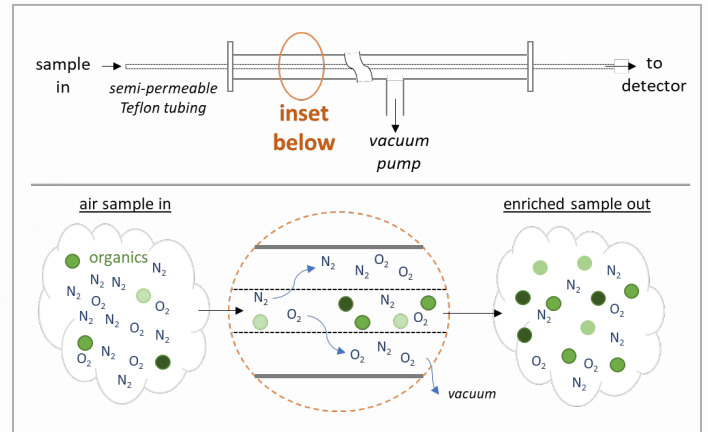
VTIP 21-059: “Apparatus for Enriching the Concentration of Trace Components in an Air Flow”

THE CHALLENGE

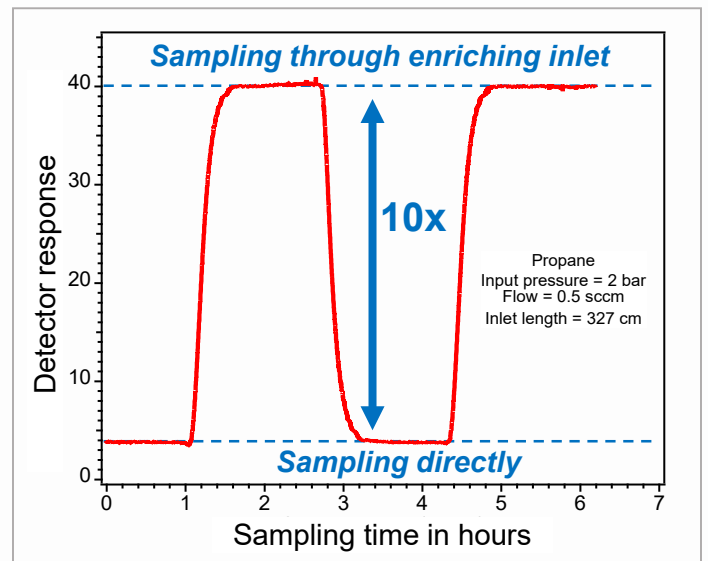
More than 99.9999% of air is comprised of gases that are not chemically reactive (e.g., nitrogen, oxygen, carbon dioxide), even in polluted regions. The remaining <0.0001% of air includes all the components that form what we typically think of as air pollution (toxic odors, particulate matter, ozone, etc.). Due to these extremely low concentrations of target compounds, air quality measurements are often limited by the sensitivity of available instruments. This is particularly true for low-cost air quality sensors. Despite the sharp increase in interest in low-cost sensor technologies, their sensitivity must be improved before they can be considered reliable.

OUR SOLUTION

Gabriel Isaacman-VanWertz has developed an attachment for current measurement systems that will increase the sensitivity of existing air quality measurement instruments. The Enriching Inlet concentrates compounds in any sampled air flow to aid in compound detection and has been specifically optimized for use with volatile organic compounds. By increasing concentrations of target compounds by factors of up to 25 times in low (ccm-level) sample flows, the Enriching Inlet can notably increase the detection levels of contaminants in air, and its modular design enables it to be added as an inlet to any detector. As a result, this technology significantly enhances the effective sensitivity of any system without significantly increasing the price.



Operating principle of the enriching inlet.



The enriching inlet can enhance sampling efficiency by a factor of ten.



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