



New EPA Passive Sorbent Method for Fenceline Monitoring of Benzene

The U.S. EPA recently promulgated Methods 325A and 325B for ambient monitoring of VOCs using passive sorbent samplers. Together these methods cover the sampler deployment and sampler preparation and analysis using tube-style axial thermal desorption tubes for long-term environmental monitoring of VOCs from fugitive and area sources. Methods 325A and 325B are incorporated in the recent refinery sector rule update requiring continuous measurement of benzene concentrations at the refinery fenceline over 14-day periods.

The goal of this work practice standard is to improve the management of the site's fugitive emission controls, and existing refineries are required to implement the fenceline monitoring work practice by October 2017. Each refinery is required to calculate an annual rolling average of the background-adjusted benzene concentration and compare to an action level of $9 \mu\text{g}/\text{m}^3$. Exceeding the action level will prompt corrective action from the refinery to identify and address the suspected emission source. Following a year of monitoring, the fenceline benzene concentrations measured for each period as well as the annual rolling average will be available to the public and reported on a quarterly basis.

As part of the rule-making process, the EPA assessed various technologies for evaluating the effectiveness of emission controls and selected passive monitoring for its low cost and technical benefits. As compared to conventional air measurement methods using evacuated canisters or pumped sorbent tubes, passive monitoring offers several practical and technical advantages which translate to significant cost savings to an air monitoring program. Without the cost of mechanical equipment and the associated burden of continued operation and maintenance of canister trains or sample pumps, passive sorbent tube monitoring is both an economical and reliable alternative technology. Deployment of sample tubes is simple due to their small size, lack of shipping and handling constraints and their lengthy 30-day media



and sample storage specification without the need to preserve the tubes on ice. In addition to the equipment and operational savings, the ability of passive sorbent methods to generate time-integrated measurements over days or weeks at low detection limits translates to fewer samples required over the monitoring program and lower overall field and laboratory costs while providing appropriate sensitivity for ambient monitoring.

The benefits of EPA 325 and passive sorbent methods have prompted significant interest from the air monitoring community beyond refinery fenceline monitoring for benzene. EPA Method 325 is currently being evaluated as an alternative to canisters to monitor VOC concentrations during remediation activities at several former Manufactured Gas Plant (MGP) sites, perimeter monitoring at landfill sites as well as indoor air measurements in buildings impacted by vapor intrusion. While chemical specific uptake rates for long-term ambient monitoring using various sorbents are published in national and international standards including ISO 16017-2, ASTM D6196 and BS EN 14662-4, relevant uptake rates may not be published for key compounds of concern at a site. To minimize this drawback, Eurofins Air Toxics has the equipment and experience to



generate chemical-specific uptake rates using exposure chambers, thereby broadening the application of EPA 325 to a variety of monitoring programs. As an example, Eurofins Air Toxics recently evaluated various passive sorbent samplers including tube-style axial samplers for a set of VOCs under a range of environmental conditions and published uptake rates relevant for ambient long-term monitoring applications¹.

Why Choose Eurofins Air Toxics?

Our ability to determine uptake rates along with our experience with sorbents and passive technology, unmatched thermal desorption (TD)-GC/MS capacity, and accredited quality systems establishes Eurofins Air Toxics as the Center of Excellence for EPA 325 and passive sorbent methods. Our experience includes over 20 years of sorbent analysis using TD-GC/MS with a focus on evaluating passive sorbent solutions since 2008. Internal research and development efforts as well as projects funded by the U.S. EPA and Department of Defense (DoD) have generated numerous publications and provided guidance to the regulatory community and environmental professionals on the use of passive sorbent samplers for ambient monitoring as well as soil vapor sampling¹⁻⁹. Specific to Method 325, Eurofins Air Toxics participated in EPA's evaluation of the method for a suite of VOCs, analyzing spiked and field samples and providing technical comments to the method to incorporate best practices.

In addition to our technical experience, Eurofins Air Toxics owns and operates the largest number of TD-GC/MS units of any single environmental laboratory facility in the U.S. This capacity allows us to effectively support multiple on-going monitoring programs and consistently deliver reports on-time. Eurofins Air Toxics has NELAP and DoD-ELAP (ISO 17025) accreditation for commonly requested passive sorbent methods and target chemicals. Our commitment to quality and continuous improvement is central to our organization and laboratory operations.



Eurofins Air Toxics has developed a media inventory and management program to meet method requirements and provide the field technicians with convenient, simple-to-use sampling kits in order to streamline sampling and minimize errors. The sampling kit consists of a rugged shipping case with custom foam inserts to organize the individual sorbent tubes packed in storage vials and other sampling equipment such as extra diffusive caps and disposable nitrile gloves.

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