

POF029: General platform presentation

Ultimate Passive Dosimeter for Respiratory Exposure Estimations

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Abstract

TDA Research, Inc., (TDA), a leading developer of specialty sorbents, has designed and tested new sorbents that can improve the performance of existing passive dosimeter badges manufactured by a major dosimeter company. Passive dosimeters are an essential part of a respiratory protection program because they allow for the identification of toxins and the determination of their concentrations in the ambient environment. TDA has demonstrated that our sorbents work well with eight different classes of contaminants specified by the DoD as respiratory exposure hazards. Our sorbents extend the range of compounds that can currently be detected using commercial sorbents. TDA sorbents were tested by exposing them to known concentrations of selected toxic substances, followed by measuring the amount of material that could be extracted from each sorbent using GC/MS. We compared the performance of our sorbents with commercially available carbons for a number of classes of contaminants, and found that our carbons performed better than commercial carbons in most categories. In addition, we tested our sorbents using an environmental chamber to simulate a contaminated environment in the field. By starting with a proven badge design and set of sorbents (already certified for monitoring many hazardous chemicals), and augmenting them with TDA's new sorbents to capture toxic gases that are not currently monitored, a new passive dosimeter can be rapidly and cost-effectively developed and brought into production. In collaboration with our commercialization partner, we will design a badge that is light weight and compact, that incorporates both commercial carbons and TDA's specialty sorbents, to make it possible to detect organophosphates, pyrethroids, nitroaromatics, tetrazoles, chlorinated organic compounds, polychlorinated biphenyls (PCBs), polychlorinated dibenzofurans (PCDFs), polychlorinated dibenzodioxins (PCDDs), polynuclear aromatic hydrocarbons, aldehydes and ketones, vinyl acetate, and fuels.