

## **CONCURRENT SESSION 3 – CHEMICAL AGENT SAMPLING & ANALYSIS**

### **METHODS**

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#### **Questions and Answers**

- **Anonymous:** Question for Philip: How do your studies relate to certification requirements for the mask of interest?
  - **Philip Gidley, U.S. Army Engineer Research and Development Center:** My work was not formally related to the certification process of masks. It is my understanding that the way a mask is certified is that they test it in the different chemicals in different NIOSH families. My work is similar in that way, in the assumption that the chemicals they test will break through faster than chemicals encountered.
- **Defence Science and Technology Laboratory:** Question for Kevin: Have you looked at variation of recovery depending on the logKo/w of the chemical that you are trying to recover?
  - **Kevin Beltis, TIAX LLC:** I have not done that. We are looking more for the set of analytes that the users are interested in. I would be interested to get additional references to investigate that more.
- **BioMax Environmental, Inc.:** Question for Matthew: Regarding to the wildfire presentation, can you discuss the primary as well as other pathway(s) by which the benzene enters the municipal water supply systems?
  - **Matthew Magnuson, U.S. EPA:** The exact mechanisms through which the benzene enters the water system is not well established. There are two main schools of thought, and maybe both occur. One is when the system depressurized (gets burned open), some vapors from the fire get sucked back into the piping and eventually find their way into the water supply or water distribution system. The wildfire combustion is known to produce benzene from the burning of trees. The other mechanism is that plastic pipes when heated to high temperatures are known to form benzene, and that is a way that plastic pipes can be recycled into raw materials. I should note that the systems in which benzene was detected, it was determined that it was not because of a spill of gasoline or other petroleum products, in such a matter that it could permeate a pipe directly. That type of mechanism is the non-wildfire route where there is a spill on the ground.
- **U.S. EPA:** Question for James: Can you comment on the kind of sensitivities across the board for the various fentanyl analogues? Are they comparable for both systems? Is there a wide variety likely to occur between the analogues?
  - **James Garcia, CSS, U.S. EPA:** Heroin has shown to be about 10 times less sensitive for both systems than the other compounds of interest.
  - **Lukas Oudejans, U.S. EPA:** I would think the array of fentanyl analogues is fairly comparable.
  - **James Garcia, CSS, U.S. EPA:** Yes, the rest seem to be very comparable to each other.
- **U.S. EPA:** Question for Philip: Have you looked at the possible impact of relative humidity on the capability to absorb or for the influence the breakthrough time for various chemicals?
  - **Philip Gidley, U.S. Army Engineer Research and Development Center:** In the ranking procedure I presented, I proposed using the multi vapor program from NIOSH from organic

based gases. That program does a good job at accounting for humidity. Humidity is not a major game changer in the programs I have looked at, but it can be for some chemicals.

- **U.S. EPA:** Question for Kevin: Have you looked at other chemicals of concerns, chemical warfare agents, for your sampling methods?
    - **Kevin Beltis, TIAX LLC:** Yes, we have. If you were to go to the paper referenced at the end of the presentation, we examined many different things that were of interest to DHS. For the original program, they were looking for signature agents. The chemicals that might be associated with a particular chemical to understand the source of the chemical. This effort was specifically for the forensics group, and we do look at some opioids for the program as well as explosives.
  - **U.S. EPA:** Question for Matthew: There are many other products that come from wildfires that follow the same route into water distribution systems. Is there a potential that there might be other hidden chemicals?
    - **Matthew Magnuson, U.S. EPA:** Some other volatile organic compounds were detected. The reason benzene was focused on is because it has a low maximum contaminant level (MCL) which is low in the federal standard and even lower in the California standard. It is purely the health effects implications of benzene.
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