3) I contact STAT Analysis again and they think they can give us more aldehyde results. They said they'll follow up today or tomorrow. Hopefully that becomes more useful.

Thanks,

Brent

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On Nov 2, 2020, at 8:00 AM, Yicheng Zeng <yzeng15@hawk.iit.edu> wrote:

Hey Professor and all,

I have finished the PM elevated and decay experiments this weekend. I have put the ions counter on the table, next to ACH. John can grab it from there.

I have done several preliminary analysis on PM data, I/O ratio, and trying to create the particle size distribution based on our SMPS and OPS data. However, I am confused about the PSD part. Summary excels attached. Please have a look and let me know what you think.

1. For most size bin, except these 3 size bin(0.154um, 0.2054um, and 0.2738um), the I/O ratio decreased after the ionizer turning on. However, on these 3 bins, the value of I/O ratio increased a lot (from 1.1 to 2.1 even 5.8, the highlights in the excel ) after turning the ionizer on, and then i/o ratio decreased again.

2. For larger particle size(OPS part), the trend of the I/O ratio is similar. They all decreased after ionizer on and then increase again. Perhaps the ionizer charged a part of the particles at first, then charged particles coagulate together into larger particles and settled faster. However, its effective time may be relatively short.

3. I am trying to create the PSD every 20 minutes(in and out sampling period), and then trying to compare them to see if there any changes in the particle size distribution. At first, I used Excel to draw "dN/dlogdp vs Dp" figure, then I have a problem on OPS data, especially the 0.3um size bin. The PSD looks so weird.

I tried the second way, using "Multi-Instrument 2.0" software to estimate and fit the distribution. The software can help me get good PSD based on our data. Photo attached. The red line is the PSD before

we turned the ionizer on, the black curve is after we turned the ionizer for a while. The particle size shift toward the left based on this figure. A reference for the software is attached.

<image.png>

The problem is how to create the dN/dlogDp vs Diameter figure based on our SMPS and OPS data. I can get the same figure and value of dN/dlogDp on the SMPS part, however, I could not get the same number on the OPS part. You can check my calculation process in the excel file. Please let me know where is the problem, I have thought for a while.

I will upload the newest measurement as soon as possible.

Thanks,

Yicheng

On Sat, Oct 31, 2020 at 5:40 PM Prashik Manwatkar <pmanwatkar@hawk.iit.edu> wrote:

Hi all,

I tried to see individual particle behavior for inside and outside particle sizes during ionization and found that there is no effect on particles of either size nano-particle and micron-particles (document attached) except a few.

I thought the reduction of nano-size particles (SMPS) should reflect in micron size particles (OPS). The overall maximum difference of three particle sizes 27.4 nm, 36.5 nm, and 48.7 nm is 85 #/cm3 which is very small to interpret in 0.3 um size particles. Therefore, we can say that there is no effect of ionization on particles or very minimal for a given testing period.

Please share your comments.

Thanks

Prashik

On Fri, Oct 30, 2020 at 6:14 PM Prashik Manwatkar <pmanwatkar@hawk.iit.edu> wrote:

Hi Professor,

Please find the short notes VOCs.

Ethylene Oxide: Ethylene oxide is a flammable colorless gas with a sweet odor, having ability to damage DNA.

Source: Carpet is the primary source of Ethylene emission in our chamber.

When ethylene undergoes oxidation at certain different conditions Acetaldehydes may form. Also, Ethylene oxide is isomeric with acetaldehyde and with vinyl alcohol i.e C2H4O.

The direct ionization of ethylene requires more energy due to its orbital structure sp2.