CAS PAMS GC vs Sanity

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Why CAS?

• Performed well in EPA “Shootout”
• Integrated system delivered assembled
• One vendor responsible for service issues
• No staff to operate GC
• Routine activities performed with “ease”
• Internal calibration source “Perm Tubes”
• Direct communication with station logger
• Small footprint
• Manufacturer support in same time zone
Perkin Elmer GC
How the H2 Generator Works

\[
\begin{align*}
4H^+ + 4e^- &= 2H_2 \\
2H_2O - 4e^- &= O_2 + 4H^+
\end{align*}
\]
Internal Reservoir – new recommended configuration
C2-C6 Chromatogram
C6-C12 Chromatogram
Issues

- Blank contamination - mainly propene and propane
- H₂ water sensor error
- C₆-C₁₂ flatlined
- VNC remote connection lost: may be due to newest version incompatible with Windows 7 on CAS GC
- H₂ generator failure: sent back entire H₂ generator for membrane cell replacement
- H₂ generator still not operational: sending us a board we will attempt to replace ourselves
- Currently very short staffed
Flatlined C6-C12
Board to be replaced
Data Handling

- Organization will be necessary for tracking of re-processed data
- CAS allows overwrite of substance tables so each one will need unique ID \(\text{ONLY 8 characters to work with!!!}\)
- A lot of baseline shifting so daily monitoring needed
- Reestablish remote connection
- Devote Angelina to sole GC responsibility for PAMS season and to finish data processing
- Work with others from Auto-GC workgroup call to learn from their experience/ QC guidance
Blank contamination and baseline shifting
Baseline shifting and swapped compounds

Cyl 1  Repeated Cyl 1 Precision check
# Initial Monthly QC Report...work in progress

## Delaware Division of Air Quality

### CAS GC Daily Check Log

<table>
<thead>
<tr>
<th>Date</th>
<th>System Blank</th>
<th>Permeation Tube Std</th>
<th>Concentration (ppb)</th>
<th>Month/Year: September / 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/1/2019</td>
<td>ethylene, propane, propylene, acetylene, n-hexane, n-undecane, n-dodecane</td>
<td>N-Hexane</td>
<td>10.33</td>
<td>0.08</td>
</tr>
<tr>
<td>3/2/2019</td>
<td>propane, propylene, acetylene, n-hexane, n-undecane, n-dodecane</td>
<td>N-Hexane</td>
<td>10.45</td>
<td>0.06</td>
</tr>
<tr>
<td>3/3/2019</td>
<td>propane, propylene, acetylene, n-hexane, n-undecane, n-dodecane</td>
<td>N-Hexane</td>
<td>10.45</td>
<td>0.05</td>
</tr>
<tr>
<td>9/4/2019</td>
<td>DNN: system down</td>
<td>N-Hexane</td>
<td>-100.00</td>
<td>N-Hexane: -100.00</td>
</tr>
<tr>
<td>3/5/2019</td>
<td>ethylene, propylene, propylene, acetylene, n-hexane, 3-methyl hexane, n-undecane</td>
<td>N-Hexane</td>
<td>10.38</td>
<td>1.37</td>
</tr>
<tr>
<td></td>
<td>n-dodecane</td>
<td>Benzene: 20.26</td>
<td>0.30</td>
<td>0.30</td>
</tr>
</tbody>
</table>