Safety Guidelines

1. Personal Protective Equipment for this activity:
   - Hardhat
   - Long pants
   - Close-toed shoes
   - Safety glasses or goggles
   - Insulated gloves when working with steam line

2. If there is a chemical spill, air mixtures may result in an explosion or cause a flash fire, which is rare and has not occurred so far. If you suspect too much chemical vapor evacuate the area and contact the lab supervisor.

3. Steam is used and therefore pipes become very hot (300°F is common). Use caution.

4. Exercise caution when working near high-pressure gas cylinders in the control room.

5. The chemicals used, denatured ethyl alcohol and isopropanol alcohol have harmful fumes, can burn, and may damage skin and eyes. Sample ports may spray when opened. Therefore, open slowly with caution.

6. Use of electronic devices including cell phones and personal computers is not allowed. You may use them in the control room as it is isolated from the main lab.

7. Do not eat or drink anywhere in Unit OPS including the control room. To drink or eat a snack, please go out to the hallway with the permission of your TA. Beware of contaminated hands.

8. All accidents and spills must be reported to the supervisor immediately.

9. If anything out of the ordinary happens, like fire, severe spills, or fire alarms evacuate the Unit OPS labs and meet in the loading dock area south of the building. Send someone to notify the lab supervisor and the main office. If there is any severe injury call 911. Do not move the injured person. Try to stop excessive bleeding by applying pressure to the wound and keep the airway clear.

10. The most probable hazards are heat and falls. During the summer labs the temperature can exceed 110°F inside the lab. Keep hydrated and set up fans as needed. Do NOT climb on anything except approved ladders used correctly. The hydraulic ladder to get up to the ports for sampling is very dangerous. Climb with care and always lock the safety chain before taking the sample. The ladder must be locked by screwing down the lift screws at the base of the steps. If the ladder is not locked down and it shifts, you could be thrown off the platform. Unit OPS floors become wet during labs and slips and falls are possible; so please use caution.

11. Any injury must be reported to the TA and lab supervisor. Aside from stopping bleeding and assisting breathing do not treat any injury. If injury is severe call 911 first.

12. Remember to wash your hands after experiments.
The health hazard materials are listed below

<table>
<thead>
<tr>
<th>Chemical(s) Used</th>
<th>Hazard Class</th>
<th>Health Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>Flammable, Reactive</td>
<td>Inhalation (cough, drowsiness, headache, fatigue), Eyes (redness, pain, burning), Skin (dryness), Ingestion (burning sensation, confusion, dizziness, headache, unconsciousness)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term or repeated exposure: affects upper respiratory and central nervous systems, may defat skin, ingestion may cause liver cirrhosis</td>
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<tr>
<td>Isopropyl Alcohol</td>
<td>Flammable, Reactive</td>
<td>Inhalation (nausea, headache, dizziness, drowsiness, unconsciousness), Eyes (irritation, burning, redness, tearing, inflammation, possible corneal injury), Skin (irritation with pain and stinging, especially if the skin is abraded), Ingestion (nausea, vomiting, diarrhea, possible kidney damage)</td>
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<tr>
<td></td>
<td></td>
<td>Long-term or exposure to high concentrations: affects respiratory and central nervous systems, may defat skin or cause dermatitis</td>
</tr>
<tr>
<td>Methanol</td>
<td>Flammable, Reactive</td>
<td>Inhalation (cough, dizziness, headache, nausea), Eyes (redness, pain), Skin (may be absorbed, redness, dryness), Ingestion (abdominal pain, shortness of breath, unconsciousness, vomiting, blindness, death)</td>
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<tr>
<td></td>
<td></td>
<td>Long-term or repeated exposure: affects the respiratory tract and central nervous system (recurring headaches, impaired vision), may cause dermatitis</td>
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