USE OF RAE PIDS FOR SOIL HEADSPACE MEASUREMENTS

Measuring organic compounds emitted from potentially contaminated soils requires special attention beyond that needed for typical ambient air monitoring. Soils are often dusty and humid, conditions that can cause high, drifting readings on MiniRAEs, ppbRAEs, and ToxiRAEs if not properly maintained. Interferences are usually traceable to condensation in the sensor, causing a current leakage across the electrodes and thus a false positive signal. This situation is exacerbated when the sensor is contaminated by soil dust or condensed, high-boiling organic compounds.

Preparing a Sample

Place the sample into a clean sample container or bag. Ensure that enough air space ("Headspace") above the sample is present for sampling. Shake the sample container to thoroughly mix the soil sample with the air in the headspace. Let the sample equiliberate to room temperature of approximately 75oF (25oC). Sample through a septum in a hard container or through the sample bag wall. A septum can easily be formed in virtually any hard container with aluminum foil held in place by a rubber band around the rim of the vessel. When sampling with the PID, ensure that dirt and moisture are not sucked into the PID probe.

To ensure optimum performance:

1) Keep the sensor clean using high-purity methanol, preferably using an ultrasound bath. A low-cost (<$150) ultrasonic cleaner can be obtained from Cole-Parmer, part no. H-08849-00, phone no. (800) 323-4340, or use a jewelry cleaner from a local department store.

2) Keep the lamp clean using high-purity methanol. Never use acetone on 11.7 eV lamps.

3) Use the C-Filter to absorb moisture and dust. Perform frequent changes of the C-Filter, membrane filter and/or green dust filters (daily to weekly depending on usage and dirtiness).

4) Use the 4.5-cm "water trap" filters as an extra precaution, especially in dusty or moist environments where water mist may be present.

5) Avoid situations in which the PID is colder than the soil being sampled, such as heating the soil samples to increase the headspace organic concentration, or bringing a cold PID into a warm room without allowing time for temperature equilibration. If anything, try to keep the PID warmer than the soil samples.

6) To obtain more stable readings, plumb the effluent flow from the MiniRAE or ppbRAE back into the sample container to reduce the losses. Use Teflon or metal tubing for this purpose so as to prevent adsorption to Tygon or other plastic tubing. Losses will not be stopped altogether but will be greatly reduced.

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