Siloxane Sampling Guide

Siloxanes in Biogas and Landfill Gas using GC/MS

ALS has developed a novel sampling and analytical approach for siloxanes for biogas and landfill gas applications. It involves sampling with a specially-prepared sorbent tube. The target analytes are extracted from the tube and are introduced into a gas chromatograph equipped with a mass spectrometer for identification and quantification.

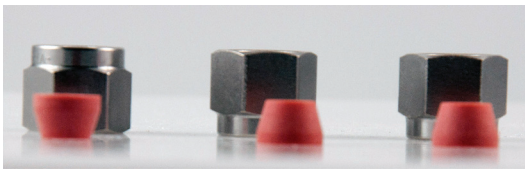
Sampling Kit Equipment

You will find the following items in the sample kit:

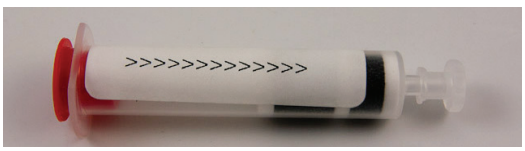
- Rotameter connected to a labeled calibration tube.
- Slip stream: Stainless steel T-fitting equipped with ¼" silicone rubber tubing fitted with a plug. The slip stream is used to provide an outlet for excess pressure. The rotameter constricts the flow of the gas to reach the desired sample flow rate, and the slip stream provides an outlet to avoid the buildup of back pressure in the sampling train.
- Extra nuts and ferrules
- Sampling sorbent tube: Specially prepared from the laboratory. Tubes may be stored at ambient temperature at all times.
- Two feet of connecting silicone tubing. Additional tubing may be provided upon rquest.
- Ziploc bags with corresponding sampling labels.

Rotameter and Calibration Tube

Prepared Slip Stream



Nuts and Ferrules



Sample Tube Fitted with Caps

Sample Guide

Air Volume: 6 L - Do not exceed recommended maximum sampling volume.

Sample Flow Rate: 0.2 L/min

Sample Time: 30 minutes

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Directions

1. Cut the provided silicone tubing into two pieces and fit each piece into the T-fitting using the attached nuts and ferrules. One piece will lead to the gas line and one side will go into the calibration tube (Figure A). To interface the silicone tubing with the calibration and sampling tube, a tubing adapter is included and is pre-attached to the inlet side of the calibration tube. Please note that the nuts only need to be finger tight; no wrench necessary.

2. Unpack the connected calibration tube and rotameter. Make sure the tube sampling arrows point toward the rotameter, indicating the flow will enter through the tubes and exit into the rotameter. Please note that the sample flow should enter through the large bed of the tube and exit through the small one. Figure B.

3. To reduce water buildup in the sample, position the slip stream at the lowest elevation in the sampling train. This can be achieved by placing the rotameter on an elevated flat surface and allowing the slip stream to hang below to collect the moisture (Figure C).

4. Turn the gas line on and twist the slip stream plug counter-clockwise until the flow reads approximately 0.5L/min on the rotameter. This does not have to be exact. Please remove the plug altogether if the flow is >1L/min, or totally close plug if flow is <0.5L/min. This reduces the back pressure on the front end of the tube. Next, rotate the rotameter knob clockwise until the flow reads approximately 0.2 L/min. The flow is now calibrated (Figure D).

5. Turn the sample stream completely off, remove the sample tube from the Ziploc bag and remove end caps, replace the calibration tube with the uncapped sample tube, and note the starting sample time. Please note that the caps are for the sample tube only. No need to cap the calibration tube.

6. Turn the gas line back on and adjust the rotameter if the flow is not at the calibrated flow rate of 0.2 L/min. Please note that nothing interfaces with the top.

7. Complete the Chain of Custody (COC) with the start and stop time, flow rate, and total sample volume. When finished, detach the tube from the rotameter and cap the open ends. Each sample tube should be placed into a Ziploc bag labeled with the sample ID name. Please do not write on the tubes.

8. If the kit has been rented, place all contents back into the original boxes in which they were shipped. Tubes can remain at ambient temperature and must be analyzed within 14 days of sampling.

Figure A: One side should attach to gas outlet while the other attaches to calibration tubes.

Figure B: Sampling arrows should point toward rotameter. Please note that these figures show two tubes in series. You will only be receiving one tube.

Figure C: Slip stream is at the lowest point of the train.

Figure D: Flow is marked by small metal ball. To decrease flow, turn black dial clockwise.

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