



Siloxanes in biogas and renewable natural gas

Method ASTM D8230 sampling instructions

ALS offers Method ASTM D8230 for the characterization of siloxanes in biogas and renewable natural gas matrices.

The gas is sampled using a sorbent tube. The target siloxanes are then extracted from the tube and are introduced into a gas chromatograph equipped with a mass spectrometer for identification and quantification.

Average Reporting Limits				
Sample Volume	Speciated Siloxanes (mg/m ³)	Speciated Siloxanes as Silicon (mg/m ³)	Speciated Siloxanes (ppbV)	Speciated Siloxanes as Silicon (ppbV)
12L	0.05	0.02	5	15
24L	0.02	0.01	3	8

Sample guide

Air Volume: 12–24 L
Sample Flow Rate: 0.2 L/min
Sample Time: 60–120 minutes

Sample collection procedure

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 next page). Please note that the nuts only need to be finger tight; no wrench necessary.
2. Connect the calibration tube to the rotameter. Make sure the tube sampling arrows point toward the rotameter, indicating the flow will enter through the tubes and exit into the rotameter. The sample flow should enter through the large bed of the tube and exit through the small one.

Sampling kit equipment

Rotameter and 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.



Rotameter and calibration tube



Slip stream

(Continued on next page)

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 B). This step may not be necessary and is optional.
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. 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 C).
5. Turn the sample stream 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. Note that nothing interfaces with the top of the rotameter.
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. Do not write on the tubes.
8. 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. Slip stream is at the lowest point of the train.



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

Sampling kit equipment (continued)

Extra nuts and ferrules

Sampling sorbent tube

Specially prepared by the laboratory. Tubes may be stored at ambient temperature at all times.

Two feet of connecting silicone tubing

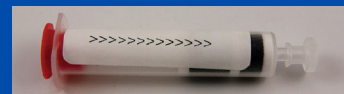
Additional tubing may be provided upon request.

Ziploc bags

With corresponding sampling labels.



Nuts and ferrules



Sample tube fitted with caps

For questions or more info, please contact your local ALS laboratory.

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