Ammonia

Ammonia is an odorous contaminant of concern for a wide variety of facilities including landfills (a product of decomposition); wastewater treatment plants (in untreated sewage); composting operations (a product of both aerobic and anaerobic decomposition); and hog, dairy, and poultry farms (in animal waste). Since ammonia is often used as a household glass & surface cleaner, most people are familiar with its odor; thus, the unique and pungent aroma can usually be detected by the human olfactory system at low ppmV concentrations. At higher ppmV concentrations, ammonia can cause serious health damage, irritating and/or burning nasal passages and lungs.

The impact of airborne ammonia is a significant concern in agricultural markets.

Collection of airborne ammonia may follow the OSHA ID-188 method, which uses sulfuric acid-coated Anasorb-747 (carbon bead) tubes and a personal sampling pump for collection. This form of sample collection is much easier and safer than the traditional collection technique of sulfuric acid solution impingers. Analysis may follow the OSHA-ID 164 analysis, which utilizes an ion-specific electrode (ISE) to detect ammonia.

Equipment

1. Air sampling pump* capable of sampling at the desired flow rate/duration with the sampling medium in-line.
2. Airflow calibrator* (bubble meter, rotometer, Bios DryCal flow meter, etc.)
3. Sorbent tube – commercially available from SKC (catalog number 226-29), laboratory will provide upon request. Tubes may be stored at ambient temperature prior to use. After sampling, samples may be stored and shipped at ambient temperature to the laboratory.
4. Field blank - A field blank tube should be included in the sampling event. Field blanks should be subjected to exactly the same handling as the samples (open, seal, and transport), but no air is drawn through them.
5. * CAS does not provide this equipment; contact your local equipment rental company or call the laboratory for help finding vendors.

Ammonia Reporting Limit (ppmV)

Flow Rate (L/MIN)	Duration					
	15 Min	30 Min	1 Hr	2 Hrs	3 Hrs	4 Hrs
0.1	9.6	4.8	2.4	1.2	0.80	0.60
0.3	3.2	1.6	0.80	0.40	0.27	0.20
0.5	1.9	0.96	0.48	0.24	0.16	0.12

Reporting Limit = 0.01 mg/tube

Related Odor & Landfill Services:

Reduced Sulfur Compounds via ASTM D5504

Amines via Columbia Analytical Method 101

Carboxylic Acids via Columbia Analytical Method 102

Speciated VOCs via EPA TO-15 and/or EPA TO-17

Methane/Total Gaseous Non-Methane Hydrocarbons via EPA 25C

Fixed Gases via EPA 3C

BTU Heat Content / CHONS via ASTM D3588

Please call the laboratory, 805.526.7161, with questions regarding the effect sample volume has on reporting limits.

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Sampling Guide

If sampling pump <u>is not received</u> pre-calibrated:

Using an airflow calibrator, calibrate pump with representative media inline, following directions provided from vendor. Request a calibration tube to be provided from the lab. **(Please do not use a sample tube.)**

Sampling Flow Rate: 0.10 - 0.50 L/min

Air Volume: 7.5 - 24L for ambient and indoor air.

Sample Time: 15 minutes - 4 hours

If sampling pump <u>is received</u> pre-calibrated:

1. Remove the sample tubes from the shipping container.
2. Please DO NOT write/scratch any additional information on the tube.
3. The airflow direction will be printed on the SKC tube in the form of a directional arrow. Ensure that the arrow points towards the pump.
4. Clip both ends of the SKC tube to allow air flow to pass through the tube. Place the end of the tube into the tubing attached to the sampling pump, ensuring the arrow is still pointing towards the pump.
5. Set up the sampling tube in the sampling location.
6. Turn the pump on and note the starting time and date.
7. If collecting a field blank, uncap the field blank tube on both ends to expose it to field conditions, and then immediately recap the tube with the red end caps provided. Place the field blank tube aside.
8. Sample at a known flow rate for the recommended period of time.
9. At the end of the sampling period, retrieve the sampler, turn the pump off and record the final sampling time.
10. Recap all samples with the red end caps provided. Label the tubes with the sampling information (sample identification, sample date, etc.) by affixing a label to the outside of the tube and/or placing the tube inside a labeled, small Ziploc bag.

Airborne ammonia can also be prevalent at landfill sites.

Storage & Shipping Instructions

- Carefully pack sample tubes and field blank in a cooler or small box. Be sure to include all pertinent information (sample identification, sampling date, time, sample volume, etc.) on the Chain of Custody form submitted with the samples.
- Ship the cooler to the laboratory using an overnight courier service (FedEx, UPS, etc.). If unable to ship the samples back to the laboratory on the same day of sampling, store the samples in sealed containers away from any potential sources of contamination.

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