SKC

Operating Instructions

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UME^{X}200 Passive Sampler for Nitrogen Dioxide
Cat. No. 500-200

Performance Profile

Sampling Rate:	17.3 ml/min with a relative standard deviation of 11.4%
Validated Concentration Range:	0.051 to 8.5 ppm, 15 minutes to 24 hours
Analysis Method:	Solvent extraction and IC analysis with conductivity detection
Lower Detection Limits:	15 minutes: 200 ppb 8 hours: 6.3 ppb 24 hours: 2 ppb
Collection Method:	Tape treated with triethanolamine (TEA); built-in blank included
Shelf-life:	18 months from date of manufacture at ambient temperature
Storage:	*Before use:* Ambient temperature *After use:* Analyze within 3 weeks. Can be stored at ambient temperature or at ≤ 39.2 F (4 C)
Accuracy:	± 27%
Temperature Effects:	No effect on sampling rate from 22 to 40 C
Humidity Effects:	No effect from 20 to 80% relative humidity (RH)
Wind Velocity Effects:	No effect from 5 to 100 cm/sec
Interferences:	None identified
Dimensions:	3.4 x 1.1 x 0.35 in (8.6 x 2.8 x 0.89 cm)
Weight:	0.38 oz (10.9 gm)
Slide Cover:	Yellow

Note: *SO_2 can be analyzed on the same UME^X 200 Sampler as NO_2.*

Sampling Instructions

Cautions:
- **Do not store with food.**
- **Before sampling, check the expiration date on the label on the outside of the pouch. Do not use after the last day of the month indicated.**
- **SKC recommends using gloves when handling chemically treated media.**
- **UME^{X} samplers are designed for single use only. Do NOT reuse UME^{X} samplers.**

1. Open the aluminized pouch and remove the sampler. Do not discard the pouch; use it to send sampler to the laboratory. **Store the pouch away from potential nitrogen dioxide sources.**

2. Enter date and location in the space provided on the back of the sampler.

3. Position the sampler on a worker's collar for personal sampling or in an appropriate location for area sampling.

4. Slide the sampler cover to the "on" position to begin sampling. Enter the sample start time in the space provided on the back of the sampler.

5. After sampling for the desired time, up to 24 hours, slide the sampler cover to the "off" position to stop sampling. Enter the sample stop time in the space provided on the back of the sampler.

6. Place the sampler in the original pouch immediately after sampling.

7. Seal the pouch. Send pertinent information and sample to an accredited laboratory for analysis.

Analysis Instructions for Nitrogen Dioxide

Calibration Standards - Nitrite

Purchase commercially available nitrite standards appropriate for your application. Prepare a range of nitrite standards in de-ionized ultra-filtered (DIUF) water and prepare as outlined in Sample Preparation.

Sample Preparation for Nitrogen Dioxide

1. Remove the sampler from the pouch and the sliding cover from the sampler.

2. Use clean forceps to lift out the reactive tape from each section. Place each section in a sealed vial. This provides a sample and a blank/correction.

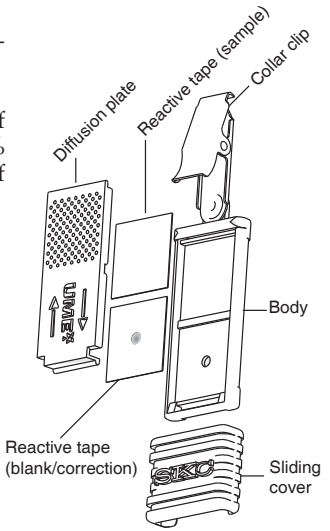
   Note: *The blank/correction section of tape has an indentation for easy identification.*

3. Nitrite is desorbed from both the sample and the blank/correction tapes by inserting each in its own 4-ml glass vial containing 2 ml of de-ionized DIUF water and placing them on a vibrator/shaker for 20 minutes.

4. Immediately transfer 1 ml of extract to an auto-sampler vial for analysis of nitrogen dioxide.

5. If also analyzing for SO_2,§ pipette 1 ml of extract into a vial and dilute with 1 ml of 0.15% hydrogen peroxide. Shake well for analysis of sulfur dioxide.

§ *Sampling rate for SO_2 is 15.2 ml/min.*



Nitrogen Dioxide Sample Analysis

1. The sample extracts are analyzed for nitrite by ion chromatography with conductivity detection.

2. A 20 microliter portion of the extract is injected onto a Dionex 4 x 250-mm AS14A column and with an 8.0/1.0 mM sodium carbonate/sodium bicarbonate eluent. For low levels (≤ 0.4 ppm), inject 70 µl onto the column.

3. Calculate the nitrite results by comparing against a standard calibration curve.

4. Convert the results from nitrite to nitrogen dioxide using the following formula:

   Concentration µg/ml nitrogen dioxide = Concentration µg/ml nitrite

   Where 46.01 is the molecular weight of both nitrogen dioxide and nitrite

5. Total mass of nitrogen dioxide is calculated below:

   Concentration nitrogen dioxide (µg/ml) x Desorption volume (2 ml)

6. The nitrogen dioxide of the blank/correction tape must always be subtracted from the sample tape when calculating air concentrations.

7. Calculate the air concentration in ppm using the following equations:

$$\text{Volume of air (liters)} = \frac{\text{Time (minutes)} \times \text{Sampling rate (17.3 ml/min)}}{1000}$$

$$\text{Concentration (ppm)} = \frac{\text{Mass (mg)} \times 24450}{\text{Air volume (L)} \times \text{Molecular weight (46.01)}}$$

UME^{X} Passive Samplers$^{\#}$	Catalog No.
UME^{x} 200,*† for sulfur dioxide and/or nitrogen dioxide, pk/10	**500-200**
UME^{X} 100,*†‡ for formaldehyde and other aldehydes, pk/10	**500-100**
UME^{X} 300,*‡ for ammonia, pk/10	**500-300**

Treated Tape for QC - UME^{X} 200,$^{*\#}$ pk/25	**P20098**

* *Limited shelf-life* † *Do not store with food.* ‡ *Storage at ≤ 39.2 F (4 C) required*

\# *UME^{x} passive samplers are designed for single use only. Do NOT reuse UME^{x} samplers.*

SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to http://www.skcinc.com/warranty.asp.