Science. Applied to Life.™

Technical Bulletin

July 23, 2019

3M Organic Vapor Monitors 3520, 3530: 1,3-Butadiene

Background

This bulletin contains updated information on sampling 1,3-Butadiene. See 3M Technical Bulletin #124 "Validation Protocol" for more information on the test protocol used to generate this report.

Sampling Rate	The published sampling rate for 1,3-Butadiene is 42.8 cc/min.
Analytical Recovery	Recovery over a range of 12 to 49 µg using Methylene Chloride was 75% with a coefficient of variation of 3.2%.
Accuracy	Table 1 on page 2 shows that the **3520/3530 meets OSHA accuracy requirements for 1,3-Butadiene STEL and 8 hour sampling.** NOTE: The 3500/3510 may be used only if it has been shown by routine sampling that no significant amount of 1,3-Butadiene is collected on the secondary section of the 3520.
Humidity	Not significant (uptake rate was linear) when monitors were exposed to 0.9 ppm 1,3-Butadiene for 1 to 12 hours at 80% RH.
Detection Limit	Assuming an analytical detection limit of 1 µg per monitor, the minimum detectable concentration is 0.7 ppm with a 15 minute sample, and 0.02 ppm with an 8 hour sample.
Reverse Diffusion	Not significant (<10%) when exposed to 1 ppm for 240 minutes, and then 240 minutes clean air at 80% RH, 23 °C.
Storage	Refrigeration prior to analysis is recommended. Storage at room temperature for 3 weeks showed a 10% loss in recovery, whereas refrigerated storage showed no such loss.
Temperature	No specific experimental data. No significant effects (<10% bias) observed for Toluene, 1,1,1-Trichloroethane, Methylene Chloride and Hexane.
Interferences	The sampling rate is not affected by the presence of other solvents provided that the monitor is not overloaded.
Orientation/Air Velocity	To accurately sample at any orientation, there must be a minimum air velocity of 25 ft/min.

Table 2 indicates the 3520/3530 accuracy for 1,3-Butadiene over a range of concentrations and times. According to OSHA, sampling for 1,3-Butadiene must be accurate at the 95% confidence interval to within +/- 25% at concentrations above 1 ppm, and within +/- 35% at concentrations below 1 ppm.

Table 2: 3520/3530 % Accuracies by concentration and sampling time.

Conc. (ppm)	15 min	8 hrs	16 hrs
1		13.9 % (50% RH) 13.6 % (80% RH)	7.4 % (25% RH)
5	16.9 % (50% RH)	6.6 % (80% RH)	

Personal Safety Division
3M Center, Building 235-2W-70
St. Paul, MN 55144-1000

3M PSD products are occupational use only.

In United States of America
Technical Service: 1-800-243-4630
Customer Service: 1-800-328-1667
3M.com/workersafety
In Canada
Technical Service: 1-800-267-4414
Customer Service: 1-800-364-3577
3M.ca/Safety