3M

Technical Data Bulletin

#123, September, 1996

3M Organic Vapor Monitors 3500/3510/3520/3530

1,1,1 -Trichloroethane

Background This report contains supplemental information for sampling *1,1,1 - Trichloroethane* using 3M organic vapor monitors. Please see Tech Data Bulletin #124 for more information on the test protocol used to generate this report.

Sampling Rate The published sampling rate for 1,1,1 Trichloroethane is 30.9 ± 0.3 cc/min.

Analytical Recovery Recovery over a range of 2.68 to 28.1 mg using carbon disulfide was 100% with a coefficient of variation of 2.0%.

Accuracy The accuracy is within ±25% as determined from a series of concentration and time experiments (See Table 1 on page 2).

Humidity Uptake rate was linear when monitors were exposed to 200 ppm for 2, 4, 6 and 8 hour periods at 50% RH. The 3520/3530 should be used for exposures above 350 ppm longer than 6 hours at 80% RH (see Figures 1 and 2 on page 2 and 3).

Detection Limit Assuming an analytical detection limit of 2 μg per monitor, the minimum detectable concentration is 1 ppm with a 15 minute sample, and 0.02 ppm with an 8 hour sample.

Reverse Diffusion Not significant (<10%) when exposed to 700 ppm 1,1,1 -Trichloroethane for 30 minutes, and then 450 minutes clean air at 80% RH, 23°C.

Storage Samples may be stored at room temperature (23°C) or refrigerated (4°C) for 21 days without significant change from initial recovery.

Temperature Not significant (<10%) in the range of 10-40°C (50-104°F).

Interferences The sampling rate is not affected by the presence of other solvents provided that the monitor is not overloaded.

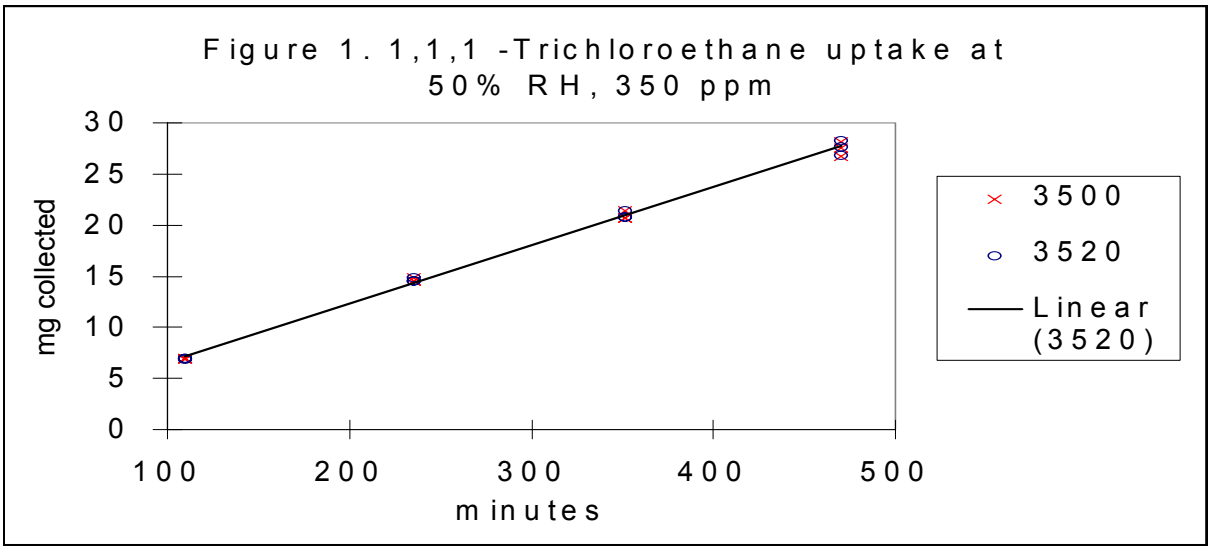
Orientation/ Air Velocity To accurately sample at any orientation, there must be a minimum air velocity of 25 ft/min.

Table 1 indicates the sampler accuracy for 1,1,1 -Trichloroethane over a range of concentrations and times at 50% RH. According to our protocol, accuracy must be within ±25%. Concentrations were chosen to bracket certain published exposure limits for 1,1,1 - Trichloroethane at the time that this work was done.

Table 1: % Accuracies by concentration and sampling time.

	15 minutes	8 hours
35 ppm	12.9 %	5.2 %
700 ppm	12.9 %	16.6 % (3500) 14.4 % (3520)

Figures 1 and 2 give the uptake rates for the 3500/3510 and the 3520/3530 at 50 and 80% RH.



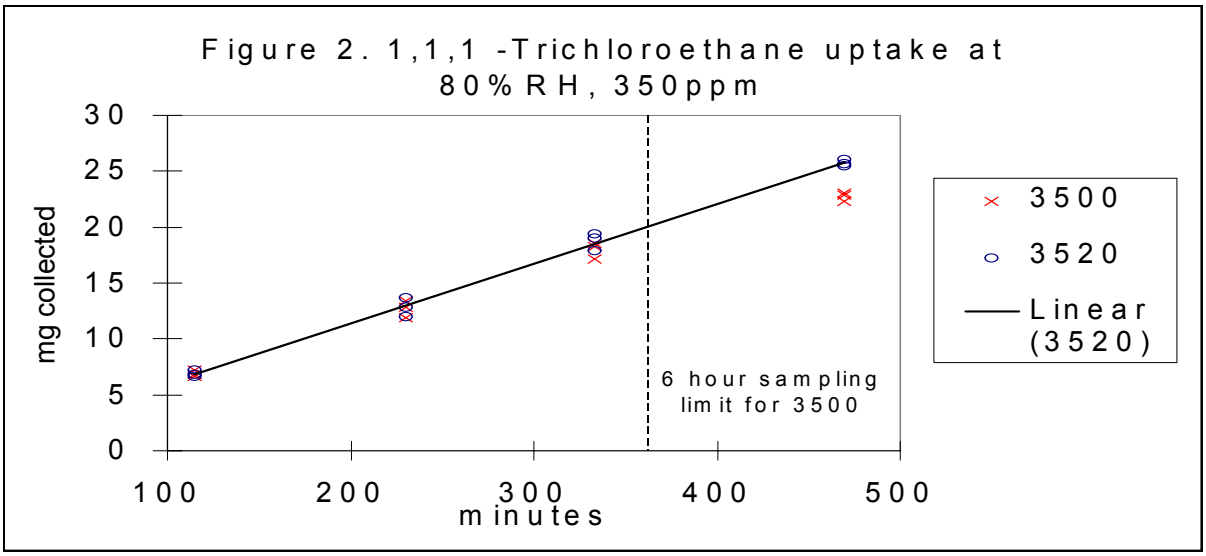


Figure 2. 1,1,1 -Trichloroethane uptake at 80% RH, 350ppm
mg collected
30
25
20
15
10
5
0
100
200
300
400
500
minutes
6 hour sampling limit for 3500
3500
3520
Linear (3520)