

Seon

Methylene Chloride (DD's) - both DuP & 3M w CT

200 ppm - 3 hrs

MW = 84.93 1.33 g/cc

$$\frac{X}{100 \text{ L/min}} = \frac{200 \text{ ppm}}{100 \text{ L}}$$

$$X = \frac{200 \times 100}{100} = 2 \times 10^4$$

$$= 2 \times 10^{-2}$$

$$= .02 \text{ L}$$

$$= 20 \text{ mL/hr}$$

$$1 \text{ gal}$$

Toluene - single - DuP & 3M w CT
8 hr - low conc 20-25 ppm

$$\frac{.020 \text{ L} \times 84.9 \text{ g/L}}{24.45 \text{ L/mole}} = \frac{1.698 \text{ g}}{24.45 \text{ L/mole}}$$

$$= 0.069 \text{ mol/L}$$

$$= 3.13 \text{ mol/hr}$$

$$\text{for } 200 \text{ ppm}$$

Lita

Vinyl Chloride

3M, DuP DD's w/

Jumbo CT's

8 hrs }
• 1 ppm @ 80% RH
• 5 ppm @ 50 & 80% RH
• 2 ppm

6 type
4 x 6 = 24 type

2 hrs 2 ppm @ 80% RH
6 hrs 0 ppm

12 type
to compare w/ 8 hrs of 5 ppm

6 hrs 0 ppm @ 80% RH
2 hrs 2 ppm

Sample storage stability

8 hrs .5 ppm @ 80% RH, or

store 1 day (above)
2 day (as if shipped)
7 days
14 days

18 type

$$\begin{array}{r} 30 \\ 12 \\ 18 \\ \hline 60 \end{array}$$

Vinyl Chloride Challenge Procedure

Known $\frac{15}{2}$ ppm } mixture

V w HC analyzer

Can 40 L @ 250 psi

$$P_1 V_1 = P_2 V_2$$

$$15 \text{ psi} V = 40 \times 250$$

$$V = \frac{40 \times 250}{15} = 666.7 \text{ L}$$

$$\frac{660 \text{ L}}{32 \text{ hrs}} = 20.6 \text{ L/hr} = .34 \text{ L/min}$$

$$\frac{1}{100} \quad .5 \text{ L/hr} \Rightarrow .083 \text{ L/min}$$

100 cc/min into
= .1 L/min into 100 L/min

$\therefore$ $\frac{100}{500}$ ppm } use 100 cc flow meter
2000 ppm

HC spreader
 $\frac{200}{1000}$ ppm } 100 cc/min $\Rightarrow$ 200 L/min $\Rightarrow$.5
4000 ppm } $\Rightarrow$ 2.0

$$\frac{4}{250} = \frac{26.2}{11.4}$$

$$x \times 10^6 = 5 \times 10^4$$

$$x = \frac{5 \times 10^4}{10^6} = 5 \times 10^{-2} = .05 \text{ psi}$$

$$= 2.57 \text{ mm Hg}$$

$$\frac{x}{250} = \frac{10^3}{10^6}$$

$$x = \frac{2.5 \times 10^2 \times 10^3}{10^6} = \frac{2.5 \times 10^5}{10^6} = 2.5 \times 10^{-1}$$

$$= .25 \text{ psi}$$

$$= 12.93$$

$$\frac{x}{250} = \frac{4 \times 10^3}{10^6}$$

$$x = \frac{10^3 \times 10^3}{10^6} = 1 \text{ psi} = 51.74 \text{ mm Hg}$$

$$14.69 \text{ psi} = 760 \text{ mm Hg}$$

$$1 \text{ psi} = 51.74 \text{ mm Hg/psi}$$

$$\begin{array}{r} 25 \\ \times 12 \\ \hline 51.7 \\ \hline 637 \end{array}$$

- 1.1) Pull vac on tanks (open gauges, tanks, pump) Return to vent tanks
- 2.2) Close Pump knob, pump off vent tank (red) 1st
- 0.2.2) Close Pump knob, pump off vent tank (red) 2nd

$$\frac{13.0 \text{ mm Hg}}{14.69} = \frac{.885 \text{ psi}}{102.5 \text{ psi}} = .0086337$$

8633.7 ppm

$$\frac{200 \text{ cc}}{.2 \text{ L}} / 143.6 \text{ L} = .00139$$

$$\frac{3.53}{102.8} = 34,347.9 \text{ ppm}$$

12.0 ppm

$$\frac{30 \text{ cc}}{103 \text{ L} / 200 \text{ L}} = .00015$$

x 8633

200 cc 143.6 L/min

$$= 1.295$$

$$.1 \text{ L} / 200 \text{ L} = .0005$$

$$\frac{x}{100} =$$

4.3 ppm

~~1000~~
1,000,000

200 ppm
1000
4000

$$\frac{1}{100} = 10,000$$

.1 1000

.01	100 -
-----	-------

.001 10

.02 200

.04 — 7 200 in 200 pin

.5

May 1955

$$\frac{1 \text{ Mf}}{10^6 \text{ Mf}} \Rightarrow \frac{1 \text{ Mf}}{2.95 \times 10^6 \text{ Mf}}$$

Amelia

w. - Ktc

$$10 \frac{\mu\text{g}}{\text{cc}} = \frac{40.8(180)(2.5)}{18360 \times 10^{-6}} = .0408 \text{ atom} \times 62.5 \frac{\mu\text{g}}{\mu\text{m}} = 2.55 \mu\text{g in 1 ml}$$

7.2 $\cdot 3 \mu\text{m} \times 3 \text{hr} \longrightarrow \frac{.018360 \text{ mg}}{18.4}$

14.4ul .3ppm x 6 ~~= 26.4~~ = 36.8ug

$$21.6 \text{ mL} \cdot 3 \text{ ppm} \times 9 \text{ hrs} = 165.6 \mu\text{g} \quad \begin{matrix} \text{H} \\ | \\ \text{C} = \text{C} - \text{Cl} \\ | \\ \text{H} \end{matrix}$$

$$2.55 \frac{\mu\text{g}}{\text{ml}} \times 10^3 \frac{\text{ml}}{\text{L}} \times 10^6 \frac{\text{L}}{\text{m}^3}$$

$$2.55 \times 10^9 \mu\text{g}/\text{m}^3$$

$$2.55 \times 10^6 \text{mg}/\text{m}^3$$

$$\begin{array}{r} 35.5 \\ 24 \\ \hline 62.5 \end{array}$$

$$\frac{1 \times 10^{-6} \times 62.5 \text{ g/mole}}{2} = 24.45 \times$$

$$2.55 \text{ mg} \times \frac{10^3 \text{ mg}}{1 \text{ g}} \times \frac{1 \text{ g}}{1000 \text{ mg}} = 2.55 \text{ g}$$

$$\frac{62.5 \times 10^{-6} \text{ g}}{24.45 \text{ g}} \Rightarrow \frac{62.5 \times 10^{-6} \text{ mg}}{24.45 \times 10^{-6} \text{ g} \times 10^{-6} \text{ m}^3/\text{g}} = 2.56 \text{ mg/m}^3$$

$$\frac{36.8 \mu\text{g}}{62.5 \mu\text{g}/\mu\text{m}} \times 24.45 \mu\text{L}/\mu\text{m} = 29.1 \mu\text{L}$$

$$391 \frac{11}{2} \Rightarrow \frac{1}{a/m} \frac{11}{2}$$

$$\frac{24.459 \text{ g/L}}{\text{mg/g/L}} = \frac{2.56 \times 10^{-3} \text{ mg}}{1 \text{ mg} \times 10^{-3} \times 10^{-9} \text{ g}} = \frac{2.56 \times 10^{-3} \text{ mg}}{10^{-6} \text{ g}} = 2560$$

14.4 μ l

$2.55 \mu\text{g}/\mu\text{L}$ why? $2.55 \mu\text{g}$
 $2.55 \mu\text{g}/10^{-3} \text{ mL} \times 10^{\frac{10^3}{\text{mL}}}$
 $1 \text{ g} = 2.55 \text{ mg} \text{ L}^{-1}$

$$\frac{242}{\text{H}} = 62.59174$$

2.56 ug/ml

$$2.56 \frac{\text{mg}}{\text{m}^3} \times \frac{10^3 \mu\text{g}}{\text{mg}} \times \frac{10^{-6} \text{m}^3}{\text{L}} \times \frac{10^{-3} \text{L}}{\text{mL}}$$

739-3350

History of the
 Religion
 of the
 People

3M 108603

ANALYSIS FORM

Vinyl Chloride

AU x 10³SF x 10⁻³

①

62.5g/m

$$\frac{62.5g/m}{24.450/m} = 2.56g/l \times 10^3 \frac{mg}{g} \times 10^{-3} \frac{ml}{l} = 2.56 \times 10^{-3} \frac{mg}{ml} = 2.56 \frac{\mu g}{ml}$$

$$SF = .00414 \pm .000219 = .0529$$

250ml

4003

↓

28.6

394.4

mg

50 50ml

18.8

50ml

128

15.4 .0029

$$50ml \times 2.56 \frac{\mu g}{ml}$$

50

246.6

50ml

50ml

28.3 .0045

50

205.9

50ml

50ml

30.0 .0041

128ug

50 7ml

8.3

50

50

30.9 .0041

$$28.3 \times 10^{-3} ml$$

↓

6.77

6.88

VC-1 dur 3520's

1 p

14.5

.060

Sve 10-25-10-26am

1 p

10.94

.043

.155

2 p

17.6

.073

~200cc/min into

3 p

8.9

.037

.154

3 p

18.3

.076

4 p

8.94

.037

.157

5 p

16.09

.068

6 p

7.86

.0325

.139

7 p

18.8

.078

8 p

8.99

.037

.159

$$V_H = .1548 \pm .0062$$

(4.090)

9 p

14.59

.081

10 p

8.78

.034

.161

11 p

19.95

.0816

12 p

9.17

.0380

.1223

13 p

18.64

.0772

14 p

8.59

.0356

.155

15 p

18.89

.0782

16 p

8.12

.0336

.152

17 p

17.77

.0736

18 p

9.196

.0381

.157

19 p

19.55

.0809

20 p

8.942

.0370

.162

21 p

18.46

.0764

22 p

8.284

.0343

.152

$$C = 2.64$$

10ml

6.171

.0256

.0041

10ml

6.564

.0256

.0039

$$C = 3.41$$

3M 108604

Calc 100 ppm in 40 l container

$$\frac{10^2 \text{ l}}{10^6 \text{ l}} = \frac{x}{667}$$

$$\frac{6.67 \times 10^4}{10^6} = x$$

$$6.67 \times 10^{-2} = x$$

.067 ~~l~~ 67 ml of methyl chloride

w/ air pressure

500 ppm 67 ml x 5 = 335 ml

w/ gas
Hight
Syringe

2000 ppm 1340 ml

			<u>achieved</u>	
Initial	12.0	12.0	12.0	12.0
	+ 12.93	12.93	↓ 13 mm Hg	↓ 30 mm Hg
	24.93	24.93	25.0 (Tall)	63.9
			103.8	104
			102.5	102.8
			8623.7 ppm	8436.9 ppm
			2453.0 ppm	99.665 ppm
			131 ppm	1.22 ppm

13 mm

14.69

760

14.7

191.1 = x

760

760 = 519

14.7

760 = x

760

180
12

24+12 36

FILE

SEC.

DATE

10/25/81 SHEET NO.

		A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10	VC-3 Jumbo CT 7 P _S	3.28	.0136	.458													
11																	
12	8 P _S	3.09	.0128	.305													
13																	
14	t=5.10 9 P _S	2.78	.0115	.315													
15																	
16	10 P _S	2.34	.0097	.318													
17																	
18	11 P _S	2.73	.0113	.279													
19																	
20	12 P _S	2.97	.0123	.270													
21	bikes dropped																
22	VC-4 Jumbo CT 7 P _S	1.16	.0048	.408 X 1.144	A67												
23																	
24	t=187 8 P _S	1.04	.0043	.259	.296												
25																	
26	9 P _S	.910	.0038	.263	.301												
27																	
28	10 P _S	.738	.0031	.256	.293												
29																	
30	11 P _S	.959	.0040	.249	.285												
31																	
32	12 P _S	.981	.0041	.225	.257												
33																	
34																	
35																	

3M 108606

C =

W 2445 x 103

K x 540 x 585 x 62.5

.852 W

K

.402

C = 2.15 W

K

Should be

C 2.46 W

K

2.46

2.15

3/10/00

FILE	
SEC.	
DATE	10-28-81
SHEET NO.	

ANALYSIS FORM 1038A

			A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
6	VC 4	3520	1 p	.826	3.42														
7		BK 1	S	—	3.42														
8			2 p	.614	2.54														
9			S	—															
10			3 p	.756	3.13														
11	t = 187		S	—															
12			4 p	.746	3.09														
13			S	—															
14			5 p	.868	3.59														
15			S	—															
16			6 p	.800	3.31														
17			S	—															
18			1 p	.776	3.21														
19			S	—															
20			2 p	.848	3.51														
21			S	—															
22			3 p	.863	3.57														
23			S	—															
24			4 p	.670	2.77														
25			S	—															
26			5 p	.747	3.09														
27			S	—															
28			1 p	.808	3.30														
29			S	—															
30																			
31																			
32																			
33																			
34																			
35																			

+10-3

$\phi_{12} = 3.215 \pm .3, 8$
($\pm 9.99\%$)

$C = .161$

B520 CT

VC 1	2.64	
1st	2	.186
2nd	3	.198
3rd	4	.161

.325 sm
jumbo
jumbo

3M 108607

4

			A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
45	VC-2 BX1	1 P	1.196	.00495														
2		S	.269	.00111		.00739												
3	t = 360	2 P	1.216	.00503														
4		S	.335	.00139		.00809												
5		3 P	1.074	.00445														
56		S	.323	.00134		.00739												
7	low level	4 P	.973	.01402														
8		S	.227	.00094		.00609												
9	none	5 P	—	—		—												
10		S	.353	—		—												
55		6 P	1.138	.00411														
12		S	.302	.00125		.00744												
13	Bx2	1 P	1.202	.00498														
14		S	.138	.000571		.00624												
15		2 P	.757	.00313														
16		S	.356	.00125		.00637												
17		3 P	1.058	.00438		.00438												
18		S	—	—		—												
19		4 P	1.140	.00472														
20		S	.316	.00131		.00760												
21		5 P	.988	.00409														
22		S	.275	.00114		.00660												
23		6 P	1.262	.00522														
24		S	.338	.00140		.00830												
25	CT	7 P	1.749	25.3	.0522		.289/n	.34										
26		S	.359	.00149	.00671													
27		8 P	1.687	35.7	.00760		.289/n	.316										
28		S	.438	.00181	.00551													
29		9 P	1.526	31.1	.00632		.264/n	.311										
30		S	.289	.00120	.00752													
31		10 P	1.403	26.04	.00581		.264/n	.316										
32		S	.149	.000617	.00643													
33		11 P	1.545	.00646			.250/n	.294										
34		S	.363	.00156	.00790													
35																		

$$X_{10} = 7.153 \pm .78 \times 10^{-3}$$

$$(10.9\%)$$

• 186 ppm

$$C = \frac{W \times 24.45 \times 10^3}{K \times 360 \times r \times 62.5}$$

$$C = \frac{1.09W}{K_r} \quad b = .85$$

$$= .325 \pm .027$$

$$(\pm 8.3\%)$$

3M 108608

~~3~~

3M 108609

ANALYSIS FORM 1038A

FILE

SEC.

DATE

SHEET NO.

VC-5
Cont

12 P
S

	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
32																
33																
34																
35																

3M 108610

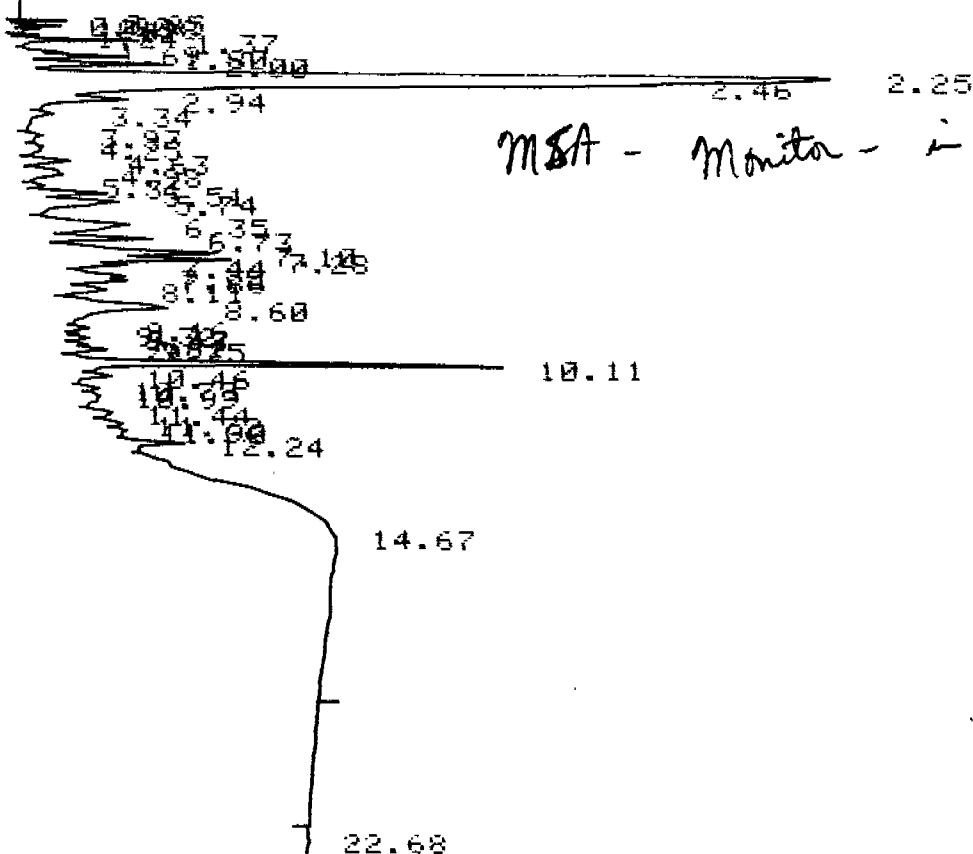
ANALYSIS FORM

ANALYSIS FORM																		
			A	min	C	cc/min	D	E	F	G	H	J	K	L	M			
1																		
2	UC-1 100cc /		.50	200		11	200											
3			.50			90	200		113.6 l									
4																		
5																		
6			.49			③	8:00											
7																		
8																		
9																		
10	VC-2 10-26																	
11	VC office 500		1.95	25.6		25.3												
12			2.00	25.0														
13	Nadine Pump 7		1.27															
14																		
15	8'		1.40	35.7														
16			1.42															
17																		
18	9'		1.61	31.6														
19																		
20	10		1.92	1.29	26.04													
21																		
22																		
23	11		1.45	34.5														
24																		
25																		
26	12		1.29	38.8														
27	50% RH					894	70		65380			4:02 pm						
28	123520's					1548	50					8:01 pm						
29	25.3 delivery 6.229 CT		181.6															
30																		
31																		
32	VC-3																	
33	50% RH 12 3520's					607	00					10:29 pm						
34	tank 1 6 jumps CT		210.64			744	00		113700			7:29 am						
35	25.3 delivery																	
36																		
37																		
38	VC-4 12 3520's		209.11			717	300					7:44 am	3'7"					
39	50% RH 6 jumps					110	400		39100			10:51 am	187 min					
40	tank 1																	
41	VC-5 12 3520's		209.01			952	70		92300			9:01 am						
42	tank 2 50% RH 6 jumps		2314			988	80		103510			4:32 pm	7128"					
43																		
44	VC-6																	
45	tank 2 -					917	50					4:46 pm						
46	humidity (64%)		195.91			1438	40		82090			11:45 pm	6'59"					
47																		

9.18	7120	0.360
9.47	2990	0.151
9.73	12910	0.653
9.94	7830	0.396
10.12	5977	0.302
10.22	15040	0.761
10.64	7588	0.384
10.81	13030	0.659
10.99	12870	0.651
11.41	28840	1.459
11.89	42400	2.145
12.18	23690	1.199
12.45	21900	1.108
12.79	47190	2.388
13.02	34280	1.734
13.50	88160	4.460
13.79	106300	5.378
14.10	50970	2.579
14.69	183500	9.284
15.03	65200	3.299
15.31	167800	8.490
16.16	674400	34.121

DIL FACTOR: 1.0000 E+ 0

START



HP RUN # 12
BOTTLE 24
AREA 2

OCT 22 1981

TIME 16:47:32

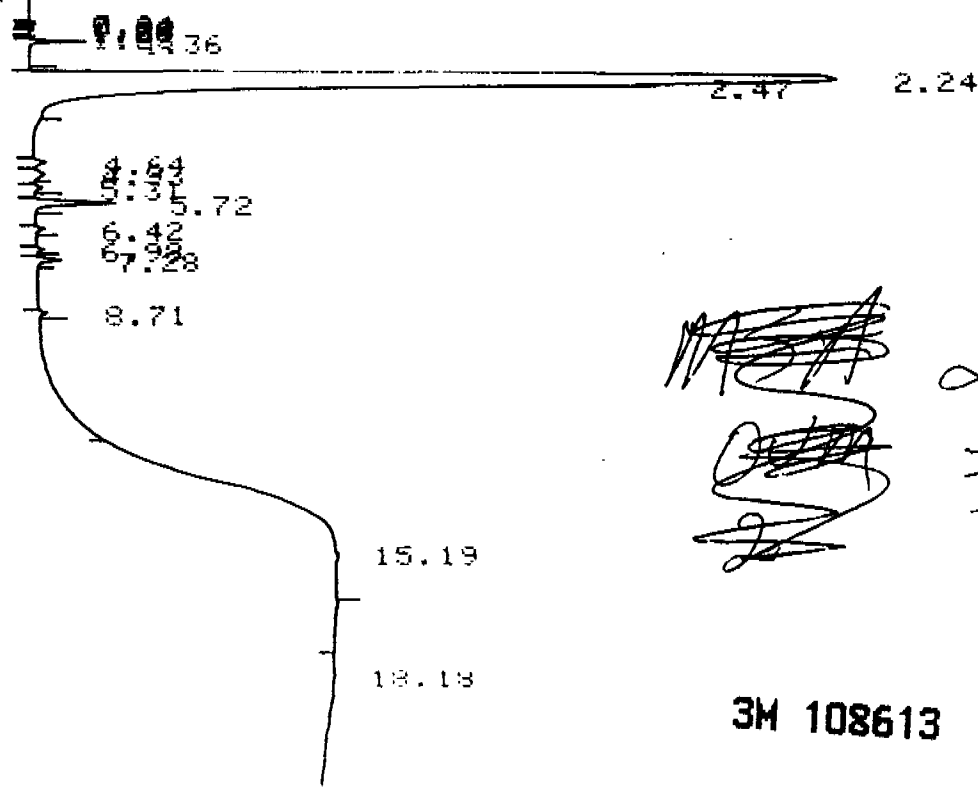
RT	AREA	AREA %
0.85	1287	0.006
0.92	234	0.012
0.97	1812	0.111
1.00	100	0.005
1.05	100	0.005

3M 108612

1.69	2885	0.175
1.80	8874	0.610
2.00	14790	1.017
2.25	158000	10.864
2.46	91020	6.258
2.94	17870	1.229
3.34	6442	0.443
3.93	3073	0.211
4.25	5635	0.387
4.63	6728	0.463
4.98	9660	0.664
5.31	2735	0.188
5.51	10840	0.745
5.74	20620	1.418
6.35	28840	1.983
6.73	17410	1.197
7.10	33650	2.314
7.28	24790	1.704
7.44	12730	0.875
7.75	16630	1.143
7.86	14260	0.980
8.11	17750	1.220
8.60	52210	3.590
9.16	13290	0.914
9.32	4887	0.336
9.43	8932	0.614
9.61	6972	0.479
9.75	13160	0.905
10.11	68060	4.680
10.46	15990	1.099
10.79	15230	1.047
10.99	23000	1.587
11.44	15530	1.068
11.72	13300	0.914
11.90	9738	0.670
12.24	24810	1.706
14.67	632300	43.475
22.68	605	0.042

DIL FACTOR: 1.0000 E+ 0

START



FILE

SEC.

DATE

SHEET NO.

ANALYSIS FORM 1038A

VC-6
No humidityAU 403
AU25.3 cc
195.96/min2.5 x 10¹
196 + 10⁵25.3 cc
= 1.28 x 1097.66
1025.32 = 195.9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	1.704																	
2	1.541	2.89																
3	1.564																	
4	1.523	2.71																
5	1.755																	
6	1.554	2.97																
7	1.586																	
8	1.572	2.71																
9	1.669																	
10	1.522	2.82																
11	1.701																	
12	1.488	2.77																
13	1.834																	
14	1.518	2.97																
15	1.812																	
16	1.337	2.55																
17	1.588																	
18	1.478	2.64																
19	1.982																	
20	1.490	3.06																
21	1.713																	
22	1.616	3.07																
23	37.1																	
24	27.7																	
25	27.1	29.4 ± 4.41 (15%)																
26	26.3																	
27	28.6																	
28	31.2																	
29	29.5																	
30	30.2	29.2 ± 2.59 (± 8.9%)																
31	24.7																	
32	30.4																	
33																		
34																		
35																		

2.82 ± .17 (± 6.0%)

= .0123 x 10³ x 10³

= .0123 ng

C = 9.38 w / 419 mm = 9.38 (12.349)

1275 ppm

6 was spilled

gross spike 50 ml p

2.56 ng = 128 ng
μgSF = ng/μg = .128 ng / 29.7 AU x 10⁻³ = .00436 ng/AU

= .00436 ng/AU

3M 108614

509012H
VC-5 tank 2

	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
1	3520	1 P	4.92													
2	Box 1	5	2.37	10.1												
3		2 P	6.23													
4		5	2.05	10.3												
5	Loss of saw	3 P	4.34													
6		5	2.09													
7		4 P	5.28													
8		5	1.94	9.5												
9		5 P	4.64	9.7												
10		5	2.30													
11		6 P	5.74	10.5												
12		5	2.18													
13	Box 2	1 P	5.69	11.1												
14		5	2.45													
15		2 P	5.12	9.7												
16		5	2.09													
17		3 P	5.80	10.8												
18		5	2.25													
19		4 P	5.19	9.3												
20		5	1.89													
21		5 P	5.51	10.1												
22		5	2.08													
23		6 P	5.48	9.8												
24		5	1.97													
25	Jumbo Tubes	17 P														
26		5														
27		8 P														
28		5														
29		9 P														
30		5														
31		10 P														
32		5														
33		11 P														
34		5														
35																

$$\bar{Y} = 10.1 \pm .68 (\pm 5.890)$$

$$10^3 \times 10.1 (.00436 \frac{\text{mg}}{\text{ml}}) = 44.0 \text{ mg}$$

$$C = \frac{44.0 \text{ mg} (9.38)}{44.8 \text{ min}} = .921$$

pump wasn't on

3M 108615

VC-1 2.64 CT 3.41
 VC2 .186 .325
 3 .198 ~~.325~~
 VC-4 .161

6 hrs }
 9 hrs } tank one
 3 hrs }

VC-5 .921

VC-6 .275

ANALYSIS FORM 1038A

FILE

SEC.

DATE

SHEET NO.

	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
32																
33																
34																
35																

3M 108617

FILE

SEC.

DATE

SHEET NO.

ANALYSIS FORM 1038A

	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
32																
33																
34																
35																

3M 108618