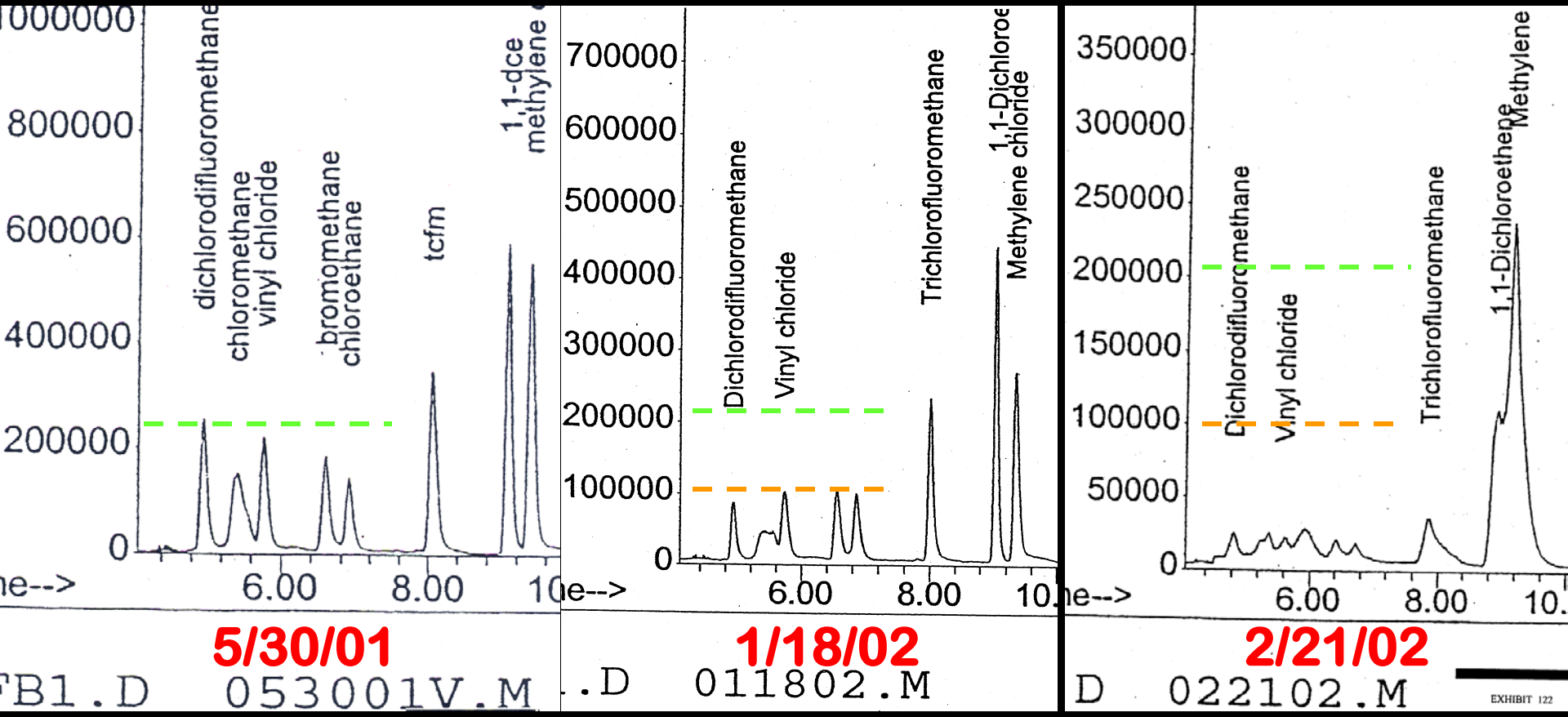
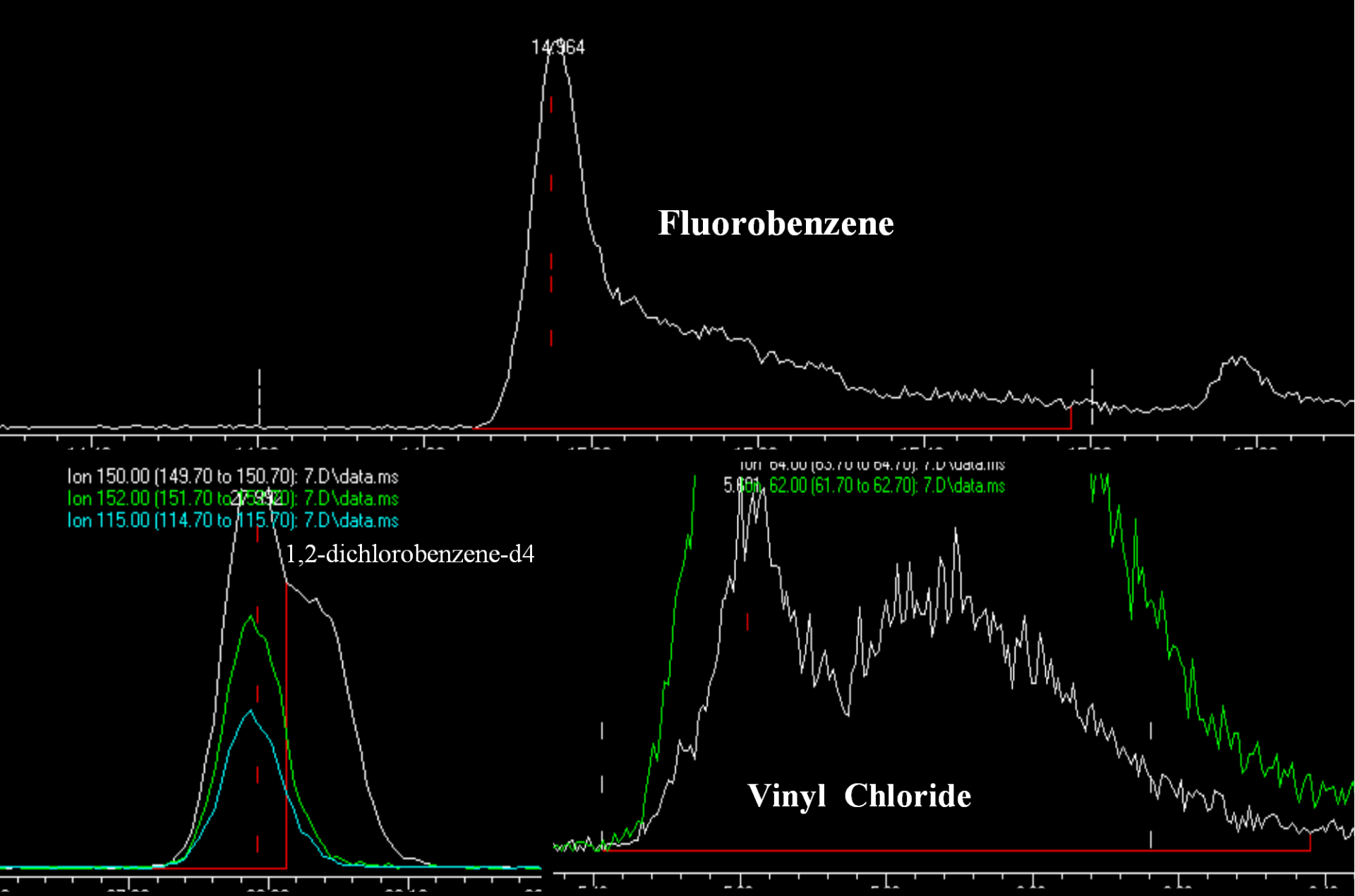
The Inappropriate Use of a Calibration Model To Compensate For Not Performing Maintenance

Note: The option for non-linear calibration may be necessary to address specific instrumental techniques. However, it is not EPA's intent to allow non-linear calibration to be used to compensate for detector saturation or to avoid proper instrument maintenance.

Ref: EPA Method 8000C, Section 11.5, Page 38
Rev. 3, March 2003



Loss of Resolution Over Time Due to Split Ratio Set Too Low With Water Destroying MS Filament



Specific Compounds with Resolution/Response Problems

ata File : C:\MSDCHEM\1\DATA\053001\LFB1.D
q On : 30 May 2001 1:55 pm
mple : 2.0 ppb LFB
sc :
Integration Params: RTEINT.P
ant Time: May 31 08:24:21 2001 Quant Resul

ant Method : C:\MSDCHEM\1\METHODS\053001V.M (RTE Int
tle : Method 524.2
st Update : Thu May 31 08:22:07 2001
sponse via : Initial Calibration
taAcq Meth : 524_2

nternal Standards	R.T.	QIon	Response
1) Fluorobenzene	15.21	96	1289020
ystem Monitoring Compounds			
2) Bromofluorobenzene	24.57	95	936070
3) 1,2-Dichlorobenzene-d4	28.32	150	1438359
arget Compounds			
4) 1,2,3-TCPA	23.99	75	295974
5) o-xylene	23.71	106	1453882

ata File : C:\MSDCHEM\1\DATA\524-2VOCS\011802\11.D Vial: 10
cq On : 18 Jan 2002 6:12 pm Operator:
ample : ~~LRB~~ CCV1 - LFB 5.0ppb 1/25/02 Inst : Instrumen
isc : Multiplr: 1.00
Integration Params: RTEINT.P
uant Time: Jan 23 16:40:43 2002 Quant Results File: 011802.RES

uant Method : C:\MSDCHEM\1\METHODS\011802.M (RTE Integrator)
itle : Method 524.2
ast Update : Wed Jan 23 16:40:30 2002
esponse via : Initial Calibration
ataAcq Meth : 011802

For Nitrobenzene ON
2/22/02

nternal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorobenzene	15.17	96	359679	1.00 ug/L	-0.05
ystem Monitoring Compounds					
2) Bromofluorobenzene	24.52	95	93957	0.93 ug/L	-0.05
3) 1,2-Dichlorobenzene-d4	28.26	150	142167m ←	1.00 ug/L	-0.05
arget Compounds					Qvalue
4) o-Xylene	23.65	106	918714	4.92 ug/L	99
5) Styrene	23.49	103	648230	5.10 ug/L	99
6) Bromoform	22.97	173	103095	4.71 ug/L	98
7) Ethylbenzene	22.36	106	811360	4.95 ug/L	81
8) Chlorobenzene	21.92	112	1386979	5.13 ug/L	96
9) Tetrachloroethene	20.49	166	522540	5.41 ug/L	97
10) 1,2-Dibromomethane	20.11	107	226685	5.21 ug/L	99
11) Dibromochloromethane	19.60	129	241891	4.93 ug/L	95
12) Toluene	18.97	92	1354461	4.96 ug/L	88
13) 1,1,2-Trichloroethane	18.57	97	257131	5.27 ug/L	99
14) Bromodichloromethane	16.08	83	464777	5.11 ug/L	96
15) Trichloroethene	16.00	130	575004	5.12 ug/L	98
16) 1,2-Dichloropropane	15.91	63	507915	5.28 ug/L #	87
17) Benzene	14.75	77	490839	5.25 ug/L	85
18) Carbon tetrachloride	14.67	117	503056	4.89 ug/L	96
19) 1,1,1-Trichloroethane	13.97	97	661213	5.03 ug/L	98
20) Chloroform	12.55	83	803741	5.28 ug/L	99
21) Bromochloromethane	12.45	130	225445	5.56 ug/L	85
22) cis-1,2-Dichloroethene	12.15	61	747939	5.39 ug/L	92
23) Methyl tert-Butyl Ether	10.84	73	538485	5.23 ug/L	100
24) Methylene chloride	9.35	84	406111	5.11 ug/L	93
25) 1,1-Dichloroethene	9.04	61	694486	5.73 ug/L	95
26) Trichlorofluoromethane	8.00	101	588297	5.42 ug/L	99
27) Vinyl chloride	5.72	64	123848	9.70 ug/L #	100
28) Dichlorodifluoromethane	4.92	85	278939	4.88 ug/L	100
29) trans-1,2-Dichloroethene	10.60	61	761311	5.22 ug/L	93

Decrease in Response over Time vs. Increase Use of Manual Integrations and Quadratic Curve Fits

Data File : C:\MSDCHEM\1\DATA\524-2VOCS\011802\11.D Vial: 10
Acq On : 18 Jan 2002 6:12 pm Operator:
Sample : ~~LRB~~ CCV1 - LFB 5.0ppb 1/25/02 Inst : Instru
Misc : Multiplr: 1.00
Integration Params: RTEINT.P
Quant Time: Jan 23 16:40:43 2002 Quant Results File: 011802

Quant Method : C:\MSDCHEM\1\METHODS\011802.M (RTE Integrator)
Title : Method 524.2
Last Update : Wed Jan 23 16:40:30 2002
Response via : Initial Calibration
DataAcq Meth : 011802

For Nitrobenz

2/22

Internal Standards	R.T.	QIon	Response	Conc Units	De
1) Fluorobenzene	15.17	96	359679	1.00 ug/L	
System Monitoring Compounds					
2) Bromofluorobenzene	24.52	95	93957	0.93 ug/L	
3) 1,2-Dichlorobenzene-d4	28.26	150	142167m ←	1.00 ug/L	
Target Compounds					Q
4) o-Xylene	23.65	106	918714	4.92 ug/L	
5) Styrene	23.49	103	648230	5.10 ug/L	
6) Bromoform	22.97	173	103095	4.71 ug/L	
7) Ethylbenzene	22.36	106	811360	4.95 ug/L	
8) Chlorobenzene	21.92	112	1386979	5.13 ug/L	
9) Tetrachloroethene	20.49	166	522540	5.41 ug/L	
10) 1,2-Dibromomethane	20.11	107	226685	5.21 ug/L	
11) Dibromochloromethane	19.60	129	241891	4.93 ug/L	
12) Toluene	18.97	92	1354461	4.96 ug/L	
13) 1,1,2-Trichloroethane	18.57	97	257131	5.27 ug/L	
14) Bromodichloromethane	16.08	83	464777	5.11 ug/L	
15) Trichloroethene	16.00	130	575004	5.12 ug/L	
16) 1,2-Dichloropropane	15.91	63	507915	5.28 ug/L	#
17) Benzene	14.75	77	490839	5.25 ug/L	
18) Carbon tetrachloride	14.67	117	503056	4.89 ug/L	
19) 1,1,1-Trichloroethane	13.97	97	661213	5.03 ug/L	
20) Chloroform	12.55	83	803741	5.28 ug/L	
21) Bromochloromethane	12.45	130	225445	5.56 ug/L	
22) cis-1,2-Dichloroethene	12.15	61	747939	5.39 ug/L	
23) Methyl tert-Butyl Ether	10.84	73	538485	5.23 ug/L	
24) Methylene chloride	9.35	84	406111	5.11 ug/L	
25) 1,1-Dichloroethene	9.04	61	694486	5.73 ug/L	
26) Trichlorofluoromethane	8.00	101	588297	5.42 ug/L	
27) Vinyl chloride	5.72	64	123848	9.70 ug/L	#
28) Dichlorodifluoromethane	4.92	85	278939	4.88 ug/L	
29) trans-1,2-Dichloroethene	10.60	61	761311	5.22 ug/L	

Data File : C:\MSDCHEM\1\DATA\524-2VOCS\022102\7.D Vial: 7
Acq On : 21 Feb 2002 4:19 pm Operator:
Sample : ccv1 lfb Inst : Instru
sc : Multiplr: 1.00
Integration Params: RTEINT.P
Quant Time: Feb 27 12:26:53 2002 Quant Results File: 022102

Quant Method : C:\MSDCHEM\1\METHODS\022102.M (RTE Integrator)
Title : Method 524.2
Last Update : Wed Feb 27 11:54:06 2002
Response via : Initial Calibration
DataAcq Meth : 524_2

2/27/02

Internal Standards	R.T.	QIon	Response	Conc Units	Dev
1) Fluorobenzene	14.96	96	216205m ←	1.00 ug/L	
System Monitoring Compounds					
2) Bromofluorobenzene	24.26	95	49967	0.79 ug/L	
3) 1,2-Dichlorobenzene-d4	27.99	150	75691m ←	0.73 ug/L	
Target Compounds					Q
4) o-Xylene	23.39	106	422244	4.80 ug/L	#
5) Styrene	23.24	103	295100m ←	4.75 ug/L	
6) Bromoform	22.70	173	12001	4.48 ug/L	#
7) Ethylbenzene	22.11	106	344906m ←	4.86 ug/L	
8) Chlorobenzene	21.66	112	670502	4.65 ug/L	
9) Tetrachloroethene	20.24	166	319340	4.54 ug/L	
10) 1,2-Dibromomethane	19.85	107	49671	6.03 ug/L	
11) Dibromochloromethane	19.35	129	33296	4.91 ug/L	
12) Toluene	18.73	92	693219m ←	4.70 ug/L	
13) 1,1,2-Trichloroethane	18.33	97	120558	4.85 ug/L	
14) Bromodichloromethane	15.85	83	101150m ←	4.93 ug/L	
15) Trichloroethene	15.78	130	425316m ←	4.81 ug/L	
16) 1,2-Dichloropropane	15.69	63	170903	4.76 ug/L	#
17) Benzene	14.55	77	256203m ←	4.22 ug/L	
18) Carbon tetrachloride	14.45	117	64019	4.51 ug/L	
19) 1,1,1-Trichloroethane	13.76	97	114837	4.53 ug/L	#
20) Chloroform	12.37	83	437297m ←	4.82 ug/L	
21) Bromochloromethane	12.26	130	135527m ←	5.13 ug/L	
22) cis-1,2-Dichloroethene	11.97	61	548384m ←	4.87 ug/L	
23) Methyl tert-Butyl Ether	10.67	73	156123	4.60 ug/L	
24) Methylene chloride	9.16	84	442168m ←	4.89 ug/L	
25) 1,1-Dichloroethene	8.92	61	1078888m ←	4.90 ug/L	
26) Trichlorofluoromethane	7.85	101	102875m ←	0.91 ug/L	
27) Vinyl chloride	5.60	64	52059m ←	1.30 ug/L	
28) Dichlorodifluoromethane	4.82	85	95849m ←	0.91 ug/L	
29) trans-1,2-Dichloroethene	10.44	61	540150m ←	4.82 ug/L	

Decrease in Response over Time vs. Increase Use of Manual Integrations and Quadratic Curve Fits

*COMPOUND LIST REPORT Instrumen

Method Path : G:\ENV\data\524.2 Data\
Method File : 082001V.M
Title : Method 524.2
Last Update : Fri Nov 02 07:26:21 2001
Response Via : *INITIAL CALIBRATION

* TOTAL CPNDS : 63
*

PK#		COMPOUND NAME	QION	EXP_RT	REL_RT	CAL	#
1	I	Fluorobenzene	96	15.220	1.000	L	
2	S	Bromofluorobenzene	95	24.577	1.615	L	
3	S	1,2-Dichlorobenzene-d4	150	28.322	1.861	L	
4		1,2,3-TCPA	75	23.997	1.577	L	
5		o-xylene	106	23.704	1.557	L	
6		1,1,2,2-TCA	83	23.672	1.555	L	
7		styrene	103	23.552	1.547	L	
8		bromoform	173	23.024	1.513	L	
9		ethylbenzene	91	22.417	1.473	L	
10		chlorobenzene	112	21.972	1.444	L	
11		PCE	166	20.545	1.350	L	
12		1,2-DBM	107	20.158	1.324	L	
13		2-BR	129	19.645	1.291	L	
14		1,3-dcpa	76	19.111	1.256	L	
15		toluene	91	19.023	1.250	L	
16		1,1,2-TCA	97	18.630	1.224	L	
17		1-BR	83	16.130	1.060	L	
18		TCE	130	16.047	1.054	L	
19		1,2-dcp	63	15.963	1.049	L	
20		benzene	78	14.802	0.973	L	
21		carbon tetrachloride	117	14.718	0.967	L	
22		1,1,-dcpe	75	14.378	0.945	L	
23		TCA	97	14.017	0.921	L	
24		2,2-dcp	77	12.736	0.837	L	
25		Chloroform	83	12.595	0.827	L	

*COMPOUND LIST REPORT Instrumen

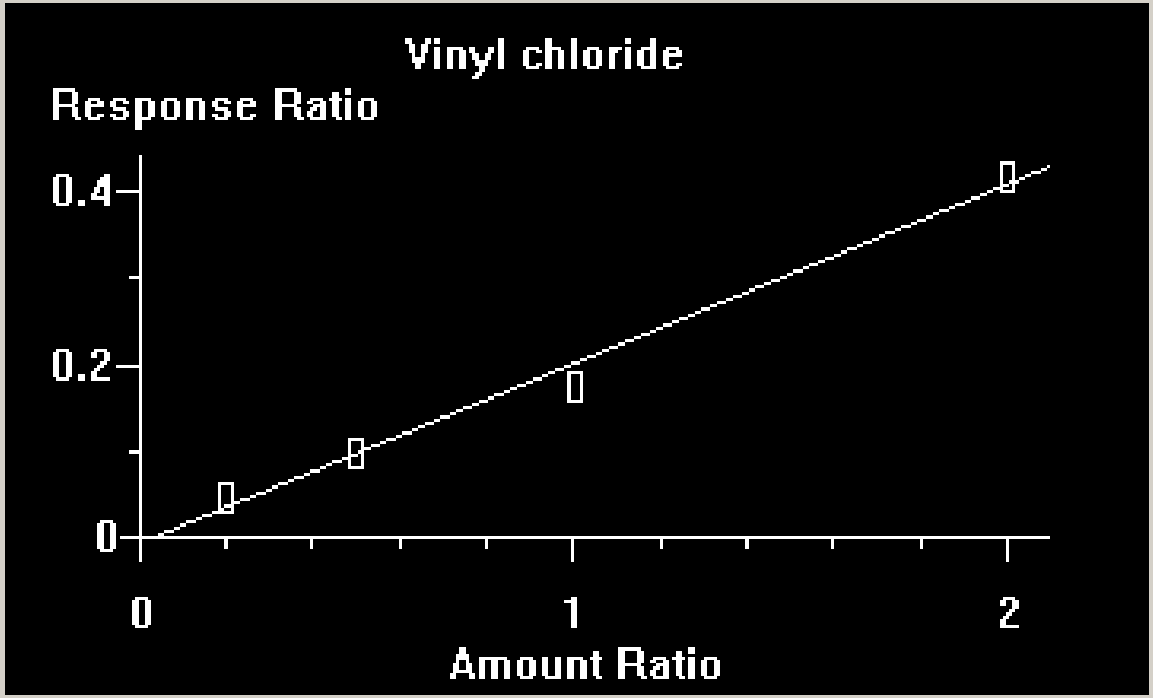
Method Path : C:\MSDchem\1\METHODS\September\Lab 2\
Method File : 022102.M
Title : Method 524.2
Last Update : Wed Feb 27 13:30:32 2002
Response Via : *INITIAL CALIBRATION

* TOTAL CPNDS : 49
*

PK#		COMPOUND NAME	QION	EXP_RT	REL_RT	CAL	#
1	I	Fluorobenzene	96	14.954	1.000	A	
2	S	Bromofluorobenzene	95	24.258	1.622	Q	
3	S	1,2-Dichlorobenzene-d4	150	27.993	1.872	Q	
4		o-Xylene	106	23.395	1.565	Q	
5		Styrene	103	23.238	1.554	L	
6		Bromoform	173	22.705	1.518	Q	
7		Ethylbenzene	106	22.108	1.478	Q	
8		Chlorobenzene	112	21.664	1.449	Q	
9		Tetrachloroethene	166	20.246	1.354	L	
10		1,2-Dibromomethane	107	19.854	1.328	L	
11		Dibromochloromethane	129	19.347	1.294	Q	
12		Toluene	92	18.730	1.253	L	
13		1,1,2-Trichloroethane	97	18.337	1.226	Q	
14		Bromodichloromethane	83	15.853	1.060	Q	
15		Trichloroethene	130	15.853	1.060	Q	
16		1,2-Dichloropropane	63	15.696	1.050	Q	
17		Benzene	77	14.540	0.972	Q	
18		Carbon tetrachloride	117	14.435	0.965	Q	
19		1,1,1-Trichloroethane	97	13.745	0.919	Q	
20		Chloroform	83	12.348	0.826	Q	
21		Bromochloromethane	130	12.239	0.818	Q	
22		cis-1,2-Dichloroethene	61	11.972	0.801	L	
23		Methyl tert-Butyl Ether	73	10.659	0.713	Q	
24		Methylene chloride	84	9.148	0.612	Q	
25		1,1-Dichloroethene	61	8.855	0.592	L	

L = Linear Q = Quadratic

Plot Calibration Curve



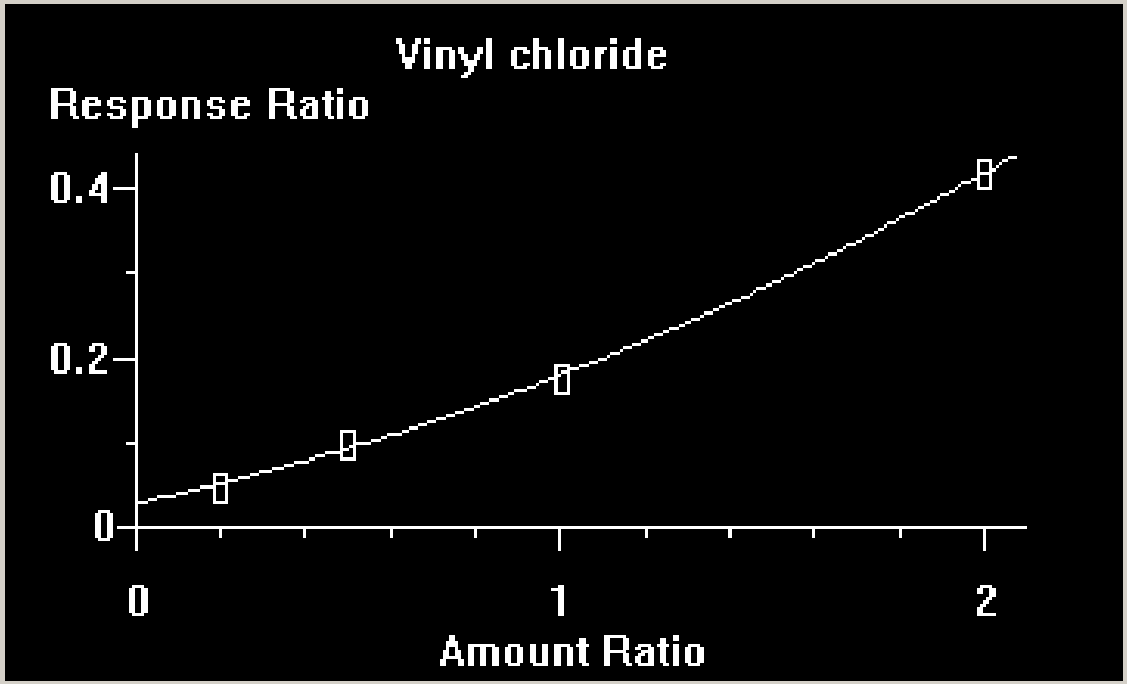
Amount Ratio	Response Ratio
0.20000000	0.04841793
0.50000000	0.09951501
1.00000000	0.17524637
2.00000000	0.41744770

Resp Ratio = 2.06e-001 * Amt - 5.29e-003

Coef of Det (r^2) = 0.988 Curve Fit Linear

OK Print

Plot Calibration Curve



Amount Ratio	Response Ratio
0.20000000	0.04841793
0.50000000	0.09951501
1.00000000	0.17524637
2.00000000	0.41744770

R = 4.39e-002 A*A + 1.06e-001 A + 2.89e-002

Coef of Det (r^2) = 0.999 Curve Fit Quadratic

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