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Level IV Data Package

MWH Group 203814

Method: 218.6

Sample No.:
2705080517
2705080516

No.	Sample Name	Time	Dil.Fac.	Amount	Comment	Analyst:	tlh
				CRVI-LOW			
				UV VIS 1		Criteria	
1,	Standard 1 - 0.1 ppb	04/09/07 10:14,	1.0,	0.111	Diluted from TLH060816-2		
2,	Standard 2 - 0.2ppb	04/09/07 10:22,	1.0,	0.219	TLH060816-1		
3,	Standard 3 - 2.0 ppb	04/09/07 10:30,	1.0,	1.849	TLH060816-2		
4,	Standard 4 - 10 ppb	04/09/07 10:38,	1.0,	10.305	TLH060816-3		
5,	Standard 5 - 20 ppb	04/09/07 10:46,	1.0,	20.021	TLH060816-4		
6,	Standard 6 - 50ppb	04/09/07 10:55,	1.0,	49.937	TLH060816-5		
7,	WASH	05/08/07 11:38,	1.0,	0.004			
8,	WASH	05/08/07 11:44,	1.0,	0.001			
9,	IPC 20	05/08/07 11:52,	1.0,	20.039			
10,	LRB	05/08/07 12:00,	1.0,	0.003			
11,	LRB BUFFER	05/08/07 12:08,	1.0,	n.a.			
12,	MRL 0.1ppb	05/08/07 12:16,	1.0,	0.087			
13,	LCS 2.0ppb	05/08/07 12:24,	1.0,	2.072	✓ TLH070323-2		
14,	LCS 2.0ppb Dup	05/08/07 12:32,	1.0,	2.067	✓		
15,	2705010113	05/08/07 12:40,	1.0,	0.422	✓		
16,	2705010113_MS	05/08/07 12:48,	1.0,	2.589	✓ 2.17 - 108% recovery		
17,	2705010113_MSD	05/08/07 12:57,	1.0,	2.624	✓ 2.20 - 110% recovery		
18,	2705080521	05/08/07 13:05,	1.0,	14.930	✓		
19,	2705080524 (1:5)	05/08/07 13:13,	5.0,	53.976	✓		
20,	2705080523 (1:5)	05/08/07 13:21,	5.0,	55.356	✓		
21,	2705080598	05/08/07 13:29,	1.0,	10.316	✓		
22,	2705080517	05/08/07 13:37,	1.0,	0.005	✓		
23,	2705080516	05/08/07 13:45,	1.0,	n.a.	✓		
24,	2705040251	05/08/07 13:53,	1.0,	0.059	✓ CRVI-L_R		
25,	2705040252	05/08/07 14:01,	1.0,	0.050	✓ CRVI-L_R		
26,	2705030231	05/08/07 14:09,	1.0,	5.868	✓		
27,	LRB	05/08/07 14:18,	1.0,	n.a.			
28,	IPC 20	05/08/07 14:26,	1.0,	20.553			
29,	2705040253	05/08/07 15:26,	1.0,	n.a.	✓ CRVI-L_R		
30,	2705020938	05/08/07 15:34,	1.0,	0.058	✓		
31,	2705020136	05/08/07 15:42,	1.0,	0.057	✓ CRVI-L_R (UNP H1)		
32,	2705070490	05/08/07 15:50,	1.0,	0.078	(UNP H1)		
33,	2705070487	05/08/07 15:58,	1.0,	n.a.	(UNP H1)		
34,	2705070488	05/08/07 16:06,	1.0,	0.002	(UP H1)	MRL 50%-150%	
35,	2705020938_MS	05/08/07 16:14,	1.0,	2.260	✓ 2.20 - 110% recovery	0.05 - 0.15ppb	
36,	2705080943	05/08/07 16:23,	1.0,	n.a.	UNP	LCS 90%-110%	
37,	LRB	05/08/07 16:31,	1.0,	0.017		Range: 1.80 - 2.20	
38,	IPC 20	05/08/07 16:39,	1.0,	20.395		MS/MSD 90%-110%	
39,	2705080826	05/08/07 16:47,	1.0,	n.a.	✓ CRVI199	True Value = 2.0	
40,	WASH	05/08/07 16:55,	1.0,	0.023		IPC 95%-105%	
41,	WASH	05/08/07 17:04,	1.0,	0.003		20ppb - 19-21ppb	
42,	WASH	05/08/07 17:12,	1.0,	0.339		10ppb - 9.5-10.5 ppb	
43,	WASH	05/08/07 17:20,	1.0,	0.009			
44,	LRB	05/08/07 17:28,	1.0,	n.a.			
45,	IPC 20	05/08/07 17:36,	1.0,	20.482			

Rev:un

Sequence: 050807-IC5-CRVI
Operator: tih

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Printed: 5/9/2007 4:39:56 PM

Title: CRVI-LOW

Datasource: Dionex_USPAS2SDIO2

Location: IC\IC5_CRVI-LOW\2007\May

Timebase: IC-#5

#Samples: 45

Created: 5/8/2007 11:27:18 AM by tih
(Modified, not saved)

No.	Name	Dil. Factor	Type	Comment	Pos.	Inj. Vol.	Program
1	Standard 1 - 0.1 ppb	1.0000	Standard	Diluted from TLH060816-2	810	1.0	CRVI-LOW-loop
2	Standard 2 - 0.2ppb	1.0000	Standard	TLH060816-1	810	1.0	CRVI-LOW-loop
3	Standard 3 - 2.0 ppb	1.0000	Standard	TLH060816-2	810	1.0	CRVI-LOW-loop
4	Standard 4 - 10 ppb	1.0000	Standard	TLH060816-3	810	1.0	CRVI-LOW-loop
5	Standard 5 - 20 ppb	1.0000	Standard	TLH060816-4	810	1.0	CRVI-LOW-loop
6	Standard 6 - 50ppb	1.0000	Standard	TLH060816-5	810	1.0	CRVI-LOW-loop
7	WASH	1.0000	Unknown		808	1.0	CRVI-LOW-loop
8	WASH	1.0000	Unknown		809	1.0	CRVI-LOW-loop
9	IPC 20	1.0000	Unknown		809	1.0	CRVI-LOW-loop
10	LRB	1.0000	Unknown		808	1.0	CRVI-LOW-loop
11	LRB BUFFER	1.0000	Unknown		808	1.0	CRVI-LOW-loop
12	MRL 0.1ppb	1.0000	Unknown		809	1.0	CRVI-LOW-loop
13	LCS 2.0ppb	1.0000	Unknown	TLH070323-2	810	1.0	CRVI-LOW-loop
14	LCS 2.0ppb Dup	1.0000	Unknown		811	1.0	CRVI-LOW-loop
15	2705010113	1.0000	Unknown		812	1.0	CRVI-LOW-loop
16	2705010113_MS	1.0000	Unknown	2.17 - 108% recovery	813	1.0	CRVI-LOW-loop
17	2705010113_MSD	1.0000	Unknown	2.20 - 110% recovery	814	1.0	CRVI-LOW-loop
18	2705080521	1.0000	Unknown		815	1.0	CRVI-LOW-loop
19	2705080524 (1:5)	5.0000	Unknown		816	1.0	CRVI-LOW-loop
20	2705080523 (1:5)	5.0000	Unknown		817	1.0	CRVI-LOW-loop
21	2705080598	1.0000	Unknown		818	1.0	CRVI-LOW-loop
22	2705080517	1.0000	Unknown		819	1.0	CRVI-LOW-loop
23	2705080516	1.0000	Unknown		820	1.0	CRVI-LOW-loop
24	2705040251	1.0000	Unknown	CRVI-L_R	821	1.0	CRVI-LOW-loop
25	2705040252	1.0000	Unknown	CRVI-L_R	822	1.0	CRVI-LOW-loop
26	2705030231	1.0000	Unknown		823	1.0	CRVI-LOW-loop
27	LRB	1.0000	Unknown		824	1.0	CRVI-LOW-loop
28	IPC 20	1.0000	Unknown		825	1.0	CRVI-LOW-loop
29	2705040253	1.0000	Unknown	CRVI-L_R	826	1.0	CRVI-LOW-loop
30	2705020938	1.0000	Unknown		827	1.0	CRVI-LOW-loop
31	2705020136	1.0000	Unknown	CRVI-L_R (UNP H1)	828	1.0	CRVI-LOW-loop
32	2705070490	1.0000	Unknown	(UNP H1)	829	1.0	CRVI-LOW-loop
33	2705070487	1.0000	Unknown	(UNP H1)	830	1.0	CRVI-LOW-loop
34	2705070488	1.0000	Unknown	(UP H1)	831	1.0	CRVI-LOW-loop
35	2705020938_MS	1.0000	Unknown	2.20 - 110% recovery	832	1.0	CRVI-LOW-loop
36	2705080943	1.0000	Unknown	UNP	833	1.0	CRVI-LOW-loop
37	LRB	1.0000	Unknown		834	1.0	CRVI-LOW-loop
38	IPC 20	1.0000	Unknown		834	1.0	CRVI-LOW-loop
39	2705080826	1.0000	Unknown	CRVI7199	835	1.0	CRVI-LOW-loop
40	WASH	1.0000	Unknown		836	1.0	CRVI-LOW-loop
41	WASH	1.0000	Unknown		837	1.0	CRVI-LOW-loop
42	WASH	1.0000	Unknown		838	1.0	CRVI-LOW-loop

Sequence: 050807-IC5-CrVI

Operator: tlh

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Printed: 5/9/2007 4:39:56 PM

Title: CRVI-LOW

Datasource: Dionex_USPAS2SDIO2

Location: ICVIC5_ CRVI-LOW\2007\May

Timebase: IC-#5

#Samples: 45

Created: 5/8/2007 11:27:18 AM by tlh
(Modified, not saved)

No.	Method	Status	Inj. Date/Time	*Analyst	*operator
1	1-IC#5-CrVI	Finished	4/9/2007 10:14:31 AM	tlh	
2	1-IC#5-CrVI	Finished	4/9/2007 10:22:37 AM	tlh	
3	1-IC#5-CrVI	Finished	4/9/2007 10:30:43 AM	tlh	
4	1-IC#5-CrVI	Finished	4/9/2007 10:38:49 AM	tlh	
5	1-IC#5-CrVI	Finished	4/9/2007 10:46:55 AM	tlh	
6	1-IC#5-CrVI	Finished	4/9/2007 10:55:01 AM	tlh	
7	1-IC#5-CrVI	Finished	5/8/2007 11:36:05 AM	tlh	
8	1-IC#5-CrVI	Finished	5/8/2007 11:44:09 AM	tlh	
9	1-IC#5-CrVI	Finished	5/8/2007 11:52:16 AM	tlh	
10	1-IC#5-CrVI	Finished	5/8/2007 12:00:21 PM	tlh	
11	1-IC#5-CrVI	Finished	5/8/2007 12:08:27 PM	tlh	
12	1-IC#5-CrVI	Finished	5/8/2007 12:16:33 PM	tlh	
13	1-IC#5-CrVI	Finished	5/8/2007 12:24:39 PM	tlh	
14	1-IC#5-CrVI	Finished	5/8/2007 12:32:45 PM	tlh	
15	1-IC#5-CrVI	Finished	5/8/2007 12:40:51 PM	tlh	
16	1-IC#5-CrVI	Finished	5/8/2007 12:48:57 PM	tlh	
17	1-IC#5-CrVI	Finished	5/8/2007 12:57:03 PM	tlh	
18	1-IC#5-CrVI	Finished	5/8/2007 1:05:09 PM	tlh	
19	1-IC#5-CrVI	Finished	5/8/2007 1:13:15 PM	tlh	
20	1-IC#5-CrVI	Finished	5/8/2007 1:21:21 PM	tlh	
21	1-IC#5-CrVI	Finished	5/8/2007 1:29:27 PM	tlh	
22	1-IC#5-CrVI	Finished	5/8/2007 1:37:33 PM	tlh	
23	1-IC#5-CrVI	Finished	5/8/2007 1:45:39 PM	tlh	
24	1-IC#5-CrVI	Finished	5/8/2007 1:53:45 PM	tlh	
25	1-IC#5-CrVI	Finished	5/8/2007 2:01:51 PM	tlh	
26	1-IC#5-CrVI	Finished	5/8/2007 2:09:58 PM	tlh	
27	1-IC#5-CrVI	Finished	5/8/2007 2:18:04 PM	tlh	
28	1-IC#5-CrVI	Finished	5/8/2007 2:26:10 PM	tlh	
29	1-IC#5-CrVI	Finished	5/8/2007 3:26:23 PM	tlh	
30	1-IC#5-CrVI	Finished	5/8/2007 3:34:28 PM	tlh	
31	1-IC#5-CrVI	Finished	5/8/2007 3:42:34 PM	tlh	
32	1-IC#5-CrVI	Finished	5/8/2007 3:50:40 PM	tlh	
33	1-IC#5-CrVI	Finished	5/8/2007 3:58:46 PM	tlh	
34	1-IC#5-CrVI	Finished	5/8/2007 4:06:52 PM	tlh	
35	1-IC#5-CrVI	Finished	5/8/2007 4:14:58 PM	tlh	
36	1-IC#5-CrVI	Finished	5/8/2007 4:23:04 PM	tlh	
37	1-IC#5-CrVI	Finished	5/8/2007 4:31:09 PM	tlh	
38	1-IC#5-CrVI	Finished	5/8/2007 4:39:16 PM	tlh	
39	1-IC#5-CrVI	Finished	5/8/2007 4:47:49 PM	tlh	
40	1-IC#5-CrVI	Finished	5/8/2007 4:55:56 PM	tlh	
41	1-IC#5-CrVI	Finished	5/8/2007 5:04:01 PM	tlh	
42	1-IC#5-CrVI	Finished	5/8/2007 5:12:07 PM	tlh	

Sequence: 050807-IC5-CRVI
Operator: tih

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Title: CRVI-LOW

Datasource: Dionex_USPAS2SDIO2

Location: ICUC5_CRVI-LOW2007May

Timebase: IC-#5

#Samples: 45

Created: 5/8/2007 11:27:18 AM by tih
(Modified, not saved)

No.	Name	Dil. Factor	Type	Comment	Pos.	Inj. Vol.	Program
43	 WASH	1.0000	Unknown		839	1.0	CRVI-LOW-loop
44	 LRB	1.0000	Unknown		840	1.0	CRVI-LOW-loop
45	 IPC 20	1.0000	Unknown		841	1.0	CRVI-LOW-loop

Sequence: 050807-IC5-CRVI
Operator: tlh

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Printed: 5/9/2007 4:39:56 PM

Title: CRVI-LOW

Datasource: Dionex_USPAS2SDIO2

Location: IC\IC5_CRVI-LOW\2007\May

Timebase: IC-#5

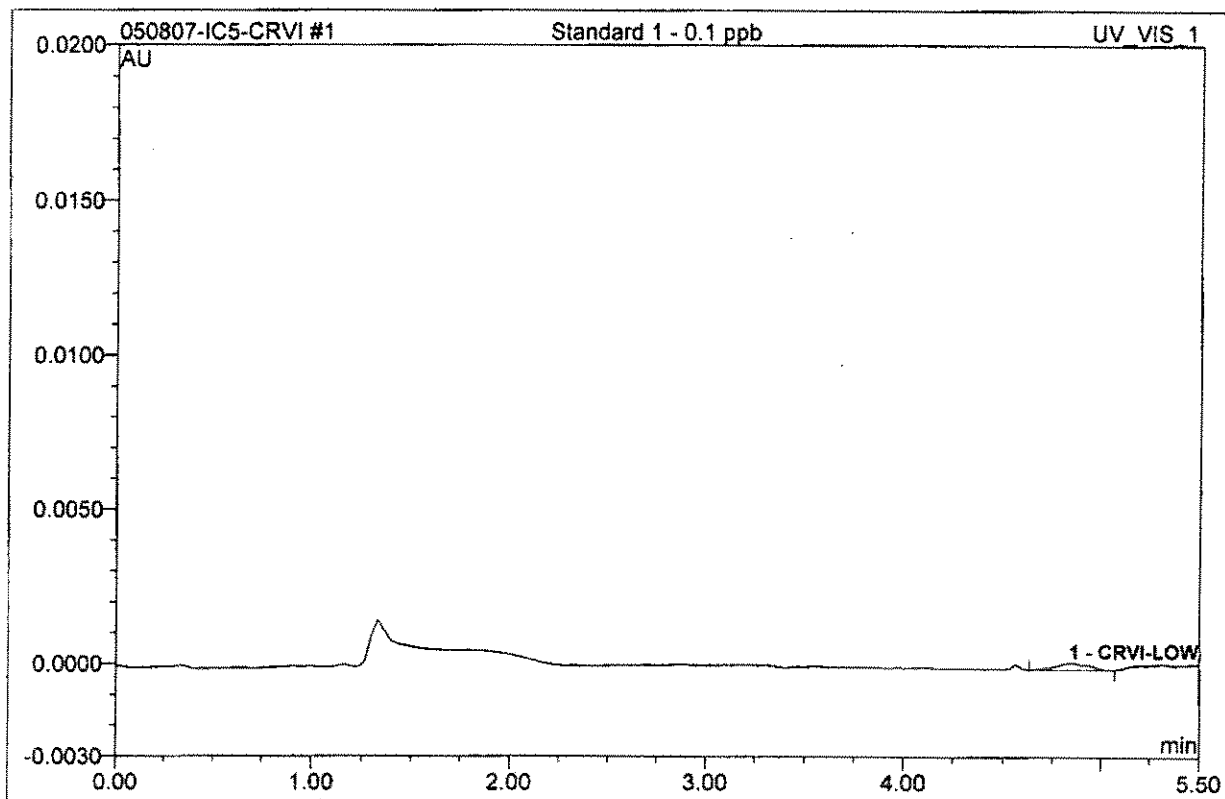
#Samples: 45

Created: 5/8/2007 11:27:18 AM by tlh
(Modified, not saved)

No.	Method	Status	Inj. Date/Time	*Analyst	*operator
43	1-IC#5-CrVi	Finished	5/8/2007 5:20:13 PM	tlh	
44	1-IC#5-CrVi	Finished	5/8/2007 5:28:20 PM	tlh	
45	1-IC#5-CrVi	Finished	5/8/2007 5:36:25 PM	tlh	

1 Standard 1 - 0.1 ppb

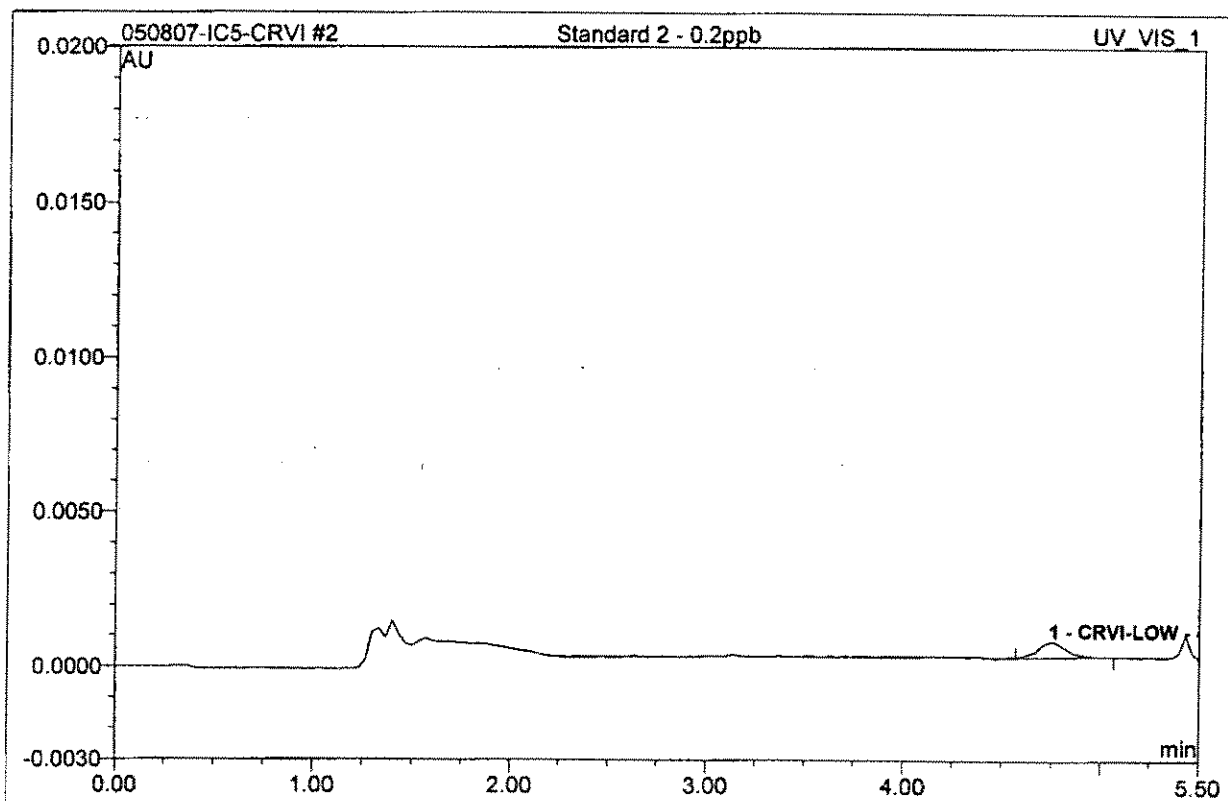
Sample Name:	Standard 1 - 0.1 ppb	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	standard	Recording Time:	4/9/2007 10:14
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.83	CRVI-LOW	0.000	0.0000442	100.00	0.111	BMB
Total:			0.000	0.000	100.00	0.111	

2 Standard 2 - 0.2ppb

Sample Name:	Standard 2 - 0.2ppb	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	standard	Recording Time:	4/9/2007 10:22
Analyst:	tlh	Channel:	UV_VIS_1

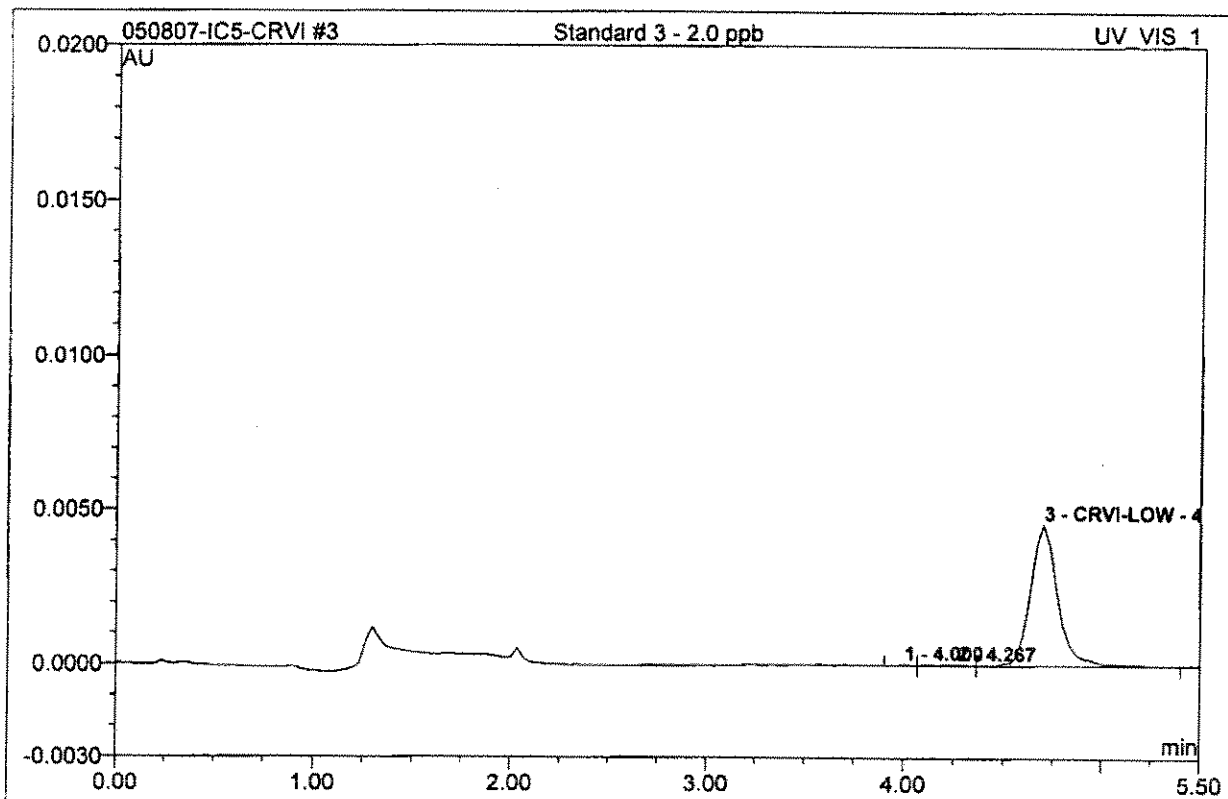


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.73	CRVI-LOW	0.000	0.0000875	100.00	0.219	BMB
Total:			0.000	0.000	100.00	0.219	

3 Standard 3 - 2.0 ppb

Sample Name: **Standard 3 - 2.0 ppb**
 Dilution Factor: **1.0000**
 Sample Type: **standard**
 Analyst: **tlh**

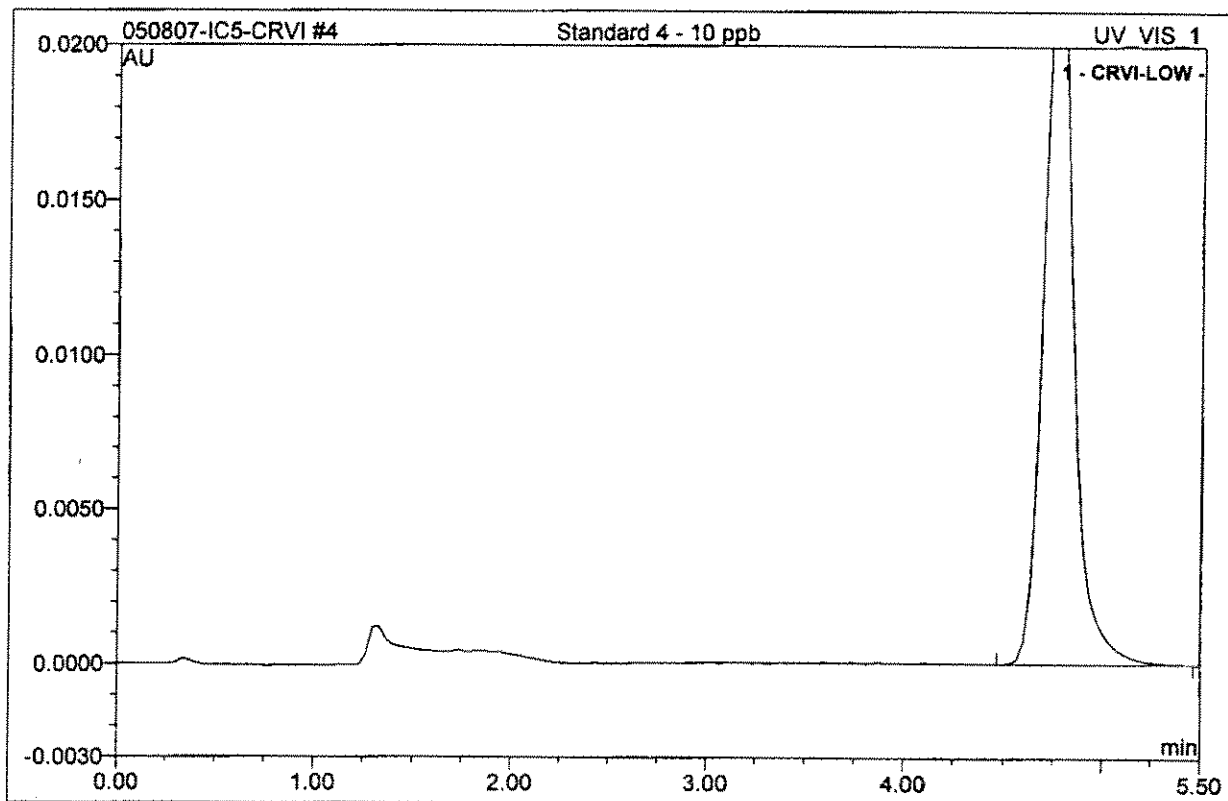
Control Program: **CRVI-LOW-loop**
 Quantif. Method: **1-IC#5-CrVI**
 Recording Time: **4/9/2007 10:30**
 Channel: **UV_VIS_1**



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.00	n.a.	0.000	0.0000018	0.24	n.a.	BM
2	4.27	n.a.	0.000	0.0000033	0.45	n.a.	M
3	4.70	CRVI-LOW	0.005	0.0007389	99.31	1.849	MB
Total:			0.005	0.001	100.00	1.849	

4 Standard 4 - 10 ppb

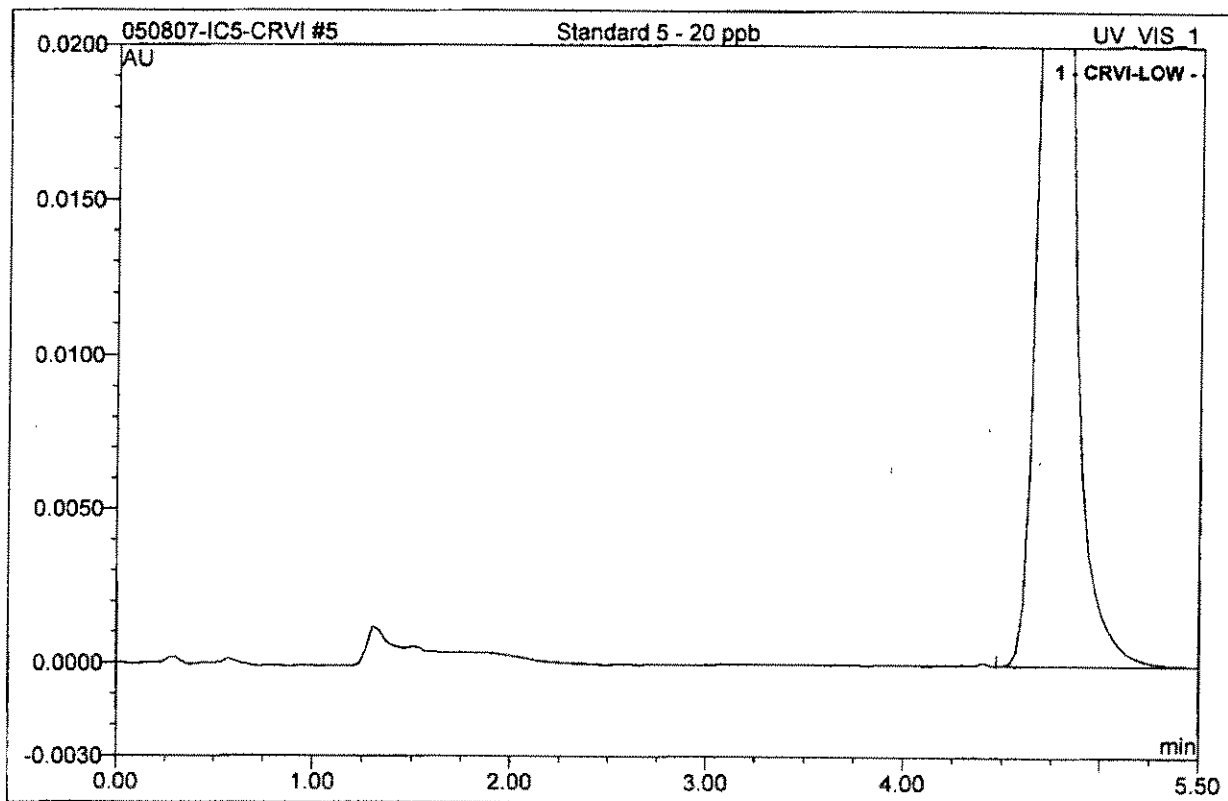
Sample Name:	Standard 4 - 10 ppb	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	standard	Recording Time:	4/9/2007 10:38
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.77	CRVI-LOW	0.025	0.0041178	100.00	10.305	BMB
Total:			0.025	0.004	100.00	10.305	

5 Standard 5 - 20 ppb

Sample Name:	Standard 5 - 20 ppb	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	standard	Recording Time:	4/9/2007 10:46
Analyst:	tlh	Channel:	UV_VIS_1

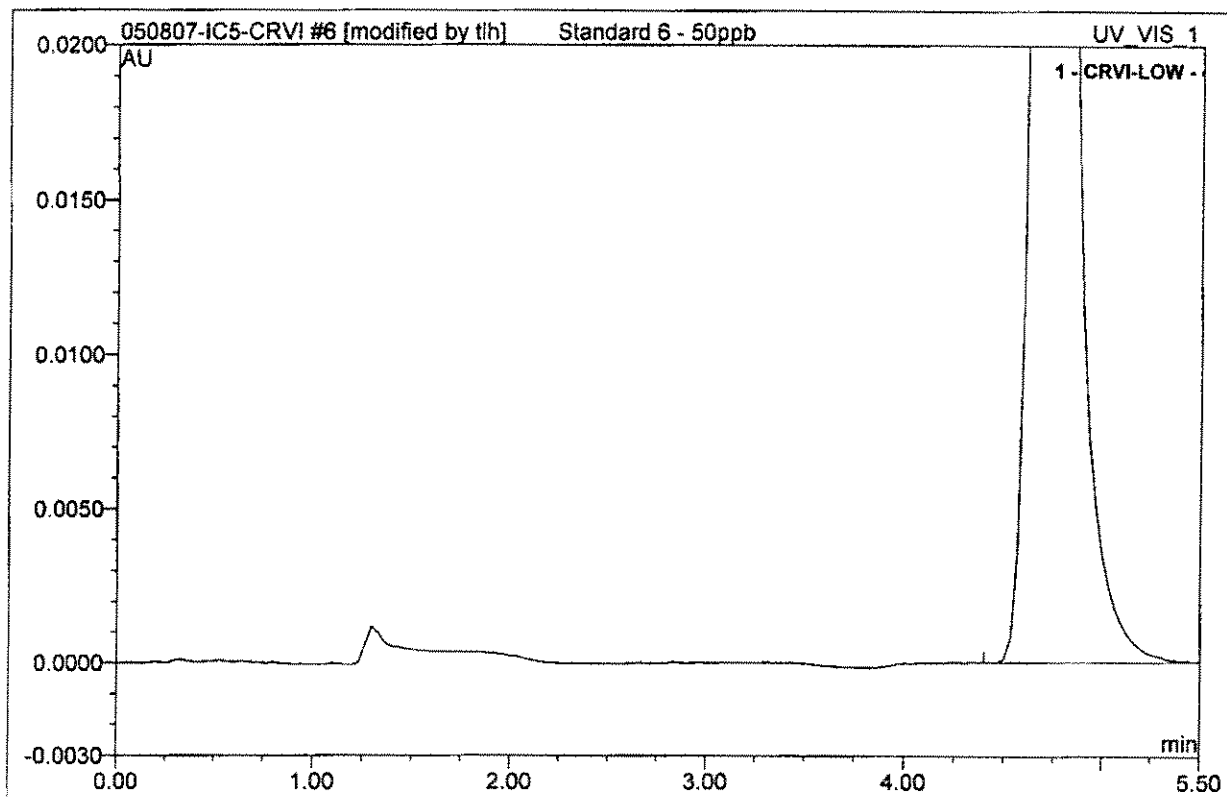


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.73	CRVI-LOW	0.047	0.0080003	100.00	20.021	BMB
Total:			0.047	0.008	100.00	20.021	

6 Standard 6 - 50ppb

Sample Name: **Standard 6 - 50ppb**
Dilution Factor: **1.0000**
Sample Type: **standard**
Analyst: **tlh**

Control Program: **CRVI-LOW-loop**
Quantif. Method: **1-IC#5-CrVi**
Recording Time: **4/9/2007 10:55**
Channel: **UV_VIS_1**

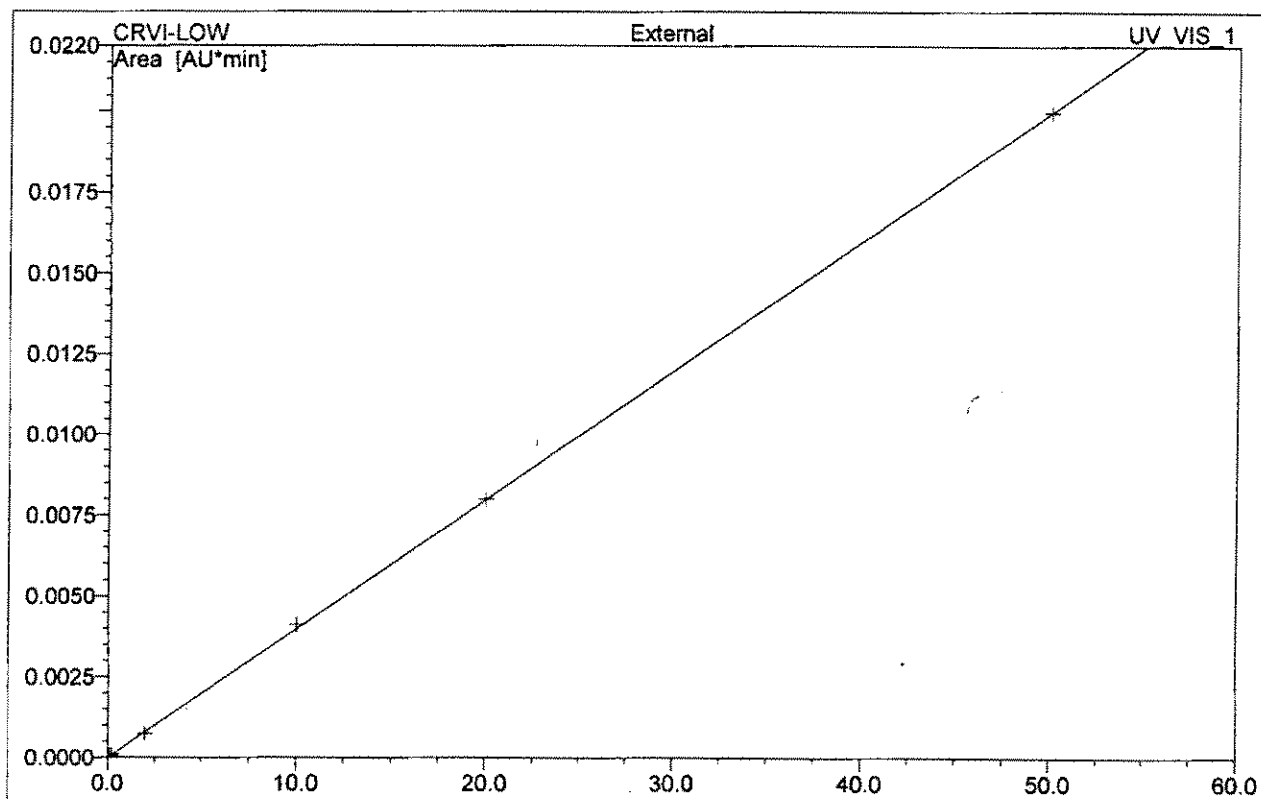


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.73	CRVI-LOW	0.119	0.0199545	100.00	49.937	BMB*
Total:			0.119	0.020	100.00	49.937	

6 Standard 6 - 50ppb

Sample Name: **Standard 6 - 50ppb**
 Sample Type: **standard**
 Recording Time: **4/9/2007 10:55**

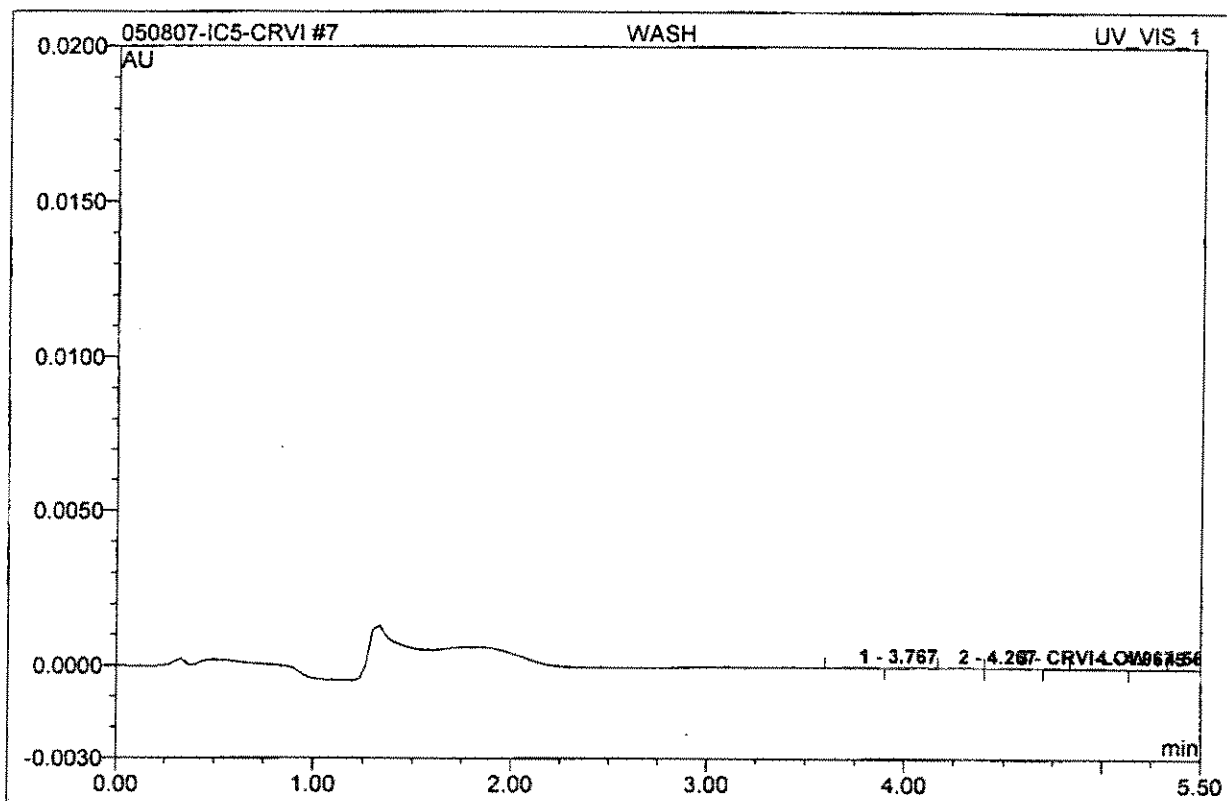
Control Program: **CRVI-LOW-loop**
 Quantif. Method: **1-IC#5-CrVI**
 Channel: **UV_VIS_1**



No.	Ret.Time min	Peak Name	Cal.Type	Points	Corr.Coeff. %	Offset	Slope	Curve
1	4.73	CRVI-LOW	Lin	6	99.9969	0.0000	0.0003996	0.0000
Average:					99.9969	0.0000	0.0004	0.0000

7 WASH

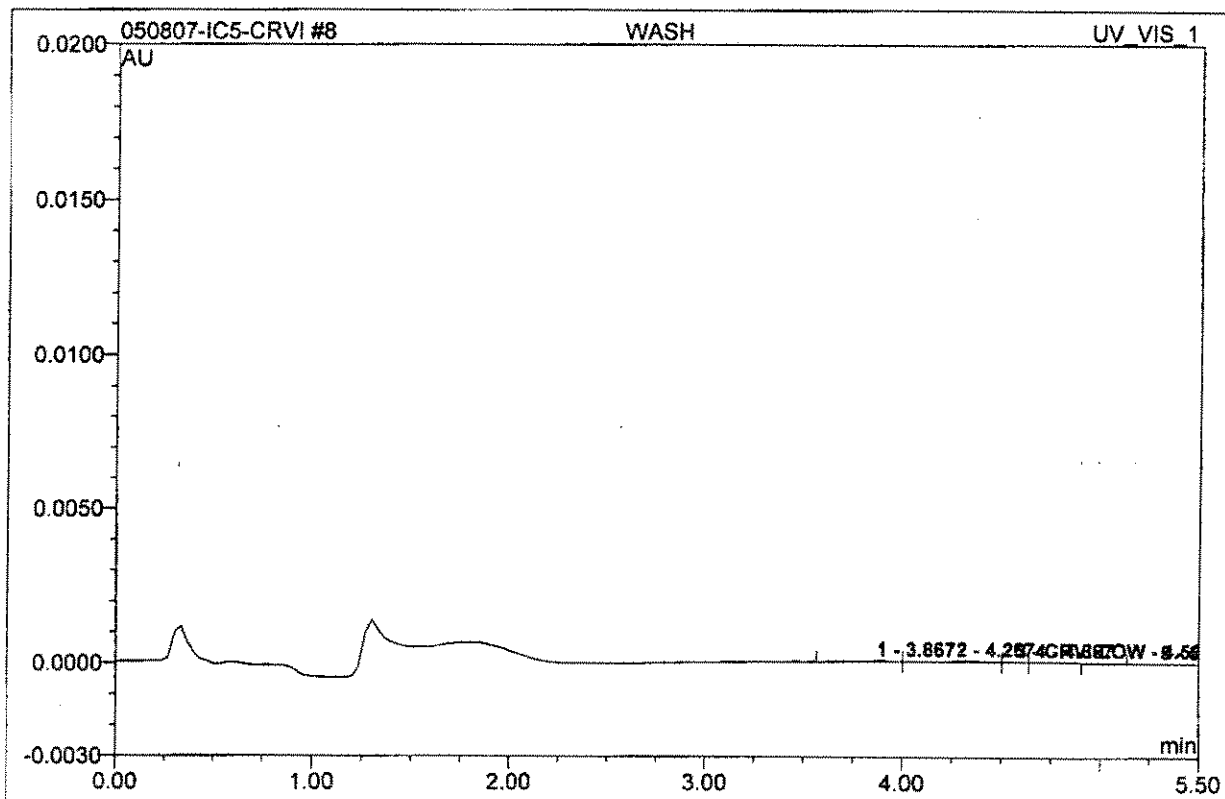
Sample Name:	WASH	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 11:36
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	3.77	n.a.	0.000	0.0000023	26.56	n.a.	BMB
2	4.27	n.a.	0.000	0.0000010	12.11	n.a.	BMB
3	4.57	CRVI-LOW	0.000	0.0000016	19.14	0.004	bMB
4	4.97	n.a.	0.000	0.0000032	37.89	n.a.	BMB
5	5.37	n.a.	0.000	0.0000004	4.30	n.a.	BMB
Total:			0.000	0.000	100.00	0.004	

8 WASH

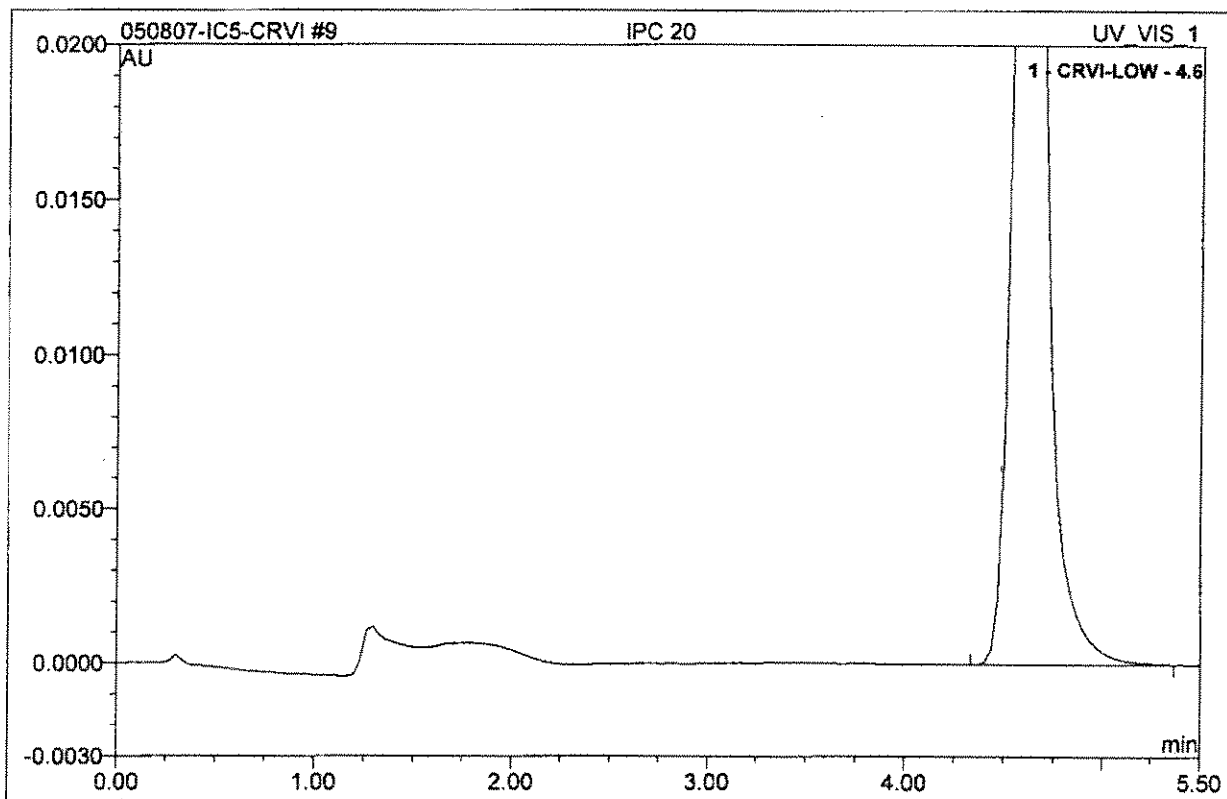
Sample Name:	WASH	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 11:44
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	3.87	n.a.	0.000	0.0000063	32.00	n.a.	BMb
2	4.27	n.a.	0.000	0.0000062	31.83	n.a.	bMB
3	4.57	CRVI-LOW	0.000	0.0000003	1.45	0.001	bMB
4	4.67	n.a.	0.000	0.0000021	10.55	n.a.	bMB
5	5.30	n.a.	0.000	0.0000047	24.17	n.a.	BMB
Total:			0.000	0.000	100.00	0.001	

9 IPC 20

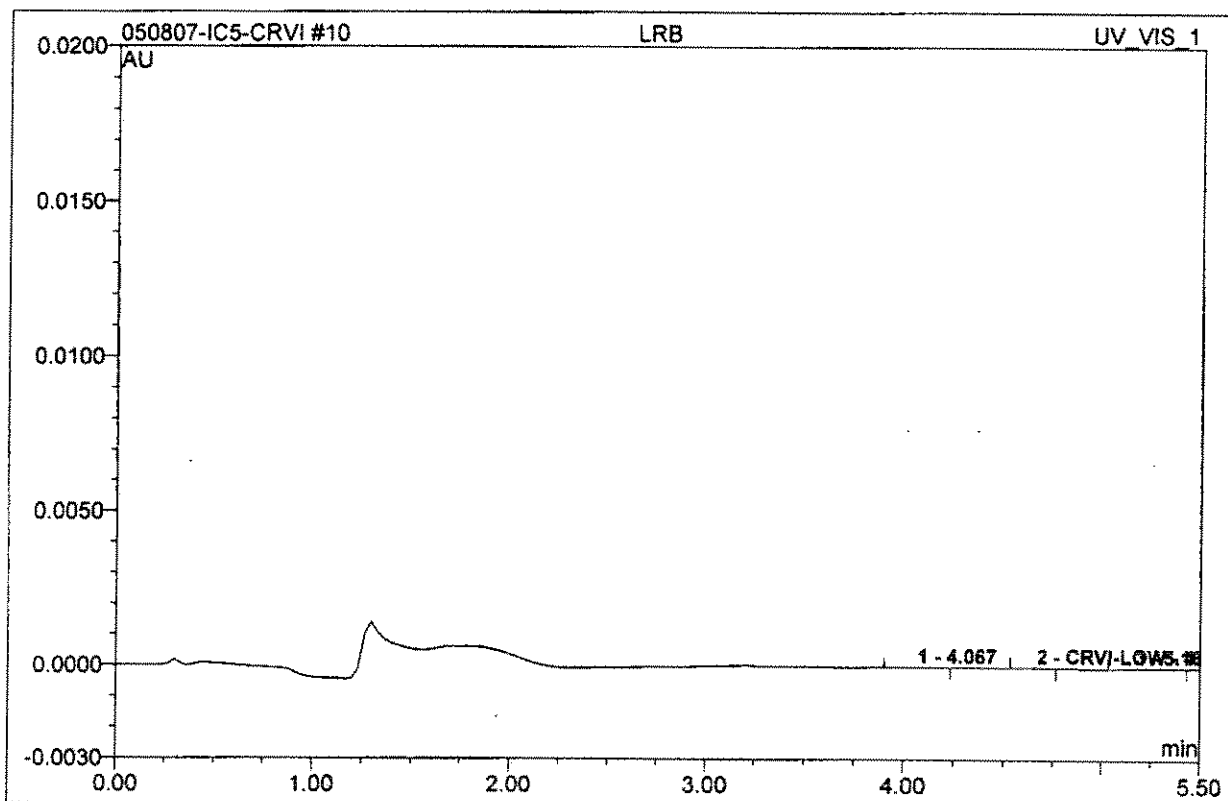
Sample Name:	IPC 20	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 11:52
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.60	CRVI-LOW	0.049	0.0080077	100.00	20.039	BMB
Total:			0.049	0.008	100.00	20.039	

10 LRB

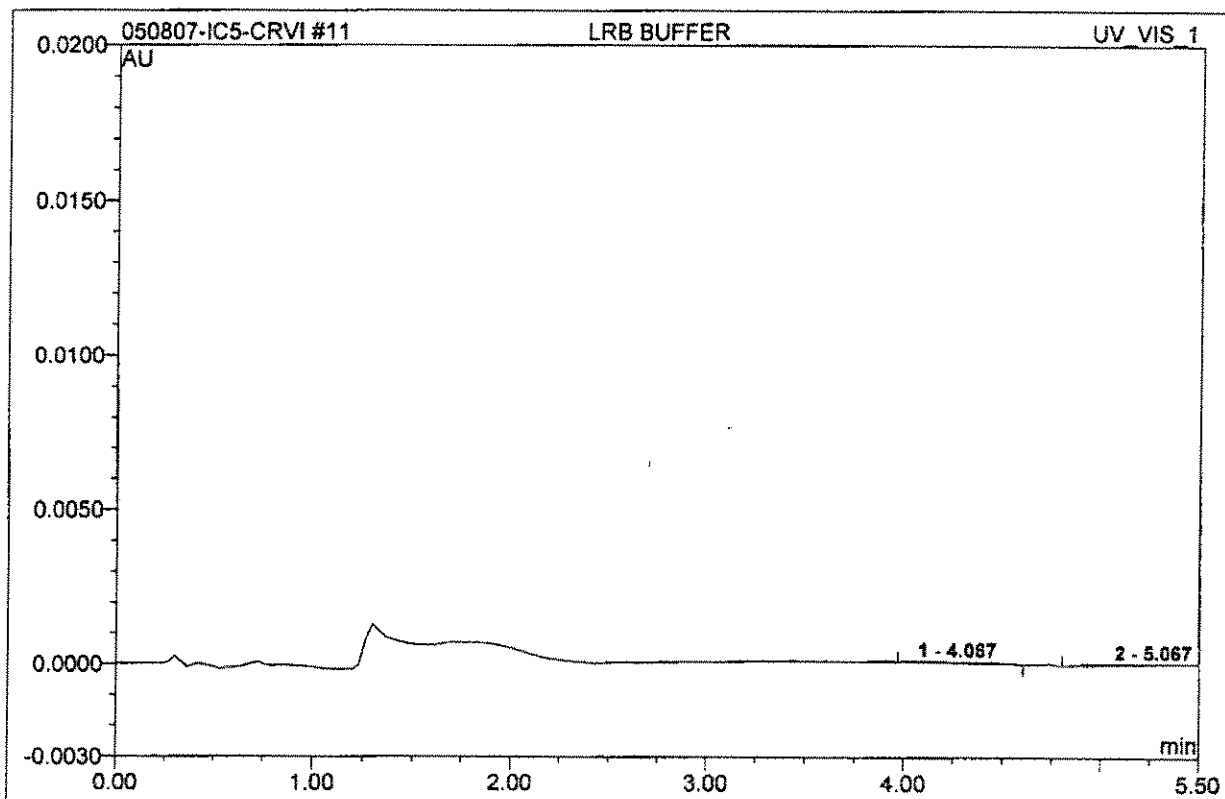
Sample Name:	LRB	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 12:00
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.07	n.a.	0.000	0.0000017	20.36	n.a.	BMB
2	4.67	CRVI-LOW	0.000	0.0000011	13.04	0.003	BMB
3	5.17	n.a.	0.000	0.0000056	66.60	n.a.	BMB
Total:			0.000	0.000	100.00	0.003	

11 LRB BUFFER

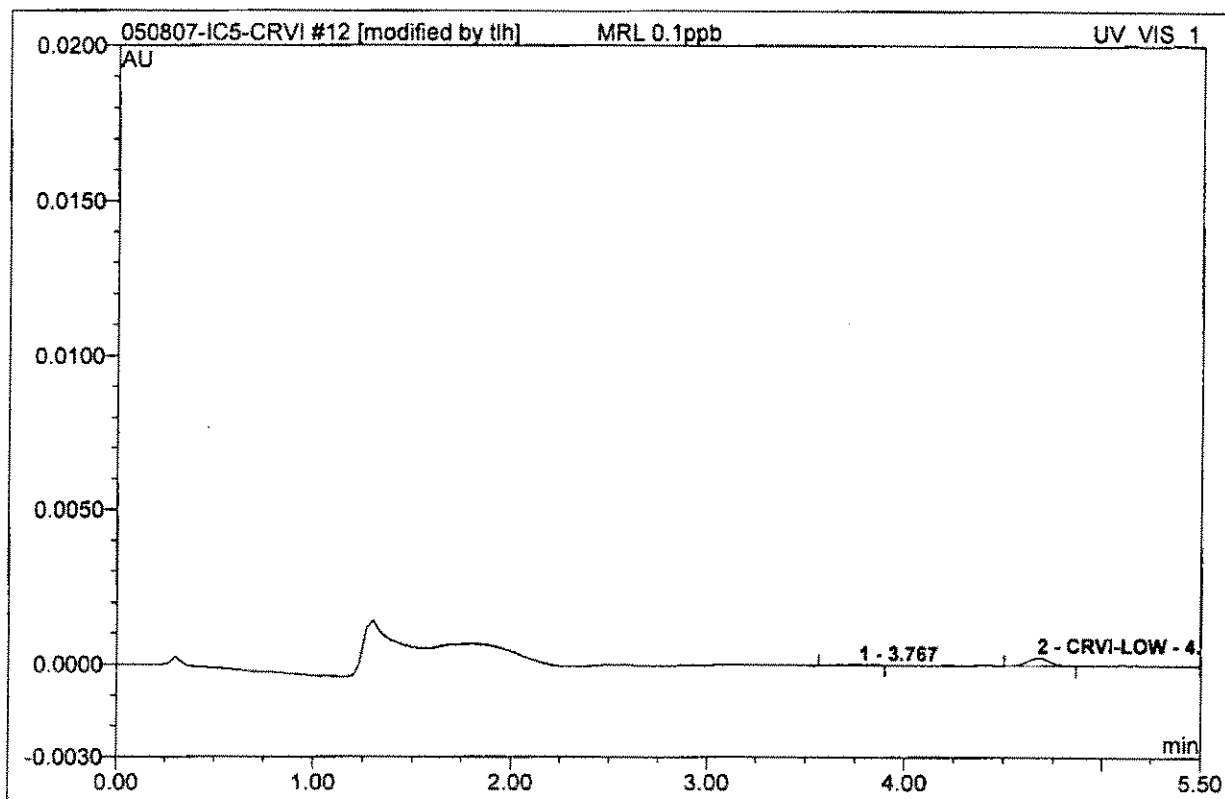
Sample Name:	LRB BUFFER	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 12:08
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.07	n.a.	0.000	0.0000208	49.06	n.a.	BMB
2	5.07	n.a.	0.000	0.0000216	50.94	n.a.	BMB
Total:			0.000	0.000	100.00	0.000	

12 MRL 0.1ppb

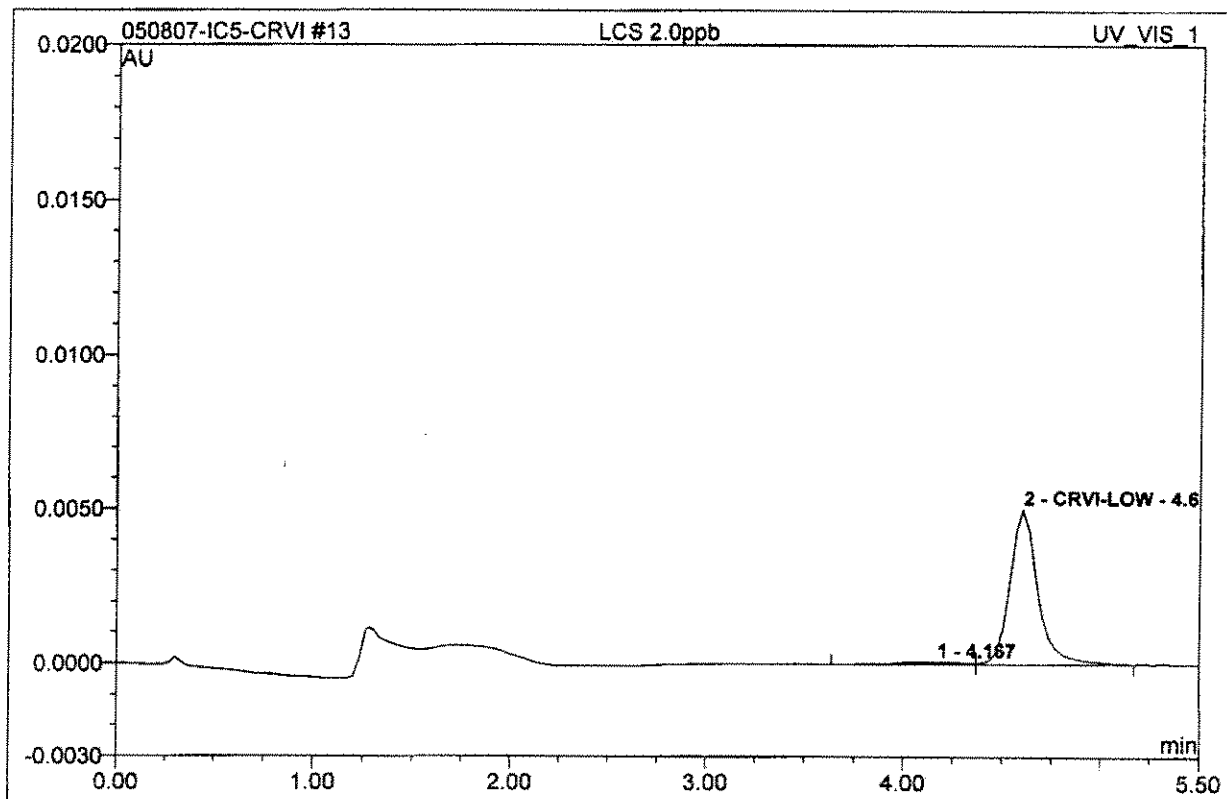
Sample Name:	MRL 0.1ppb	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 12:16
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	3.77	n.a.	0.000	0.0000035	9.08	n.a.	BMB
2	4.67	CRVI-LOW	0.000	0.0000349	90.92	0.087	BMB*
Total:			0.000	0.000	100.00	0.087	

13 LCS 2.0ppb

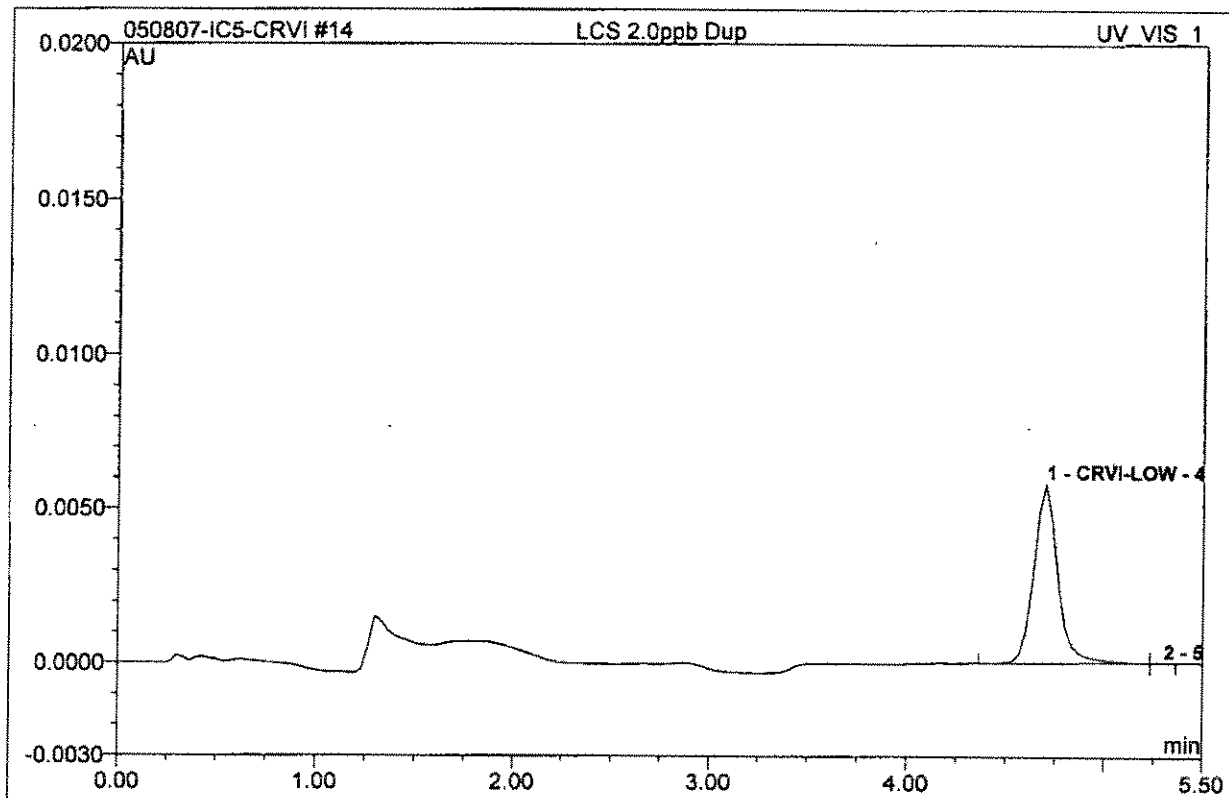
Sample Name:	LCS 2.0ppb	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 12:24
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.17	n.a.	0.000	0.0000302	3.52	n.a.	BM
2	4.60	CRVI-LOW	0.005	0.0008278	96.48	2.072	MB
Total:			0.005	0.001	100.00	2.072	

14 LCS 2.0ppb Dup

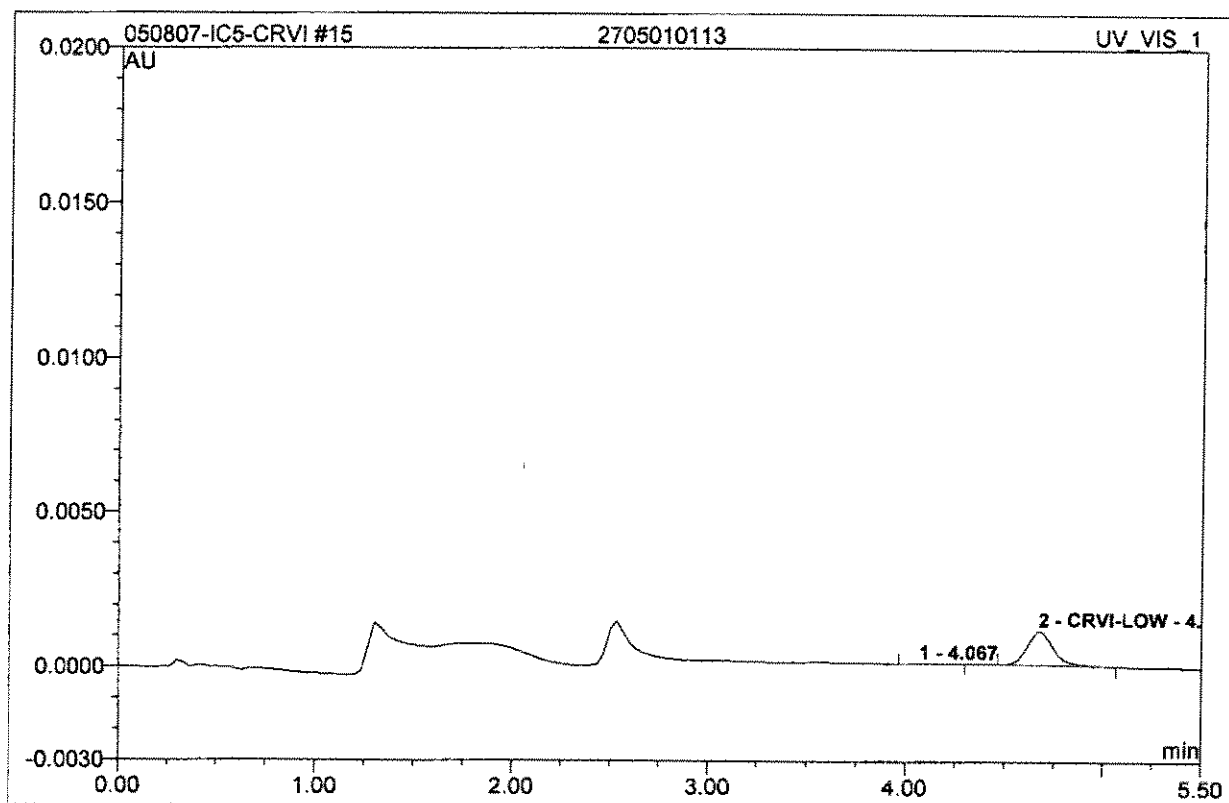
Sample Name:	LCS 2.0ppb Dup	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 12:32
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.70	CRVI-LOW	0.006	0.0008260	99.96	2.067	BM
2	5.30	n.a.	0.000	0.0000004	0.04	n.a.	MB
Total:			0.006	0.001	100.00	2.067	

15 2705010113

Sample Name:	2705010113	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 12:40
Analyst:	tlh	Channel:	UV_VIS_1

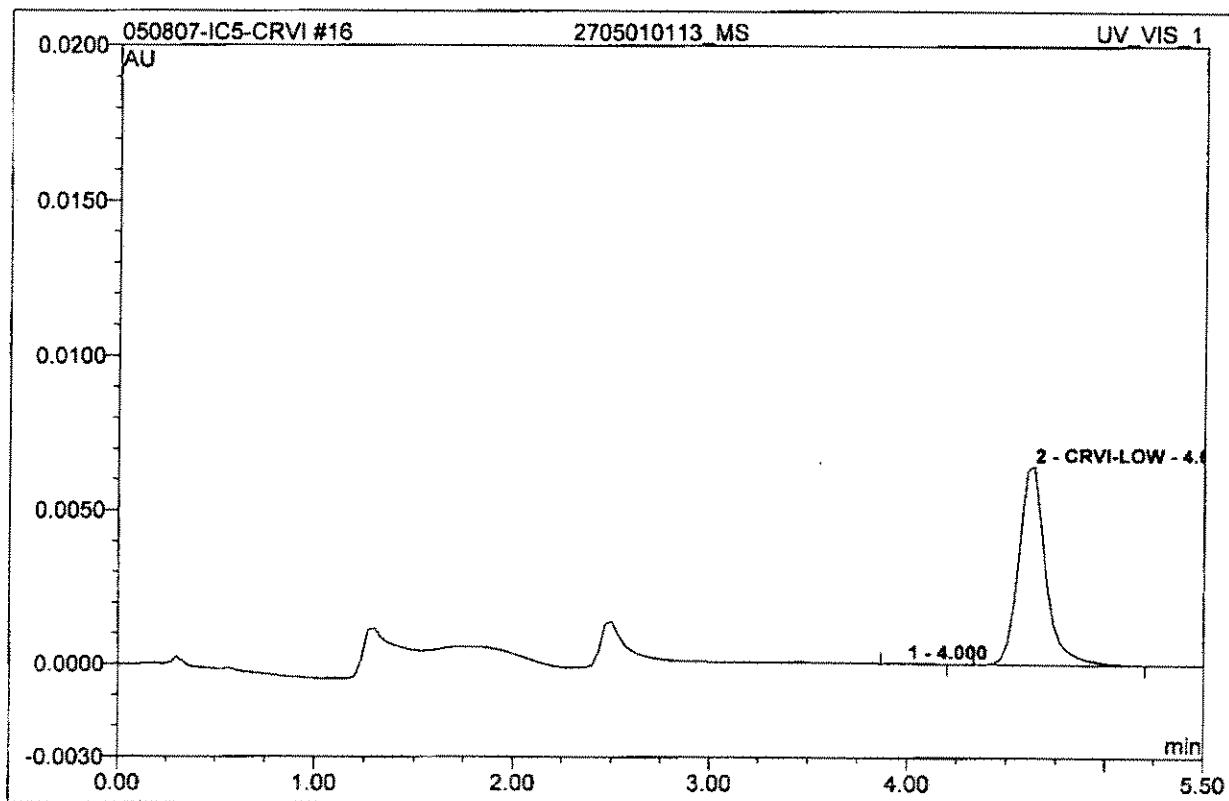


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.07	n.a.	0.000	0.0000028	1.63	n.a.	BMB
2	4.67	CRVI-LOW	0.001	0.0001687	98.37	0.422	BMB
Total:			0.001	0.000	100.00	0.422	

16 2705010113_MS

Sample Name: 2705010113_MS
Dilution Factor: 1.0000
Sample Type: unknown
Analyst: tlh

Control Program: CRVI-LOW-loop
Quantif. Method: 1-IC#5-CrVI
Recording Time: 5/8/2007 12:48
Channel: UV_VIS_1

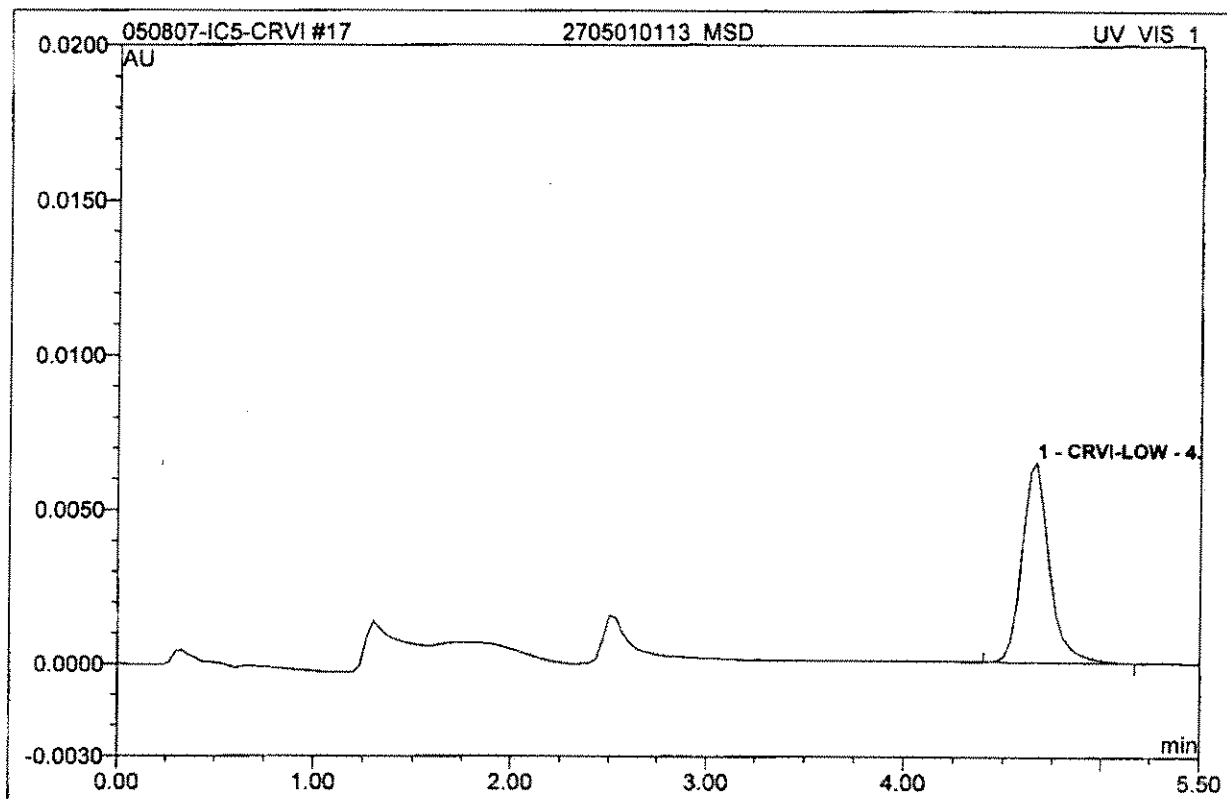


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.00	n.a.	0.000	0.0000028	0.27	n.a.	BMB
2	4.63	CRVI-LOW	0.006	0.0010346	99.73	2.589	BMB
Total:			0.006	0.001	100.00	2.589	

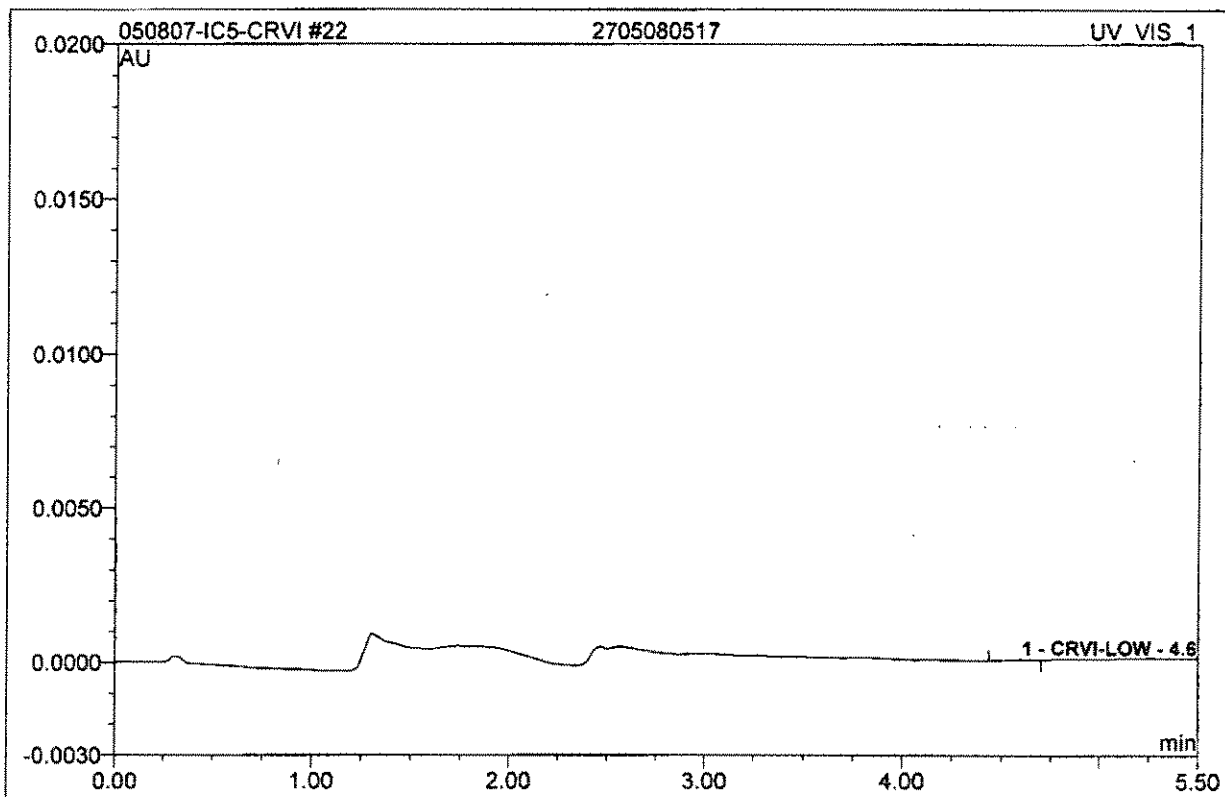
17 2705010113_MSD

Sample Name: 2705010113_MSD
Dilution Factor: 1.0000
Sample Type: unknown
Analyst: tlh

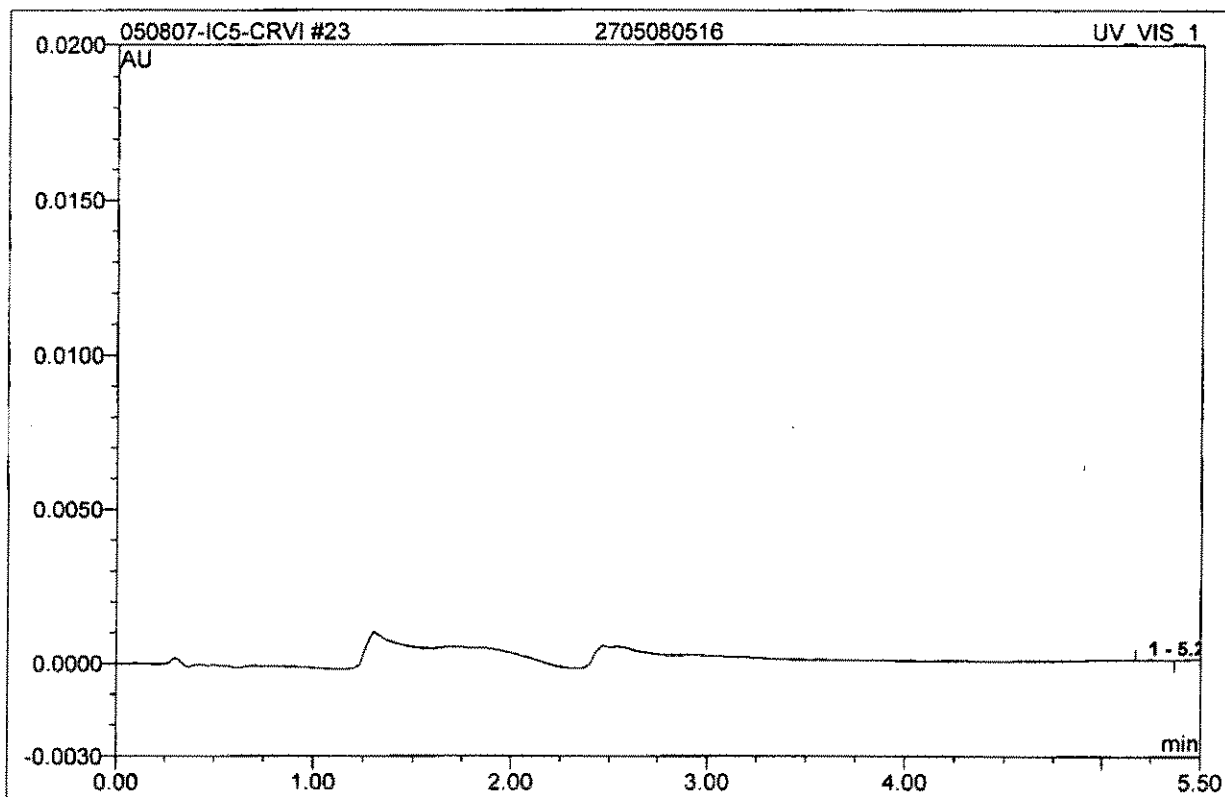
Control Program: CRVI-LOW-loop
Quantif. Method: 1-IC#5-CrVI
Recording Time: 5/8/2007 12:57
Channel: UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.67	CRVI-LOW	0.006	0.0010484	100.00	2.624	BMB
Total:			0.006	0.001	100.00	2.624	

22 2705080517Sample Name: **2705080517**Control Program: **CRVI-LOW-loop**Dilution Factor: **1.0000**Quantif. Method: **1-IC#5-CrVI**Sample Type: **unknown**Recording Time: **5/8/2007 13:37**Analyst: **tlh**Channel: **UV_VIS_1**

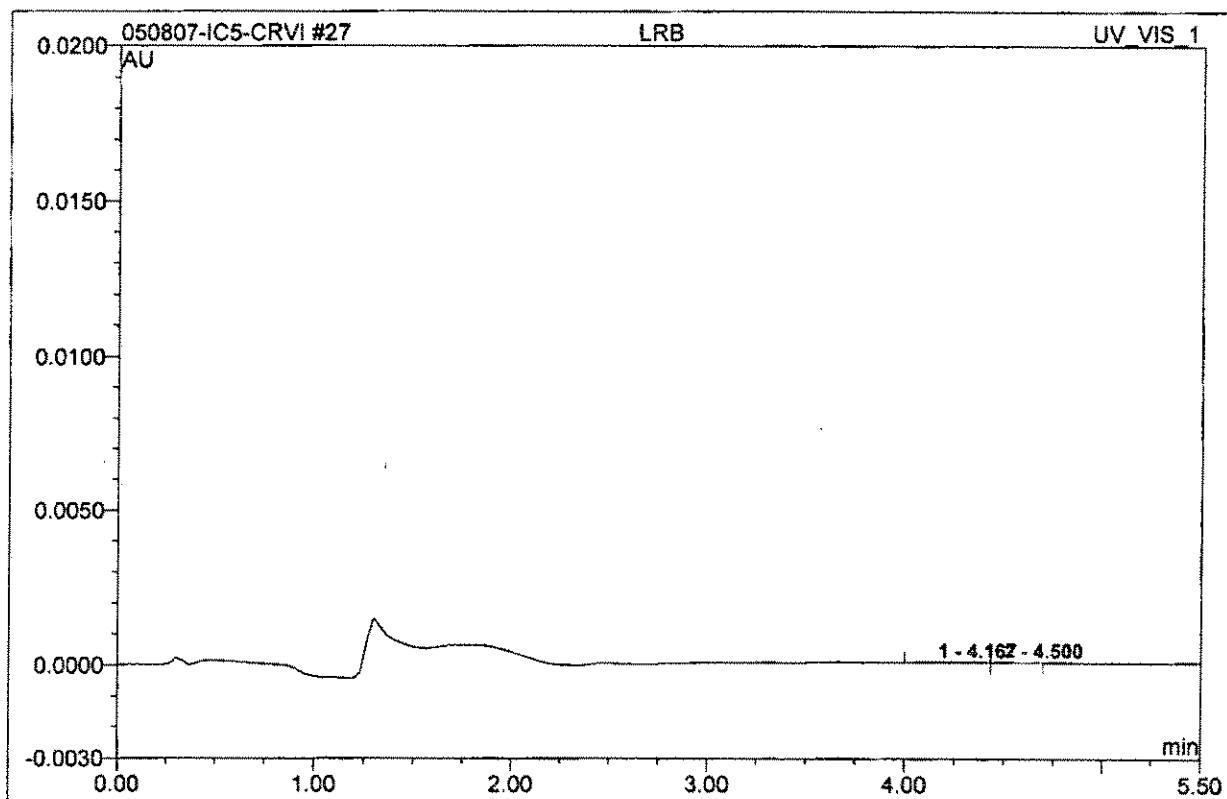
No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.60	CRVI-LOW	0.000	0.0000021	100.00	0.005	BMB
Total:			0.000	0.000	100.00	0.005	

23 2705080516Sample Name: **2705080516**
Dilution Factor: **1.0000**
Sample Type: **unknown**
Analyst: **tlh**Control Program: **CRVI-LOW-loop**
Quantif. Method: **1-IC#5-CrVI**
Recording Time: **5/8/2007 13:45**
Channel: **UV_VIS_1**

No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	5.23	n.a.	0.000	0.0000012	100.00	n.a.	BMB
Total:			0.000	0.000	100.00	0.000	

27 LRB

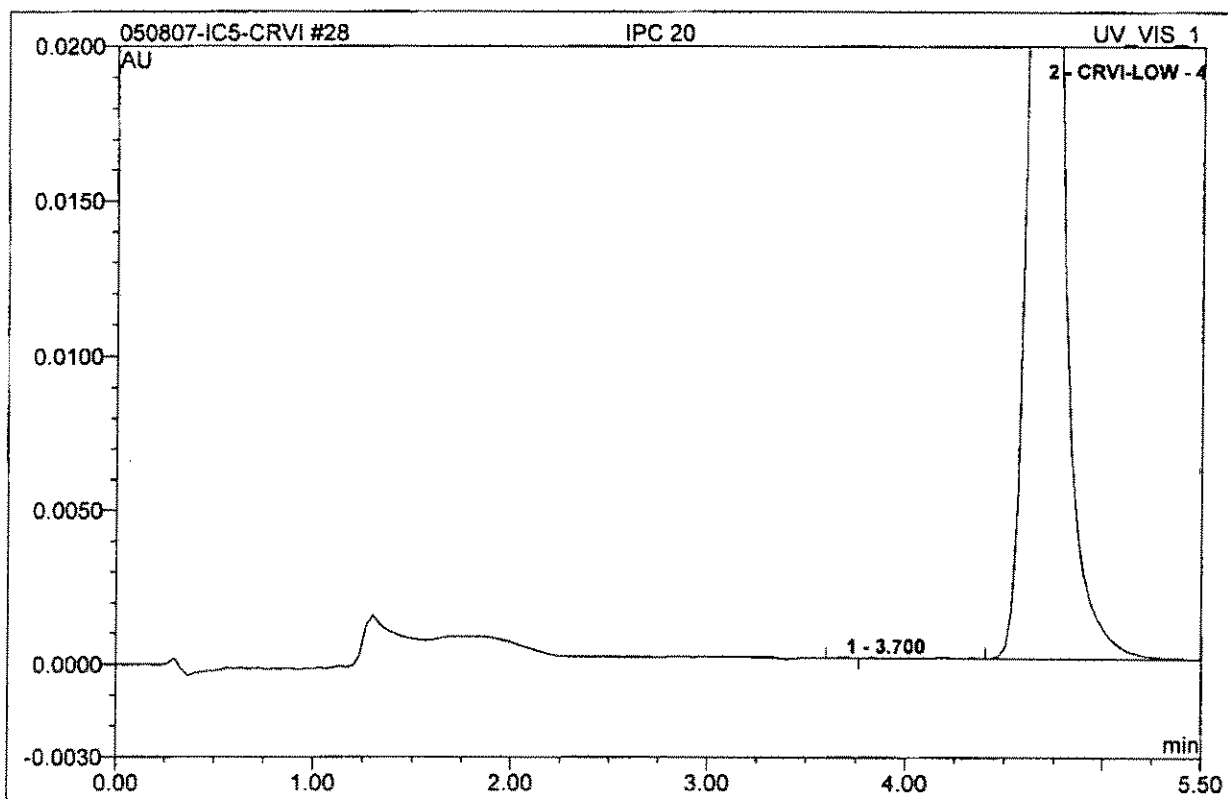
Sample Name:	LRB	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 14:18
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.17	n.a.	0.000	0.0000053	80.41	n.a.	BM
2	4.50	n.a.	0.000	0.0000013	19.59	n.a.	MB
Total:			0.000	0.000	100.00	0.000	

28 IPC 20

Sample Name:	IPC 20	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 14:26
Analyst:	tlh	Channel:	UV_VIS_1

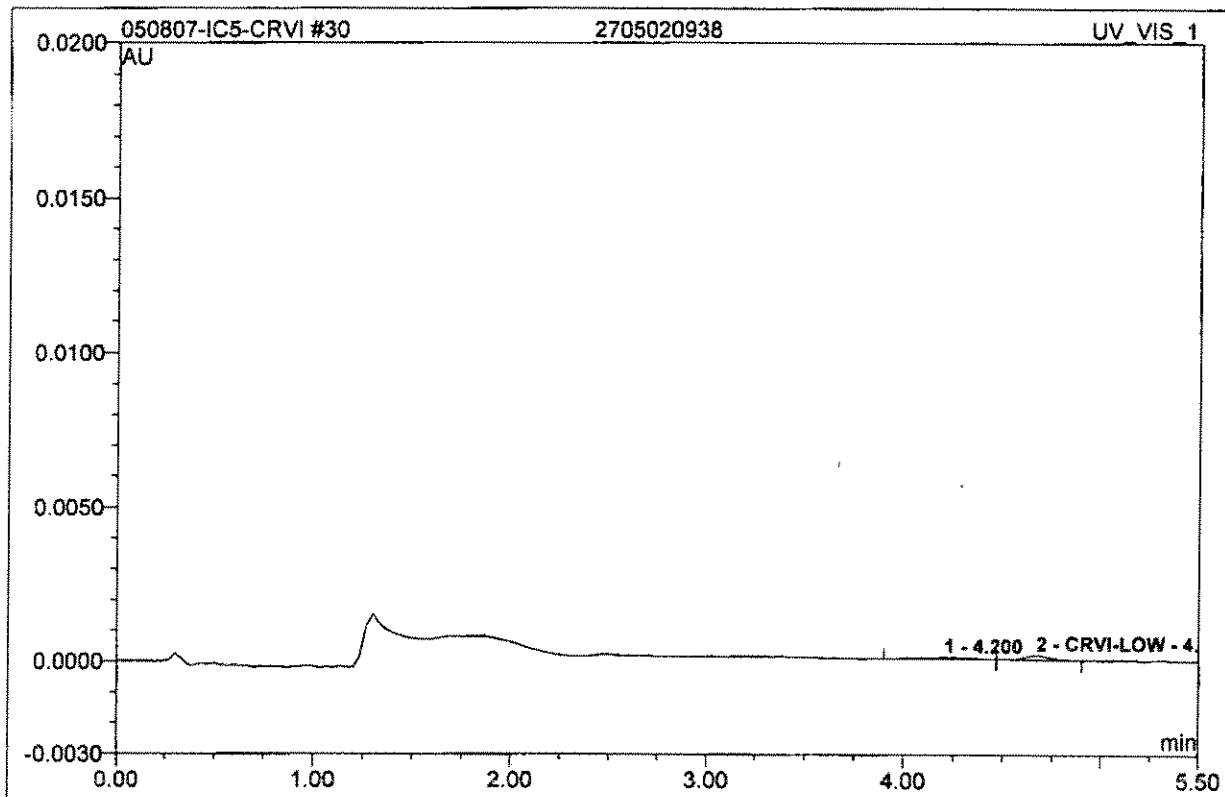


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	3.70	n.a.	0.000	0.0000011	0.01	n.a.	BMB
2	4.70	CRVI-LOW	0.050	0.0082128	99.99	20.553	BMB
Total:			0.050	0.008	100.00	20.553	

30 2705020938

Sample Name: 2705020938
Dilution Factor: 1.0000
Sample Type: unknown
Analyst: tlh

Control Program: CRVI-LOW-loop
Quantif. Method: 1-IC#5-CrVi
Recording Time: 5/8/2007 15:34
Channel: UV_VIS_1

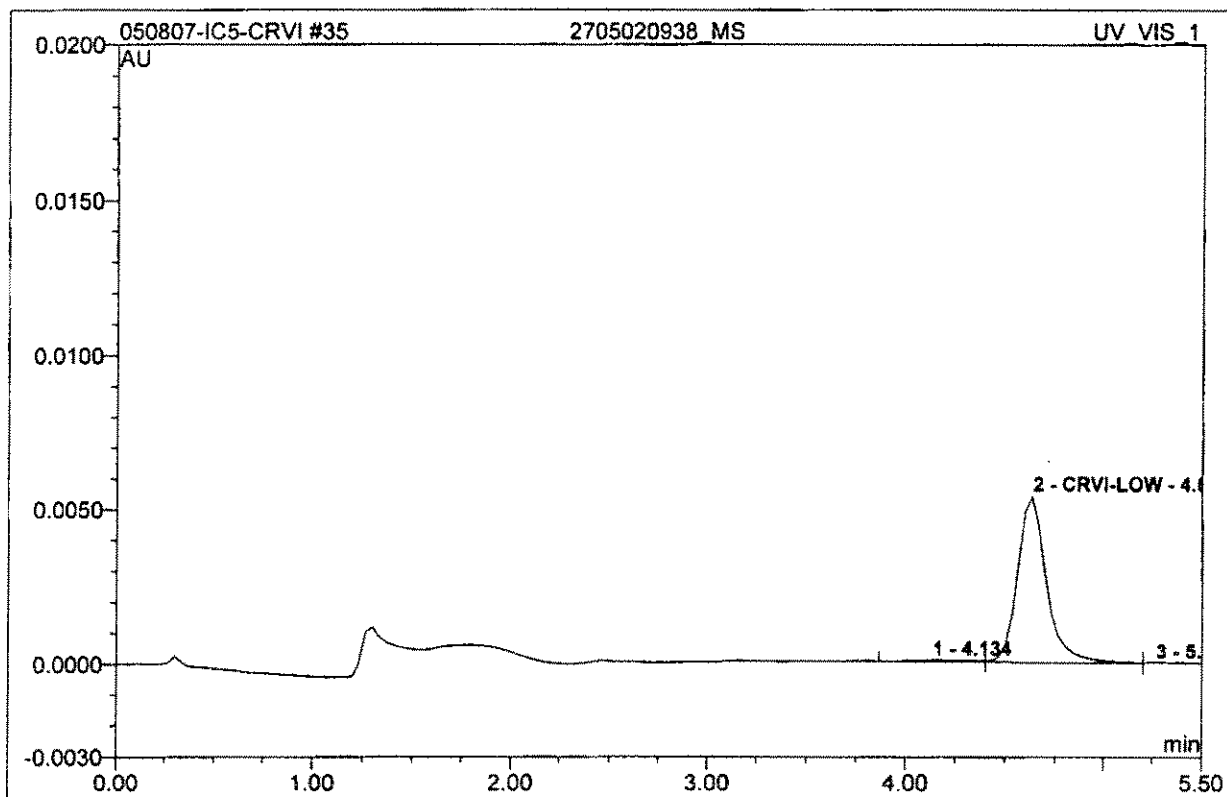


No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.20	n.a.	0.000	0.0000164	41.59	n.a.	BMB
2	4.67	CRVI-LOW	0.000	0.0000230	58.41	0.058	bMB
Total:			0.000	0.000	100.00	0.058	

35 2705020938_MS

Sample Name: 2705020938_MS
Dilution Factor: 1.0000
Sample Type: unknown
Analyst: tlh

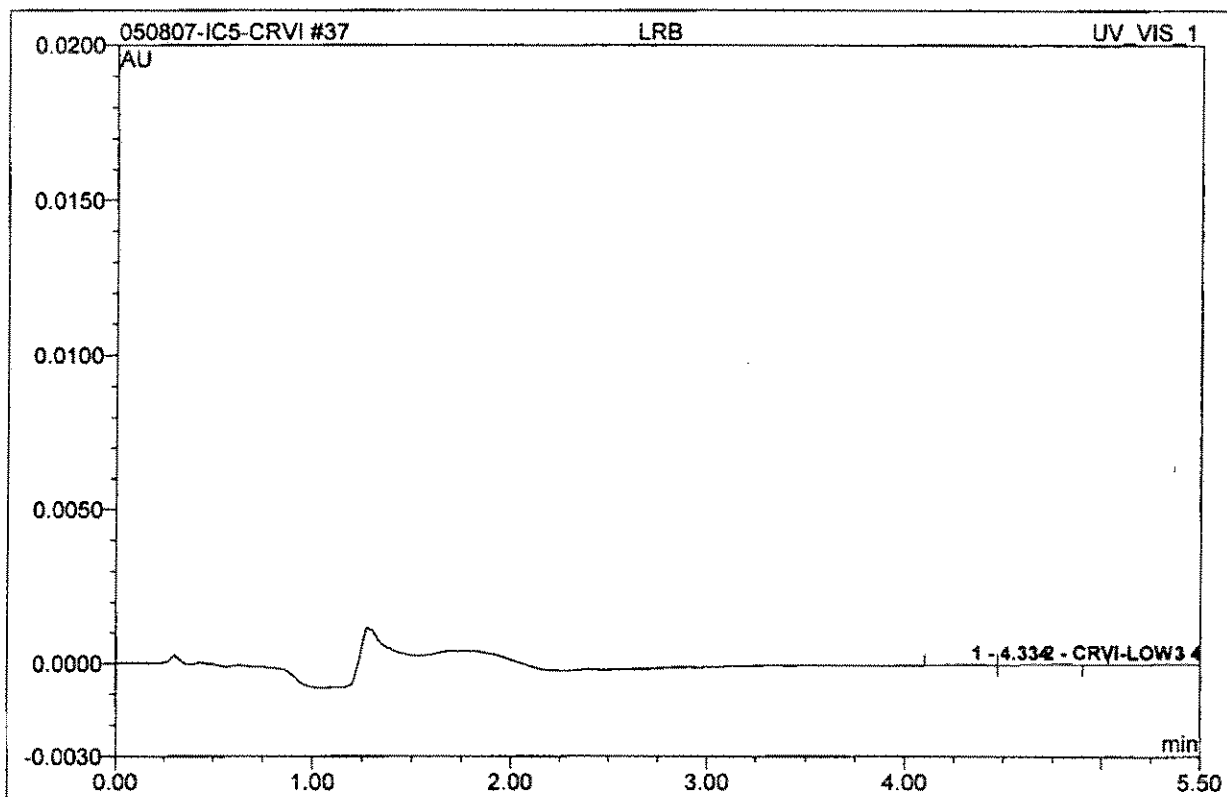
Control Program: CRVI-LOW-loop
Quantif. Method: 1-IC#5-CrVi
Recording Time: 5/8/2007 16:14
Channel: UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.13	n.a.	0.000	0.0000200	2.16	n.a.	BM
2	4.63	CRVI-LOW	0.005	0.0009032	97.67	2.260	Mb
3	5.27	n.a.	0.000	0.0000016	0.17	n.a.	bMB
Total:			0.005	0.001	100.00	2.260	

37 LRB

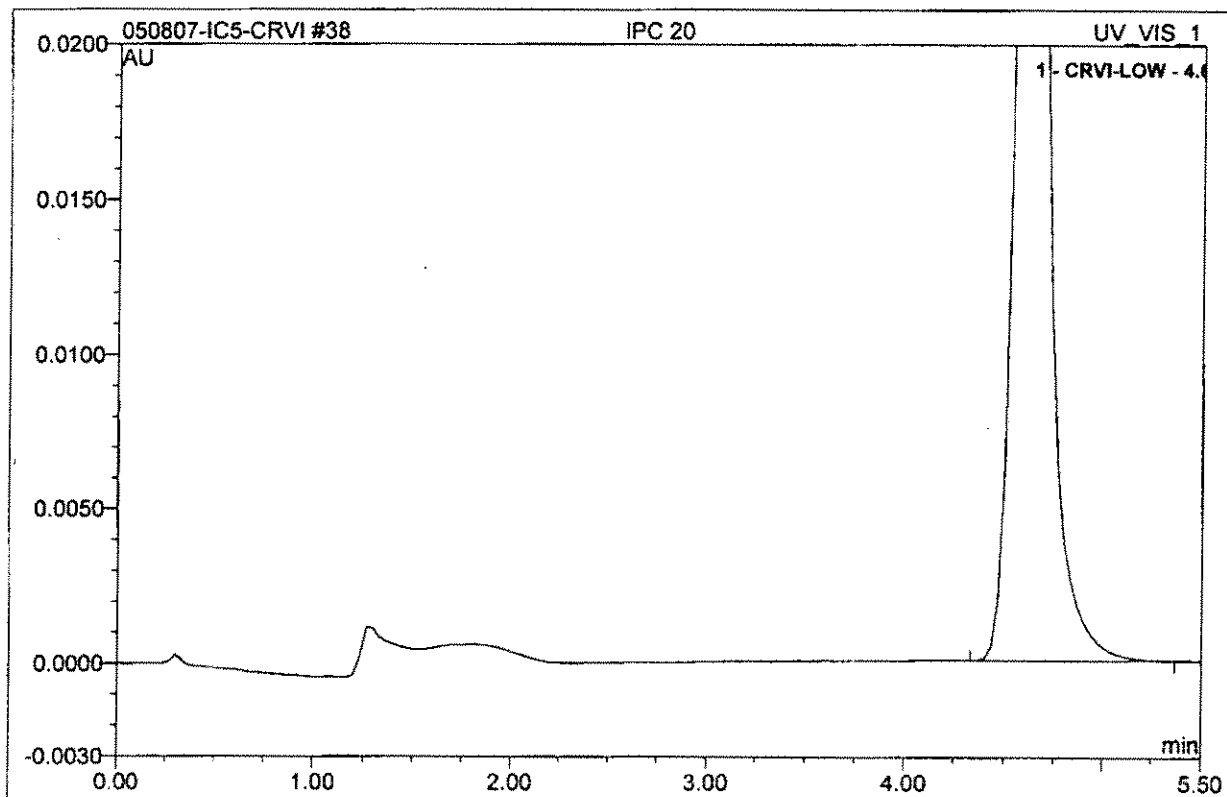
Sample Name:	LRB	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 16:31
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.33	n.a.	0.000	0.0000060	35.91	n.a.	BM
2	4.70	CRVI-LOW	0.000	0.0000070	41.47	0.017	MB
3	5.37	n.a.	0.000	0.0000038	22.62	n.a.	BMB
Total:			0.000	0.000	100.00	0.017	

38 IPC 20

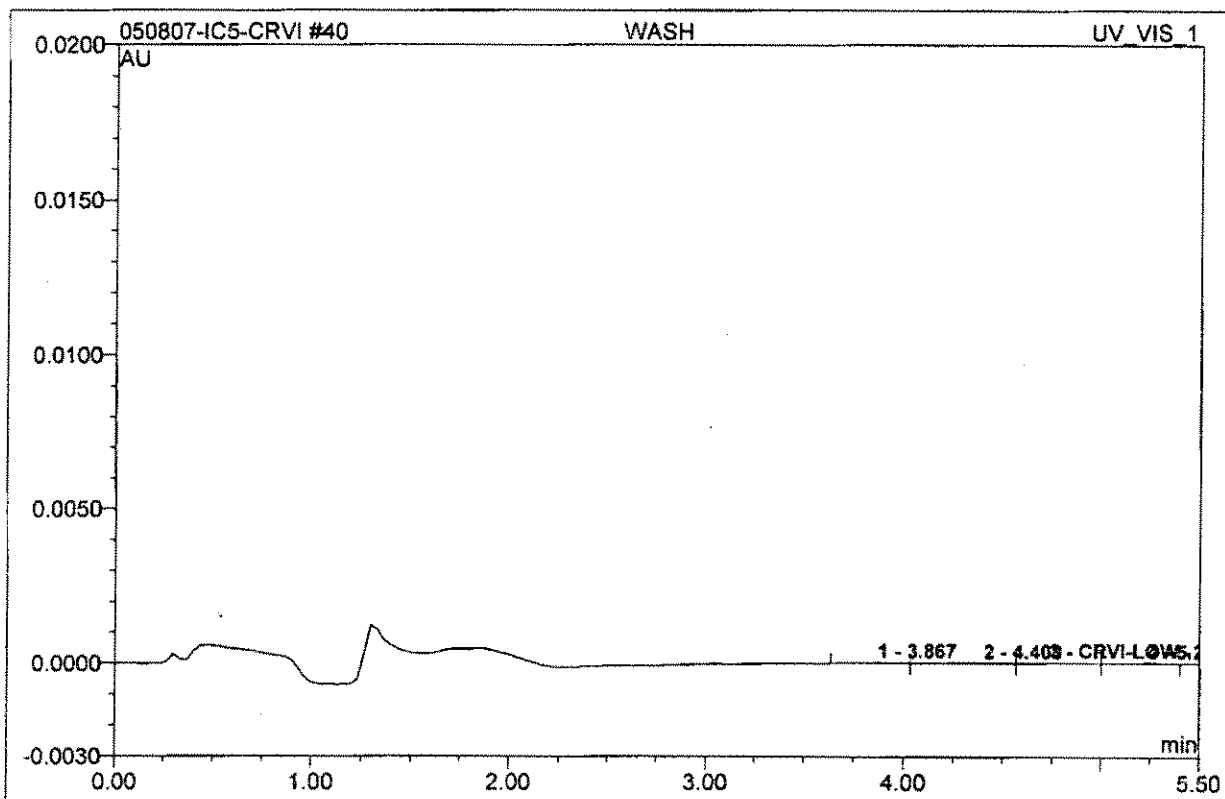
Sample Name:	IPC 20	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 16:39
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.63	CRVI-LOW	0.049	0.0081498	100.00	20.395	BMB
Total:			0.049	0.008	100.00	20.395	

40 WASH

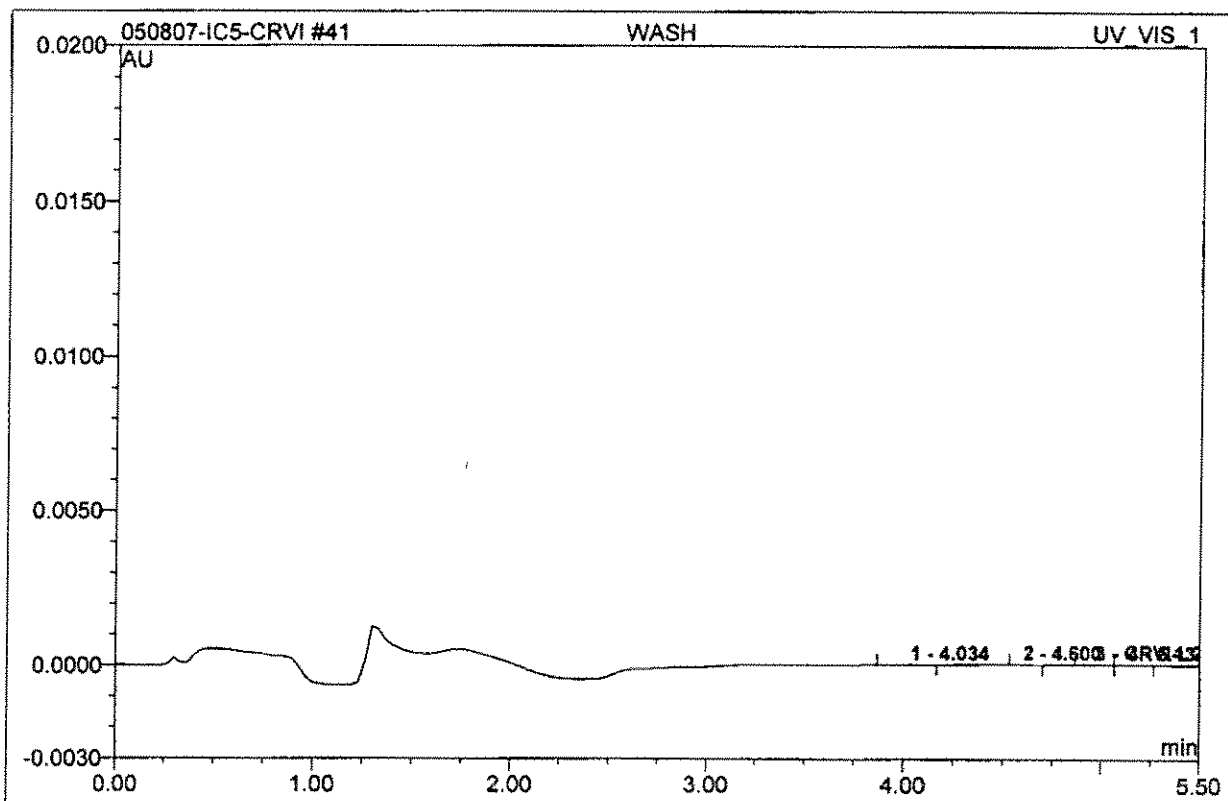
Sample Name:	WASH	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 16:55
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	3.87	n.a.	0.000	0.0000041	14.56	n.a.	BMB
2	4.40	n.a.	0.000	0.0000097	34.58	n.a.	bM
3	4.73	CRVI-LOW	0.000	0.0000091	32.33	0.023	M
4	5.23	n.a.	0.000	0.0000052	18.53	n.a.	MB
Total:			0.000	0.000	100.00	0.023	

41 WASH

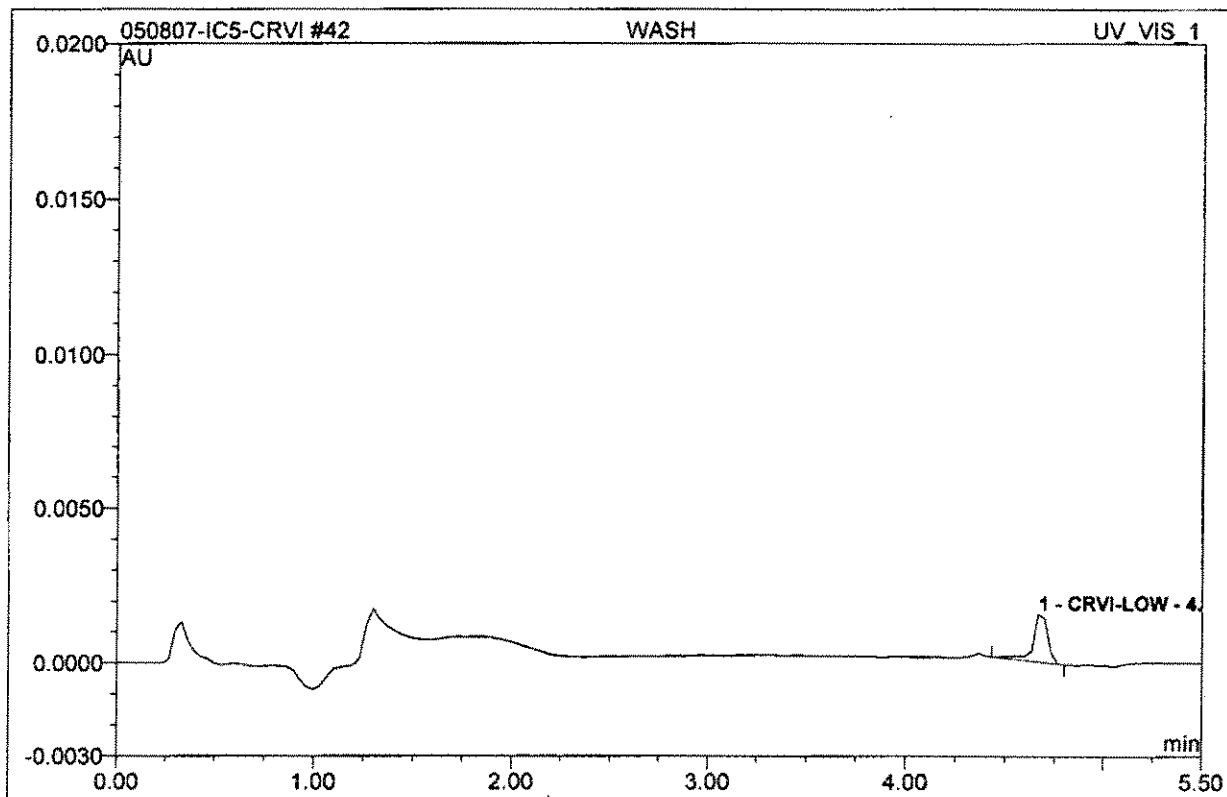
Sample Name:	WASH	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 17:04
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.03	n.a.	0.000	0.0000023	45.64	n.a.	BMB
2	4.60	n.a.	0.000	0.0000008	16.78	n.a.	BMB
3	4.97	CRVI-LOW	0.000	0.0000013	25.50	0.003	BMB
4	5.13	n.a.	0.000	0.0000006	12.08	n.a.	bMB
Total:			0.000	0.000	100.00	0.003	

42 WASH

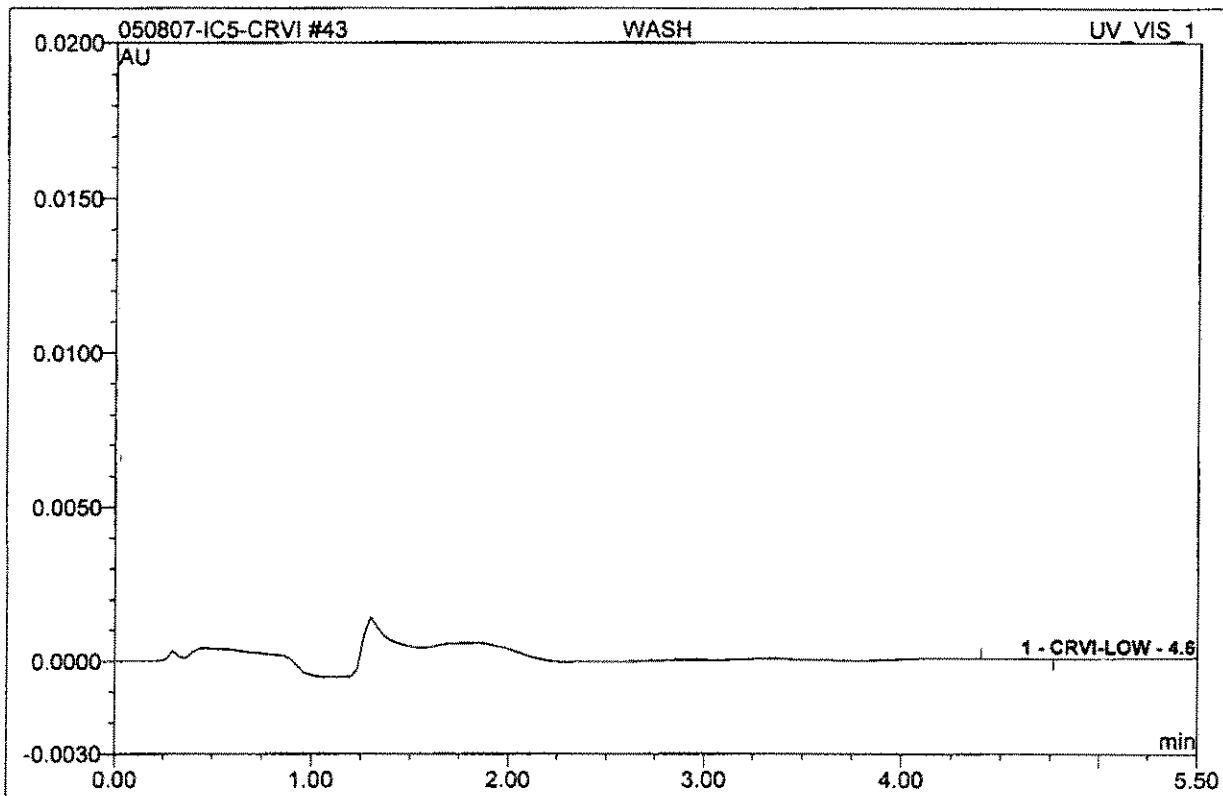
Sample Name:	WASH	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 17:12
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.67	CRVI-LOW	0.002	0.0001353	100.00	0.339	BMB
Total:			0.002	0.000	100.00	0.339	

43 WASH

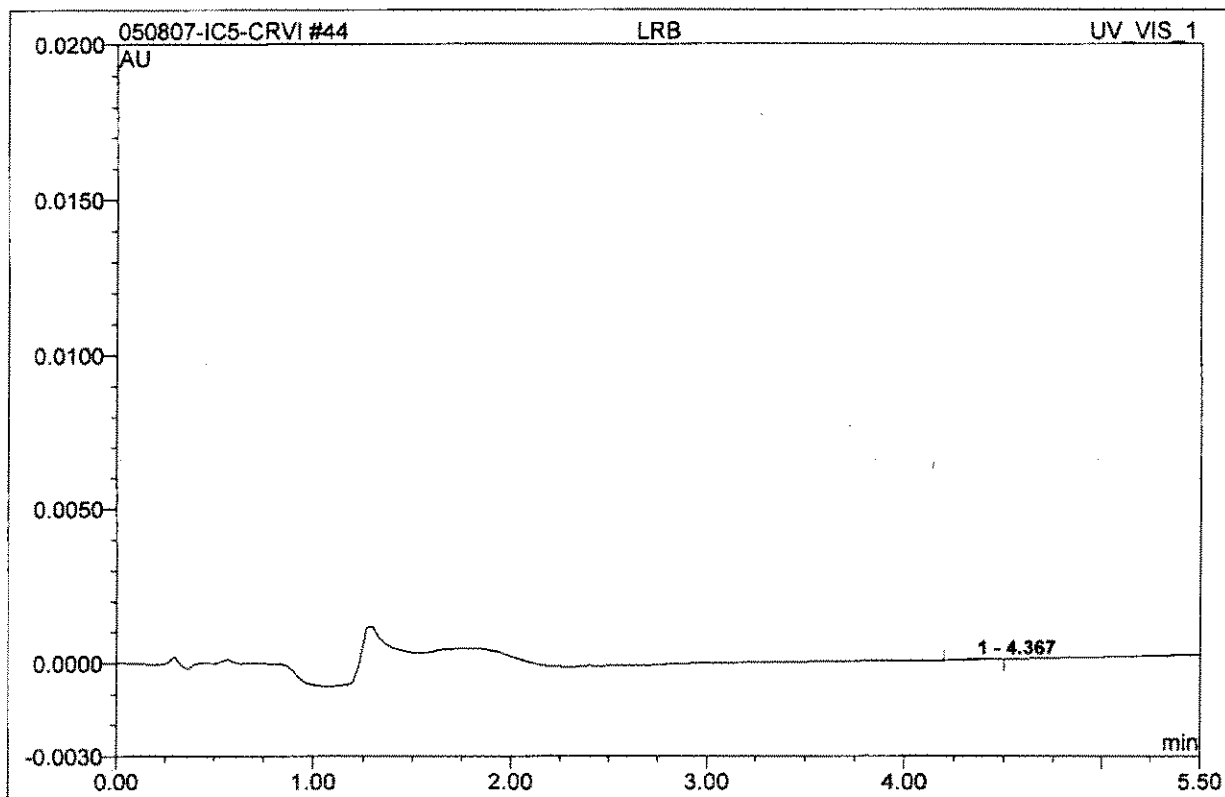
Sample Name:	WASH	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVi
Sample Type:	unknown	Recording Time:	5/8/2007 17:20
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.60	CRVI-LOW	0.000	0.0000035	100.00	0.009	BMB
Total:			0.000	0.000	100.00	0.009	

44 LRB

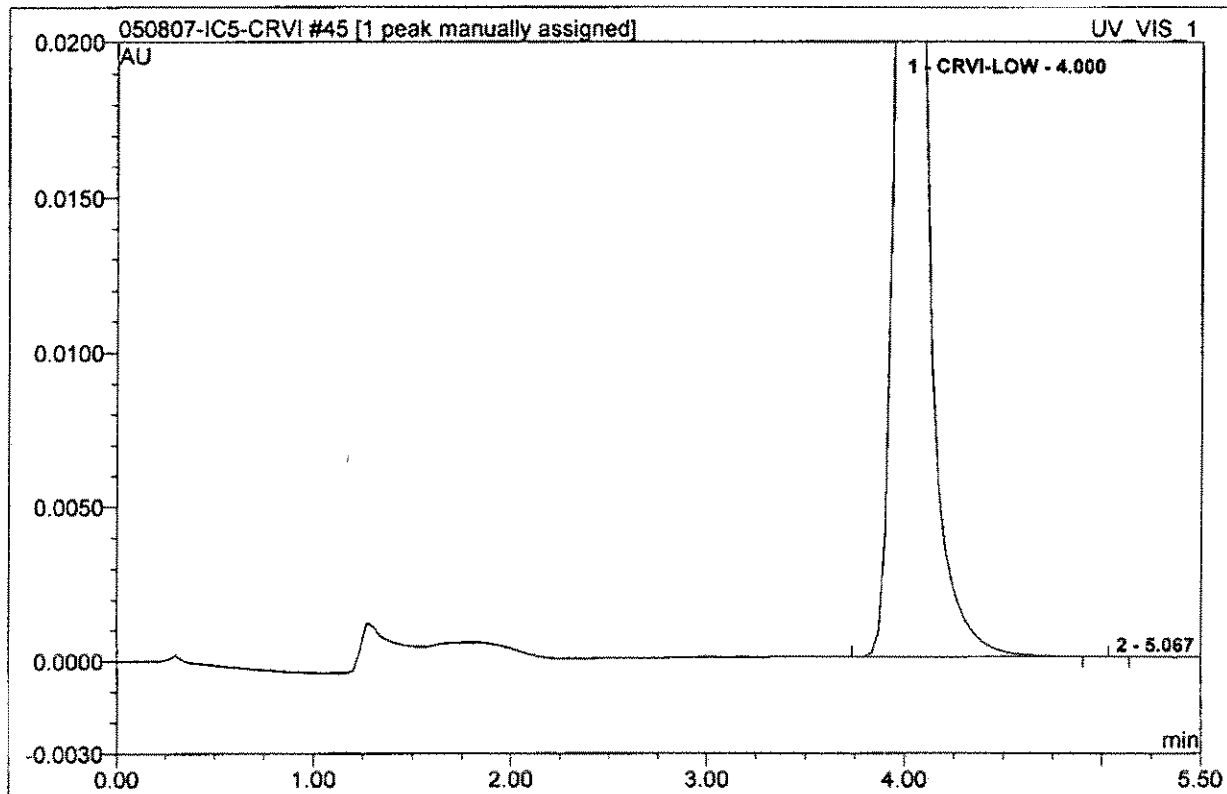
Sample Name:	LRB	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 17:28
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.37	n.a.	0.000	0.0000035	100.00	n.a.	BMB
Total:			0.000	0.000	100.00	0.000	

45 IPC 20

Sample Name:	IPC 20	Control Program:	CRVI-LOW-loop
Dilution Factor:	1.0000	Quantif. Method:	1-IC#5-CrVI
Sample Type:	unknown	Recording Time:	5/8/2007 17:36
Analyst:	tlh	Channel:	UV_VIS_1



No.	Ret.Time min	Peak Name	Height AU	Area AU*min	Rel.Area %	Amount	Type
1	4.00	CRVI-LOW	0.054	0.0081844	100.00	20.482	BMB^
2	5.07	n.a.	0.000	0.0000002	0.00	n.a.	BMB
Total:			0.054	0.008	100.00	20.482	

Standard Preparation Worksheet & Certificate of Analysis

Reagent Preparation Documentation

Page: 7

Reagent:

Date Received/Prepped:

Date Expired:

Manufacturer:

Storage Condition:

Cr⁶⁺ Buffer Solution

8/15/06 11/1/06 1/5/07

9/15/06 12/1/06

room temperature

MW #: TLH060815-4

By: TLH

Matrix: ag

Amount: 100mL

Lot #:

Component	Comment	Standard	Concentration
Ammonium Sulfate	33g dissolved in ~60mL DI H ₂ O	R201208	
Ammonium Hydroxide	6.5mL added bring to volume w/ DI H ₂ O	R201403	

Comment:

Reagent:

Date Received/Prepped:

Date Expired:

Manufacturer:

Storage Condition:

Cr⁶⁺ Calibration Std. - 0.2ppb

8/16/06 9/23/06 10/31/06 11/28/06 11/30/06 1/20/07

8/23/06 9/23/06

room temperature

MW #: TLH060816-1

By: TLH

Matrix: ag

Amount: 100mL

Lot #:

Component	Comment	Standard	Concentration
Cr ⁶⁺ Calibration Stock	200ul diluted to 100mL w/ DI H ₂ O	TLH060815-3	
Buffer Solution	1mL added AFTER diluted to final volume	TLH060815-4	0.2ppb

Comment: 3/9/07 3/23/07 4/6/07

Reagent:

Date Received/Prepped:

Date Expired:

Manufacturer:

Storage Condition:

Cr⁶⁺ Calibration Std. - 2.0ppb

8/16/06 8/25/06 9/5/06 9/13/06 9/21/06 9/22/06

8/23/06 9/1/06 9/12/06 9/20/06 9/28/06 9/29/06

room temperature

MW #: TLH060816-2

By: TLH

Matrix: ag

Amount: 100mL

Lot #:

Component	Comment	Standard	Concentration
Cr ⁶⁺ Calibration Stock	200ul diluted to 100mL w/ DI H ₂ O	TLH060815-3	2.0ppb
Buffer Solution	1mL added AFTER diluted to final volume	TLH060815-4	

Comment: 10/2/06 10/20/06 10/31/06 11/28/06 11/30/06 1/20/07 3/9/07 3/23/07 4/6/07

Reagent Preparation Documentation

Page: 8

Reagent: Cr⁶⁺ Calibration Std. - 10ppb
 Date Received/Prepped: 8/16/06 8/23/06 9/5/06 9/13/06 9/21/06 9/22/06
 Date Expired: 8/23/06 9/11/06 9/12/06 9/26/06 9/28/06 9/29/06
 Manufacturer: _____
 Storage Condition: room temperature

MW #: TLH060816-3
 By: TLH
 Matrix: ag
 Amount: 100mL
 Lot #: _____

Component	Comment	Standard	Concentration
Cr ⁶⁺ Calibration Stock	1.0 mL diluted to 100mL w/ DI H ₂ O	TLH060815-3	10.0ppb
Buffer Solution	1mL added AFTER diluted to final volume	TLH060815-4	

Comment: 10/2/06 10/20/06 11/30/06 12/18/06 1/25/07 3/9/07 3/23/07 3/27/07 3/29/07
4/6/07

Reagent: Cr⁶⁺ Calibration Std. - 20ppb
 Date Received/Prepped: 8/16/06 8/23/06 8/31/06 9/11/06 9/18/06 9/22/06
 Date Expired: 8/23/06 8/30/06 9/7/06 9/18/06 9/28/06 9/29/06
 Manufacturer: _____
 Storage Condition: room temperature

MW #: TLH060816-4
 By: TLH
 Matrix: ag
 Amount: 100mL
 Lot #: _____

Component	Comment	Standard	Concentration
Cr ⁶⁺ Calibration Stock	2.0 mL diluted to 100mL w/ DI H ₂ O	TLH060815-3	20.0ppb
Buffer Solution	1mL added AFTER diluted to final volume	TLH060815-4	

Comment: 10/2/06 10/2/06 10/20/06 11/9/06 11/24/06 11/30/06 12/18/06 1/2/07 1/9/07 1/23/07
1/31/07 2/20/07 3/7/07 3/16/07 3/22/07 3/23/07 4/3/07 4/5/07 4/12/07 5/10/07

Reagent: Cr⁶⁺ Calibration Std. - 50ppb
 Date Received/Prepped: 8/16/06 9/22/06 10/3/06 11/28/06 11/30/06 1/24/07
 Date Expired: 8/23/06 9/24/06 1 1 1
 Manufacturer: _____
 Storage Condition: room temperature

MW #: TLH060816-5
 By: TLH
 Matrix: ag
 Amount: 100mL
 Lot #: _____

Component	Comment	Standard	Concentration
Cr ⁶⁺ Calibration Stock	5mL diluted to 100mL w/ DI H ₂ O	TLH060815-3	50ppb
Buffer Solution	1mL added AFTER diluted to final volume	TLH060815-4	

Comment: 3/9/07 3/23/07 4/6/07

Reagent Preparation Documentation

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Reagent:

Date Received/Prepped:

~~Date Expired:~~

Manufacturer:

Storage Condition:

BrO₃ Color Reagent
3/12/07 3/21/07 x1 3/27/07 x2 4/6/07 x1 11/26/07 x2
5/16/07 x1 5/26/07 x2 1 1 1
room temperature

MW #: TLH070312-1

By: TLH

Matrix: ag

Amount: 2x2L

Lot #:

Component	Comment	Standard	Concentration
HPLC Grade Methanol	400ml	R201577	
O-dianisidine (ODA)	1.0g dissolved in methanol	R201466	
KBr	10.0g dissolved in ~1.4L DI H ₂ O	R201284	
Ultrex HNO ₃	160ml	R201576	

Comment: Add ODA to methanol & dissolve. In a 2L flask dissolve KBr into DI H₂O. Add HNO₃ to KBr soln. Add ODA to KBr & HNO₃ soln & dilute to mark w/ DI H₂O. Soln. must be clear w/in 30 mins. Soln. must stand a minimum of 6 hrs. before using. Overnight is better.

Reagent:

Date Received/Prepped:

Date Expired:

Manufacturer:

Storage Condition:

Cr⁶⁺ Low LCS Stock Solution - 1ppm
3/23/07 5/14/07 1 1 1
1 1 1 1
room temperature

MW #: TLH070323-1

By: TLH

Matrix: ag

Amount: 100mL

Lot #:

Component	Comment	Standard	Concentration
<u>Hach 1000ppm</u>	<u>100ul in 100mL DI H₂O</u>	<u>R201090</u>	<u>1ppm</u>
<u>exp. Jan 2010</u>			

Comment:

Reagent:

Date Received/Prepped:

Date Expired:

Manufacturer:

Storage Condition:

Cr⁶⁺ Low LCS Working Standard - 2ppb
3/23/07 4/6/07 15/14/07 6/4/07 6/13/07
1 1 1 1 1
room temperature

MW #: TLH070323-2

By: TLH

Matrix: ag

Amount: 100mL

Lot #:

Component	Comment	Standard	Concentration
<u>Cr⁶⁺ Low LCS Stock</u>	<u>200ul into ~90ml DI H₂O</u>	<u>TLH070323-1</u>	<u>2ppb</u>
<u>(TLH070323-1)</u>	<u>Bring to 100ml final vol w/ DI H₂O</u>		
<u>Cr⁶⁺ Buffer Soln</u>	<u>1ml added AFTER soln @ final vol</u>	<u>TLH070815-4</u>	

Comment:

Reagent Preparation Documentation

Page: 6

Reagent: Cr⁶⁺ Low LCS Stock Solution - 1ppm MW #: TLH060815-1
 Date Received/Prepped: 8/15/06 9/22/06 11/30/06 1 1 By: TLH
 Date Expired: 9/15/06 11/02/06 1 1 1 Matrix: aq
 Manufacturer: _____ Amount: 100mL
 Storage Condition: room temperature Lot #: _____

Component	Comment	Standard	Concentration
Absolute Standards	100uL in 100mL DI H ₂ O	R201081	1ppm
1000ppm			

Comment: _____

Reagent: Cr⁶⁺ Low LCS Std - 2ppb MW #: TLH060815-2
 Date Received/Prepped: 8/15/06 8/24/06 1 8/31/06 9/11/06 1 9/21/06 1 9/22/06 By: TLH
 Date Expired: 8/22/06 1 8/31/06 1 9/7/06 1 9/18/06 1 9/28/06 1 9/29/06 Matrix: aq
 Manufacturer: _____ Amount: 100mL
 Storage Condition: room temperature Lot #: _____

Component	Comment	Standard	Concentration
Cr ⁶⁺ Low LCS Stock	200uL into ~90mL DI H ₂ O	TLH060815-1	2ppb
(TLH060815-1)	Bring to 100mL final volume w/ DI H ₂ O in 100mL vol. flask		
Cr ⁶⁺ Buffer Soln.	1mL added AFTER soln. at final volume		

Comment: 10/2/07 10/2/06 10/20/06 11/1/06 11/30/06 12/11/06 1/5/07 2/5/07 2/19/07 3/5/07 3/14/07

Reagent: Cr⁶⁺ Low Calibration Stock Soln - 1000ppb MW #: TLH060815-3
 Date Received/Prepped: 8/15/06 9/22/06 1 11/30/06 3/23/07 1 By: TLH
 Date Expired: 8/22/06 1 9/22/06 1 1 1 Matrix: aq
 Manufacturer: _____ Amount: 100mL
 Storage Condition: room temperature Lot #: _____

Component	Comment	Standard	Concentration
Inorganic Ventures	100uL diluted to 100mL w/ DI H ₂ O	ME0604003	1000ppb
1000ppm			
exp. 1 May 2007			

Comment: _____

Initial:

Date:

DTW

4/14/06

METALS STANDARD DOCUMENTATION

Standard: 1000 ug/L Chromium(VI) Standard
Date Received/Prepped: 4/14/2006
Date Expired: 5/1/2007
Manufacturer: Inorganic Ventures
Matrix: Water
Amount: 100 mL

ME #: 0604003
By: DTN
Lot #: Y-CR02144
Certificate: Y
NIST SRM: 3112a
Storage: Room Temp

Component	Comment	Conc. Unit:
Chromium (VI)	Cat No.: CGCR(6)1-1	1006 mg/L

CERTIFICATE OF ANALYSIS

Tel: 800.669.6799 • 732.901.1900

Fax: 732.901.1903

info@inorganicventures.com

1.0 INORGANIC VENTURES is an ISO Guide 34:2000 registered Certified Reference Material (CRM) Manufacturer (Certificate #883-02). The certificate is designed and the data is determined in accordance with ISO Guide 31:2000 (Reference Materials-Contents of Certificates and Labels), ISO Guide 34:2000 "Quality System Guidelines for the Production of Reference Materials," and ISO Guide 35-1989 "Certification of Reference Materials - General and Statistical Principles."

2.0 DESCRIPTION OF CRM **1000 µg/mL Chromium (+6) in H2O**

Catalog Number: CGCR(6)1-1, CGCR(6)1-2, and CGCR(6)1-5
Lot Number: **Y-CR02144**
Starting Material: (NH₄)₂Cr₂O₇
Starting Material Purity (%): 99.984219
Starting Material Lot No: D25M04
Matrix: H₂O

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1006 ± 2 µg/mL

Certified Density: 0.998 g/mL (measured at 22° C)

The Certified Value is based upon the most precise method used to analyze this CRM. The following equations are used in the calculation of the certified value and the uncertainty:

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_1}{n} \quad \begin{array}{l} (\bar{x}) = \text{mean} \\ x_1 = \text{individual results} \\ n = \text{number of measurements} \end{array}$$
$$\text{Uncertainty } (\pm) = \frac{2[(\sum s_1^2)]^{1/2}}{(n)^{1/2}} \quad \begin{array}{l} \sum s_1 = \text{The summation of all significant estimated errors} \\ \text{(Most common are the errors from instrumental measurement} \\ \text{weighting, dilution to volume, and the fixed error reported on the NIST} \\ \text{SRM certificate of analysis.)} \end{array}$$

The independent samples t-test was used to determine if there is agreement between the above assay methods at the 95% confidence interval. Both methods were compared and showed agreement within the stated uncertainties. This agreement is a confirmation of the accuracy of this CRM.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

- "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)
- This IV product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 Assay Method #1 **1006 ± 2 µg/mL**
Redox NIST SRM 136e Lot Number: 136e

Assay Method #2 **1001 ± 4 µg/mL**
ICP Assay NIST SRM 3112a Lot Number: 990607

- 4.2 BALANCE CALIBRATION** - All balances are checked daily using in-house procedure number 6-IMM001. The weights used for testing are annually compared to Gerhart Scale Corporation's master weights and are traceable to the National Institute of Standards and Technology (NIST). The NIST Traceability numbers are 692476 - Class 1 and 692476A - Class 2. The NIST test number is 822/260017-98. All analytical balances are calibrated every 4 months by Gerhart Scale Corp. of South Amboy. The balances are calibrated with a class 1 and/or class 2 analytical weight set. These weights are tested annually by a NIST / NVLAP accredited calibration lab. The NIST test number is 822/260017-98.
- 4.3 THERMOMETER CALIBRATION** - The thermometers used in the determination of the final densities are calibrated vs standard thermometer No. 903-2680 which was certified in accordance with the procedures outlined by ASTM E77-87 and NIST Monograph 150 using NIST Test Nos. and Std Nos.: 769543, 217368/769543, 217368/P14452, 176240/P14452, 176240. The in-house procedure No. is 2-QC-001. Thermometers which are not calibrated vs standard thermometer No. 903-2680 are traceable to NIST Identification Nos. 92564, 119016, 471047 and NIST test report Nos. 811/258522, 811/2557078, and 236090.
- 4.4 GLASSWARE CALIBRATION** - In-house procedure 3-QC-002 is used to calibrate all Class A glassware used in the manufacture and quality control of CRM's.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP/MS AND ICP-OES IN µg/mL

CRM's solutions are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

<u>Q</u> Al < 0.00090	<u>M</u> Dy < 0.00598	<u>Q</u> Li < 0.00002	<u>M</u> Pr < 0.00030	<u>M</u> Te < 0.02989
<u>M</u> Sb < 0.00050	<u>M</u> Er < 0.00498	<u>M</u> Lu < 0.00040	<u>M</u> Re < 0.00100	<u>M</u> Tb < 0.00030
<u>M</u> As < 0.00996	<u>M</u> Eu < 0.00299	<u>Q</u> Mg < 0.00030	<u>M</u> Rh < 0.00100	<u>M</u> Tl < 0.00100
<u>M</u> Ba < 0.00996	<u>M</u> Gd < 0.00100	<u>M</u> Mn < 0.00399	<u>M</u> Rb < 0.00100	<u>M</u> Th < 0.00100
<u>M</u> Be < 0.00050	<u>M</u> Ga < 0.00080	<u>Q</u> Hg < 0.01500	<u>M</u> Ru < 0.00199	<u>M</u> Tm < 0.00040
<u>M</u> Bi < 0.00040	<u>M</u> Ge < 0.00598	<u>M</u> Mo < 0.00199	<u>M</u> Sm < 0.00100	<u>M</u> Sn < 0.00498
<u>Q</u> B < 0.01000	<u>M</u> Au < 0.00299	<u>M</u> Nd < 0.00199	<u>M</u> Sc < 0.00996	<u>Q</u> Ti < 0.00100
<u>M</u> Cd < 0.00299	<u>M</u> Hf < 0.00199	<u>M</u> Ni < 0.00797	<u>M</u> Se < 0.00797	<u>M</u> W < 0.00996
<u>Q</u> Ca < 0.00250	<u>M</u> Ho < 0.00050	<u>M</u> Nb < 0.00050	<u>Q</u> Si < 0.00600	<u>M</u> U < 0.00199
<u>M</u> Ce < 0.00498	<u>M</u> In < 0.00996	<u>n</u> Os	<u>M</u> Ag < 0.00199	<u>Q</u> V < 0.02000
<u>M</u> Cs < 0.00030	<u>M</u> Ir < 0.00498	<u>M</u> Pd < 0.00498	<u>Q</u> Na < 0.00650	<u>M</u> Yb < 0.00100
<u>S</u> Cr	<u>Q</u> Fe < 0.01000	<u>Q</u> P < 0.04000	<u>M</u> Sr < 0.00050	<u>M</u> Y < 0.03985
<u>M</u> Co < 0.00299	<u>M</u> La < 0.00050	<u>M</u> Pt < 0.00199	<u>i</u> S	<u>Q</u> Zn < 0.00400
<u>M</u> Cu < 0.00598	<u>M</u> Pb < 0.05579	<u>Q</u> K < 0.13000	<u>M</u> Ta < 0.00697	<u>M</u> Zr < 0.00498

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

For the calibration of analytical instruments including but not limited to the following:
 ICP-MS, ICP-OES, FAAS, GFAA, XRF, and DCP
 For the validation of analytical methods
 For the preparation of "working reference samples"
 For interference studies and the determination of correction coefficients
 For detection limit and linearity studies
 For additional intended uses, contact IV Technical Staff

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

Storage & Handling - Keep tightly sealed when not in use. Store and use at $20 \pm 4^\circ\text{C}$. Do not pipet from container. Do not return portions removed for pipetting to container.

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 51.9961; +3; 6; $\text{Cr}_2\text{O}_7^{2-}$

Chemical Compatibility - Stable in HCl , HNO_3 , H_2SO_4 , HF , H_3PO_4 . Avoid basic media. Stable with most metals (Except Ba and Pb) and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container as Total Cr, however, the stability of this oxidation state is unknown. 1-10,000 ppm solutions chemically stable for years in 0 - 1% HNO_3 / LDPE container.

Cr Containing Samples (Preparation and Solution) - Metal (soluble in HCl); Oxides/Ores (Chrome ore/oxides are very difficult to dissolve. The following procedures [A-D] are commonly used:

A. Fusion with KHSO_4 and extraction with hot KCl . The residue fused with Na_2CO_3 and KClO_3 , 3:1.

B. Fusion with NaKSO_4 and NaF , 2:1.

C. Fusion with magnesia or lime and sodium or potassium carbonates, 4:1.

D. Fusion with Na_2O_2 or NaOH and KNO_3 or NaOH and Na_2O_2 .

Nickel, iron, copper, or silver crucibles should be used for D. Platinum may be used for A, B and C;

Organic Matrices (Ash at 450EC followed by one of the fusion methods above or sulfuric/hydrogen peroxide acid digestions may be applicable to non oxide containing samples).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Type	Interferences (underlined indicates severe)
ICP-OES 205.552 nm	0.006 / 0.0008 $\mu\text{g/mL}$	1	ion	<u>Os</u>
ICP-OES 284.325 nm	0.008 / 0.0007 $\mu\text{g/mL}$	1	ion	
ICP-OES 276.654 nm	0.01 / 0.001 $\mu\text{g/mL}$	1	ion	<u>Cu</u> , <u>Ta</u> , <u>V</u>
ICP-MS 52 amu	40 ppt	n/a	M+	$^{36}\text{S}^{16}\text{O}$, $^{36}\text{Ar}^{16}\text{O}$ - The ^{50}Cr , ^{53}Cr , ^{54}Cr lines suffer from many more potential interferences from sulfur, chlorine and argon compounds of oxygen, nitrogen and carbon.

8.0 **HAZARDOUS INFORMATION** - Please refer to the enclosed Material Safety Data sheet for information regarding this CRM.

9.0 **HOMOGENEITY** - This solution was mixed according to procedure IV-MPM-004 and is guaranteed to be homogeneous.

10.0 QUALITY STANDARD DOCUMENTATION



10.1 ISO 9001:2000 Quality Management System Registration - QMI Certificate Number 010105

Recognized by:

Registrar Accreditation Board (ANSI-RAB)

Standards Council of Canada (SCC)

Dutch Council for Accreditation (RVA)

Entidad Mexicana de Acreditacion, a.c.(EMA)

Members of IQ Net International Certification Network:

Argentina (IRAM), Australia (QAS), Austria (ÖQS), Belgium (Avinter), Brazil (FCAV), Canada (QMI), Hong Kong (HKQAA), Columbia (ICONTEC), Czech Republic (CQS), Denmark (DS), Finland (SFS), France (AFAQ), Germany (DQS), Greece (ELOT), Hungary (MSZT), Ireland (NSAI), Israel (SII), Italy (CISQ), Japan (JQA), Korea (KSA-QA), Netherlands (KEMA), Norway (NCS), Poland(PCBC), Portugal (APCER), Singapore (PSB), Slovenia (SIQ), Spain (AENOR), Switzerland (SQS)

10.2 ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration"

- Chemical Testing - Accredited A2LA Certificate Number 883.01

10.3 ISO/IEC Guide 34 - 2000 "General Requirements for the Competence of Reference Material Producers"

- Reference Materials Production - Accredited A2LA Certificate Number 883.02

A2LA Mutual Recognition Agreement Partners:

Australia (NATA), Austria (BmWA), Belgium (BELTEST) (BKO-OBE), Canada (SCC), Chinese Taipei (CNLA), Czech Republic (NAO), Denmark (DANAK), Finland (FINAS), France (COFRAC), Germany (DAR), Hong Kong (HKAS), Ireland (NAB), Italy (SIT) (SINAL), Japan (JAB) (JNLA), Republic of Korea (KOLAS), The Netherlands (RvA), New Zealand (IANZ), Norway (NA), Portugal (IPQ), Singapore (SAC-SINGLAS), Spain (ENAC), Sweden (SWEDAC), Switzerland (SAS), United Kingdom (UKAS) and United States (NVLAP) (ICBO ES)

10.4 10CFR50 Appendix B - Nuclear Regulatory Commission

- Domestic Licensing of Production and Utilization Facilities

10.5 10CFR21 - Nuclear Regulatory Commission - Reporting Defects and Non-Compliance

10.6 MIL-STD-45662A (Obsolete/Observed)

11.0 DATE OF CERTIFICATION AND PERIOD OF VALIDITY

11.1 IV Shelf Life - The period of time during which the concentration of the analyte(s) in a properly packaged, unopened, and unused standard stored under environmentally controlled and monitored conditions will remain within the specified uncertainty range. Shelf life is limited primarily by transpiration (loss of water from the solution) and infrequently, by chemical instability. Transpiration studies (P-SP01020) of chemically-stable solutions performed at Inorganic Ventures Labs indicate a CRM shelf-life of four years for solutions packaged in 500-mL low density polyethylene bottles. When stored under special conditions that minimize transpiration and instability, the shelf life can be extended past this limit.

11.2 Expiration Date - The date after which a CRM should not be used. Routine laboratory use of a CRM increases transpiration losses and the chance of contamination which affect the integrity of the CRM and limit its useful life. Inorganic Ventures Labs concurs with state and federal regulatory agencies' recommendations that solution standards be assigned a one-year expiration date.

Certification Date: September 01, 2005

Expiration Date:

EXPIRES
12/2007

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Prepared By: Nick Maida, QA Administrator

Nick Maida

Certificate Approved By: Katalin Le, QC Manager

Katalin Le

Certifying Officer: Paul Gaines, PhD., Technical Director

Paul R. Gaines