Laboratory Services

Process Sciences, Inc.
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Leander, TX 78641
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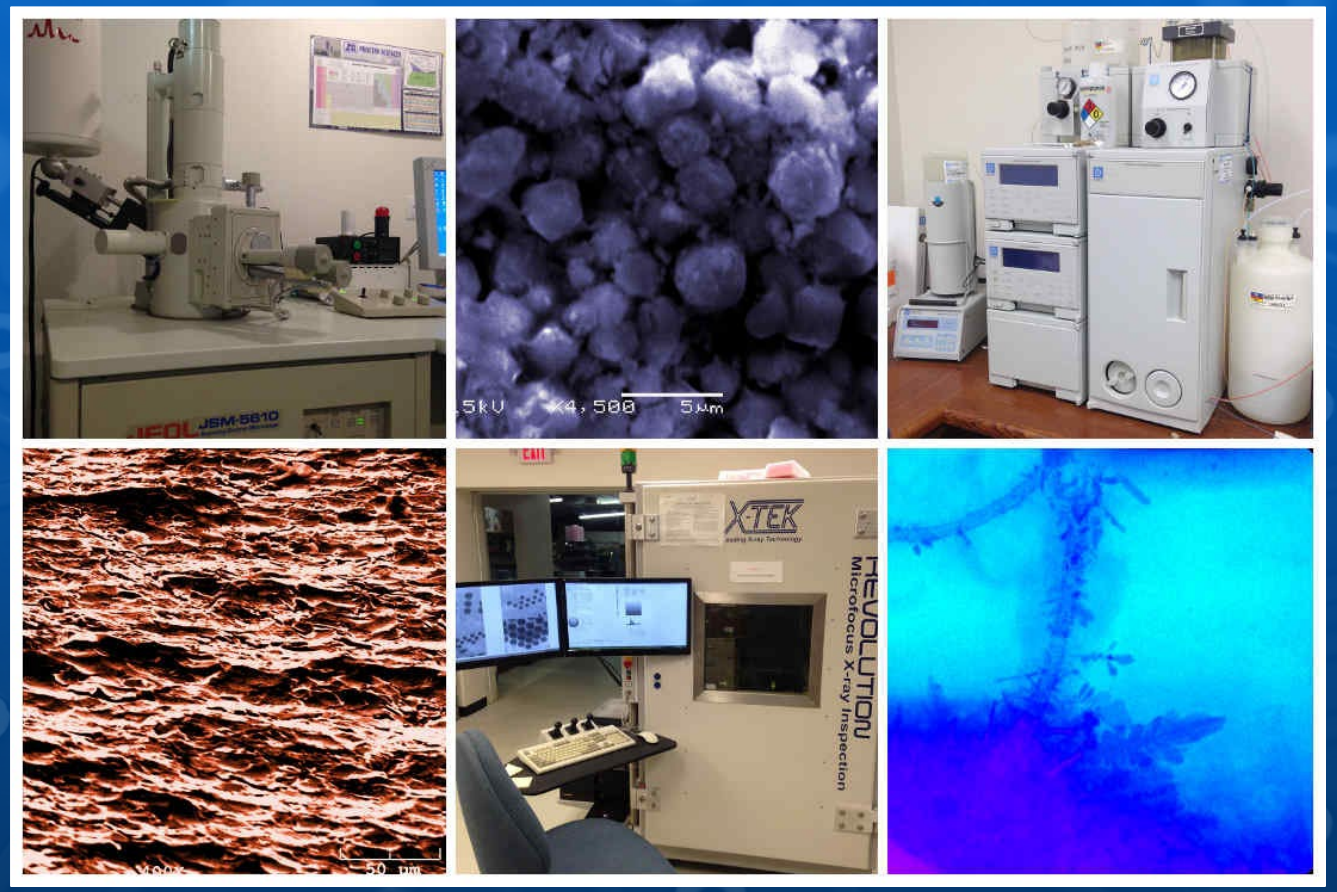


AS9100D CERTIFIED ISO 9001

CERTIFIED ISO 9001:2015 COMPANY

SMTA Surface Mount Technology Association Member Since 1997

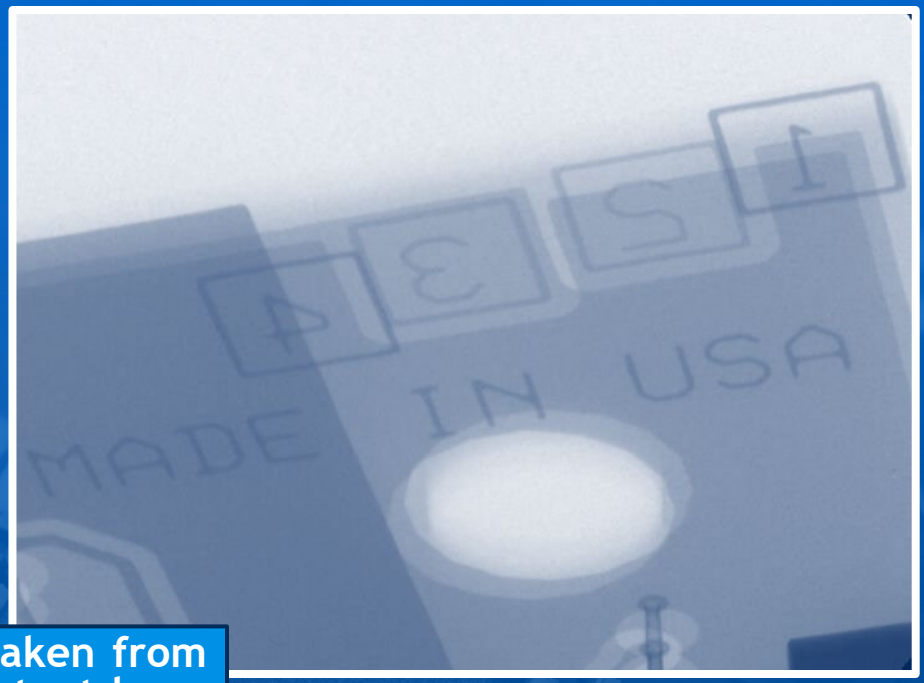
ITAR Compliant International Traffic in Arms Regulation

IPC MEMBER ASSOCIATION CONNECTING ELECTRONICS INDUSTRIES

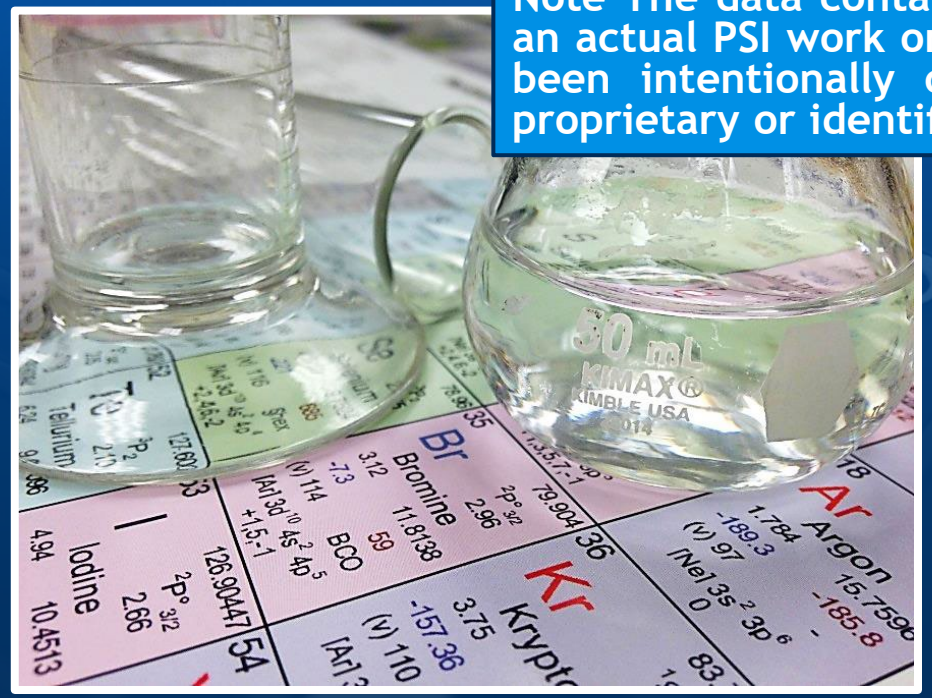
PROCESS SCIENCES INCORPORATED

Confidential Analytical Report & Summary

- Prepared For: Contact Name
- Company: Company Name
- Analysis Report Number: 240613-WorkOrder#
- Date of Analytical Summary: 6/13/24
- Quote #: Q198907
- Participating Analyst: PSI Analyst



Note The data contained in this report are taken from an actual PSI work order. Certain images and text have been intentionally obscured or removed to protect proprietary or identifying information.



Analyst:	Reviewed by:
Analyst	Manager

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Samples Received:

Two assemblies, PN: XXXX-002 Rev H and PN: XXXX Rev K were received for analysis.

Statement of Work:

- The assemblies were documented before analysis.
- Each assembly was spot tested at 3 locations as identified by the customer for surface ionic contamination using the C3 Localized Electronic Cleanliness Tester. See the next page for more detailed information.
- The extracted C3 solutions from each test site were analyzed using Ion Chromatography to identify and quantify any ionic contaminants.

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C3 Analysis Results:

Assembly XXXX location Q1 Failed, locations C8 and U3 Passed. Assembly XXXX, locations Q3, U1 and U2 all passed. A passing result indicates that the level of ionic residues on the board surface are considered acceptable for Class 2 and Class 3 PC Assemblies.

Ion Chromatography Analysis Results:

The 3 test locations from both assemblies had Anions, Cations and WOA that were greater than the recommended upper limits.

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C3 Cleanliness Tester – Principles of Operation

The information gathered when using the C3 is intended to provide a measure of cleanliness of a localized region of a circuit board.

The C3, in conjunction with the extraction solution, has been designed to achieve effective ionic residue removal using a heated delivery system that consists of 3 stages:

1) Heat the extraction solution and deliver it to the extraction site.

2) Soak cycle to allow solubilization of the ionic species.

3) Aspirate the solution into a collection cell.

This process cycle is repeated nine times to allow for effective removal of the surface contaminating residues from an area of approximately 0.1 square inch. Diameter of the Test Cell is 0.375 inch.

A simple “Clean” / “Dirty” analysis is performed using the C3 on-board measurement system. This system uses a sacrificial circuit board electrode immersed in the extracted solution to measure the electrical conductivity of the solution. The Foresite company, who designed the C3, has determined through extensive testing that a “Clean” analysis is one where the conductivity of the extracted solution remains less then 250 uA (micro Amps) for 120 seconds. A “Dirty” analysis is one where the conductivity of the extracted solution is greater then 250 uA in less then 120 seconds. These are the parameters used for IPC Class II and Class III circuit boards.

The C3 measurement system will graph the conductivity of the extracted solution. See the next page for examples of the graphs.

At the end of the analysis, the measurement system will assign a “Corrosivity Index” (C.I.) number. This number is an indicator of the cleanliness of the test site. The lower the C.I. number the cleaner the site is. Foresite has determined that any C.I. number less then 2.08 will result in a “Clean” analysis and any number 2.08 or greater will result in a “Dirty” analysis.

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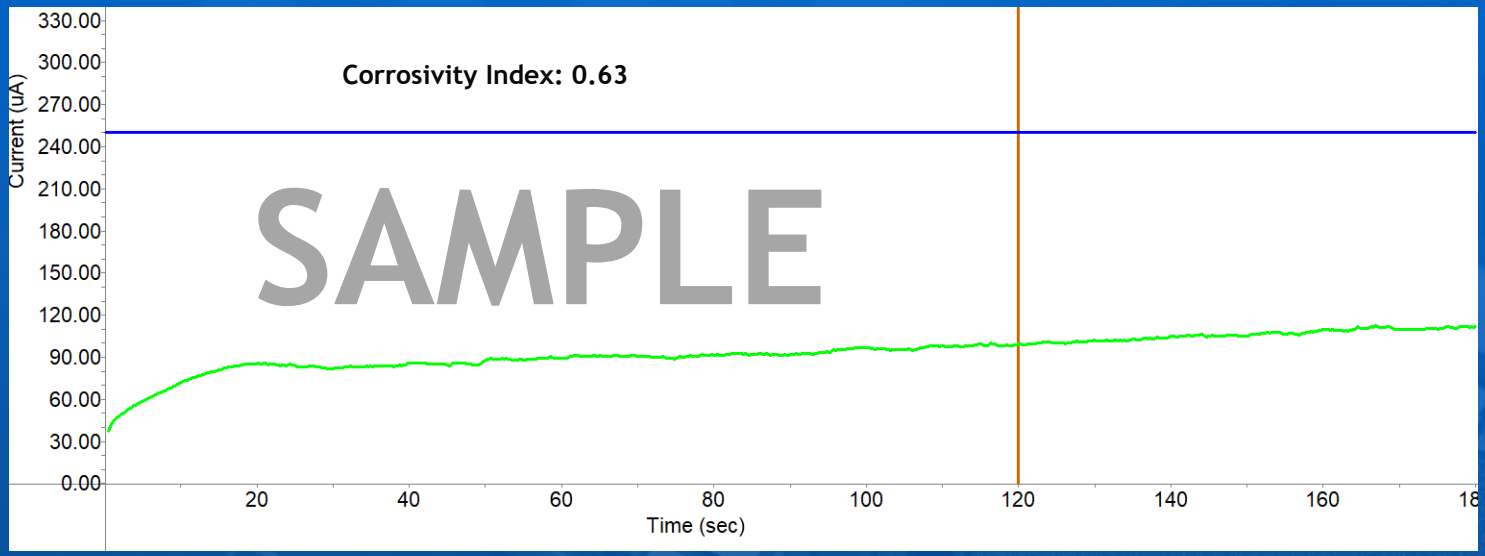
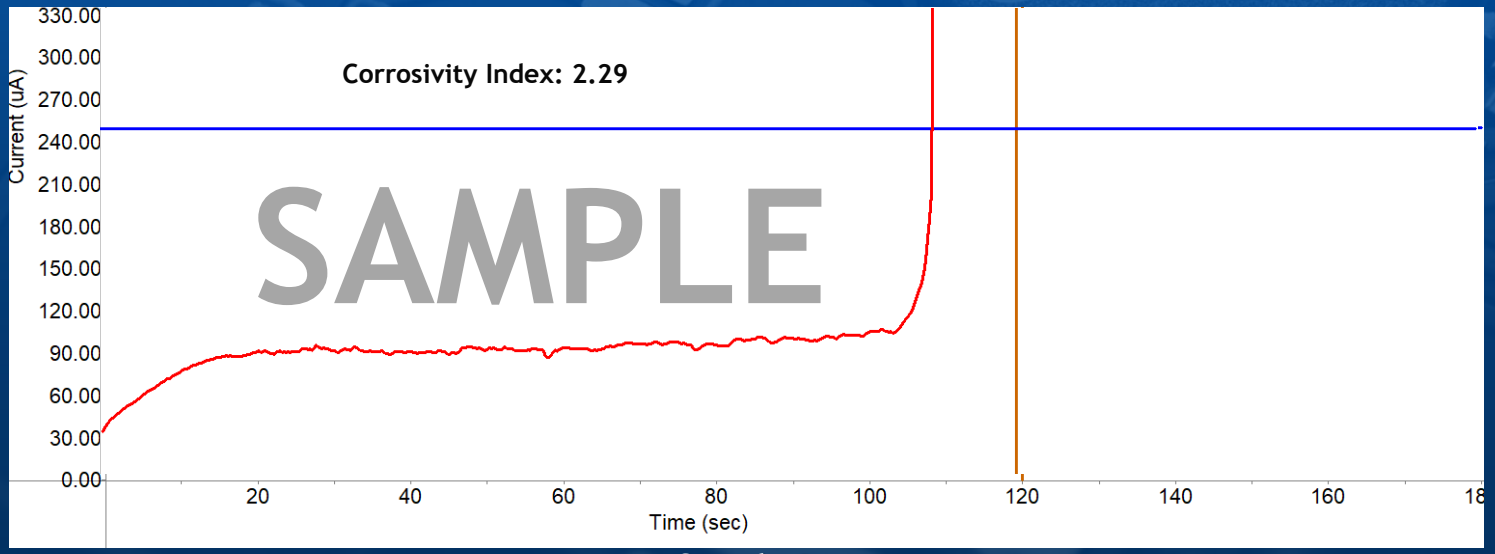
C3 Cleanliness Tester – Principles of Operation



Sample 1
Graph of a Clean Analysis



Sample 2
Graph of a Dirty Analysis

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Testing Equipment

- Foresite Localized Electronics Cleanliness Tester
- Dionex DX 500 Ion Chromatograph

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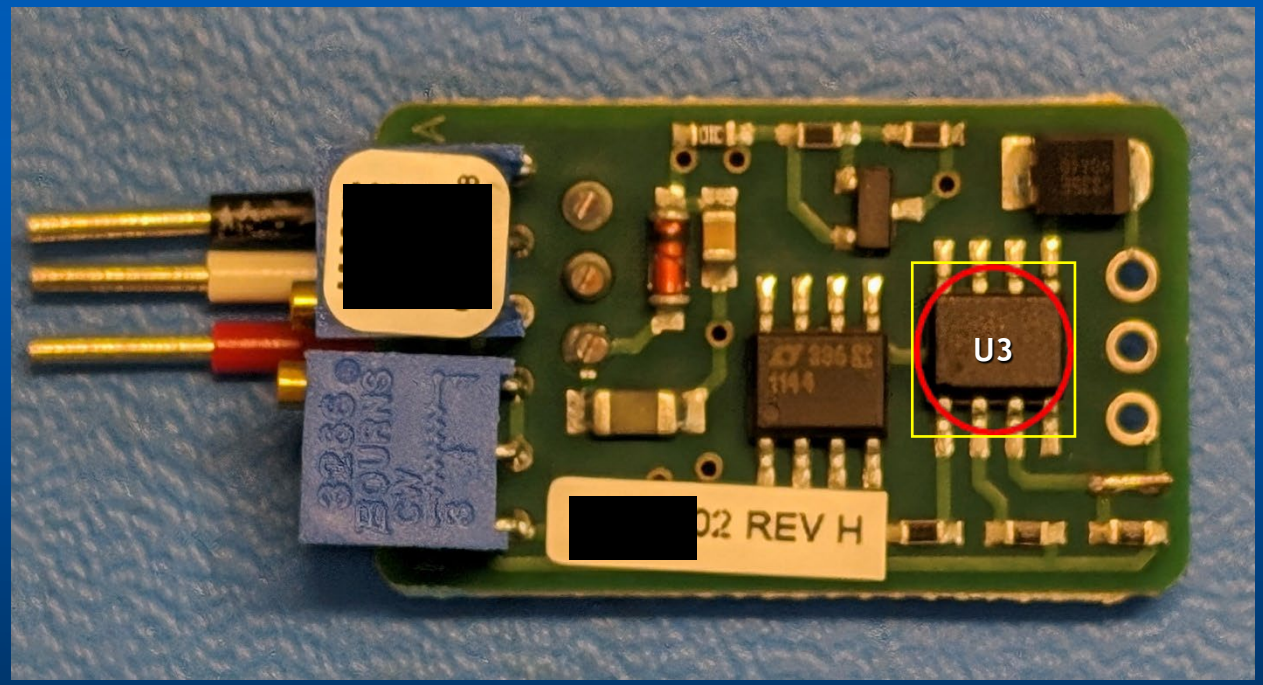
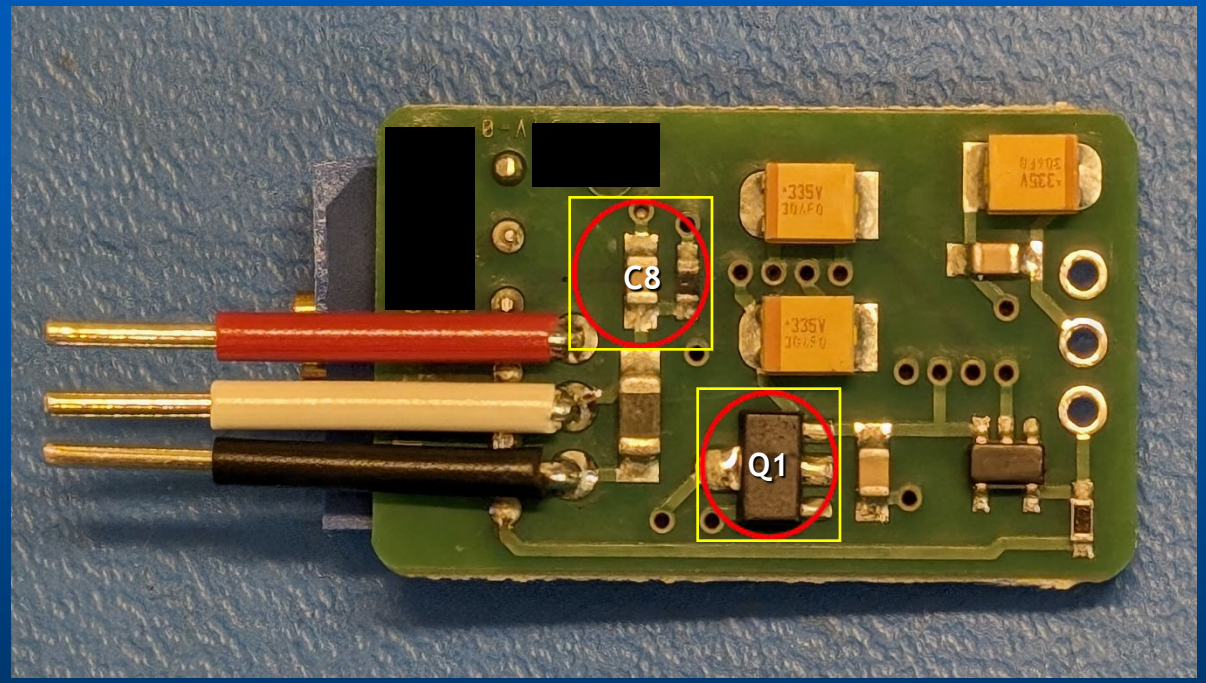
Company Name - Assembly XXXX - Board Images



Side 1
The red circle identifies the test location.



Side 2
The red circle identifies the test location.

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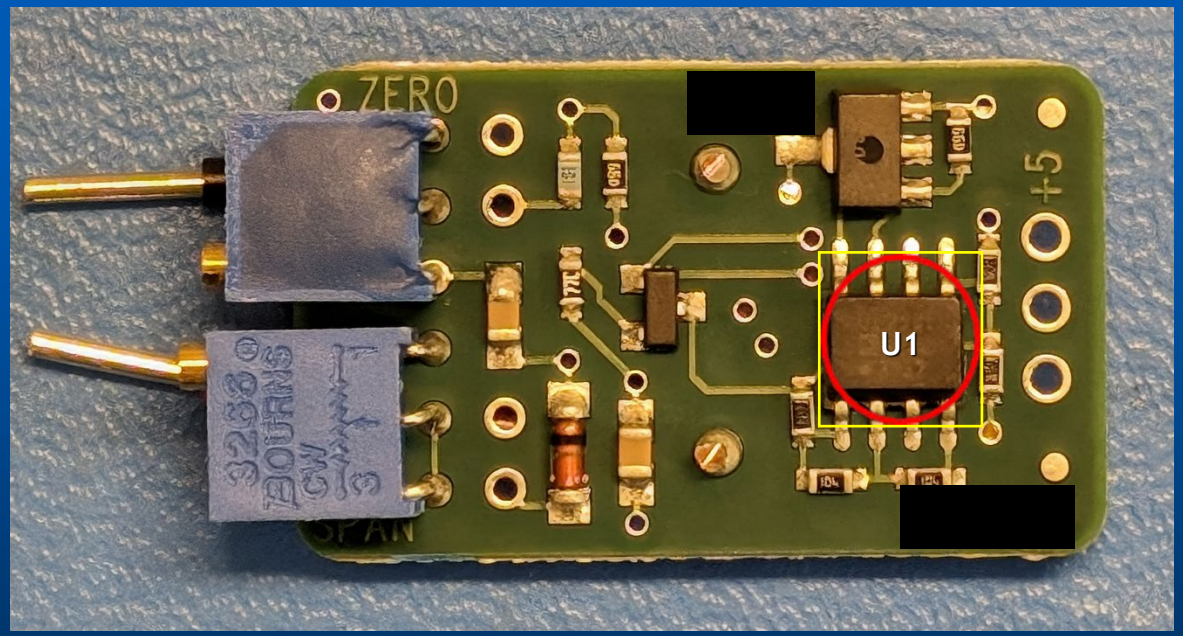
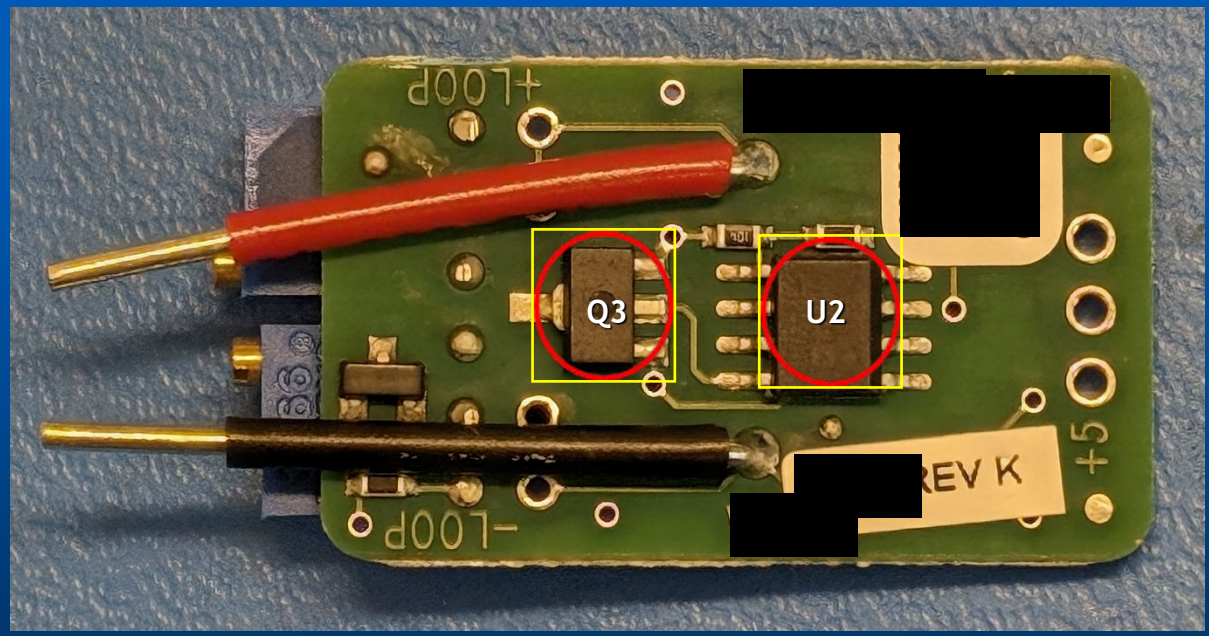
Company Name - Assembly XXXX - Board Images



Side 1
The red circle identifies the test location.



Side 2
The red circle identifies the test location.

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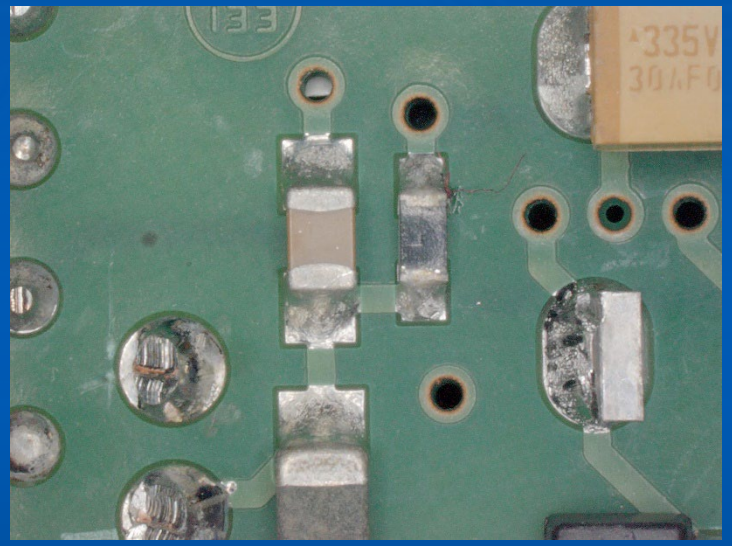
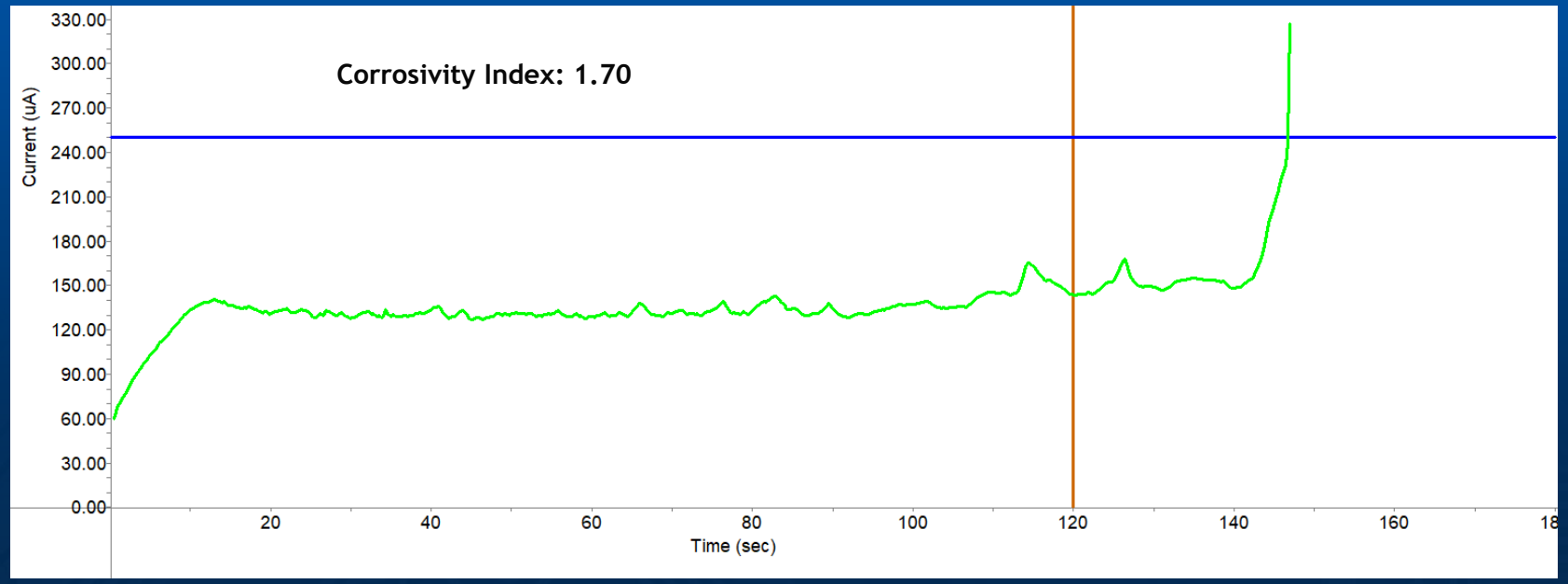
Company Name - Assembly XXXX - C8 - C3 Cleanliness Analysis



Test Area



Analysis Result

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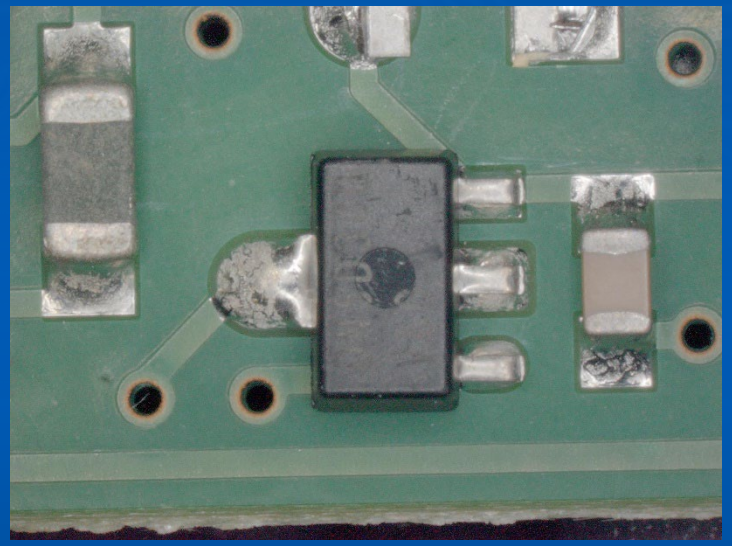
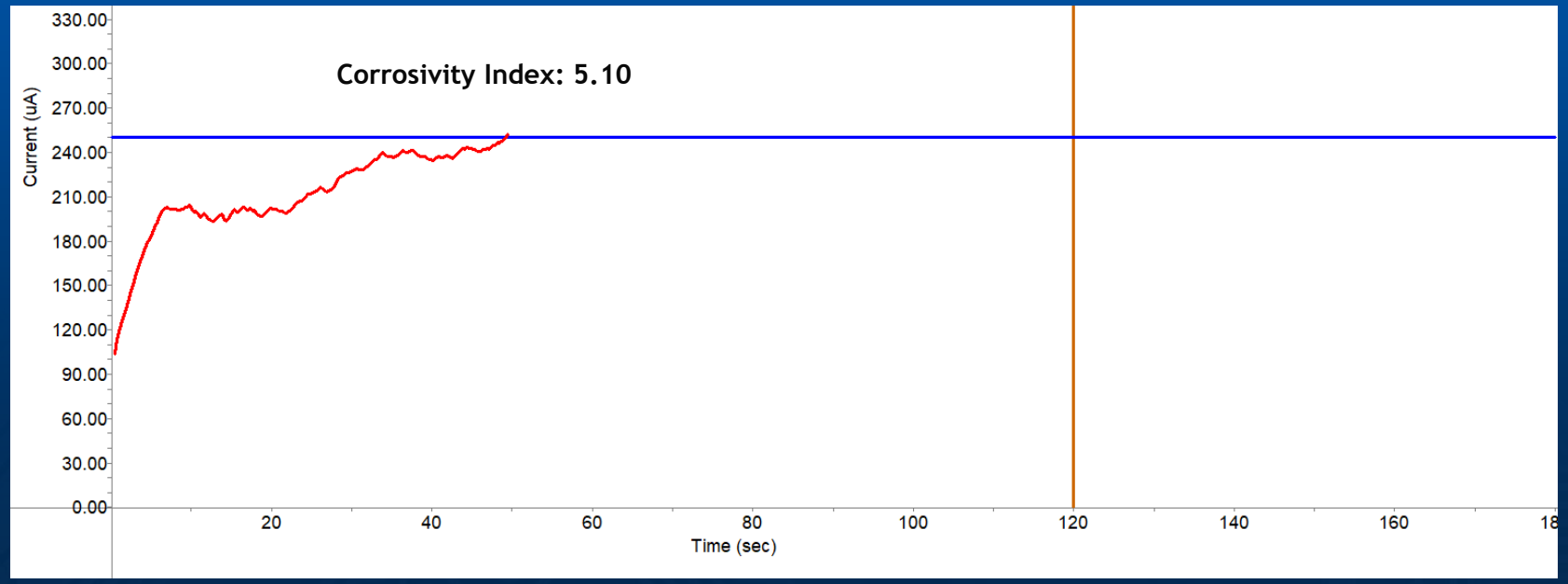
Company Name - Assembly XXXX - Q1 - C3 Cleanliness Analysis



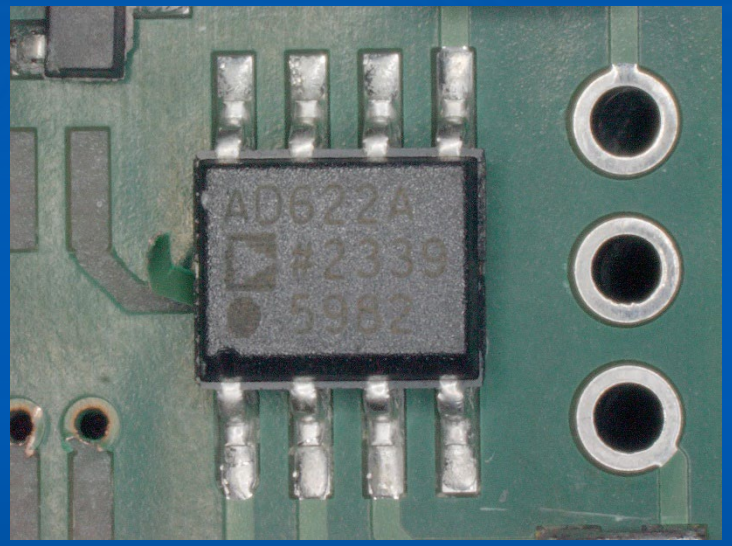
Test Area



Analysis Result

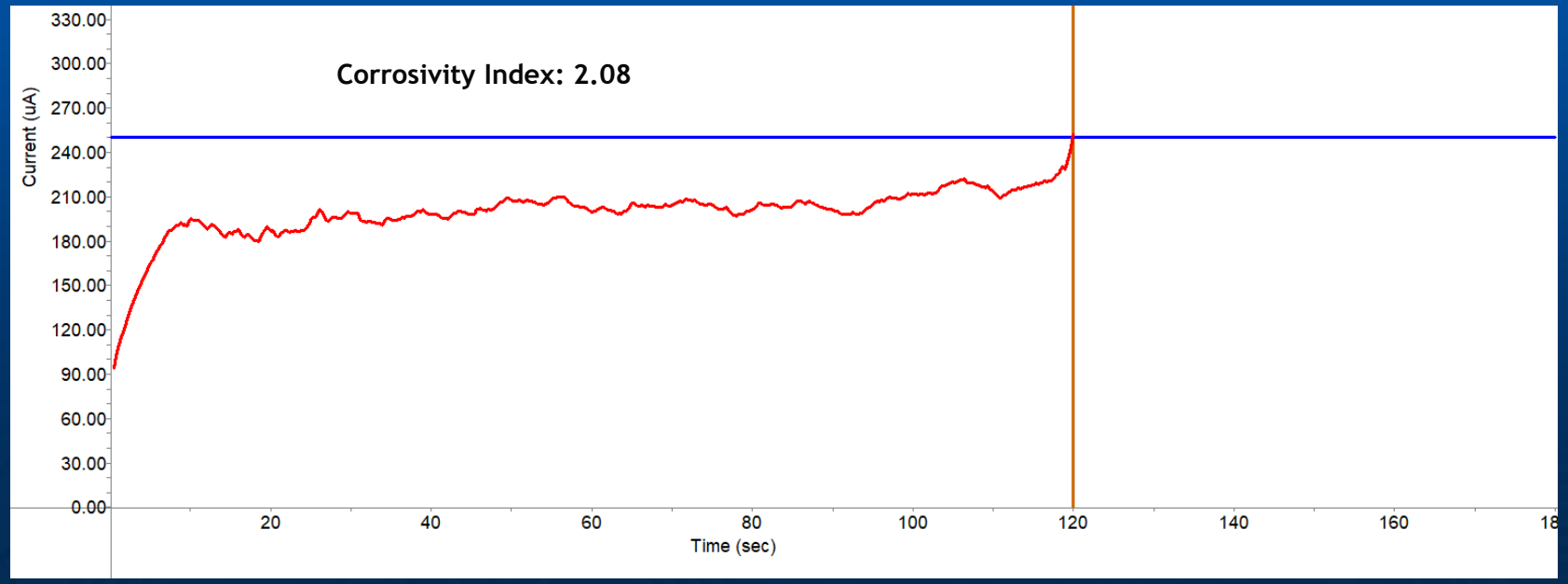
PROCESS SCIENCES INCORPORATED

Company Name - Assembly XXXX - U3 - C3 Cleanliness Analysis



Test Area

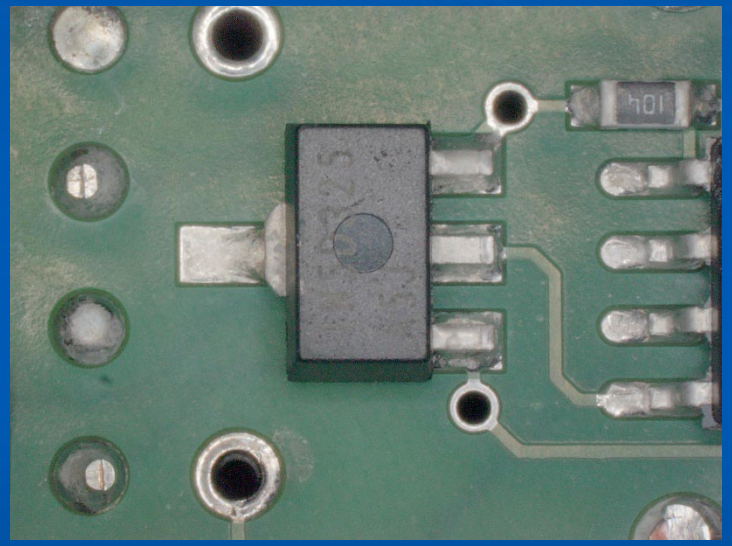
This result is borderline with the corrosivity index being 2.08 which is the upper limit for a “Clean” result. The graph color is red indicating a “Dirty” result, however, the C3 analysis was “Clean”.



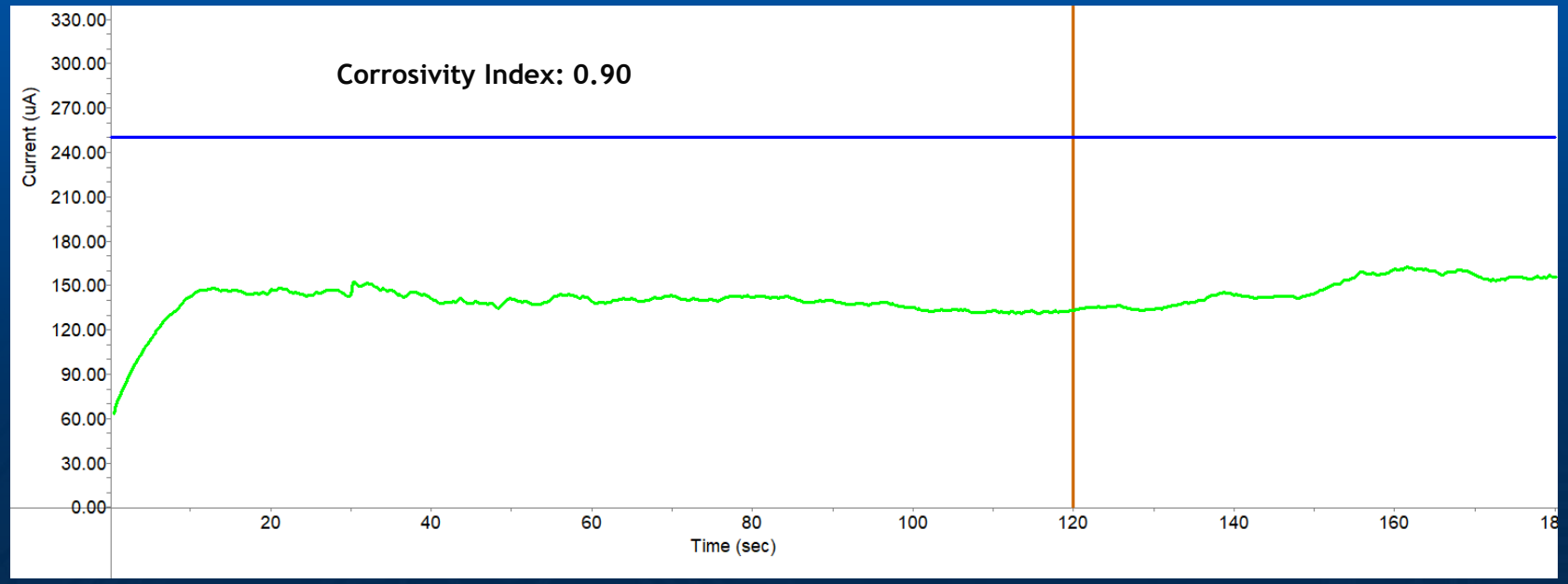
Analysis Result

PROCESS SCIENCES INCORPORATED

Company Name - Assembly XXXX - Q3 - C3 Cleanliness Analysis



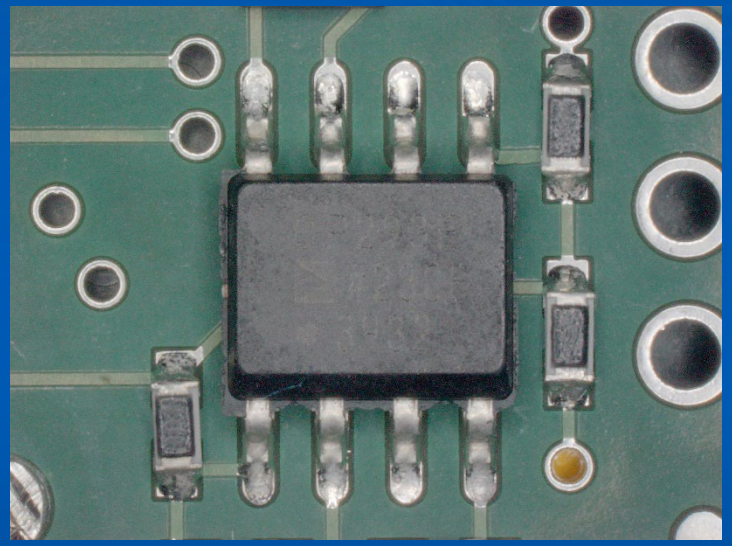
Test Area



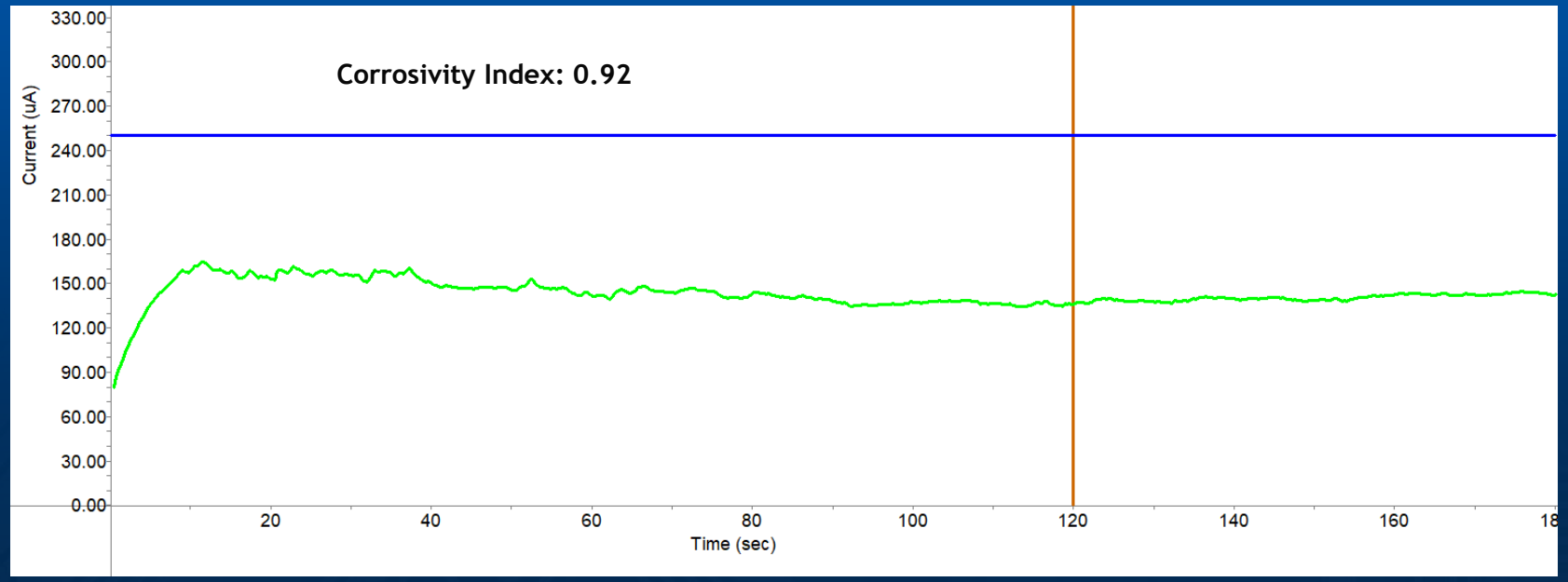
Analysis Result

PROCESS SCIENCES INCORPORATED

Company Name - Assembly XXXX - U1 - C3 Cleanliness Analysis



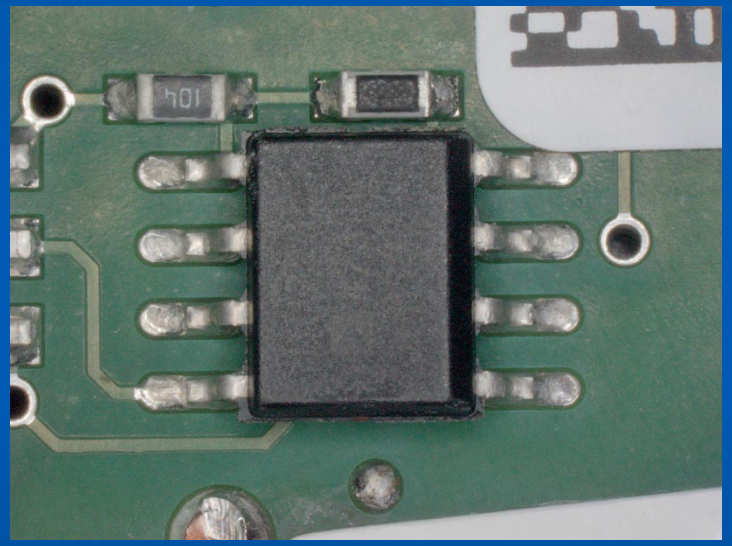
Test Area



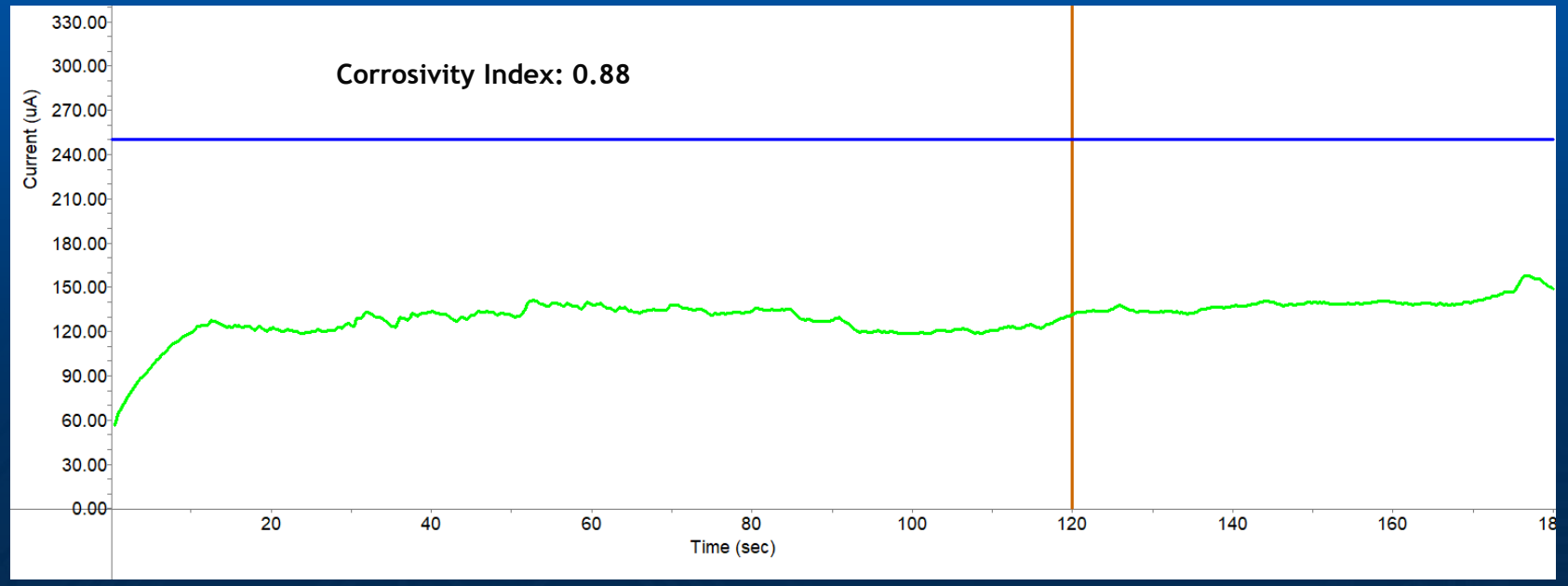
Analysis Result

PROCESS SCIENCES INCORPORATED

Company Name - Assembly XXXX - U2 - C3 Cleanliness Analysis



Test Area



Analysis Result

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Company Name - IC Analysis - Anion Summary Table

		Vol	Fluoride		Chloride		Nitrite		Bromide		Nitrate		Sulfate		Phosphate	
Sample	(sqin)	ml	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2
C3 Blank Solution	NA	1 ml	0.000	NA	0.065	NA	0.000	NA	0.000	NA	0.004	NA	0.000	NA	0.000	NA
[redacted] C8	0.11	2.6	0.072	**1.70**	0.239	**4.11**	0.000	**0.00**	0.410	**9.69**	0.237	**5.51**	0.318	**7.52**	0.000	**0.00**
[redacted] Q1	0.11	2.6	0.108	**2.55**	0.789	**17.11**	0.000	**0.00**	0.179	**4.23**	1.075	**25.31**	0.353	**8.34**	0.000	**0.00**
[redacted] U3	0.11	2.6	0.143	**3.38**	0.524	**10.85**	0.000	**0.00**	0.447	**10.57**	0.554	**13.00**	0.427	**10.09**	0.000	**0.00**
[redacted] Q3	0.11	2.6	0.083	**1.96**	0.292	**5.37**	0.000	**0.00**	0.338	**7.99**	0.417	**9.76**	0.255	**6.03**	0.122	**2.88**
[redacted] U1	0.11	2.6	0.132	**3.12**	0.411	**8.18**	0.000	**0.00**	0.568	**13.43**	0.377	**8.82**	0.351	**8.30**	0.000	**0.00**
[redacted] U2	0.11	2.6	0.096	**2.27**	0.253	**4.44**	0.000	**0.00**	0.369	**8.72**	0.206	**4.77**	0.227	**5.37**	0.000	**0.00**

IC Test Results

Forsite Recommended limits	
Fluoride	< 1 ug/sqin
Bromide	< 6 ug/sqin
Chloride (Clean)	< 6 ug/sqin
Chloride (No Clean)	< 3 ug/sqin
Sulfate	< 3 ug/sqin
Phosphate	< 3 ug/sqin
Nitrate	< 3 ug/sqin
Nitrite	< 3 ug/sqin

The background noise from those peaks found in the Blank sample have been subtracted out of the final results.

Almost all of the test results for the Anions that were found are greater than their upper acceptable limit for both assemblies.

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Company Name - IC Analysis - WOA Summary Table

	Vol	Acetic		Formic		MSA		Glutaric		Adipic		Succinic		Malic		Tartaric		Maleic		Oxalic		Phthalic		Citric		Total
ıple (sqin)	ml	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ug/in2
C3 Blank Solution NA	1 ml	0.092	ND	0.000	ND	0.000	ND	0.000	ND	0.000	ND	0.000	ND	0.000	ND	0.296	ND	0.051	ND	0.005	ND	0.000	ND	0.000	ND	NA
[redacted] C8 0.11	2.6	0.072	**0.00**	0.000	**0.00**	0.000	**0.00**	0.052	**1.23**	0.000	**0.00**	0.013	**0.31**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.043	**0.90**	0.000	**0.00**	0.000	**0.00**	**2.43**
[redacted] Q1 0.11	2.6	1.190	**25.95**	0.000	**0.00**	0.000	**0.00**	0.072	**1.70**	0.000	**0.00**	0.016	**0.38**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.078	**1.73**	0.000	**0.00**	0.000	**0.00**	**29.76**
[redacted] U3 0.11	2.6	0.649	**13.17**	0.000	**0.00**	0.000	**0.00**	0.212	**5.01**	0.000	**0.00**	0.015	**0.35**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.103	**2.32**	0.000	**0.00**	0.000	**0.00**	**20.85**
[redacted] Q3 0.11	2.6	0.630	**12.72**	0.000	**0.00**	0.000	**0.00**	0.057	**1.35**	0.000	**0.00**	0.031	**0.73**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.069	**1.51**	0.000	**0.00**	0.000	**0.00**	**16.31**
[redacted] U1 0.11	2.6	1.109	**24.04**	0.000	**0.00**	0.000	**0.00**	0.086	**2.03**	0.000	**0.00**	0.054	**1.28**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.114	**2.58**	0.000	**0.00**	0.000	**0.00**	**29.92**
[redacted] U2 0.11	2.6	0.533	**10.42**	0.000	**0.00**	0.000	**0.00**	0.047	**1.11**	0.000	**0.00**	0.033	**0.78**	0.000	**0.00**	0.000	**0.00**	0.000	**0.00**	0.061	**1.32**	0.000	**0.00**	0.000	**0.00**	**13.64**

IC Test Results

Forsite Recommended limits	
Acetic	< 3 ug/sqin
Formic	< 3 ug/sqin
MSA	< 1 ug/sqin
WOA (Clean)	< 25 ug/sqin
WOA (No Clean)	< 150 ug/sqin

The background noise from those peaks found in the Blank sample have been subtracted out of the final results.

The test results for Acetic acid were greater than their upper acceptable limit for both assemblies.

Depending on the type of solder, clean or no clean, location Q1 on assembly XXXX and U1 on assembly XXXX may have exceeded the upper limit for total WOAs.

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Company Name - IC Analysis - Cation Summary Table

		Vol	Lithium		Sodium		Ammonium		Potassium		Magnesium		Calcium	
Sample	(sqin)	ml	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2	ppm	ug/in2
C3 Blank Solution	NA	1 ml	0.000	ND	0.071	ND	0.016	ND	0.119	ND	0.000	ND	0.000	ND
[redacted] C8	0.11	2.6	0.000	**0.00**	0.414	**8.11**	0.068	**1.23**	0.484	**8.63**	0.000	**0.00**	0.000	**0.00**
Q1	0.11	2.6	0.000	**0.00**	0.400	**7.78**	0.084	**1.61**	1.045	**21.89**	0.000	**0.00**	0.000	**0.00**
U3	0.11	2.6	0.000	**0.00**	0.378	**7.26**	0.071	**1.30**	0.689	**13.47**	0.000	**0.00**	0.000	**0.00**
Q3	0.11	2.6	0.000	**0.00**	0.200	**3.05**	0.065	**1.16**	0.523	**9.55**	0.000	**0.00**	0.000	**0.00**
U1	0.11	2.6	0.000	**0.00**	0.363	**6.90**	0.096	**1.89**	0.585	**11.01**	0.000	**0.00**	0.000	**0.00**
U2	0.11	2.6	0.000	**0.00**	0.296	**5.32**	0.061	**1.06**	0.329	**4.96**	0.000	**0.00**	0.000	**0.00**

IC Test Results

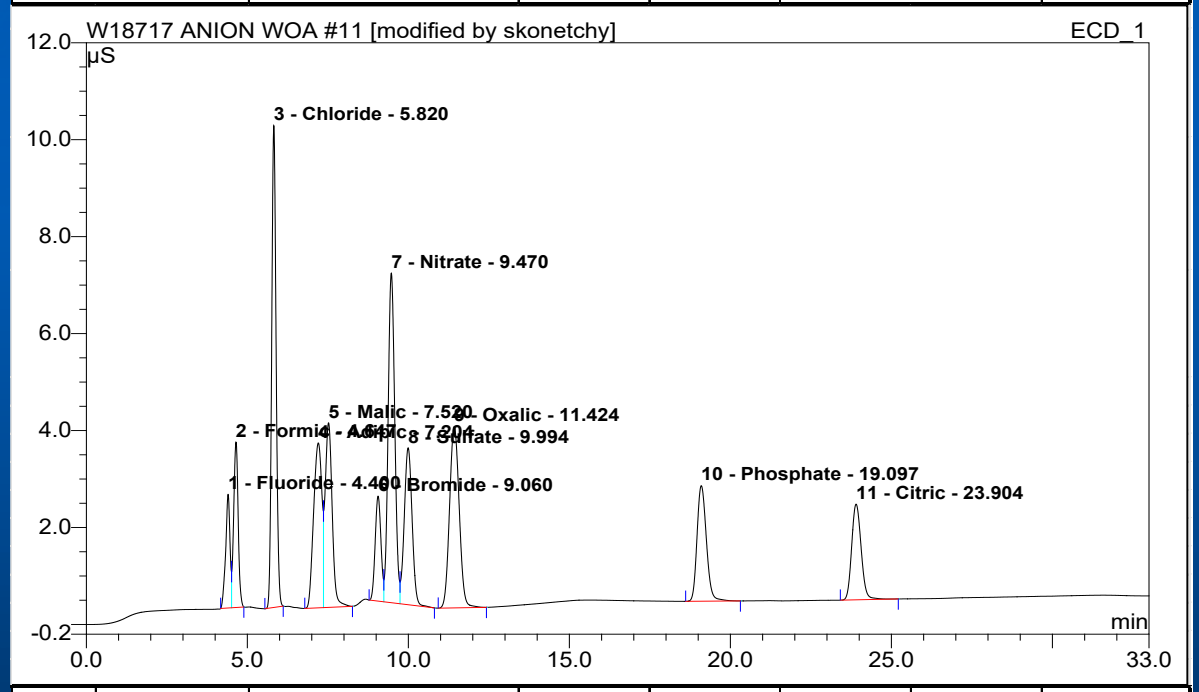
Forsite Recommended limits	
Lithium	< 3 ug/sqin
Sodium	< 3 ug/sqin
Potassium	< 3 ug/sqin
Ammonium	< 3 ug/sqin
Magnesium	NA
Calcium	NA

The background noise from those peaks found in the Blank sample have been subtracted out of the final results.

The test results for Sodium and Potassium were greater than their upper acceptable limit for both assemblies. Ammonium was less than their upper acceptable limit for both assemblies.

IC Analysis - Anion/WOA Calibration Standard 1

Sample Name:	**Anions/WOA Cal Std 1**		*Injection Volume:*	**50 ul**
Vial Number:	**15**		*Channel:*	**ECD_1**
Sample Type:	**standard**		*Wavelength:*	**n.a.**
Control Program:	**WOA Program**		*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**		*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 14:29**		*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**		*Sample Amount:*	**1.0000**

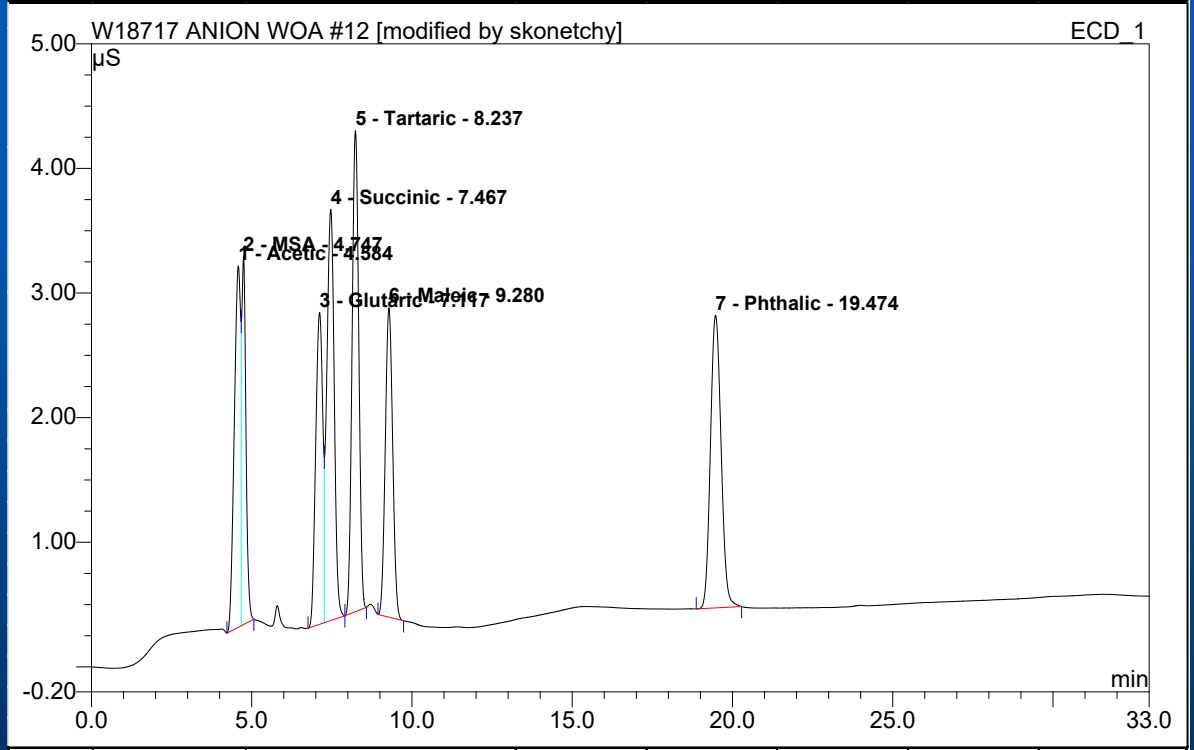


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.40	Fluoride	2.344	0.369	3.60	0.330	BM *
2	4.65	Formic	3.410	0.555	5.41	0.670	MB*
3	5.82	Chloride	9.939	1.583	15.44	1.670	BMB*
4	7.20	Adipic	3.402	1.007	9.82	3.330	BM
5	7.52	Malic	3.808	0.969	9.45	6.670	MB*
6	9.06	Bromide	2.166	0.453	4.42	1.670	BM
7	9.47	Nitrate	6.799	1.630	15.89	1.670	M
8	9.99	Sulfate	3.237	0.915	8.92	1.670	MB
9	11.42	Oxalic	3.738	1.299	12.66	3.340	BMB
10	19.10	Phosphate	2.384	0.803	7.83	3.340	BMB
11	23.90	Citric	1.974	0.673	6.56	3.340	BMB
Total:			43.200	10.256	100.00	27.700	

The chart shows the calibration curve for the 6 Anions and 5 Weak Organic Acids (WOA) that the samples were tested for.

IC Analysis - Anion/WOA Calibration Standard 2

Sample Name:	**WOA Cal Std 2**			*Injection Volume:*	**50 ul**
Vial Number:	**9**			*Channel:*	**ECD_1**
Sample Type:	**standard**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 15:06**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**

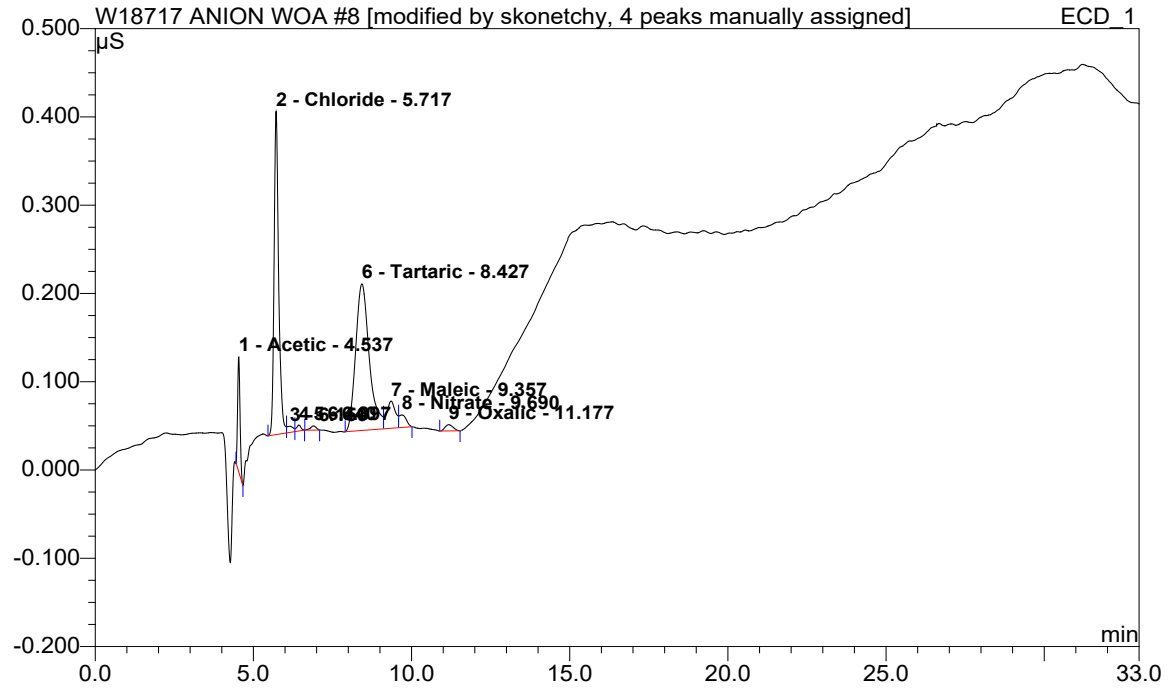


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.58	Acetic	2.899	0.660	12.84	5.330	BM *
2	4.75	MSA	2.950	0.459	8.92	0.670	MB*
3	7.12	Glutaric	2.502	0.638	12.41	4.000	BM
4	7.47	Succinic	3.298	0.889	17.30	3.340	Mb*
5	8.24	Tartaric	3.858	0.930	18.09	3.340	bMB
6	9.28	Maleic	2.482	0.662	12.87	3.340	BMB
7	19.47	Phthalic	2.348	0.903	17.57	4.660	BMB*
Total:			20.337	5.141	100.00	24.680	

The chart shows the calibration curve for the other 7 Weak Organic Acids (WOA) that the samples were tested for.

IC Analysis - Anion/WOA Blank C3 Extraction Solution

Sample Name:	**C3 Extraction Solution**			*Injection Volume:*	**50 ul**
Vial Number:	**22**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 10:06**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.54	Acetic	0.130	0.011	6.56	0.092	BMB*
2	5.72	Chloride	0.366	0.061	35.14	0.065	BM *^
3	6.15	n.a.	0.007	0.002	0.89	n.a.	M *
4	6.44	n.a.	0.007	0.001	0.63	n.a.	MB*
5	6.90	n.a.	0.005	0.001	0.57	n.a.	BMB*
6	8.43	Tartaric	0.166	0.082	47.16	0.296	BM *^
7	9.36	Maleic	0.031	0.010	5.73	0.051	M *
8	9.69	Nitrate	0.014	0.004	2.13	0.004	MB*^
9	11.18	Oxalic	0.007	0.002	1.19	0.005	BMB*^
Total:			0.733	0.175	100.00	0.513	

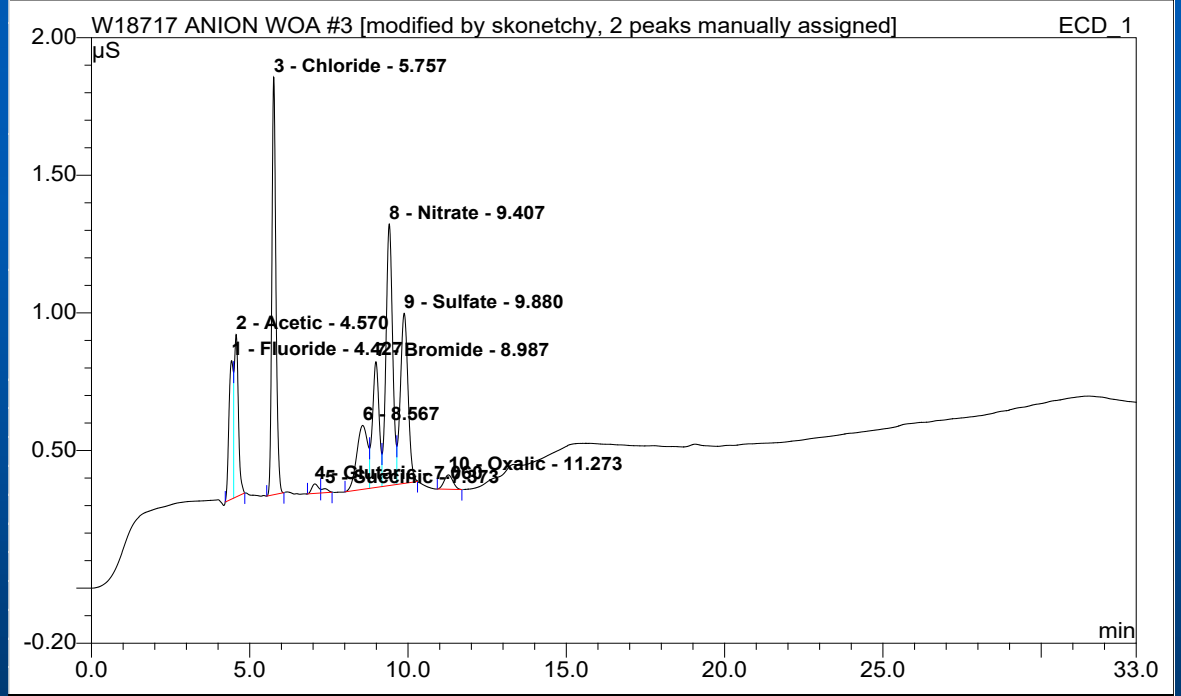
The chart shows the blank C3 Extraction solution used for C3 Ionic surface analysis.

The Blank sample had 2 anion peaks for Chloride and Nitrate. There were 4 WOA peaks for Acetic Acid, Tartaric Acid, Maleic Acid and Oxalic Acid.

There were 3 unidentified peaks.

IC Analysis - Anion/WOA - Assembly XXXX - C8

Sample Name:	[redacted] C8			*Injection Volume:*	**50 ul**
Vial Number:	**19**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 11:22**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.43	Fluoride	0.503	0.081	7.81	0.072	BM *
2	4.57	Acetic	0.590	0.090	8.68	0.726	MB*
3	5.76	Chloride	1.517	0.226	21.87	0.239	BMB
4	7.06	Glutaric	0.034	0.008	0.80	0.052	BM *
5	7.37	Succinic	0.015	0.004	0.34	0.013	MB*
6	8.57	n.a.	0.232	0.092	8.92	n.a.	BM *
7	8.99	Bromide	0.457	0.111	10.74	0.410	M *
8	9.41	Nitrate	0.950	0.231	22.35	0.237	M *
9	9.88	Sulfate	0.618	0.174	16.86	0.318	MB*^
10	11.27	Oxalic	0.052	0.017	1.62	0.043	BMB*^
Total:			4.969	1.035	100.00	2.110	

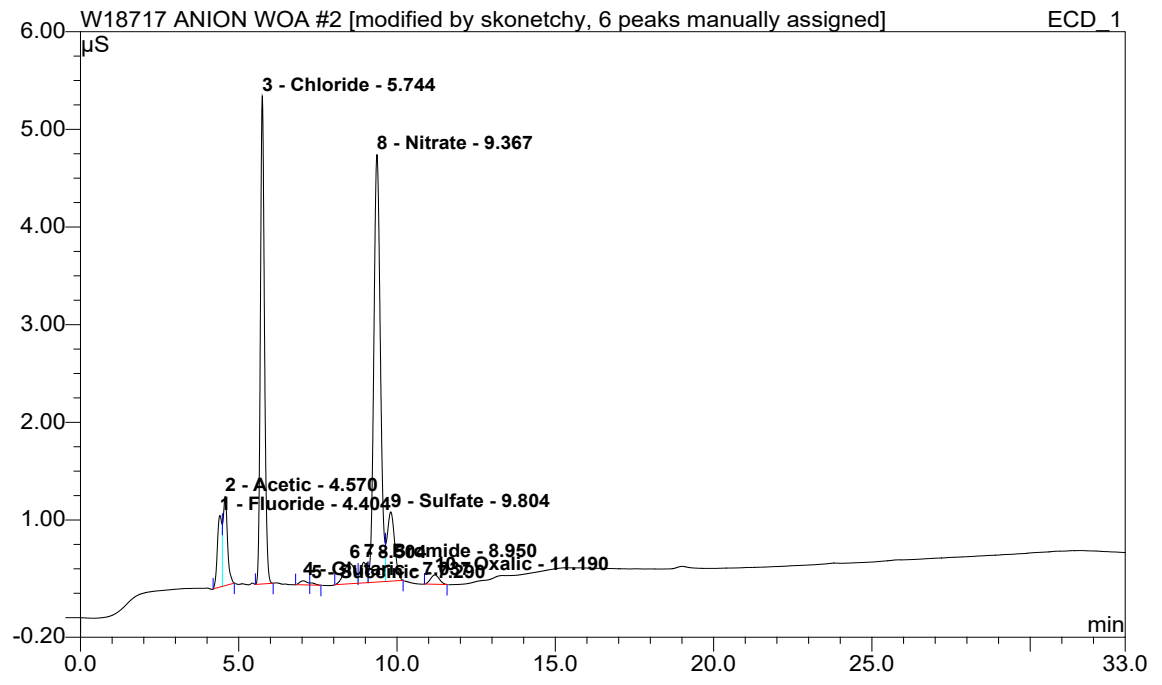
The chart shows the IC results for Assembly XXXX location C8.

The results show 5 Anion peaks of Fluoride, Chloride, Bromide, Nitrate and Sulfate. There were 4 WOA peaks of Acetic Acid, Glutaric Acid, Succinic Acid and Oxalic Acid.

There was 1 unidentified peak.

IC Analysis - Anion/WOA - Assembly XXXX - Q1

Sample Name:	[redacted]Q1			*Injection Volume:*	**50 ul**
Vial Number:	**18**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 10:44**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.40	Fluoride	0.733	0.121	4.95	0.108	BM *
2	4.57	Acetic	0.912	0.147	6.04	1.190	MB*
3	5.74	Chloride	4.994	0.748	30.69	0.789	BMB
4	7.04	Glutaric	0.041	0.011	0.47	0.072	BM *^
5	7.29	Succinic	0.022	0.004	0.17	0.016	MB*^
6	8.50	n.a.	0.209	0.085	3.50	n.a.	BM *
7	8.95	Bromide	0.210	0.049	1.99	0.179	M *^
8	9.37	Nitrate	4.377	1.049	43.00	1.075	M *^
9	9.80	Sulfate	0.709	0.194	7.94	0.353	MB*^
10	11.19	Oxalic	0.095	0.030	1.24	0.078	BMB*^
Total:			12.301	2.439	100.00	3.860	

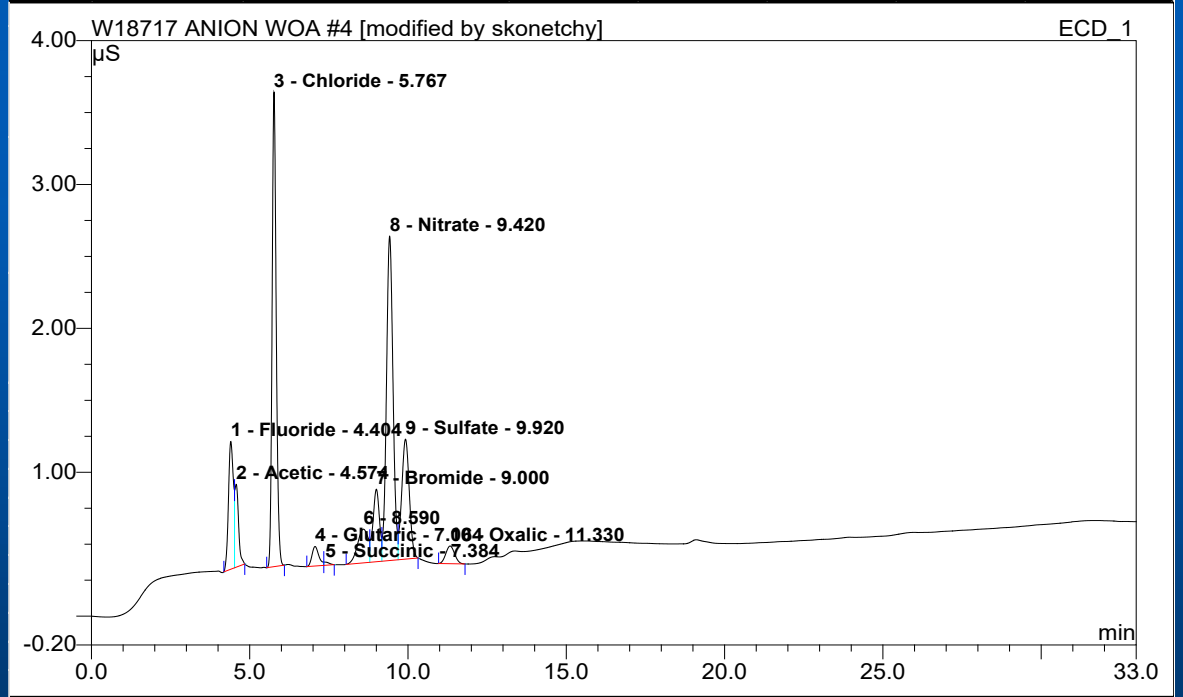
The chart shows the IC results for Assembly XXXX location Q1.

The results show 5 Anion peaks of Fluoride, Chloride, Bromide, Nitrate and Sulfate. There were 4 WOA peaks of Acetic Acid, Glutaric Acid, Succinic Acid and Oxalic Acid.

There was 1 unidentified peak.

IC Analysis - Anion/WOA - Assembly XXXX - U3

Sample Name:	[redacted] U3			*Injection Volume:*	**50 ul**
Vial Number:	**19**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 11:59**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.40	Fluoride	0.887	0.160	8.87	0.143	BM *
2	4.57	Acetic	0.576	0.080	4.46	0.649	MB*
3	5.77	Chloride	3.298	0.496	27.57	0.524	BMB
4	7.06	Glutaric	0.136	0.034	1.87	0.212	BM *
5	7.38	Succinic	0.022	0.004	0.22	0.015	MB*
6	8.59	n.a.	0.234	0.091	5.03	n.a.	BM *
7	9.00	Bromide	0.504	0.121	6.73	0.447	M *
8	9.42	Nitrate	2.254	0.540	30.02	0.554	M *
9	9.92	Sulfate	0.834	0.234	13.00	0.427	MB*
10	11.33	Oxalic	0.123	0.040	2.21	0.103	BMB*
Total:			8.868	1.800	100.00	3.072	

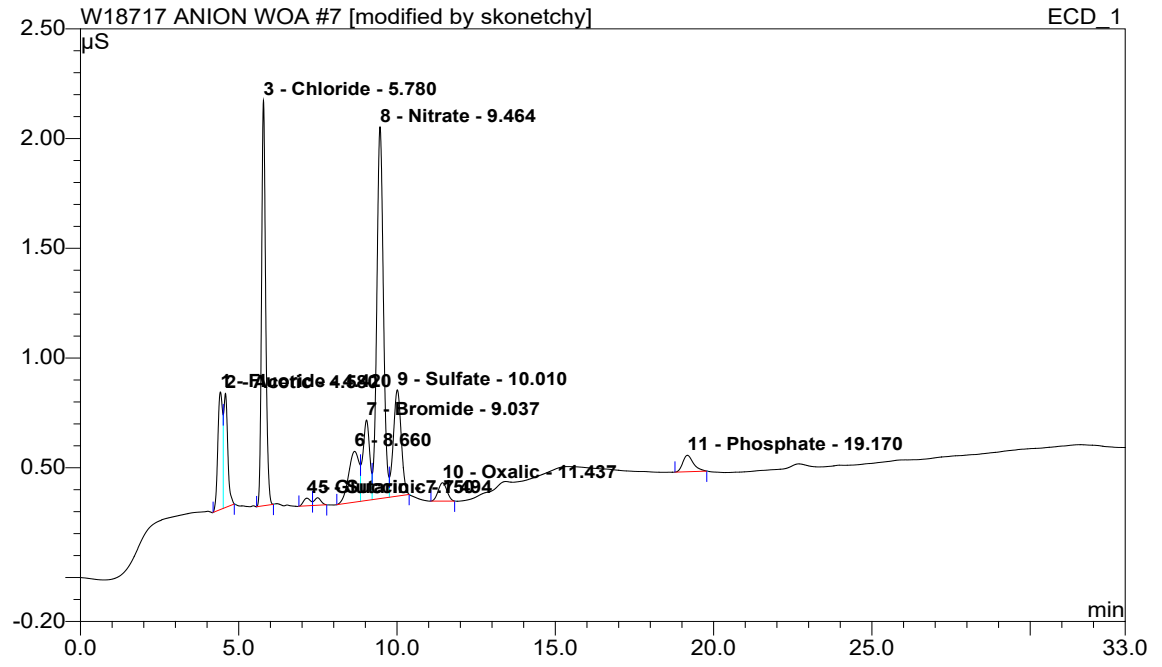
The chart shows the IC results for Assembly XXXX location U3.

The results show 5 Anion peaks of Fluoride, Chloride, Bromide, Nitrate and Sulfate. There were 4 WOA peaks of Acetic Acid, Glutaric Acid, Succinic Acid and Oxalic Acid.

There was 1 unidentified peak.

IC Analysis - Anion/WOA - Assembly XXXX - Q3

Sample Name:	[redacted] Q3			*Injection Volume:*	**50 ul**
Vial Number:	**21**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 13:51**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.42	Fluoride	0.536	0.093	7.45	0.083	BM *
2	4.58	Acetic	0.520	0.078	6.25	0.630	MB*
3	5.78	Chloride	1.846	0.277	22.18	0.292	BMB
4	7.15	Glutaric	0.035	0.009	0.72	0.057	BM *
5	7.49	Succinic	0.034	0.008	0.67	0.031	MB*
6	8.66	n.a.	0.231	0.089	7.10	n.a.	BM *
7	9.04	Bromide	0.366	0.092	7.33	0.338	M *
8	9.46	Nitrate	1.694	0.407	32.61	0.417	M *
9	10.01	Sulfate	0.484	0.140	11.21	0.255	MB*
10	11.44	Oxalic	0.083	0.027	2.14	0.069	BMB*
11	19.17	Phosphate	0.075	0.029	2.34	0.122	BMB*
Total:			5.905	1.249	100.00	2.294	

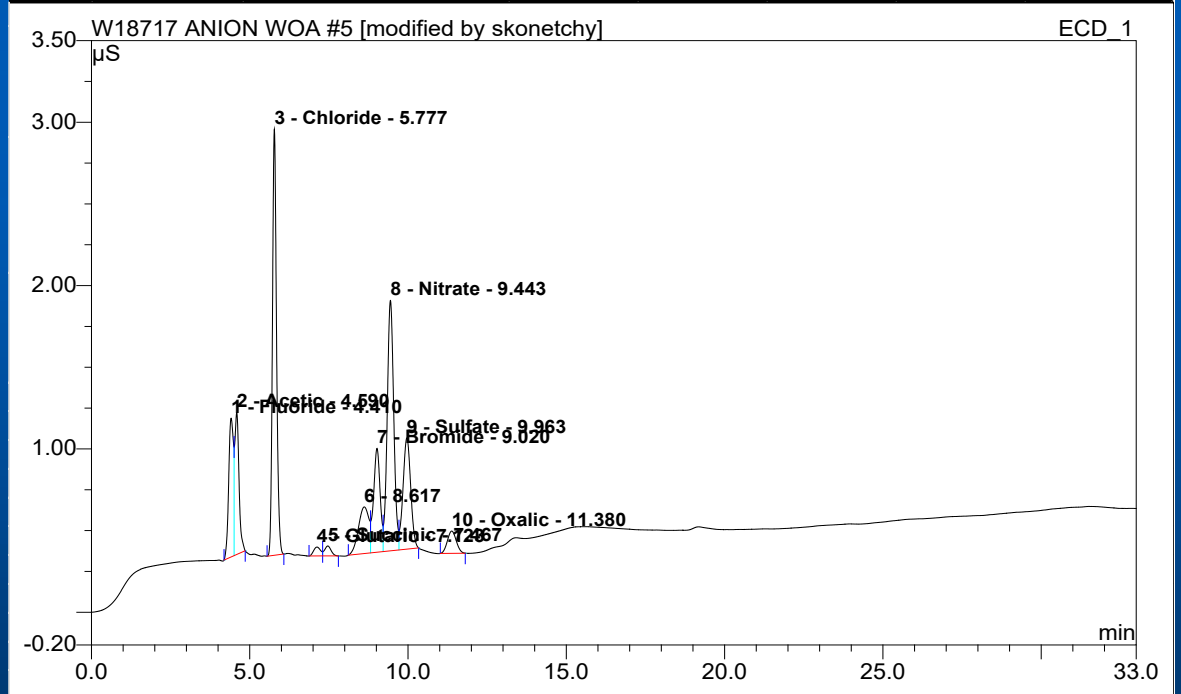
The chart shows the IC results for Assembly XXXX location Q3.

The results show 6 Anion peaks of Fluoride, Chloride, Bromide, Nitrate, Sulfate and Phosphate. There were 4 WOA peaks of Acetic Acid, Glutaric Acid, Succinic Acid and Oxalic Acid.

There was 1 unidentified peak.

IC Analysis - Anion/WOA - Assembly XXXX - U1

Sample Name:	[redacted]U1			*Injection Volume:*	**50 ul**
Vial Number:	**20**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 12:37**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.41	Fluoride	0.850	0.148	9.40	0.132	BM *
2	4.59	Acetic	0.868	0.137	8.75	1.109	MB*
3	5.78	Chloride	2.609	0.390	24.81	0.411	BMB*
4	7.12	Glutaric	0.054	0.014	0.88	0.086	BM *
5	7.47	Succinic	0.061	0.014	0.92	0.054	MB*
6	8.62	n.a.	0.285	0.109	6.95	n.a.	BM *
7	9.02	Bromide	0.636	0.154	9.80	0.568	M *
8	9.44	Nitrate	1.533	0.368	23.45	0.377	M *
9	9.96	Sulfate	0.681	0.192	12.23	0.351	MB*
10	11.38	Oxalic	0.136	0.044	2.82	0.114	BMB*
Total:			7.713	1.571	100.00	3.202	

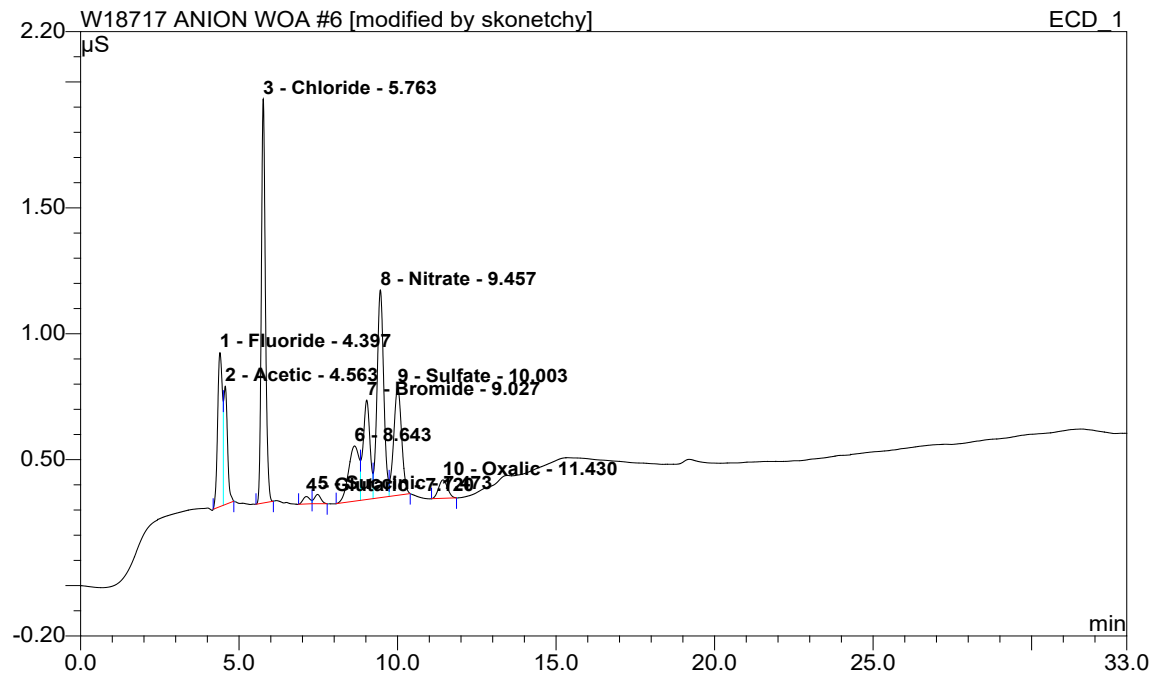
The chart shows the IC results for Assembly XXXX location U1.

The results show 5 Anion peaks of Fluoride, Chloride, Bromide, Nitrate and Sulfate. There were 4 WOA peaks of Acetic Acid, Glutaric Acid, Succinic Acid and Oxalic Acid.

There was 1 unidentified peak.

IC Analysis - Anion/WOA - Assembly XXXX - U2

Sample Name:	[redacted]U2			*Injection Volume:*	**50 ul**
Vial Number:	**20**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**WOA Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**7-Anions Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/12/2024 13:14**			*Sample Weight:*	**1.0000**
Run Time (min):	**33.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.40	Fluoride	0.612	0.107	11.12	0.096	BM *
2	4.56	Acetic	0.470	0.066	6.85	0.533	MB*
3	5.76	Chloride	1.605	0.240	24.91	0.253	BMB
4	7.12	Glutaric	0.029	0.007	0.77	0.047	BM *
5	7.47	Succinic	0.037	0.009	0.91	0.033	MB*
6	8.64	n.a.	0.219	0.084	8.75	n.a.	BM *
7	9.03	Bromide	0.395	0.100	10.38	0.369	M *
8	9.46	Nitrate	0.825	0.201	20.92	0.206	M *
9	10.00	Sulfate	0.429	0.124	12.91	0.227	MB*
10	11.43	Oxalic	0.073	0.024	2.47	0.061	BMB*
Total:			4.695	0.963	100.00	1.824	

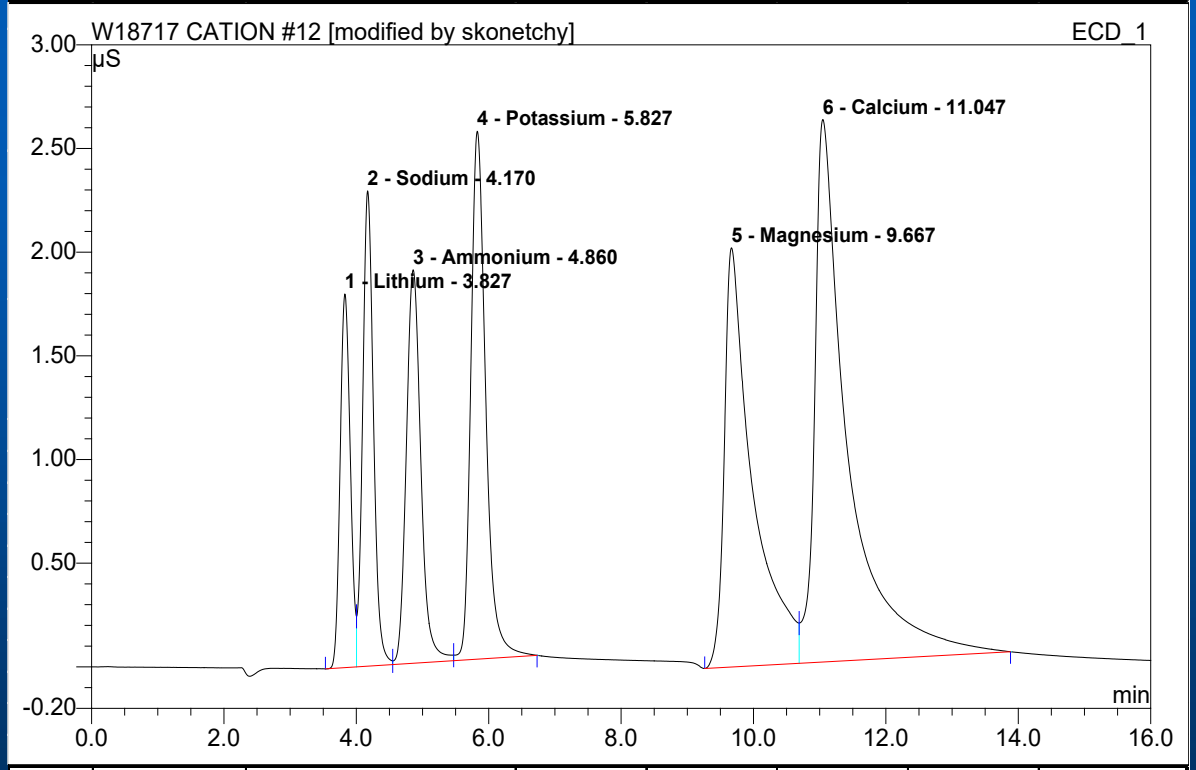
The chart shows the IC results for Assembly XXXX location U2.

The results show 5 Anion peaks of Fluoride, Chloride, Bromide, Nitrate and Sulfate. There were 4 WOA peaks of Acetic Acid, Glutaric Acid, Succinic Acid and Oxalic Acid.

There was 1 unidentified peak.

IC Analysis - Cation Calibration Standard

Sample Name:	**Cal Standard**			*Injection Volume:*	**50 ul**
Vial Number:	**9**			*Channel:*	**ECD_1**
Sample Type:	**standard**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 13:26**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**

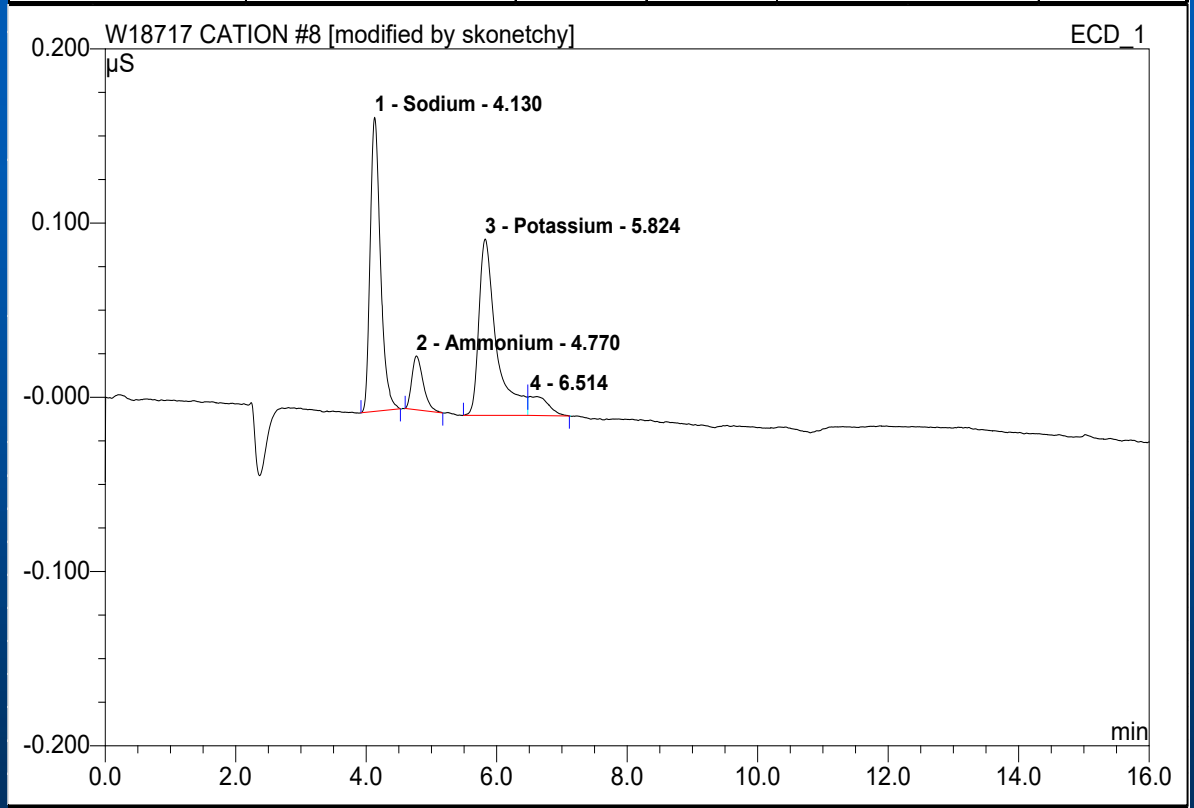


No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	3.83	Lithium	1.801	0.320	7.24	0.250	BM *
2	4.17	Sodium	2.291	0.434	9.83	1.000	M *
3	4.86	Ammonium	1.897	0.483	10.95	1.250	M *
4	5.83	Potassium	2.546	0.664	15.04	2.500	MB*
5	9.67	Magnesium	2.021	0.995	22.54	1.250	BM *
6	11.05	Calcium	2.616	1.518	34.40	2.500	MB*
Total:			13.173	4.413	100.00	8.750	

The chart shows the calibration curve for the other 6 Cations that the samples were tested for.

IC Analysis - Cation Blank C3 Extraction Solution

Sample Name:	**C3 Extraction Solution**			*Injection Volume:*	**50 ul**
Vial Number:	**29**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 10:25**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.13	Sodium	0.169	0.031	42.68	0.071	BMB*
2	4.77	Ammonium	0.031	0.006	8.63	0.016	BMB*
3	5.82	Potassium	0.101	0.031	43.42	0.119	BM *
4	6.51	n.a.	0.011	0.004	5.27	n.a.	MB*
Total:			0.312	0.072	100.00	0.206	

The chart shows the blank C3 Extraction solution used for C3 Ionic surface analysis.

The Blank sample had 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.

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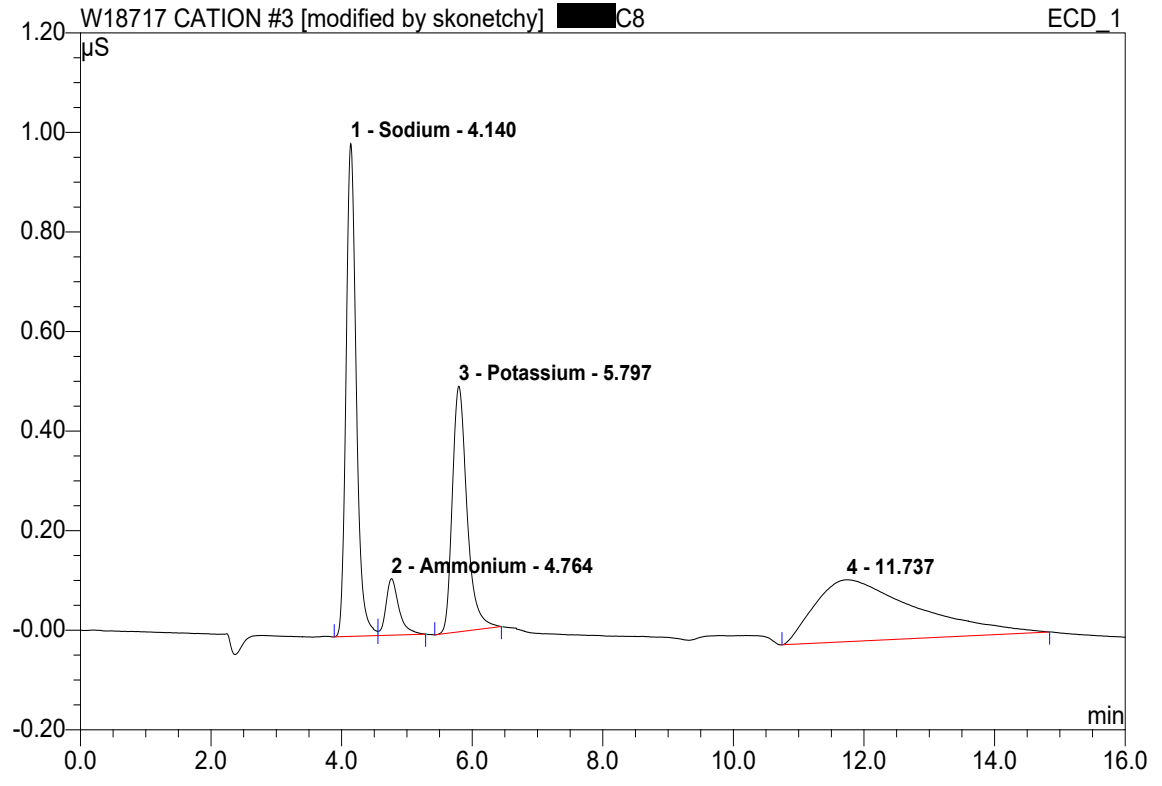
IC Analysis - Cation - Assembly XXXX - C8

Sample Name:	[redacted]C8			*Injection Volume:*	**50 ul**
Vial Number:	**19**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 11:03**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.14	Sodium	0.990	0.179	32.18	0.414	BM *
2	4.76	Ammonium	0.113	0.026	4.70	0.068	MB*
3	5.80	Potassium	0.493	0.129	23.05	0.484	BMB*
4	11.74	n.a.	0.124	0.223	40.07	n.a.	BMB
Total:			1.721	0.558	100.00	0.966	

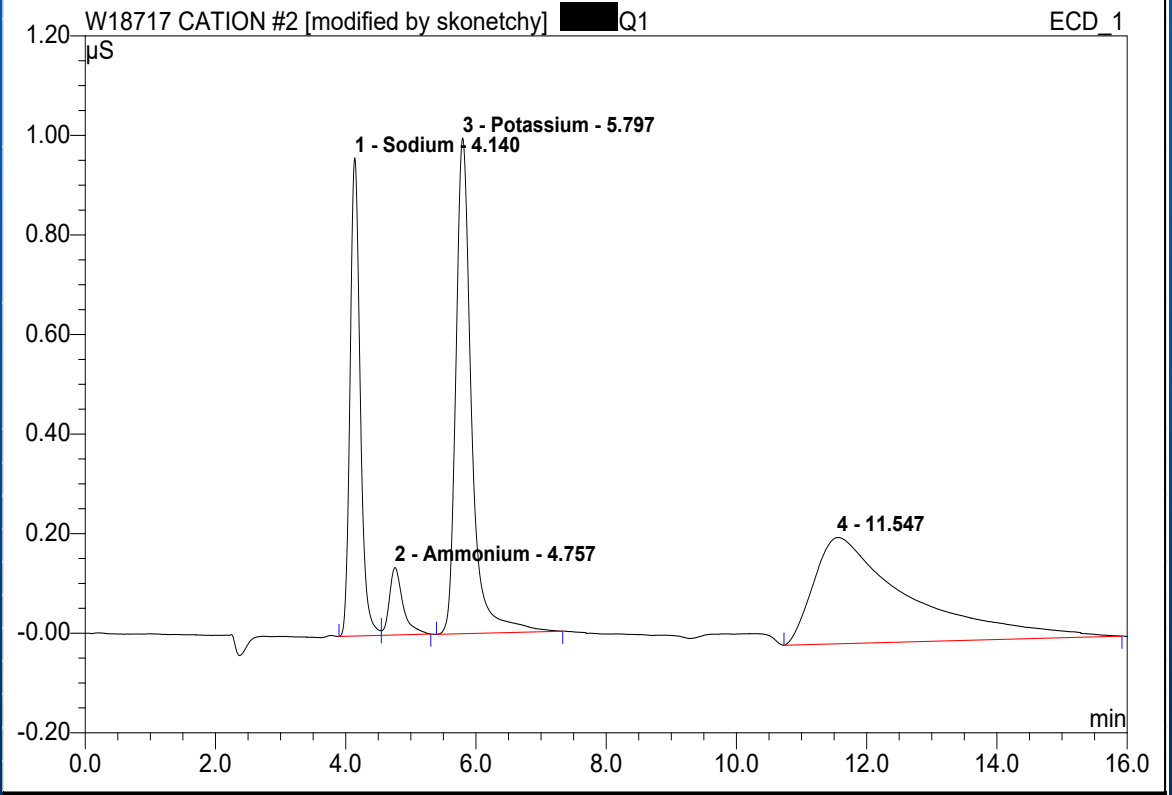
The chart shows the IC results for Assembly XXXX location C8.

The results show 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.

IC Analysis - Cation - Assembly XXXX - Q1

Sample Name:	[redacted]Q1			*Injection Volume:*	**50 ul**
Vial Number:	**18**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 10:44**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.14	Sodium	0.960	0.173	20.57	0.400	BM *
2	4.76	Ammonium	0.135	0.033	3.87	0.084	MB*
3	5.80	Potassium	0.995	0.278	32.93	1.045	BMB
4	11.55	n.a.	0.214	0.359	42.63	n.a.	BMB
Total:			2.304	0.843	100.00	1.529	

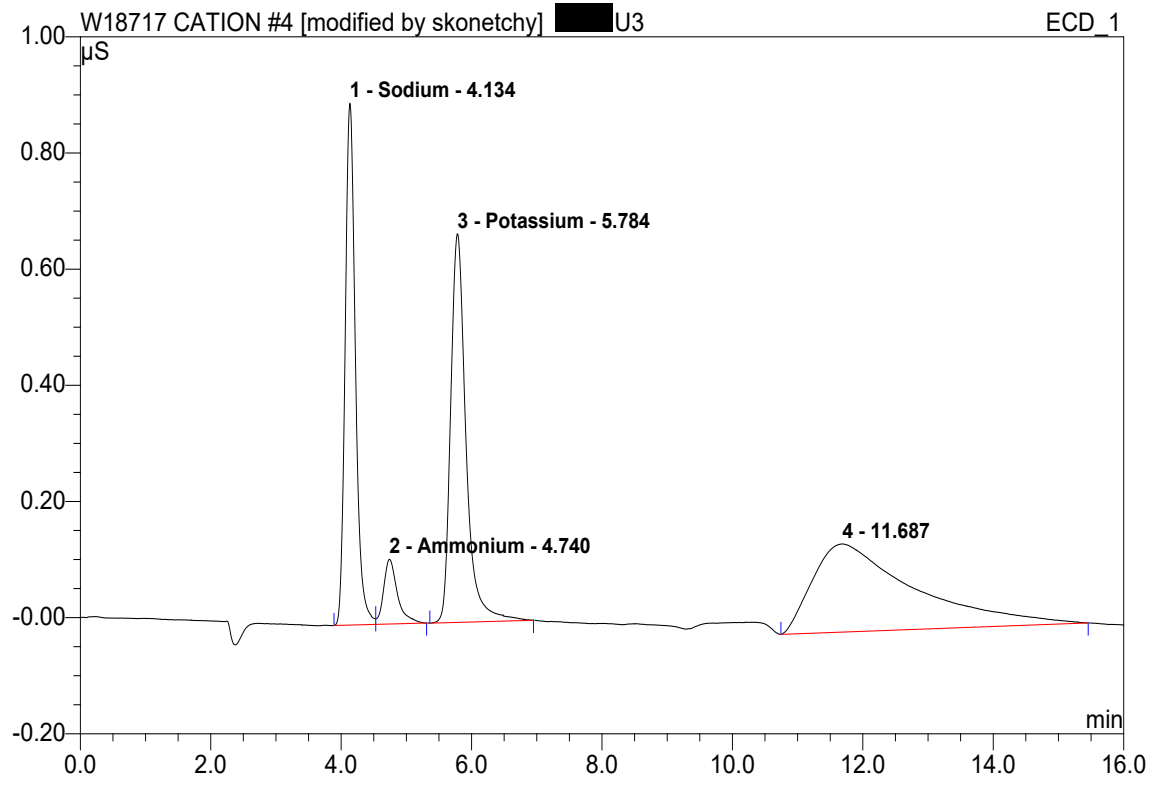
The chart shows the IC results for Assembly XXXX location Q1.

The results show 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.

IC Analysis - Cation - Assembly XXXX - U3

Sample Name:	[redacted]U3			*Injection Volume:*	**50 ul**
Vial Number:	**20**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 11:22**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.13	Sodium	0.898	0.164	25.34	0.378	BM *
2	4.74	Ammonium	0.111	0.027	4.22	0.071	MB*
3	5.78	Potassium	0.669	0.183	28.25	0.689	BMB
4	11.69	n.a.	0.152	0.273	42.19	n.a.	BMB
Total:			1.830	0.647	100.00	1.138	

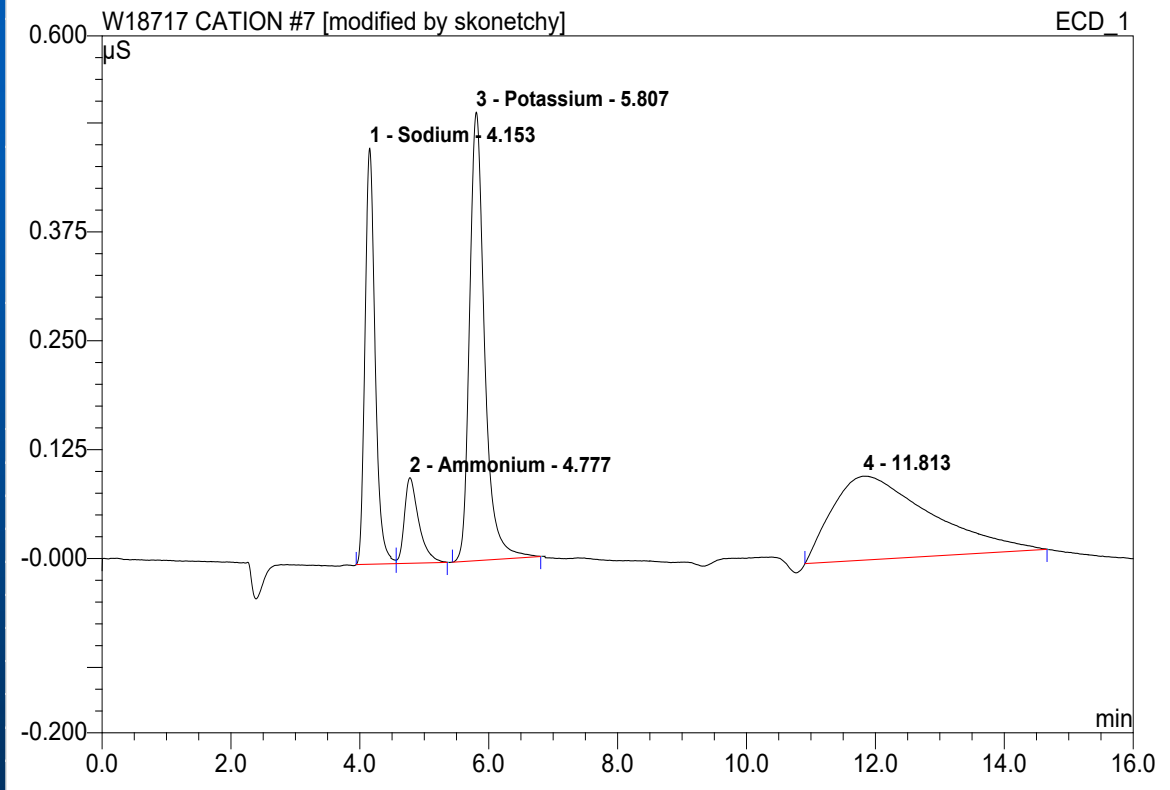
The chart shows the IC results for Assembly XXXX location U3.

The results show 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.

IC Analysis - Cation - Assembly XXXX - Q3

Sample Name:	[redacted]Q3			*Injection Volume:*	**50 ul**
Vial Number:	**28**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 13:07**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.15	Sodium	0.478	0.087	20.66	0.200	BM *
2	4.78	Ammonium	0.098	0.025	6.01	0.065	MB*
3	5.81	Potassium	0.515	0.139	33.04	0.523	BMB
4	11.81	n.a.	0.096	0.169	40.28	n.a.	BMB*
Total:			1.187	0.420	100.00	0.789	

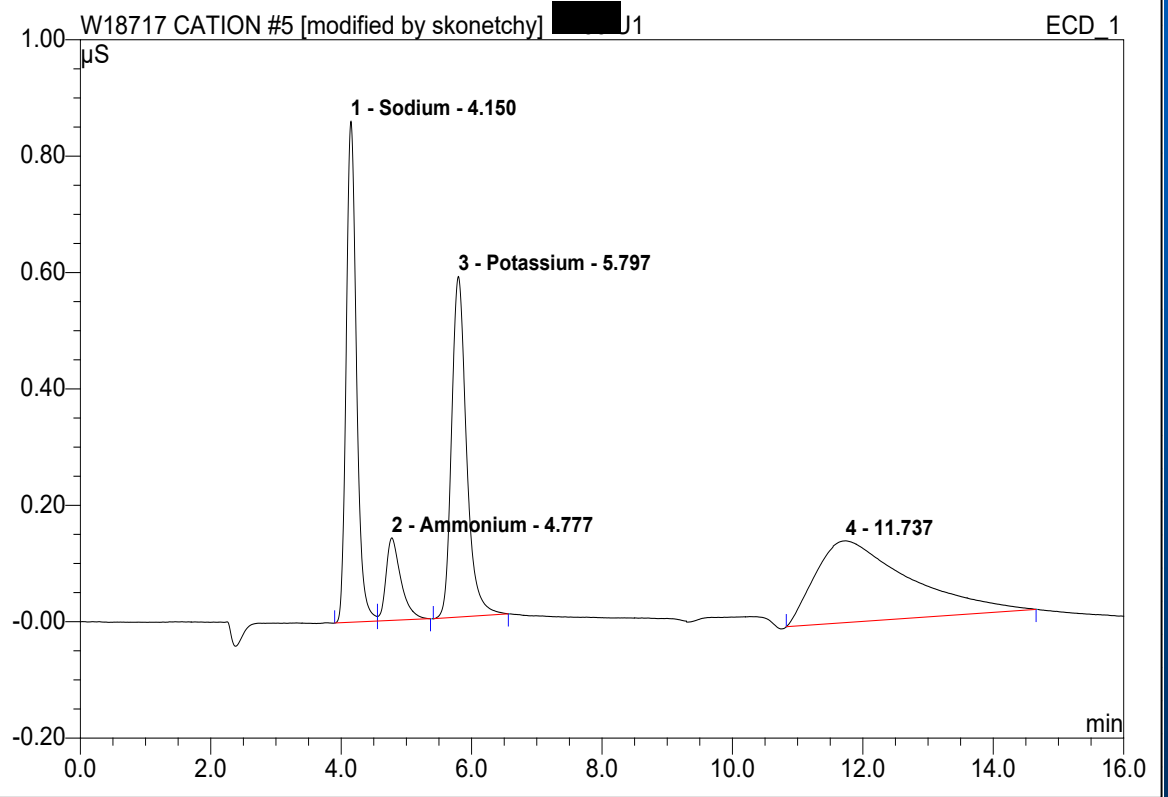
The chart shows the IC results for Assembly XXXX location Q3.

The results show 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.

IC Analysis - Cation – Assembly XXXX - U1

Sample Name:	[redacted]U1			*Injection Volume:*	**50 ul**
Vial Number:	**21**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 12:28**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.15	Sodium	0.861	0.157	27.00	0.363	BM *
2	4.78	Ammonium	0.142	0.037	6.40	0.096	MB*
3	5.80	Potassium	0.585	0.155	26.66	0.585	BMB
4	11.74	n.a.	0.141	0.233	39.94	n.a.	BMB*
Total:			1.728	0.583	100.00	1.044	

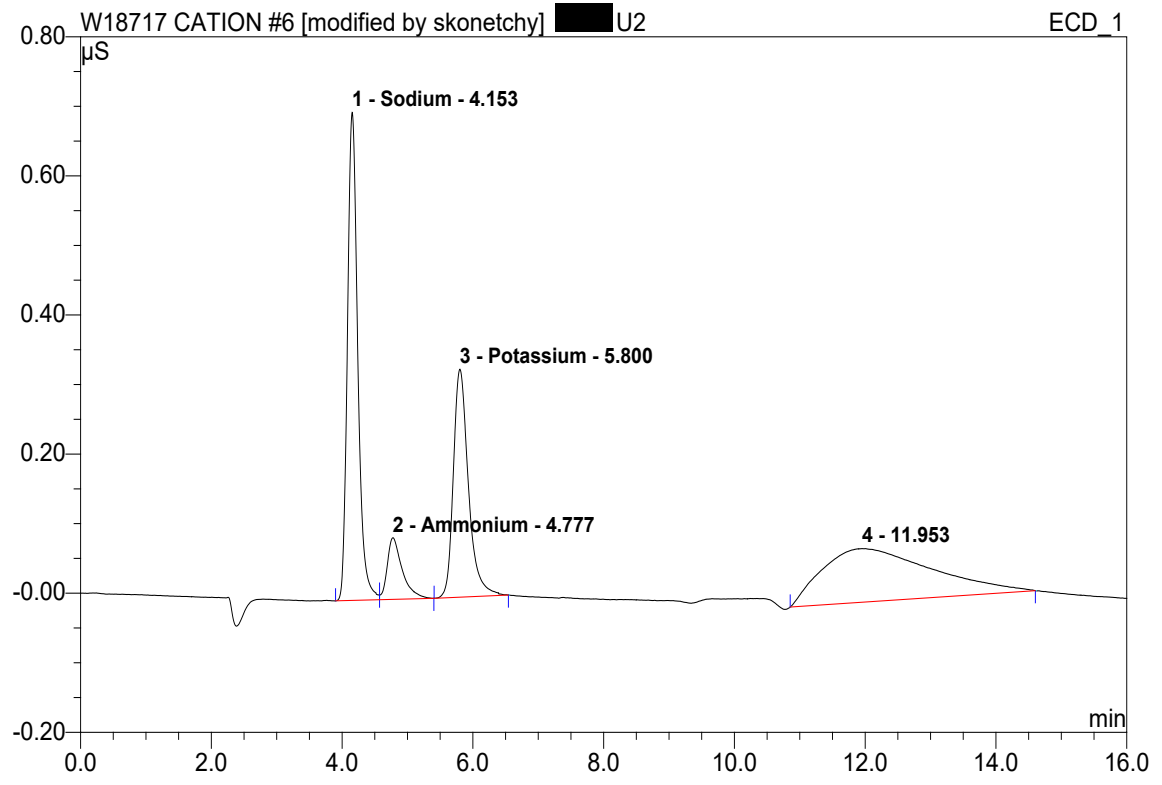
The chart shows the IC results for Assembly XXXX location U1.

The results show 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.

IC Analysis - Cation – Assembly XXXX - U2

Sample Name:	[redacted]U2			*Injection Volume:*	**50 ul**
Vial Number:	**22**			*Channel:*	**ECD_1**
Sample Type:	**unknown**			*Wavelength:*	**n.a.**
Control Program:	**Cation Program**			*Bandwidth:*	**n.a.**
Quantif. Method:	**6-Cations Method**			*Dilution Factor:*	**1.0000**
Recording Time:	**6/13/2024 12:47**			*Sample Weight:*	**1.0000**
Run Time (min):	**16.00**			*Sample Amount:*	**1.0000**



No.	Ret.Time min	Peak Name	Height µS	Area µS*min	Rel.Area %	Amount ppm	Type
1	4.15	Sodium	0.702	0.128	33.06	0.296	BM *
2	4.78	Ammonium	0.089	0.024	6.07	0.061	MB*
3	5.80	Potassium	0.328	0.087	22.53	0.329	BMB*
4	11.95	n.a.	0.077	0.149	38.35	n.a.	BMB*
Total:			1.195	0.388	100.00	0.686	

The chart shows the IC results for Assembly XXXX location U2.

The results show 3 cation peaks for Sodium, Ammonium and Potassium.

There was 1 unidentified peak.