

Appendix E

SEM/EDS Data for T2D30 Sediment

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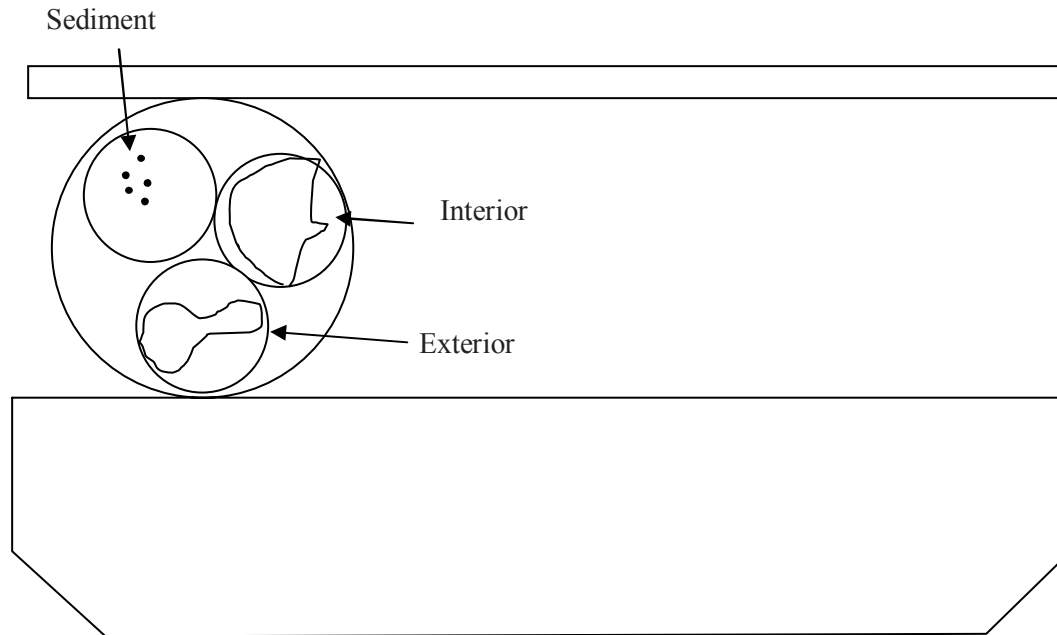
Particulate sediments at the bottom of the tank directly relate to the corrosion products and debris generated during ICET tests. This appendix lists the SEM/EDS results for the sediment samples collected from the bottom of the tank on the date Test 2 was shut down (March 7, 2005). The purpose of these analyses is to provide information on the morphology and the composition of the sediment, in order to evaluate the potentially occurring chemical reactions during ICET tests.

Probe SEM was used to examine the sediment samples after drying in air at room temperature, followed by being coated with carbon. EDS results provide a semi-quantitative elemental analysis of the sediment after calibration. Probe SEM/EDS results of the Test 2 Day 30 sediment samples were obtained on April 12, 2005.

Transcribed Laboratory Log

Laboratory session from April 12, 2005.

T2D30 Sediment Samples



Sediment Samples

Image:	T2D30SEDMT003	150 ×	SEM image	Figure E-1
	T2D30SEDMT006	100 ×	SEM image sediment sample	Figure E-2
EDS:	T2D30SED1		Spot of the layer show in 006	Figure E-3
Image:	T2D30SEDMT004	300 ×	Porous structure	Figure E-4
EDS:	T2D30SED2		Of porous material in Image 004	Figure E-5

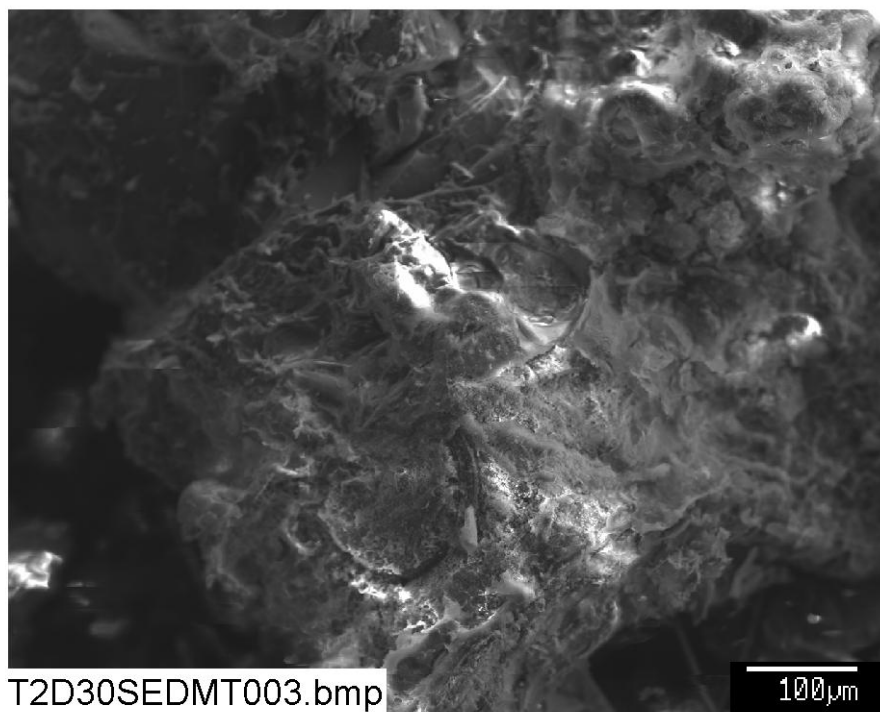


Figure E-1. SEM image for a Test 2 Day-30 sediment sample at 150 × magnification (T2D30SEDMT003).

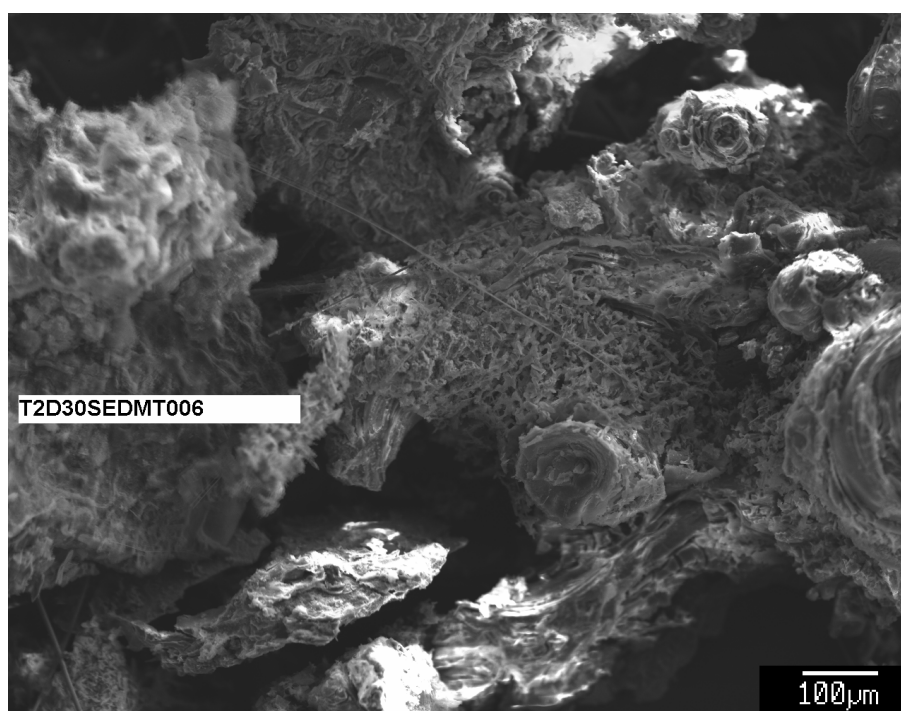


Figure E-2. SEM image for a Test 2 Day-30 sediment sample at 100 × magnification (T2D30SEDMT006).

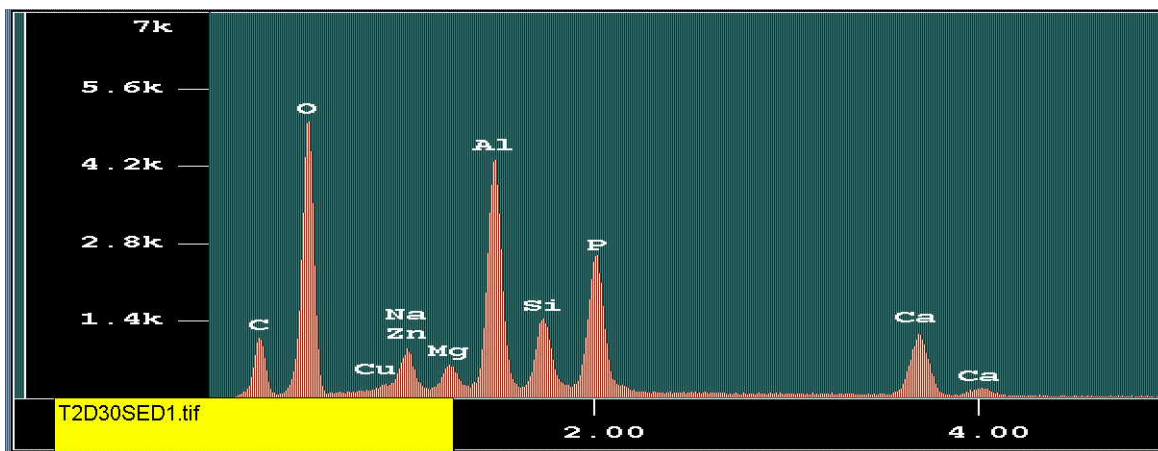


Figure E-3. EDS counting spectrum for the circularly layered material close to the right edge of Figure E-2 (T2D30SED1).

The results from the chemical composition analysis for T2D30SED1 are given in Table E-1.

Table E-1. The Chemical Composition for T2D30SED1 (Figure E-2)

Apr 12 13:35 2005 /tmp/eds_pout.log Page 1

Group : NRC
 Sample : Sediment ID# : 1
 Comment : T2D30 layered sediment
 Condition : Full Scale : 20KeV(10eV/ch,2Kch)
 Live Time : 60.000 sec Aperture # : 1
 Acc. Volt : 15.0 KV Probe Current : 4.371E-09 A
 Stage Point : X=86.820 Y=57.236 Z=10.927
 Acq. Date : Tue Apr 12 13:28:07 2005

Element	Mode	ROI (KeV)	K-ratio(%)	+/-	Net/Background	
C K	Normal	0.09- 0.46	4.5208	0.0013	6861 /	798
O K	Normal	0.25- 0.77	30.9657	0.0080	31679 /	628
Na K	Normal	0.81- 1.27	0.2289	0.0033	673 /	316
Mg K	Normal	0.97- 1.57	0.9830	0.0008	4198 /	412
Al K	Normal	1.19- 1.83	8.3515	0.0016	35453 /	290
Si K	Normal	1.50- 2.05	2.8377	0.0012	11233 /	2308
P K	Normal	1.75- 2.38	9.9889	0.0090	24403 /	700
Ca K	Normal	3.39- 4.30	7.5785	0.0045	14581 /	62
Cu K	Normal	7.63- 9.27	0.2619	0.0048	102 /	10
Zn K	Normal	8.22-10.03	0.6558	0.0069	194 /	10

Chi_square = 136.8970

Element	Mass%	Atomic%	ZAF	Z	A	F
C	20.663	30.4778	4.4603	1.0251	4.3512	1.0000
O	45.036	49.8700	1.4193	0.9778	1.4515	1.0000
Na	0.316	0.2434	1.3462	1.0323	1.3050	0.9993
Mg	1.403	1.0223	1.3928	0.9720	1.4370	0.9971
Al	10.778	7.0766	1.2594	1.0050	1.2560	0.9977
Si	3.597	2.2689	1.2370	0.9827	1.2628	0.9968
P	9.217	5.2716	0.9004	1.1798	0.7635	0.9996
Ca	7.778	3.4382	1.0016	1.0043	0.9974	1.0000
Cu	0.344	0.0959	1.2820	1.2856	0.9972	1.0000
Zn	0.868	0.2353	1.2917	1.2954	0.9971	1.0000

Total 100.000 100.0000
 Normalization factor = 1.0247

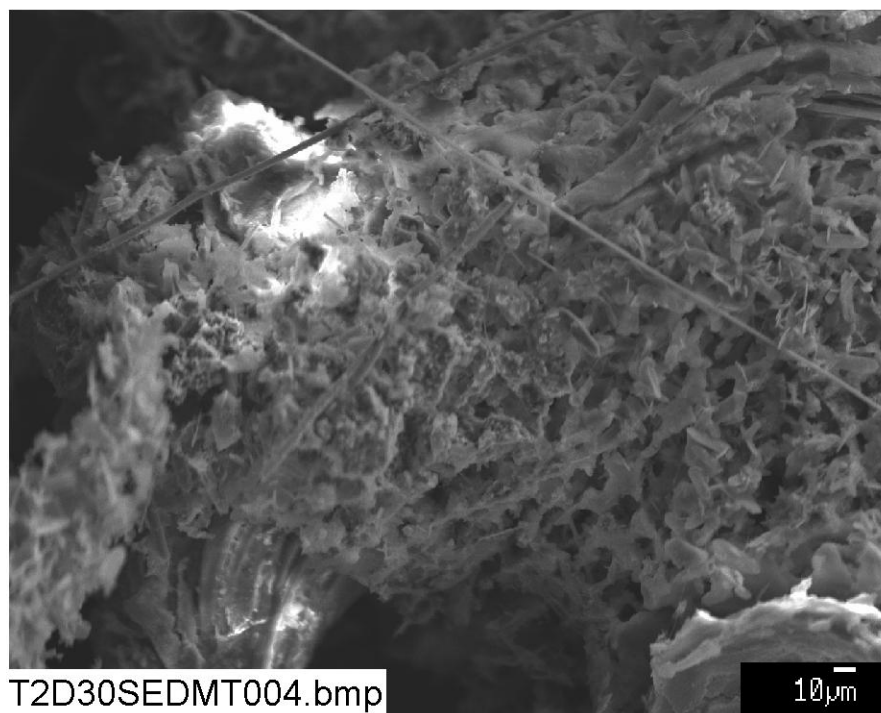


Figure E-4. SEM image for a Test 2 Day-30 sediment sample at 300 × magnification (T2D30SEDMT004).

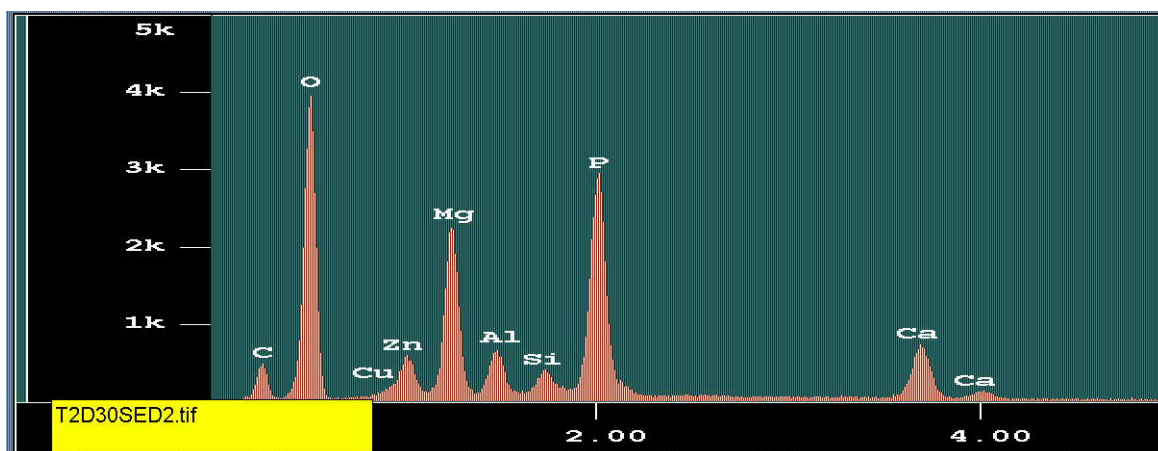


Figure E-5. EDS counting spectrum for the porous structured material shown in Figure E-3 (T2D30SED2).