

ASCE OXYGEN TRANSFER DETERMINATION

PROJECT: Aerations Solutions Inc.
DATE: 18-May-01
RUN: 1

599 Waldron Rd.
 LaVergne, TN 37086
 615/793-7547
 FAX 615/793/5070

	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.358	14.356	14.354		
(mm Hg)	742.30	742.20	742.10	Air Flow Device 1 (SCFM)	3.94
Ambient Temperature (°F)	84.20	86.00	86.00	Air Flow/Device (SCFM)	3.94
Relative Humidity (%)	57%	58%	57%		
Line Pressure (PSIG)	2.186	2.186	2.186		
(In. Hg)	4.45	4.45	4.45	Average Air Flow (SCFM)	3.94
Line Temperature (°F)	100.00	101.00	102.00	Effective Depth Correction (f)	0.39
Flowmeter Reading (ACFM)	4.25	4.25	4.25	Headloss (In. H ₂ O)	12.51
Water Temp. (°C)	19.50	19.60	19.60	C* (mg/l)	9.37
Orifice Diameter (in)		NA		C _{smT} (Standard Methods, mg/l)	9.17
Number Of Aeration Devices		1		C* ₂₀ Standard Conditions	9.50
Side Water Depth (ft)		5.00	(1.52 m)	Tank Volume (Ft ³)	65.7
Air Release Depth (ft)		4.00	(1.22 m)	(Gallons)	491.5
Tank Length (ft)		6.57	(2.00 m)	(m ³)	1.9
Tank Width (ft)		2.00	(0.61 m)	(Million Pounds)	0.004
Tank Diameter (ft)		0.00	(0.00 m)	g NaSO ₃ @ 150% Stoichiometric	206.77
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concen. (mg/l)	0.100
Motor Efficiency		100.0%		Grams Cobalt Chloride	0.8
Hpmotor		0.05		Turbine HP or Motor HP _{wire}	0.00
Total HP _{wire} av.		0.05	#N/A	Total HP _{motor} av.	0.00

NON-LINEAR REGRESSION RESULTS

Probe	K _L a _r	K _L a ₂₀	SOTR	SOTR/dev	SOTE	SAE _{wire}	C*	Std. Err.
1	8.34	8.42	0.33	0.33	8.08	6.22	9.42	0.0578
2	8.82	8.91	0.35	0.35	8.47	6.52	9.33	0.0477
avg.	8.58	8.67	0.34	0.34	8.28	6.37	9.37	0.0528
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

AIR FLOW RATE

Total SCFM:	3.9	6.336	:Nm ³ /Hr
SCFM/Diff.:	3.94	6.336	:Nm ³ /hr/Diff
SCFM/1000 Ft ³ :	60.0	3.406	:Nm ³ /hr/m ³
Total ICFM:	3.5	2.07%	per Ft. DWD

OXYGEN TRANSFER

#O ₂ /Hr:	0.34	0.153	:KgO ₂ /Hr
#O ₂ /Hr/Diff.:	0.34	0.153	:KgO ₂ /Hr/Diff.
#O ₂ /Day:	8.1	3.7	:KgO ₂ /Day
#O ₂ /Day/1000 Ft ³ :	123	1.98	:KgO ₂ /Day/m ³

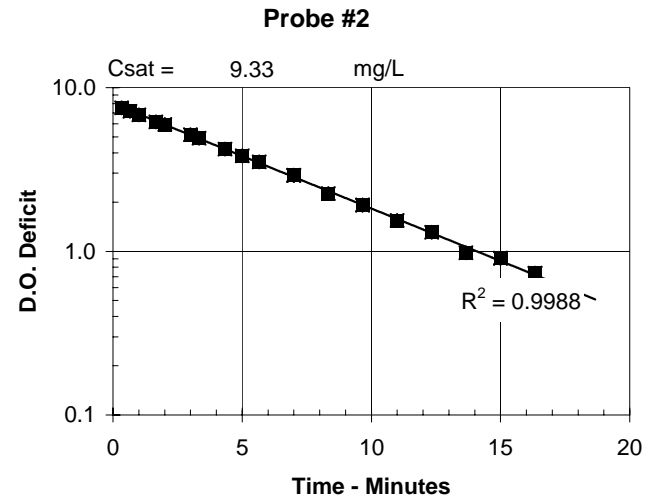
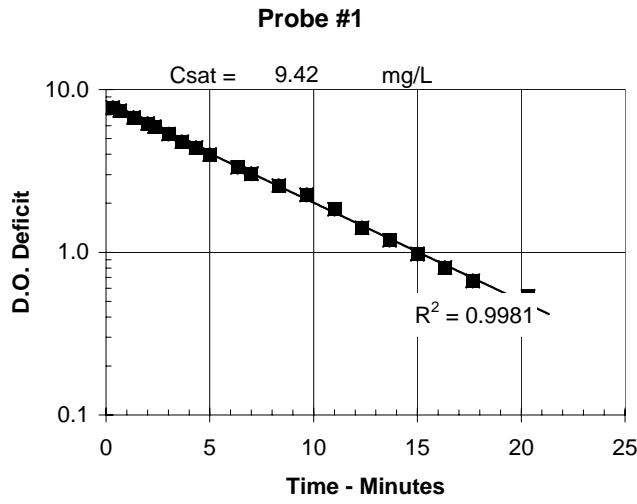
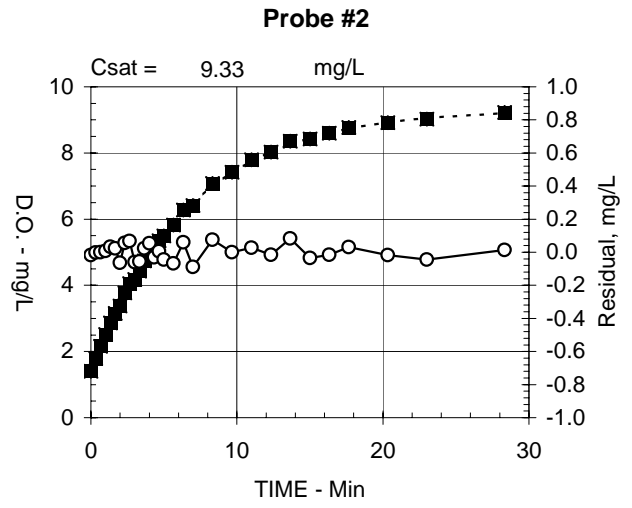
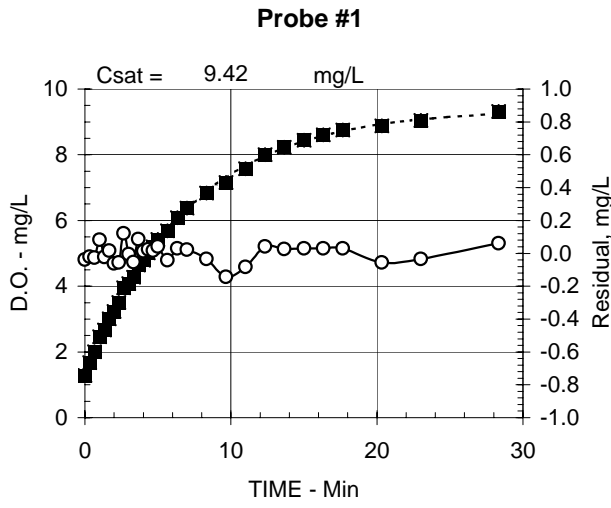
LINEAR REGRESSION RESULTS

Probe	K _L a _r	K _L a ₂₀	SOTR	SOTR/dev	SOTE	SAE _{wire}	C*	Corr.Coeff.
1	8.35	8.44	0.33	0.33	8.09	6.23	9.42	0.9981
2	8.85	8.94	0.35	0.35	8.51	6.55	9.33	0.9988
avg.	8.60	8.69	0.34	0.34	8.30	6.39	9.37	0.9984
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

Pt. 1				Pt. 2			
	est.	calc.		est.	calc.		
C0	1.33	1.33		C0	1.42	1.42	
Kla-in	8.34	8.34		Kla-in	8.82	8.82	
C*	9.42	9.42		C*	9.33	9.33	
Sq.Diff.	0.0903			Sq.Diff.	0.0616		
Time	D.O.	D.O.calc	diff	Time	D.O.	D.O.calc	diff
0.00	1.3	1.3	0.0	0.00	1.4	1.4	0.0
0.33	1.7	1.7	0.0	0.33	1.8	1.8	0.0
0.66	2.0	2.0	0.0	0.66	2.2	2.2	0.0
1.00	2.5	2.4	0.1	1.00	2.5	2.5	0.0
1.33	2.7	2.7	0.0	1.33	2.9	2.8	0.0
1.66	3.0	3.0	0.0	1.66	3.2	3.1	0.0
2.00	3.2	3.3	-0.1	2.00	3.4	3.4	-0.1
2.33	3.5	3.6	-0.1	2.33	3.8	3.7	0.1
2.66	4.0	3.8	0.1	2.66	4.0	4.0	0.1
3.00	4.1	4.1	0.0	3.00	4.2	4.2	-0.1
3.33	4.3	4.3	-0.1	3.33	4.4	4.5	-0.1
3.66	4.6	4.6	0.1	3.66	4.7	4.7	0.0
4.00	4.8	4.8	0.0	4.00	5.0	4.9	0.1
4.33	5.0	5.0	0.0	4.33	5.1	5.1	0.0
4.66	5.2	5.2	0.0	4.66	5.4	5.3	0.0
5.00	5.4	5.4	0.0	5.00	5.5	5.5	0.0
5.66	5.7	5.7	0.0	5.66	5.8	5.9	-0.1
6.33	6.1	6.1	0.0	6.33	6.3	6.2	0.1
7.00	6.4	6.4	0.0	7.00	6.4	6.5	-0.1
8.33	6.8	6.9	0.0	8.33	7.1	7.0	0.1
9.66	7.2	7.3	-0.1	9.66	7.4	7.4	0.0
11.00	7.6	7.7	-0.1	11.00	7.8	7.8	0.0
12.33	8.0	8.0	0.0	12.33	8.0	8.0	0.0
13.66	8.2	8.2	0.0	13.66	8.4	8.3	0.1
15.00	8.4	8.4	0.0	15.00	8.4	8.5	0.0
16.33	8.6	8.6	0.0	16.33	8.6	8.6	0.0
17.66	8.8	8.7	0.0	17.66	8.8	8.7	0.0
20.33	8.9	8.9	-0.1	20.33	8.9	8.9	0.0
23.00	9.1	9.1	0.0	23.00	9.0	9.1	0.0
28.33	9.3	9.3	0.1	28.33	9.2	9.2	0.0

Probe 1				Probe 2			
Lower	13.70%	Upper	98.99%	Lower	15.04%	Upper	98.83%
	Value	Abs.Un.	%LSE		Value	Abs.Un.	%LSE
C*	9.416	0.038	0.403	C*	9.334	0.029	0.315
C0	1.328	0.029	2.180	C0	1.421	0.024	1.706
KLaT	8.338	0.002	1.335	KLaT	8.818	0.002	1.088
Error	0.058			Error	0.048		

PROJECT: Aerations Solutions Inc.
DATE: 5/18/2001



Project: Aerations Solutions Inc.
 Date: May 18, 2001
 Run: 1

ASCE OXYGEN TRANSFER DETERMINATION

PROJECT: **Aerations Solutions Inc.**
 DATE: **18-May-01**
 RUN: **2**

599 Waldron Rd.
 LaVergne, TN 37086
 615/793-7547
 FAX 615/793/5070

	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.354	14.350	14.344		
(mm Hg)	742.10	741.90	741.60	Air Flow Device 1 (SCFM)	1.95
Ambient Temperature (°F)	86.00	87.80	87.80	Air Flow/Device (SCFM)	1.95
Relative Humidity (%)	56%	54%	54%		
Line Pressure (PSIG)	2.038	2.038	2.038		
(In. Hg)	4.15	4.15	4.15	Average Air Flow (SCFM)	1.95
Line Temperature (°F)	102.00	100.00	100.00	Effective Depth Correction (f)	0.33
Flowmeter Reading (ACFM)	2.13	2.13	2.13	Headloss (In. H ₂ O)	8.43
Water Temp. (°C)	19.70	19.90	20.00	C* (mg/l)	9.26
Orifice Diameter (in)		NA		C _{smT} (Standard Methods, mg/l)	9.12
Number Of Aeration Devices		1		C* ₂₀ Standard Conditions	9.45
Side Water Depth (ft)		5.00	(1.52 m)	Tank Volume (Ft ³)	65.7
Air Release Depth (ft)		4.00	(1.22 m)	(Gallons)	491.5
Tank Length (ft)		6.57	(2.00 m)	(m ³)	1.9
Tank Width (ft)		2.00	(0.61 m)	(Million Pounds)	0.004
Tank Diameter (ft)		0.00	(0.00 m)	g NaSO ₃ @ 150% Stoichiometric	204.19
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concen. (mg/l)	0.100
Motor Efficiency		100.0%		Grams Cobalt Chloride	0.8
Hpmotor		0.02		Turbine HP or Motor HP _{wire}	0.00
Total HP _{wire} av.		0.02	#N/A	Total HP _{motor} av.	0.00

NON-LINEAR REGRESSION RESULTS

Probe	K _L a _r	K _L a ₂₀	SOTR	SOTR/dev	SOTE	SAE _{wire}	C*	Std. Err.
1	4.84	4.86	0.19	0.19	9.36	7.70	9.33	0.0448
2	5.39	5.41	0.21	0.21	10.28	8.46	9.19	0.0651
avg.	5.12	5.13	0.20	0.20	9.82	8.08	9.26	0.0549
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

AIR FLOW RATE

Total SCFM:	2.0	3.142	:Nm ³ /Hr
SCFM/Diff.:	1.95	3.142	:Nm ³ /hr/Diff
SCFM/1000 Ft ³ :	29.7	1.689	:Nm ³ /hr/m ³
Total ICFM:	1.7	2.46%	per Ft. DWD

OXYGEN TRANSFER

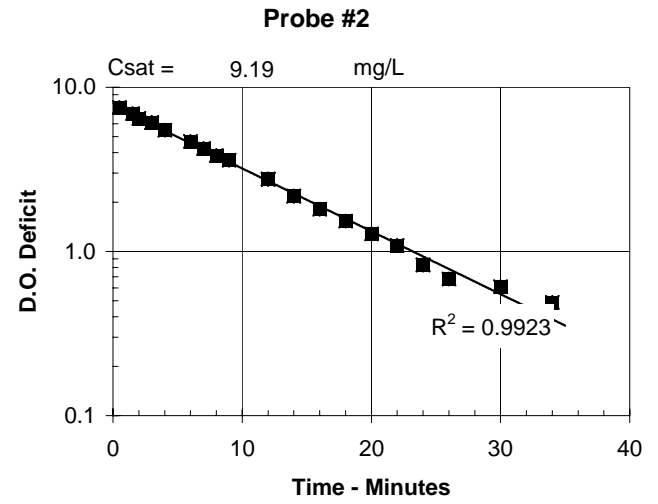
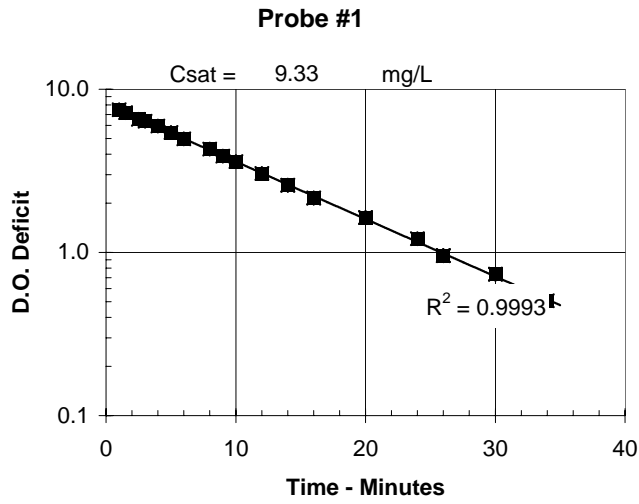
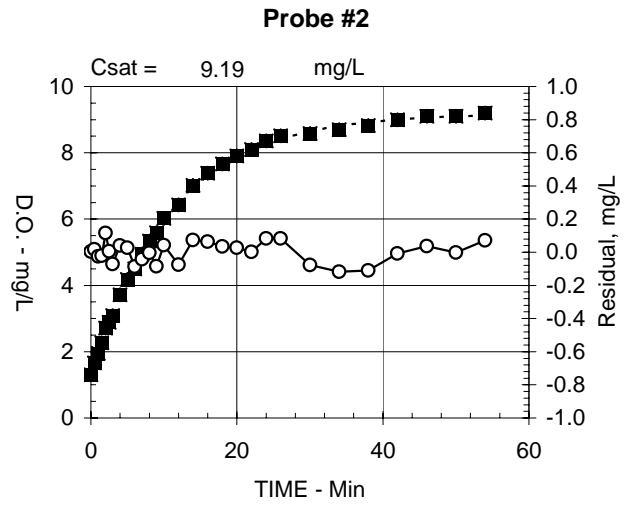
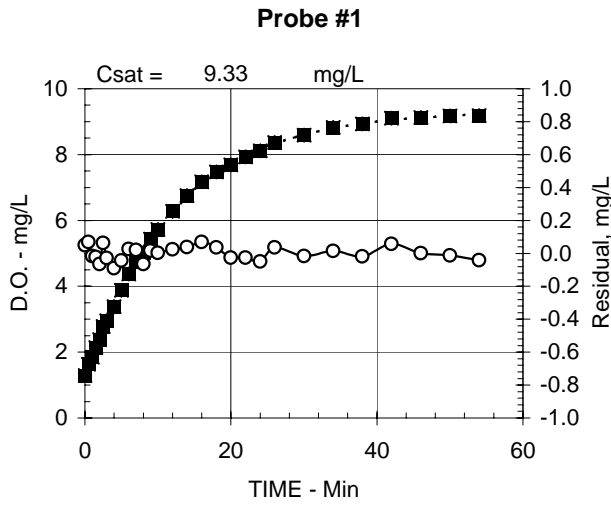
#O ₂ /Hr:	0.20	0.090	:KgO ₂ /Hr
#O ₂ /Hr/Diff.:	0.20	0.090	:KgO ₂ /Hr/Diff.
#O ₂ /Day:	4.8	2.2	:KgO ₂ /Day
#O ₂ /Day/1000 Ft ³ :	73	1.16	:KgO ₂ /Day/m ³

LINEAR REGRESSION RESULTS

Probe	K _L a _r	K _L a ₂₀	SOTR	SOTR/dev	SOTE	SAE _{wire}	C*	Corr.Coeff.
1	4.86	4.88	0.19	0.19	9.40	7.73	9.33	0.9993
2	5.29	5.31	0.20	0.20	10.09	8.29	9.19	0.9923
avg.	5.08	5.09	0.20	0.20	9.75	8.01	9.26	0.9958
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

Pt. 1				Pt. 2			
	est.	calc.		est.	calc.		
C0	1.24	1.24		C0	1.30	1.30	
Kla-in	4.84	4.84		Kla-in	5.39	5.39	
C*	9.33	9.33		C*	9.19	9.19	
Sq.Diff.	0.0521			Sq.Diff.	0.1101		
Time	D.O.	D.O.calc	diff	Time	D.O.	D.O.calc	diff
0.00	1.3	1.2	0.0	0.00	1.3	1.3	0.0
0.50	1.6	1.6	0.1	0.50	1.7	1.6	0.0
1.00	1.9	1.9	0.0	1.00	2.0	2.0	0.0
1.50	2.1	2.2	0.0	1.50	2.3	2.3	0.0
2.00	2.4	2.4	-0.1	2.00	2.7	2.6	0.1
2.50	2.8	2.7	0.1	2.50	2.9	2.9	0.0
3.00	3.0	3.0	0.0	3.00	3.1	3.2	-0.1
4.00	3.4	3.5	-0.1	4.00	3.7	3.7	0.0
5.00	3.9	3.9	0.0	5.00	4.2	4.2	0.0
6.00	4.4	4.3	0.0	6.00	4.5	4.6	-0.1
7.00	4.8	4.7	0.0	7.00	4.9	5.0	0.0
8.00	5.0	5.1	-0.1	8.00	5.3	5.3	0.0
9.00	5.4	5.4	0.0	9.00	5.6	5.7	-0.1
10.00	5.7	5.7	0.0	10.00	6.0	6.0	0.0
12.00	6.3	6.3	0.0	12.00	6.4	6.5	-0.1
14.00	6.8	6.7	0.0	14.00	7.0	6.9	0.1
16.00	7.2	7.1	0.1	16.00	7.4	7.3	0.1
18.00	7.5	7.4	0.0	18.00	7.7	7.6	0.0
20.00	7.7	7.7	0.0	20.00	7.9	7.9	0.0
22.00	7.9	8.0	0.0	22.00	8.1	8.1	0.0
24.00	8.1	8.2	0.0	24.00	8.4	8.3	0.1
26.00	8.4	8.3	0.0	26.00	8.5	8.4	0.1
30.00	8.6	8.6	0.0	30.00	8.6	8.7	-0.1
34.00	8.8	8.8	0.0	34.00	8.7	8.8	-0.1
38.00	8.9	8.9	0.0	38.00	8.8	8.9	-0.1
42.00	9.1	9.1	0.1	42.00	9.0	9.0	0.0
46.00	9.1	9.1	0.0	46.00	9.1	9.1	0.0
50.00	9.2	9.2	0.0	50.00	9.1	9.1	0.0
54.00	9.2	9.2	0.0	54.00	9.2	9.1	0.1

Probe 1				Probe 2			
Lower	13.83%	Upper	98.43%	Lower	14.15%	Upper	100.11%
	Value	Abs.Un.	%LSE		Value	Abs.Un.	%LSE
C*	9.326	0.023	0.246	C*	9.190	0.030	0.328
C0	1.240	0.021	1.720	C0	1.296	0.032	2.460
KLaT	4.840	0.001	0.919	KLaT	5.394	0.001	1.314
Error	0.045			Error	0.065		
PROJECT:		Aerations Solutions Inc.					
DATE:		5/18/2001					



Project: Aerations Solutions Inc.
 Date: May 18, 2001
 Run: 2

ASCE OXYGEN TRANSFER DETERMINATION

PROJECT: **Aerations Solutions Inc.**
 DATE: **18-May-01**
 RUN: **3**

599 Waldron Rd.
 LaVergne, TN 37086
 615/793-7547
 FAX 615/793/5070

	Initial	Mid Point	Final		
Barometric Pres. (PSIA)	14.344	14.350	14.344		
(mm Hg)	741.60	741.90	741.60	Air Flow Device 1 (SCFM)	7.78
Ambient Temperature (°F)	87.80	89.60	89.60	Air Flow/Device (SCFM)	7.78
Relative Humidity (%)	54%	54%	54%		
Line Pressure (PSIG)	2.579	2.554	2.530		
(In. Hg)	5.25	5.20	5.15	Average Air Flow (SCFM)	7.78
Line Temperature (°F)	101.00	107.00	108.00	Effective Depth Correction (f)	0.29
Flowmeter Reading (ACFM)	8.33	8.33	8.33	Headloss (In. H ₂ O)	22.71
Water Temp. (°C)	20.00	20.10	20.20	C* (mg/l)	9.17
Orifice Diameter (in)		NA		C _{smT} (Standard Methods, mg/l)	9.07
Number Of Aeration Devices		1		C* ₂₀ Standard Conditions	9.40
Side Water Depth (ft)		5.00	(1.52 m)	Tank Volume (Ft ³)	65.7
Air Release Depth (ft)		4.00	(1.22 m)	(Gallons)	491.5
Tank Length (ft)		6.57	(2.00 m)	(m ³)	1.9
Tank Width (ft)		2.00	(0.61 m)	(Million Pounds)	0.004
Tank Diameter (ft)		0.00	(0.00 m)	g NaSO ₃ @ 150% Stoichiometric	202.14
Gear Reducer or Belt Efficiency		100.0%		Cobalt Concen. (mg/l)	0.100
Motor Efficiency		100.0%		Grams Cobalt Chloride	0.8
Hpmotor		0.12		Turbine HP or Motor HP _{wire}	0.00
Total HP _{wire} av.		0.12	#N/A	Total HP _{motor} av.	0.00

NON-LINEAR REGRESSION RESULTS

Probe	K _L a _r	K _L a ₂₀	SOTR	SOTR/dev	SOTE	SAE _{wire}	C*	Std. Err.
1	16.30	16.26	0.63	0.63	7.87	5.22	9.28	0.0874
2	18.61	18.57	0.71	0.71	8.77	5.82	9.05	0.0763
avg.	17.46	17.41	0.67	0.67	8.32	5.52	9.17	0.0819
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

AIR FLOW RATE

Total SCFM:	7.8	12.514	:Nm ³ /Hr
SCFM/Diff.:	7.78	12.514	:Nm ³ /hr/Diff
SCFM/1000 Ft ³ :	118.5	6.726	:Nm ³ /hr/m ³
Total ICFM:	6.9	2.08%	per Ft. DWD

OXYGEN TRANSFER

#O ₂ /Hr:	0.67	0.304	:KgO ₂ /Hr
#O ₂ /Hr/Diff.:	0.67	0.304	:KgO ₂ /Hr/Diff.
#O ₂ /Day:	16.1	7.3	:KgO ₂ /Day
#O ₂ /Day/1000 Ft ³ :	245	3.93	:KgO ₂ /Day/m ³

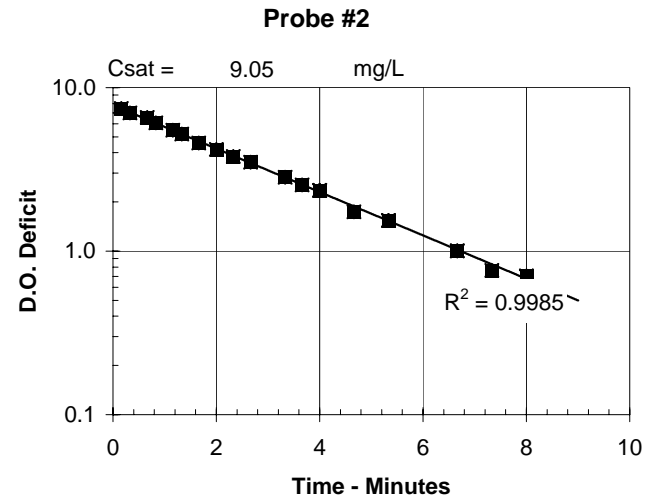
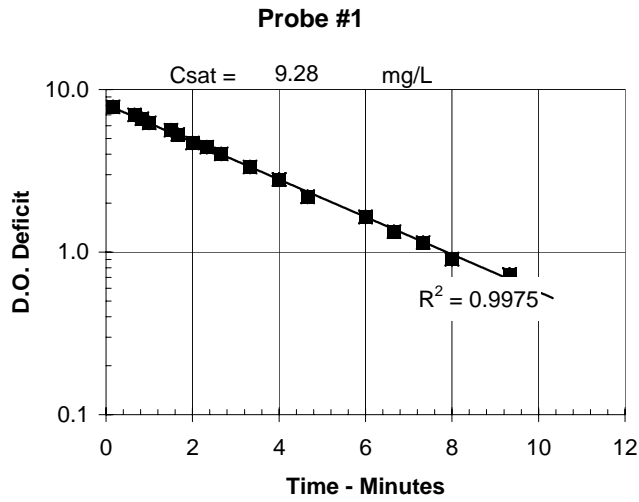
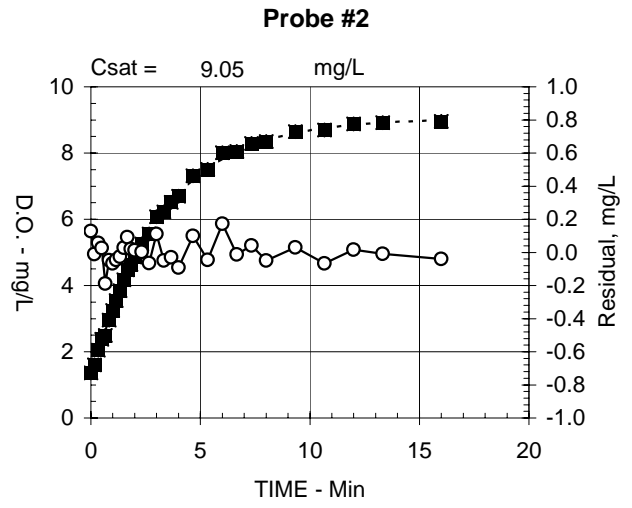
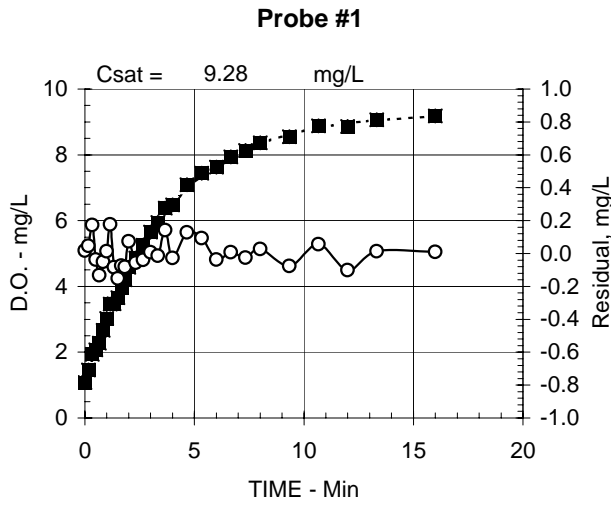
LINEAR REGRESSION RESULTS

Probe	K _L a _r	K _L a ₂₀	SOTR	SOTR/dev	SOTE	SAE _{wire}	C*	Corr.Coeff.
1	15.93	15.89	0.62	0.62	7.69	5.10	9.28	0.9975
2	18.32	18.28	0.70	0.70	8.64	5.73	9.05	0.9985
avg.	17.13	17.08	0.66	0.66	8.16	5.42	9.17	0.9980
	/hr	/hr	#O ₂ /hr		%	#O ₂ /hr-HPw		

Pt. 1				Pt. 2			
	est.	calc.		est.	calc.		
C0	1.06	1.06		C0	1.23	1.23	
Kla-in	16.30	16.30		Kla-in	18.61	18.61	
C*	9.28	9.28		C*	9.05	9.05	
Sq.Diff.	0.2062			Sq.Diff.	0.1573		
Time	D.O.	D.O.calc	diff	Time	D.O.	D.O.calc	diff
0.00	1.1	1.1	0.0	0.00	1.4	1.2	0.1
0.16	1.5	1.4	0.0	0.16	1.6	1.6	0.0
0.33	1.9	1.8	0.2	0.33	2.1	2.0	0.1
0.50	2.1	2.1	0.0	0.50	2.4	2.4	0.0
0.66	2.3	2.4	-0.1	0.66	2.5	2.7	-0.2
0.83	2.7	2.7	-0.1	0.83	3.0	3.0	0.0
1.00	3.0	3.0	0.0	1.00	3.3	3.3	-0.1
1.16	3.5	3.3	0.2	1.16	3.6	3.6	0.0
1.33	3.5	3.6	-0.1	1.33	3.9	3.9	0.0
1.50	3.7	3.8	-0.2	1.50	4.2	4.1	0.0
1.66	4.0	4.0	-0.1	1.66	4.5	4.4	0.1
1.83	4.2	4.3	-0.1	1.83	4.6	4.6	0.0
2.00	4.6	4.5	0.1	2.00	4.9	4.8	0.0
2.33	4.9	4.9	-0.1	2.33	5.3	5.3	0.0
2.66	5.3	5.3	0.0	2.66	5.6	5.6	-0.1
3.00	5.7	5.6	0.0	3.00	6.1	6.0	0.1
3.33	5.9	6.0	0.0	3.33	6.2	6.3	0.0
3.66	6.4	6.2	0.1	3.66	6.5	6.5	0.0
4.00	6.5	6.5	0.0	4.00	6.7	6.8	-0.1
4.66	7.1	7.0	0.1	4.66	7.3	7.2	0.1
5.33	7.4	7.3	0.1	5.33	7.5	7.6	0.0
6.00	7.6	7.7	0.0	6.00	8.0	7.8	0.2
6.66	7.9	7.9	0.0	6.66	8.1	8.1	0.0
7.33	8.1	8.2	0.0	7.33	8.3	8.2	0.0
8.00	8.4	8.3	0.0	8.00	8.4	8.4	0.0
9.33	8.6	8.6	-0.1	9.33	8.7	8.6	0.0
10.66	8.9	8.8	0.1	10.66	8.7	8.8	-0.1
12.00	8.9	9.0	-0.1	12.00	8.9	8.9	0.0
13.33	9.1	9.1	0.0	13.33	8.9	8.9	0.0
16.00	9.2	9.2	0.0	16.00	9.0	9.0	0.0

Probe 1				Probe 2			
Lower	11.64%	Upper	98.96%	Lower	15.02%	Upper	98.97%
	Value	Abs.Un.	%LSE		Value	Abs.Un.	%LSE
C*	9.277	0.051	0.550	C*	9.053	0.039	0.434
C0	1.063	0.043	4.007	C0	1.231	0.039	3.137
KLaT	16.301	0.005	1.846	KLaT	18.611	0.005	1.592
Error	0.087			Error	0.076		

PROJECT: Aerations Solutions Inc.
DATE: 5/18/2001



Project: Aerations Solutions Inc.
 Date: May 18, 2001
 Run: 3
