

HYDRANAUTICS DESIGN PROGRAM - VERSION 4.05 (1990)  
 Calculation was made by: NITTO DENKO

01-10-92

Project name : NACL RO SYSTEM SIMURATION

Permeate flow : 29065 GPD

Feedwater temperature : 33.0 C      Recovery : 35.0%  
 Raw water pH : 6.50      Element age : 0.0 years  
 Acid dosage, ppm(100%): 0.0 H2SO4      Flux decline coefficient : -0.035  
 Acidified feed CO2,ppm : 0.0      3-yr salt passage increase factor :1.5

Feed Pressure : 749.7 psi

Concentrate Pressure : 716.3 psi

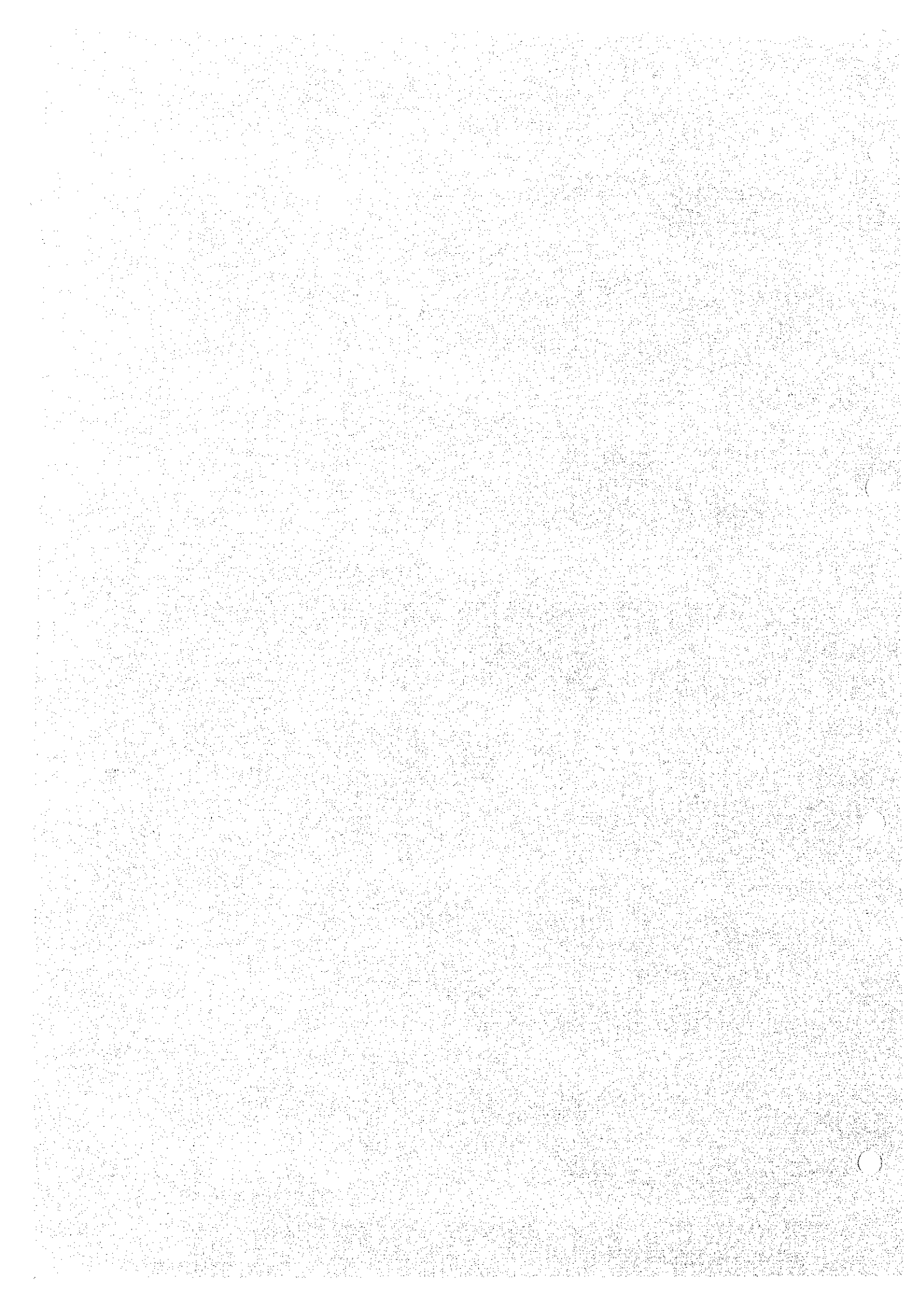
Pass	Feed Flow Total gpm	Flow Vessel gpm	Conc. Total gpm	Flow Vessel gpm	Beta	Conc. Press. psi	Element Type	Element No.	Array
1	57.7	57.7	37.5	37.5	1.03	716.3	NTR-759HR-SW8S	6	1x6

Ion	Raw water		Feed water		Permeate		Concentrate	
	mg/l	ppm*	mg/l	ppm*	mg/l	ppm*	mg/l	ppm*
Ca	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Na	13760.0	29913.0	13760.0	29913.0	474.8	1032.1	20913.6	45464.3
K	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NH4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ba	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CO3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HCO3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SO4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cl	21240.0	29957.7	21240.0	29957.7	731.8	1032.1	32282.9	45533.0
F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NO3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SiO2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TDS	35000.0		35000.0		1206.6		53196.5	
pH	6.5		6.5					

Notes: \*ppm as CaCO3.      Calculated concentrations are accurate to +/- 10%

	Raw water	Feed water	Concentrate
CaSO4/Ksp*100,%	0.0	0.0	0.0
SrSO4/Ksp*100,%	0.0	0.0	0.0
BaSO4/Ksp*100,%	0.0	0.0	0.0
SiO2 sat.,%	0.0	0.0	0.0
Langelier ind.	0.00	0.00	0.00
Stiff & Davis ind.	0.00	0.00	0.00
Ionic strength	0.62	0.62	0.96
Osmotic press.,psi	425.3	425.3	658.8

APPENDIX R6-4





RECORDING SHEET FOR R-6 EXPERIMENT (7-2-1) DATE Nov. 28, 1991

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL No	MEMBRANE NAME
		TEMP	EC	PH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
10:00	start	25.0	45.6/46.0		14.0	16.9	24.8	24.8	1	SC-8000
10:30	5.6	(24.8)							5	
10:30		26.0	46.8/46.0		16.0	19.7	26.7	25.9	3	
11:40		28.0	48.7/46.0		18.5	-	22.5	22.0		
11:53	5.6	28.5	49.1/46.0	9.33	20.5		28.8	28.0		

NaCl 20,000 mg/l

Cell No	TIME	PRESS	BRINE FLUX	time	P.E. MEAT E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
1	10:30	5.6	2.0	0	18.7	1729	7.5			
	11:00	800psi	1.9	30	20.6/8.4	1638	22.5	888	97.04	0.707
	11:30				21.9/9.1	1750	8.2	899		0.751
	12:00	800	1.9		21.0/8.6	1690	7.1	867		0.720
	:				/	1610				
	:				/	22.6		AV 885	AV 97.05	AV 0.726
2	10:30	800psi	2.0	0	/	1641	7.5			
	11:00		2.0	30	19.1/7.6	1560	22.7	840		0.656
	11:30				20.6/8.4	1640	8.2	840		0.707
	12:00	795	2.0		19.9/8.0	1650	7.2	846		0.681
	:				/	1570				
	:				/			AV 842	AV 97.19	AV 0.681
3	10:30	805	2.0	0	/	1624	7.5			
	11:00		2.0	30	19.5/7.8	1536	22.5	830		0.669
	11:30				20.4/8.3	1630	7.9	835		0.700
	12:00	805	2.0		20.1/8.1	1660	7.2	851		0.688
	:				/	22.6				
	:				/			AV 839	AV 97.20	AV 0.686

Product NaCl =  $(\frac{EC}{2.4298}) \cdot 1.0343 (= NaCl_p)$

PRD: 91.11.22

Flux<sub>(p)</sub> = 1.86 x scale + 5 (ml) ; Flux<sub>(calc)</sub> Flux<sub>(p)</sub> x 3.427 x 10<sup>-2</sup> (m<sup>3</sup>/m<sup>2</sup>·day)  
 R<sub>i</sub> =  $(1 - \frac{NaCl_p}{NaCl_f}) \cdot 100$  7-52

RECORDING SHEET FOR R-6 EXPERIMENT (71-2-2) DATE Nov. 24, 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	pH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	4	SC-8000
:									5	
:									6	

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	pH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
4	10:30	800psi	2.0	0	/		7.6			
	11:00		2.0	30	20.3/8.2	(2170) / 2030	22.2	1120		0.69 $\Delta$
	11:30				21.0/8.6	(2120) / 1990	7.7	1096		0.72
	12:00	800	2.0		20.6/8.4	(2080) / 1980	7.2	1075		0.71
	:				/			AV 1098	AV 96.34	AV 0.71
5	10:30	800	2.0	0	/		7.6			
	11:00		2.0	30	19.3/7.7	(1665) / 1564	22.3	854		0.66 $\circ$
	11:30				20.8/8.5	(1640) / 1530	7.6	840		0.71
	12:00	800	1.9		19.7/7.9	(1630) / 1540	7.2	835		0.67
	:				/			AV 843	AV 97.19	AV 0.68
6	10:30	800	2.0	0	/		7.6			
	11:00		2.0	30	21.4/8.8	(3350) / 3150		1759		0.73 $\times$
	11:30				22.7/9.5	(3420) / 3210	8.5	1797		0.78
	12:00	800	2.0		21.9/9.1	(3400) / 3210	7.2	1786		0.75
	:				/			AV 1781	94.06	0.75

PRO; 91.11.22 mls

RECORDING SHEET FOR R-6 EXPERIMENT (11-2-3) DATE Nov. 24, 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP °C	EC MS/cm	PH	IN	OUT	IN	OUT		
10:30	800								No 758	SC-8000

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	PH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
7	10:30	800	2.0	0	/		7.6			
	11:00		2.0	30	20.5/	1630/1540	6.8	835	97.2	0.70
	11:30				21.5/	1640/1540/220	6.8	840		0.74
	12:00	800	1.9		20.5/	1660/1570/226	7.0	851		0.70
						/			AV 842	AV 97.19
8	10:30	800	2.0	0	/		7.6			
	11:00		2.0	30	20.4/	3120/2930		163K	95.8	0.70
	11:30				20.5/	2060/1910/219	6.7	106K		0.70
	12:00	800	2.0		19.5/	2070/1940/225	6.9	1069		0.67
						/			AV 1256	95.81
9	10:30	800	2.0	0	/		7.6			
	11:00		1.9	30	19.5/	1990/1890		1027	94.85	0.67
	11:30				21.5/	3370/3150/218	6.8	1770		0.74
	12:00	800	1.9		20.5/	3490/3280/224		1835		0.70
						/			AV 1544	94.85

PRO: 91.11.22 mba





RECORDING SHEET FOR R-6 EXPERIMENT (PI-1-1) DATE 27. Nov. 1991

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP	EC	PH	TEMP.(°C)	IN	OUT	IN		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
10:20	start		(46.2, 25°C)						1	UTC-80HR
:30	(800PSI)									
:30		25°C	46.3		14.0	18.0	25.0	25.2	2	UTC 80 HF
11:00	800	29	(46.8, 25°C) 49.0	6.6	20.0	-	28.0	27.5		( " )
11:50	800	25.5	(47.2, 25.4) 47.5	6.5	15.0	-	25.2	25.4	3	UTC 90
13:05	800	25.8	(47.6, 25.4) 47.4	6.6	16.0	18.8	25.4	25.4		( " )
13:45		27			20	21.5	26.6	26.6		

Cell No	TIME	PRESS	BRINE FLUX	time	P E M E A T E			CALCULATED		
					Flux	EC	PH	Conc.	Rej.	Flux
					ml/scale	µS/cm	-	mg/l	%	m³/m²·day
1	:		1.6	18'00"	21.2/8.7	(23.0) 2660		2020	93.0	1.21
	11:30				/	2500				
	:					(21.0) 2400		1300		0.99
	:				20.3/8.2	2500		182		1.03
	2=10'08"			30'	30 /	(23.9) 2220		1101		1.03
	:	800		30'	30 /	2170		AV 1194	AV 96.02	AV 1.02
	13:45		1.6	30'	/					0.93
2	:		1.6	18'00"	23.0/9.7	(23.3) 970		508	98.31	1.32
	:			15'10" 30'43"	25.6/11.1	(23.0) 921		484		1.32
	:			30'	38 /	(23.9) 910		420		1.30
	13:45	800PSI	1.6	30'	38 /	926		465		1.30
	:				/			AV 482	AV 98.39	AV 1.31
	:				/					1.21
3	:		1.6	4'05"	25.1/10.8	(22.9) 3320	189ml			6.45
	10:43			8'05"	25.6/11.1	3460	192ml	21400		6.58
	:			29.1	24.5/10.5	22.7 3440	212ml			7.27
	:			(20.8 sec)		36200		22500		7.27
	:			30'	22 /	(23.9) 357		22900		7.57
	13:45	200	1.6	30'	224 /	35800		22200		7.68
	:				/			AV 22250	AV 25.53	AV 7.11

$$NaCl = \left( \frac{EC}{2.4398} \right)^{1.0343} \quad (EC < 18000), \quad NaCl = \left( \frac{EC+517}{16.64} \right)^{1.182} \quad (EC > 17000)$$

$$Flux = 1.86 \times scale + 5 \text{ (ml)}, \quad Flux (m^3/m^2 \cdot day) = Flux (l) \times 2.47 \times 10^{-2}$$

$$Rej = \left( 1 - \frac{NaCl_{(p)}}{NaCl_{(F)}} \right) \times 100$$

RECORDING SHEET FOR R-6 EXPERIMENT (P1-1-2) DATE 27 Nov. 1991

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP	EC	PH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									4	SC-8000 (To ray)
:									5	SC-8000 ( " )
:									6	NTR-759HR (NITTO)

Cell No	TIME	PRESS	BRINE FLUX	time	P.E. MEAT E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
:	:	MPa	l/min	min	ml./scale	MS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
4	:		1.6	30'09	193/7.7	(23.6) 2,050		1,096		0.66
:	:			1:10'40"	25.1/10.8	2,120				
:	:			1:51'27"		(22.7) 2240		1,203		0.26
:	:			30'	191	2320		1,198		0.65
:	13:45	800	1.6	30'	191	(23.7) 2240		1,182		0.65
:	:				/	2310				
:	:				/	2280				
:	:				/			AV	AV	
:	:				/			1.170	96.10	0.71
										0.653
5	:		1.6	30'09	18.6/7.3	(23.6) 1680		893		0.64
:	:			1:10'40"	24.1/10.3	1,740				
:	:		40.8	1:51'27"		(22.9) 1660		893		0.61
:	:			30'	181	1740		856		0.62
:	13:45	800	1.6	30'	181	(23.7) 1620		850		0.62
:	:				/	1670				
:	:				/	1660				
:	:				/			AV	AV	AV
:	:				/			873	97.09	0.62
										0.57
6	:		1.6	18'00	23.4/9.9	(23.1) 1,190		740		1.34
:	:			1:10'40"	24.5/10.5	1,450				
:	:			1:31'15"		(23.0) 1170		619		1.22
:	:			20.6	43/	1,220		614		1.47
:	:			30'	43/	(23.9) 1180		582		1.47
:	13:45	800	1.6	30'	43/	1,210				
:	:				/	1150				
:	:				/			AV	AV	AV
:	:				/			619	97.89	1.38
										1.29

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RECORDING SHEET FOR R-6 EXPERIMENT (PI-1-3) DATE 27 Nov. 1991

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP	EC	PH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									7	NTR759HR (NITTO)
:									8	UTC-80HR (Toray)
:									9	UTC-80HR ( )

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
7	:	13:45	1.6	(15.92) 15:55	25.0/	(27.0) 1180		624		1.61
	:			(17.9) 142.51	26.2/	1270		481		1.52
	:			200/334	45/	(23.3) 924		473		1.54
	:			30'	45/	956		448		1.54
	:			30'	45/	892		AV 507	AV 98.31	AV 1.55
8	:	13:45	1.6	22' 23.0/	(27.2) 1,050		550		1.06	
	:			14	1.090					
	:			(1:10'40" 1:23'54")	24.0/	(22.9) 1290		661		1.06
	:			(23'23")	31/	= 1302		628		1.06
	:			30'	30/	(24.0) 1200		640		1.03
:	30'	30/	1260		AV 620	AV 97.93	AV 1.05	0.91		
9	:	13:45	1.6	(15.9) 15:55	(23.2) 2570		1397		1.39	
	:				2.680					
	:			(MEMBRANE CHANGE!)	22.3/	(22.8) 3190		1759		0.99
	:			1:34:19	29/	3350		1494		0.92
	:			30'	27/	(23.9) 2790		1451		0.96
:	30'	27/	2780		AV 1473	AV 95.09	0.96	0.22		

PRD: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (PI-1-4) DATE 27 Nov. 1991

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL No	MEMBRANE NAME
		TEMP	EC	pH	TEMP.(°C)	IN	OUT	IN		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									10	JTC-70
:									11	NTR 759SW
:									12	NTR 759SW

Cell No	TIME	PRESS	BRINE FLUX	time	PE MEAT E			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
10	10:47		1.6	11'23"	35.4/	(23.1) 20800		12.500		3.20
	10:57		1.6	11'20"	33.5/	(22.8) 20200		13.300		3.5/
	:			30'	102/	(22.8) 22800		14.000		3.50
	:			30'	100/	23400		13.800		3.43
	:				1	1		AV 13.400	AV 55.33	AV 3.41
11	:		1.6	22'35"	22.6/	(23.6) 1727		919		1.03
	:		1.6	1:35'11"	24.0/	(23.0) 1394		743		1.01
	:			30'	29/	(24.5) 2070		1069		0.99
	13:45			30'	29/	1300		661	97.80	0.99
	:				1	1		AV 848	AV 97.17	AV 1.01
12	:		1.6	21'55"	22.0/	(23.2) 1505		799		1.03
	:		1.6	1:35'24"	24.5/	(22.0) 1282		680		1.02
	:			30'	30/	(24.7) 1250		650		1.03
	:			30'	29/	1215		616		0.99
	:				1	1		AV 686	AV 97.71	AV 1.02

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (P2-1-1) DATE 1. Dec 199

TIME	PRESS	FEED			COOLING & SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
10:45	Start 800PSI	25.0	48.0	7.0 6.4 (HCL)	9.0	20.8	24.5	24.5	1	UTC-80HR SP
11:45	800PSI	25.5	47.0	6.4	15.5	19.8	25.3	25.5	2	UTC-80HF
12:15	800PSI	26.0	47.1	6.5	15.5	19.0	26.6	26.2	3	UTC-90 SP
12:50	800PSI	26.5	47.2	6.5	15.0	19.0	26.0	26.6	4	SC-8000 SP
13:20	800	26.0	47.4	6.5	16.5	21.0	25.7	25.8	6	NTR-759HR
13:50	800	27.0	47.2	6.5	16.0	20.2	26.1	27.0		

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej.	Flux
					ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	11:45	800 PSI	1.6	30	29 /	1.055				
2	12:15	↓	1.6	↓	52 /	1.216				
3	:	↓	1.6	↓	72 /	7.700				
4	:	↓	1.6	↓	20 /	1.473				
6	:	↓	1.6	↓	42 /	1.151				
	:				1					
1	12:15	800	1.6	35	36 /	1.008				
2	:	↓	1.6	↓	64 /	1.236				
3	:	↓	1.6	↓	84 /	7.540				
4	:	↓	1.6	↓	23 /	1.530				
6	:	↓	1.6	↓	50 /	1.136				
	:				1					
1	12:50	800	1.6	30	31 /	9.87				
2	:	↓	1.6	↓	54 /	1.280				
3	:	↓	1.6	↓	73 /	7.410				
4	:	↓	1.6	↓	18 /	1.540				
6	:	↓	1.6	↓	43 /	1.080				
	:				1					

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (P2-1-2) DATE 1 Dec 199

TIME	PRESS	FEED			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC	PH	IN	OUT	IN	OUT		
10:45	Start 800PSI	(Ref: P2-1-1)							7	NTR759 SW
:									8	UTC-80HR SP
:									9	UTC-80HF SP
:									10	UTC-70 SP
:									11	NTR759 SW SP
:									12	NTR759HR SP

Cell No	TIME	PRESS	BRINE FLUX	time	RE MEASURE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
					ml / scale	µ S/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
7	11:45	800PSI	1.6	30	31/	1539				
8	:	↓	1.6	↓	28/	947				
9	:	↓	1.6	↓	38/	877				
10	:	↓	1.6	↓	7/	6950				
11	:	↓	1.6	↓	28.5/	1937				
12	:	↓	1.6	↓	39.5/	1175				
7	12:15 12:50	800	1.6	35	37/	1466				
8	:	↓	↓	↓	33/	884				
9	:	↓	↓	↓	46/	835				
10	:	↓	↓	↓	82.5/	6670				
11	:	↓	↓	↓	33/	1840				
12	:	↓	↓	↓	46/	1140				
7	12:50 13:20	800	1.6	30	32/	1380	6.2/			
8	:	↓	↓	↓	28/	851	6.5			
9	:	↓	↓	↓	38/	818				
10	:	↓	↓	↓	70/	6550				
11	:	↓	↓	↓	28/	1780				
12	:	↓	↓	↓	39/	1101				

spreaded Silicone LUBRICANT without No7.

PRD; 91.11.22

SP: Added Spacer

RECORDING SHEET FOR R-6 EXPERIMENT (P2-1-3) DATE 1 Dec 199

TIME	PRESS	FEED			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME	
		TEMP. °C	EC	PH	IN	OUT	IN	OUT			
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT			
:	(Ref; P2-1-1)									1	UTC-80HR
:										2	" HF
:										3	UTC-70
:										4	SC-8000
:										5	-
:										6	NTR-759HR
:										7	" SW
:										8	UTC-80HR
:										9	" HF
:										10	UTC-70
:										11	NTR-759SW
:										12	" HR

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	13:20 13:50	800PSI	1.6	30	30/	965	6.1			
2	:	↓	↓	↓	55/	1277	6.49			
3	:	↓	↓	↓	72/	7320	6.18			
4	:	↓	↓	↓	20/	1480	6.52			
6	:	↓	↓	↓	43/	1050	6.20			
	:	↓	↓	↓	1					
7	13:20 13:50	800PSI	1.6	1.6	32/	1320	6.23			
8	:	↓	↓	↓	28/	833	6.46			
9	:	↓	↓	↓	38/	784	6.05			
10	:	↓	↓	↓	70/	8250	6.30			
11	:	↓	↓	↓	28/	1698	6.24			
12	:	↓	↓	↓	39/	1054	6.34			
	:				1					
	:				1					
	:				1					
	:				1					
	:				1					
	:				1					

PRD; 91.11.22 mls

RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-1) DATE 3 Dec 1991

TIME	PRESS	F E E D			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP °C	EC MS/cm	PH	IN	OUT	IN	OUT		
9:50	800 PSI	24.0	53.1	6.56	14.0	18.0	23.8	23.6	1	UTC-80HR
10:20	800 PSI	25.5	53.0	6.58	15.0	19.5	25.4	25.4	2	UTC 80HT
10:50	800	26.0	53.1	6.59	16.0	19.5	25.0	25.2	3	UTC 70
11:20	800	26.5	53.1	6.61	16.5	19.8	26.0	26.3	4	
11:50	800	27.0	53.1	6.62	19.0	21.7	26.7	26.5	5	
12:20	800	29.5	53.1	6.63	22.0	24.5	29.0	28.1	6	
12:50		30.5			24.0					
13:05		33.5	53.1	6.63	28.5		33.0	31.8		

Cell No	TIME	PRESS MPA	BRINE FLUX l/min	time min	P E M E A T E			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	PH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
1	10:20	800	1.6	30	25/	1016				
	10:50				26.5/	929				
	11:20				27.0/	999				
	:				/					
	:				/					
2	10:20	800	1.6	30	51/	19680				
	10:50				51.5/	20200				
	11:20				53.1/	19930				
	:				/					
	:				/					
3	10:20	800	1.6	30	63/	11990				
	10:50				63/	11780				
	11:20				65/	11720				
	:				/					
	:				/					

PRD; 91.11.22 mba



RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-2) DATE 3 Dec. 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC	pH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									4	SC-8000
:									6	NTR759HR
:									7	NTR759SW

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	pH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
4	10:20	800	1.6	30	18/	2140				
	10:50				17.5/	2150				
	11:20				18.5/	2220				
	11:50	800	4.0	30	17.1/	2130				
	12:20				19/	2040				
	12:50			15	10/	2030	6.5/			
6	10:20	800	1.6	30	35/	1160				
	10:50				35/	1140				
	11:20				36/	1140				
	11:50		4.0	30	38/	1090				
	12:20				41.5/	1140				
	12:50			15	23/	1240	6.43			
7	10:20	800	1.6	30	27/	1420				
	10:50				27/	1370				
	11:20				28/	1340				
	11:50		4.0	30	29/	1190				
	12:20				32.5/	1120				
	12:50			15	17.5/	1200	6.46			

PRD; 91.11.22 mla

RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-3) DATE 3 Dec 1991

TIME	PRESS	F E E D			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP	EC	PH	TEMP.(°C)		TEMP.(°C)			
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									8	UTC-80HR
:									9	UTC-80HF
:									10	UTC-70

Cell No	TIME	PRESS	BRINE FLUX	time	P E M E A T E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scan	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
8	10:20	800	1.6	30	24 /	848				
	10:50				23 /	834				
	11:20				24 /	818				
	11:50		4.0	30	25.5 /	750				
	12:20				28.0 /	726				
	12:50				15	16.5 /	763	6.65		
9	10:20	800	1.6	30	31 /	928				
	10:50				30.5 /	912				
	11:20				32.5 /	890				
	11:50		4.0	30	35.0 /	746				
	12:20				38.5 /	722				
	12:50				15	22 /	733	6.33		
10	10:20	800	1.6	30	63 /	10730				
	10:50				62 /	10500				
	11:20				62 /	10930				
	11:50		4.0	30	106 /	22600				
	12:20				114 /	22100				
	12:50				15	61 /	21000	6.33		

PRO; 91.11.22 ~~mb~~

RECORDING SHEET FOR R-6 EXPERIMENT (P3-1-4) DATE 3 DEC 1991

TIME	PRESS	FEED			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	mS/cm	-	IN	OUT	IN	OUT		
:									11	NTR759SW
:									12	NTR759HK
:										
:										
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	PE MEAT E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
					mL / scale	µS/cm	-	mg/l	%	m³/m²·day
11	10:20	800	1.6	30	24 /	175 /				
	10:50				23.5 /	1680				
	11:20				25 /	1655				
	:				/					
	:				/					
	:				/					
12	10:20	800	1.6	30	32 /	1.100				
	10:50				32 /	1.09				
	11:20				33 /	1.077				
	:				/					
	:				/					
	:				/					
	:				/					
	:				/					
	:				/					

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-1-1) DATE DEC. 8, 1991

56 kg/cm<sup>2</sup>  
797 PSI  
5.5 MPa  
:  
:  
5 kg/cm<sup>2</sup>  
25 PSI  
4 MPa  
:  
:  
v

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL No	MEMBRANE NAME
		TEMP. °C	EC MS/cm	PH	TEMP. (°C) IN	TEMP. (°C) OUT	TEMP. (°C) IN	TEMP. (°C) OUT		
9:20	start									
9:50	5.5	27.0	53.3	6.51	17.0	19.5	26.0	26.0	1	NTR759HR
10:10		26.0	53.2	6.54	16.0	18.0	26.0	26.8	2	NTR759HR
10:30		26.0	53.2	6.56	16.0	19.2	26.0	26.5	3	NTR759SR
10:55	6.4			6.4						
11:10		27.0	53.3	6.45	16.0	18.0	26.8	27.5		
11:30		27.0	53.3	6.47	18	1-	27.0			

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	P.E. MEAT E			CALCULATED		
					Flux ml/scale	EC μS/cm	PH	Conc. mg/l	Rej %	Flux m <sup>3</sup> /m <sup>2</sup> .day
1	9:50	5.5	4.0	20	28/	2.460				
	10:10	↓	↓	↓	29/	2.350				
	10:30	↓	↓	↓	28/	2.380				
	11:10	6.4	↓	↓	36.4/	2.030				
	11:30	↓	↓	↓	36.1/	2.080	6.14			
1	:				1					
2	9:50	5.5	4.0	20	28/	2.010				
	:	↓	↓	↓	28.5/	2.040				
	:	↓	↓	↓	27.8/	2.020				
	:	6.4	↓	↓	36.4/	1.710				
	:	↓	↓	↓	36/	1.770	6.4			
2	:				1					
3	9:50	5.5	4.0	20	18.5/	3.220				
	10:10	↓	↓	↓	18.7/	3.010				
	10:30	↓	↓	↓	18.5/	2.960				
	:				1					
3	:				1					
3	:				1					

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-1-2) DATE Dec. 8, 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC	pH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									6	NTR759SW
:									8	UTC80HR
:									12	UTC80HR

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	pH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
6	9:50	5.5	4.0	20	18.5/	2110				
	10:10	↓	↓	↓	18.2/	2080				
	10:30	↓	↓	↓	18.0/	2080				
	11:10	6.4	↓	↓	24.2/	1890				
	11:30	↓	↓	↓	23.1/	1890	6.3			
:	:	:	:	:	1					
8	9:50	5.5	4.0	20	19.1/	1780				
	10:10	↓	↓	↓	19.2/	1650				
	10:30	↓	↓	↓	19.2/	1680				
	11:10	6.4	↓	↓	26.0/	1520				
	11:30	↓	↓	↓	25.1/	1550	6.35			
:	:	:	:	:	1					
12	9:50	5.5	4.0	20	18.5/	845				
	:	↓	↓	↓	19.5/	220				
	:	↓	↓	↓	18.7/	1050				
	:	6.4	↓	↓	25.2/	892				
	:	↓	↓	↓	25.0/	905	6.45			
:	:	:	:	:	1					

PRO; 91.11.22 *mlb*

RECORDING SHEET FOR R-6 EXPERIMENT (4-2-1) DATE Dec. 9, 1991

TIME	PRESS	F E E D			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP.	EC	PH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
8:30	start		53.5							
8:50	5.5	26.0	53.2	6.57	14.0		25.2	25.5	1	UTC-80HF
9:20		25.0	53.2	6.59	14.0	17.0	25.0	25.5	2	"
9:30	5.5	27.0	53.3	6.59	17.0	19.8	26.2	27.0	3	SC-8000
11:10		27.0	53.4	6.60	16.0		26.5	27.0		
11:40	5.5	25.0	53.2	6.61	14.0		25.4	25.5		
12:10	5.5	25.5	53.2	6.62	15.0		25.4	25.5		
12:20	6.4	26.0	53.2	6.62	15.0		26.2			

Cell No	TIME	PRESS	BRINE FLUX	time	P E M E A T E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
:	:	MPa	l/min	min	ml/scale	uS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	8:50	5.5	4.0	30	44/	1.534				
	9:20				45.5/	1.390				
	11:10	5.5	1.6		36/	1.570				
	11:40	5.5			35/	1.470				
	12:20	6.4	1.6	20	32.5/	1.600				
2	:				42/	2.370				
	:				43/	2.120				
	:				38/	2.320				
	:				38/	2.090				
	:			20	34/	1.890				
	:				1					
3	:				18/	2.460				
	:				19/	2.230				
	:				17.5/	1.860				
	:				17/	1.760				
	:			20	16.5/	1.490	6.0			
	:				1					

M. change

M. change

M. change

2990  
3320  
3610

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT-(M-2-2) DATE Dec. 9, 1991

TIME	PRESS	FEED			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									6	SC-8000
:									8	NTR759HR
:									12	"
:									10	"

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej.	Flux
					ml/scale	MS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
6 <i>Mem. change</i>	:			30	18 /	2030				
	:				17 /	2070				
	:				17 /	1700				
	:				17 /	1640				
	:			20	15 /	1400	6.2			
	:				/					
8 <i>Mem. change</i>	:				37 /	1340				
	:				37.5 /	1290				
	:				36.0 /	1640				
	:				35.5 /	1550				
	:			20	33.5 /	1270	6.2			
	:				/					
12 <i>M. change</i>	:				39 /	1640				
	:				39 /	1570				
	:				34 /	1390				
	:				31.5 /	1220				
	:			20	30.5 /	1090	6.2			
	:				/					

10 30 34 3140  
 32 2940  
 20 29 1250 6.4  
 7-70  
 PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT-(P-3-1) DATE Dec. 10, 199

TIME	PRESS	FEED			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC MS/cm	PH	IN	OUT	IN	OUT		
10:10	5.5	25.0	53.1	6.46	12.0	19.5	25.0	24.8	1	SC8000
10:40	5.5	25.0	53.1	6.48	15.5	19.5	25.5	25.5	6	
11:10	5.5	25.0	53.1	6.51	15.0	18.1	25.2	25.8		
:										
:										
:										
:										
:										

NaCl 34953 ✓

Cell No	TIME	PRESS	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	PH	Conc. mg/l	Rej. %	Flux $m^3/m^2 \cdot day$
1	10:10	5.5	1.6	30	20.5	6950				
	10:40				21.5	7950				
	11:10				20	9210				
2	10:10	5.5	1.6	30	18.0	2780				
	:				18.5	2540				
	:				18.1	2520				
3	10:10	5.5	1.6	30	21	6850				
	:				21	8560				
	:				21	9550				
4	10:10	5.5	1.6	30	19	3150				
	:				18	3540				
	:				18	3690				
5	10:10	5.5	1.6	30	19.5	2290				
	:				18	2500				
	:				17	2550				
6	10:10	5.5	1.6	30	18.0	2790				
	:				19	2650				
	:				18	2840				

9:40 start

PRD; 91.11.22





RECORDING SHEET FOR R-6 EXPERIMENT-(P-4-1) DATE Dec. 10, 199

TIME	PRESS	F E E D			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP	EC	pH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
12:40	5.5	25.2	53.0	6.53	15.0	18.4	25.7	26.3	1	SC-8050
:40	5.5	26.0	53.1	6.54	16.0	19.5	26.2	26.5	5	
13:10	5.5	26.0	53.0	6.55	17.0	20.0	26.5	26.7	6	
:										
:										
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	RE ME A T E			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µ S/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	12:10		1	29	181	5240				
	:40			30	181	3360				
	13:10				191	3180	6.0			
2	12:10			29	171	2980				
	:40			30	181	2480				
	:10				18.51	2420	6.3			
3	12:10				181	7950				
	:40				18.51	4170				
	:				18.51	5100	6.2			
4	12:10				171	4270				
	:40				181	3680				
	:				181	3610	6.3			
5	12:10				171	2780				
	:40				17.51	2380				
	:				18.51	2240	6.2			
6	12:10				171	3240				
	:40				181	2090				
	:				181	2630	6.1			

12:10 29-t  
 No. 3 Membrane change  
 11/27. Add to space  
 11/12 Membrane change

RECORDING SHEET FOR R-6 EXPERIMENT (P-4-2) Dec. 10, 199

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL No	MEMBRANE NAME
		TEMP.	EC	PH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
12:40									7	SC-8000
:									5	
:									12	
:										
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	PE MEAT. E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
7	12:10				17.5 / 16.5	4.000				
	:40				18 /	2210				
	13:10				19 /	2130	6.3			
8	12:10				16 /	2710				
	:40				17 /	2260				
	13:10				18 /	2250	9.6			
9	12:10				17 /	2620				
	:40				18 /	2680				
	13:10				19.5 /	2450	6.9			
10	12:10				18 /	2310				
	:40				18.5 /	2420				
	13:10				19 /	2310	6.4			
11	12:10				17 /	2440				
	:40				18.5 /	1950				
	:				19.1 /	1860	6.1		949	
12	12:10				15 /	2200				
	:40				17.5 /	1750				
	:				17.1 /	1730	6.1		882	

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT-(M-3-1) DATE Dec. 11, 199

TIME	PRESS	F E D			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP.	EC	pH	TEMP.(°C)	TEMP.(°C)	TEMP.(°C)	TEMP.(°C)		
:	MPa	°C	ms/cm	-	IN	OUT	IN	OUT	No	NAME
10:15	5.5	25.0	60.8	6.54	13.0	18.5	25.0	25.5	1	UTC80HR
10:45	5.5	26.0	60.9	6.57	16.0	18.5	28.0	26.5	2	" 80HR
11:15	5.5	24.8	60.9	6.57	14.0	17.5	24.8	25.3	3	" 80HR
11:45	5.5	26.0	60.9	6.59	17	20.0	26.2	25.7		
12:00	6.4	27.0	60.9	6.59	15	16.5	26.7	26.6		
12:30	6.4	26.0	60.8	6.59	13.0	16.0	26.0	27.0		
12:39	6.4	25.0	60.8	6.60	13.0	16.0	25.6	25.7		
	6.4	25.0	60.8	6.60	12.0	16.0	25.5	26.0		✓

Cell No	TIME	PRESS	BRINE FLUX	time	RE MEAT E			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
:	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	10:15	5.5	1.6	30	201	802				
	10:45	"	"	"	18.51	766				
	:	"	"	"	201	748				
	12:00	6.4	1.6	30	26.7	568				
	:	"	"	"	25.51	576	6.6			
2	10:15				261	1108				
	:				26.51	1060				
	:				271	1047				
	12:00				361	883				
	:				34.51	907	6.6			
3	:				181	2610				
	:				181	2468				
	:				181	2470				
	:				1					
	:				1					

PRD: 91.11.22 mls

RECORDING SHEET FOR RFD EXPERIMENT

TIME	PRESS	FEED			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									4	NTR759SW
:									5	SC8000
:									6	NTR759HR
:										✓

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
	:	MPa	L/min	min	ml/scale	MS/cm	-	mg/L	%	m <sup>3</sup> /m <sup>2</sup> .day
4	:				21.5/	1540				
	:				21.0/	1460				
	:				22/	1430				
	12:00				29/	1132				
	:				28/	1137	6.4			
	:				/					
5	:				14.5/	2890				
	:				<del>14.5/</del> 15/	2820				
	:				15/	2820				
	12:00				20/	2130				
	:				18.5/	2220	6.0			
	:				/					
6	:				27.5/	1090				
	:				27/	1090				
	:				28/	1090				
	12:00				36/	890				
	:				35.5/	880	6.1			
	:				/					

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-3-3) Dec. 11, 1991

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP.	EC	PH	TEMP. (°C)		TEMP. (°C)			
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									7	NTR759SW
:									8	UTC80HR
:									9	HF
:										
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	P.E. MEAT E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
:	:	MPa	l/min	min	ml/scale	μS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
7	:				22.0	3500				
	:				27.8	3070				
	:				23.0	3250				
	:				21					
	:				1					
8	:				29	2290				
	:				18	2260				
	:				20	2110				
	12:00				27	1712				
	:				25	1723	8.6			
9	:				28	1420				
	:				27	1420				
	:				28	1340				
	12:00				38	1095				
	:				36.5	1113	6.7			

PRD; 91.11.22 *mls*

RECORDING SHEET FOR K-O EXPERIMENT 91-3-4) 11/11/91

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									10	NTR759 HR
:									11	NTR759 SW
:									12	NTR759 HR

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu S/cm$	PH -	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
					10	:				(24)/
	:				30/	3950				
	:				30/	3850				
	:				/					
	:				/					
	:				/					
11	:				20/	3340				
	:				21/	2990				
	:				20/	3120				
	:				/					
	:				/					
	:				/					
12	:				28/	3580				
	:				29/	3390				
	:				28/	3520				
	:				/					
	:				/					
	:				/					

PRD: 91.11.22

RECORDING SHEET FOR K-6 EXPERIMENT (1-5-1) 11.11.1971

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC	PH	IN	OUT	IN	OUT		
13:00	6.4	25.0	60.8	6.6	13.0	16.8	25.2	25.8		
13:20	6.4	28.0	-	6.6	20.5	23.0	28.2	27.5		
13:40	6.4	31.0	-	6.6	24.0	26.0	30.9	29.8		
14:00										
14:20										
14:40										
15:00										

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
		MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
1	13:00	6.4	4.1	30	30 /	493				
	13:20				/					
	13:40				/					
2	13:00	6.4	4.0	30	40 /	742				
	13:20				/					
	13:40				/					
6	13:00	6.4	4.0	30	39 /	820				
	13:20				/					
	13:40				/					
9	13:00	6.4	4.0	30	43 /	945				
	13:20				/					
	13:40				/					
	14:00				/					
	14:20				/					
	14:40				/					
	15:00				/					

PRD: 91.11.22 mls



RECORDING SHEET FOR R-6 EXPERIMENT (M-5-1) DATE Dec. 14, 199

20 art

TIME	PRESS	F E E D			COOLING SYS. TEMP.(°C)		FEED TANK TEMP.(°C)		CELL No	MEMBRANE NAME
		TEMP °C	EC ms/cm	PH	IN	OUT	IN	OUT		
9:50	5.5	25.5	53.8	6.49	14.5	17.5	25.4	25.9	1	UTC-80HR
10:20	5.5	25.0	53.9	6.51	15.0	19.5	25.0	24.7	2	" HF
10:50 (10:53)	5.5 (6.4)	25.5	53.9	6.52	16.0	19.5	25.5	25.3	3	UTR259 HR
11:20	6.4	26.0	54.9	6.53	16.0	-	25.3	25.3		(CH): change mem.
11:50	6.4	26.0	54.0	6.54	16.0	19.0	25.0	24.8		
12:20	5.5	26.0	53.7	6.54	17.0	19.7	25.7	25.3		
12:50	5.5	26.0	53.7	6.55	17.0	-	25.8	-		

Cell No	TIME	PRESS MPA	BRINE FLUX l/min	time min	P E M E A T E			CALCULATED		
					Flux ml/scale	EC μS/cm	PH	Conc. mg/l	Rej %	Flux m <sup>2</sup> /mi <sup>2</sup> -day
1	9:50	5.5	1.6	30	271	397				
	10:20	"	"	"	271	436				
	10:50	6.4	"	"	435	370				
	11:20	6.4	1.6	"	341	350	6.35			
	11:50	5.5	4.0	"	27.5	358				
	12:20	"	"	"	271	376				
2	9:50	5.5	1.6	30	331	685				
	10:20	"	"	"	321	702				
	10:50	6.4	"	"	421	694				
	11:20	"	"	"	411	624	6.40			
	11:50	5.5	4.0	"	341	601				
	12:20	"	"	"	341	597				
3	9:50	5.5	1.6	30	34.5	1402				
	10:20	"	"	"	341	1448				
	10:50	6.4	"	"	441	1220				
	11:20	"	"	"	431	1164	6.2			
	:									
	:									

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-5-2) DATE Dec. 14, 199

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC	DH	IN	OUT	IN	OUT		
:	MPa	°C	ms/cm	-	IN	OUT	IN	OUT	No	NAME
:									4	NTR759SW
:									5	SC-8000
:									6	NTR759HR

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/sec	EC $\mu S/cm$	PH	Conc. mg/l	Rej %	Flux $m^2/m^2 \cdot day$
4	9:50	5.5	1.6	30	27.5	900				
	10:20	"	"	"	27.1	931				
	10:50	6.4	"	"	36.1	875	6.4			
	11:20	"	"	"	35.1	872				
	11:50	5.5	4.0	30	28.1	880				
	12:20	"	"	"	29.1	862				
5	9:50	5.5	1.6	30	17.5	2220				
	10:20	"	"	"	18.1	2180				
	10:50	6.4	"	"	22.1	2000	6.1			
	11:20	"	"	"	22.1	1938				
	11:50	5.5	4.0	"	16.5	2090				
	12:20	5.5	4.0	"	17.1	2130				
6	9:50	5.5	1.6	30	34.4	770				
	10:20	"	"	"	35.1	773				
	10:50	6.4	"	"	45.1	726	6.3			
	11:20	"	"	"	45.1	7087				
	11:50	5.5	4.0	"	34.5	703				
	12:20	"	"	"	35.1	699				

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-5-3) DATE Dec. 14, 199

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									7	NTR759SW (CH)
:									8	UTC80HR (CH)
:									9	UTC80HF

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	RE MEAT E			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	PH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
7	9:50	5.5	1.6	30	25%	2990				
	10:20	"	"	"	26/	2780				
	10:50	6.4	"	"	33/	2460				
	11:20	"	"	"	32/	2300	6.1			
	:				/					
8	9:50	5.5	1.6	30	23%	1660				
	10:20	"	"	"	24/	1550				
	10:50	6.4	"	"	31/	1360				
	11:20	"	"	"	31/	1260	6.6			
	11:50	5.5	4.0	"	/					
	12:20	"	"	"	/					
9	9:50	5.5	1.6	30	44.5/	671				
	10:20	"	"	"	35/	670				
	10:50	6.4	"	"	46/	607				
	11:20	"	"	"	45/	586	6.7			
	11:50	5.5	4.0	"	36/	572				
	12:20	"	"	"	39/	538				

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-5-4) DATE Dec. 14, 199

TIME	PRESS	F E E D			COOLING SYS.		F E E D T A N K		CELL	MEMBRANE
		TEMP	EC	DH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									10	NTR759HR
:									11	" SW
:									12	" HR
:										

(CF)  
(CF)  
(CF)

✓

Cell No	TIME	PRESS	BRINE FLUX	time	P E M E A T E			C A L C U L A T E D		
					Flux	EC	pH	Conc.	Rej	Flux
:	:	MPa	l/min	min	ml/scan	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
10	9:50	5.5	1.6	30	411	4780				
	10:20	"	"	"	421	4540				
	10:50	STOP			/	—				
	:				/					
	:				/					
	:				/					
11	9:50	5.5	1.6	30	2451	1330				
	10:20	"	"	"	251	1260				
	10:50	6.4	"	"	321	1056				
	11:20	"	"	"	321	981	6.5			
	:				/					
	:				/					
12	9:50	5.5	1.6	30	361	2700				
	10:20	"	"	"	261	2630				
	10:50	6.4	"	"	471	2260				
	11:20	"	"	"	461	2120	6.3			
	:				/					
	:				/					

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-5-6) DATE Dec. 14, 199

TIME	PRESS	F E D			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	DH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
12:50	6.4									
13:00		27.0	53.8	6.6	17.0	19.0	27.0	26.7		
13:30	6.4	27.5	53.9	6.6	17.0	20.2	27.0	26.8		
:										
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	P E M E A T E			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>2</sup> /m <sup>2</sup> ·day
1	12:50	6.4	4.0	30	38/	328				
2	12:50	"	"	"	45/	523				
4	12:50	"	"	"	39/	760				
6	12:50	"	"	"	49/	592				
9	12:50	"	"	"	52/	482				
:	:				/					
:	:				/					
:	:				/					
:	:				/					
:	:				/					
:	:				/					
:	:				/					
:	:				/					
:	:				/					
:	:				/					

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-6-1) DATE Dec. 16, 1991

start  
8:45

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL No	MEMBRANE NAME
		TEMP	EC	pH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	mS/cm	-	IN	OUT	IN	OUT		
9:15	4.9	25.0	54.0	6.47	12.0	20.0	25.0	25.0	1	ZTC 80HR
9:45	4.9	26.0	53.8	6.49	13.0	21.5	25.8	25.4	2	" HF
10:20	5.9	25.0	53.9	6.51	14.0	17.5	24.0	24.3	3	NTR 759HR
10:50	5.9	25.0	54.0	6.52	15.0		24.0	23.9		
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
					ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	9:15	4.9	1.6	30	201	489				
	9:45	"	"	"	207	462				
	10:20	5.9	"	"	291	375				
	10:50	"	"	"	301	373	6.0			
	:				1					
2	9:15	4.9	1.6	30	251	788				
	9:45	"	"	"	251	790				
	10:20	5.9	"	"	351	643				
	10:50	"	"	"	361	620	6.0			
	:				1					
3	9:15	4.9	1.6	30	281	1511				
	9:45	"	"	"	281	1488				
	10:20	5.9	"	"	401	1190				
	10:50	"	"	"	401	1185	6.0			
	:				1					

f. 7 0 8 12 (CH)  
 753 30 219  
 SW 115 112  
 112  
 SC 811

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-6-2) DATE Dec. 16, 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									4	NTR759S77
:									5	SC-8000
:									6	NTR759HR
:										
:										
:										

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
					ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
4	9:15	4.9	1.6	30	22 /	1070				
	9:45	"	"	"	21 /	1102				
	10:20	5.9	"	"	30.5 /	915				
	10:50	"	"	"	31 /	917	6.3			
	:				1					
5	9:15	4.9	1.6	30	14 /	2690				
	9:45	"	"	"	14 /	2670				
	10:20	5.9	"	"	19 /	2190				
	10:50	"	"	"	19.5 /	2150	5.9			
	:				1					
6	9:15	4.9	1.6	30	27 /	929				
	9:45	"	"	"	26.5 /	933				
	10:20	5.9	"	"	38 /	736				
	10:50	"	"	"	39 /	745	6.1			
	:				1					

PRD: 91.11.22 mba

RECORDING SHEET FOR R-6 EXPERIMENT (4-6-3) DATE 12<sup>th</sup> Dec. 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									7	NTR759SW (CH)
:									8	JTC80HR (CH)
:									9	JTC80HF

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
					ml/scale	µS/cm	-	mg/l	%	mm <sup>3</sup> /m <sup>2</sup> .day
7	9:15	4.9	1.6	30	21/	1000				
	9:45	"	"	"	20/	948				
	10:20	5.9	"	"	28 <sup>5</sup> /	743				
	10:50	"	"	"	29/	708	6.1			
	:				/					
8	9:15	4.9	1.6	30	26/	1445				
	9:45	"	"	"	26/	1340				
	10:20	5.9	"	"	36/	1112				
	10:50	"	"	"	37/	1105	9.4			
	:				/					
9	9:15	4.9	1.6	30	27 <sup>5</sup> /	768				
	9:45	"	"	"	27 <sup>0</sup> /	758				
	10:20	5.9	"	"	38 <sup>5</sup> /	611				
	10:50	"	"	"	39 <sup>5</sup> /	630	6.8			
	:				/					

PRD: 91.11.22 *mls*



RECORDING SHEET FOR R-6 EXPERIMENT (4-6-4) DATE Dec. 16, 199

TIME	PRESS	F E E D			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP	EC	pH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:									10	NTR759HR (CH)
:									11	NTR759SW
:									12	SC-8000 (CH)

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
10	9:15	4.9	1.6	30	32 /	3450				
	9:45	"	"	"	32 /	3350				
	:				/					
	:				/					
	:				/					
11	9:15	4.9	1.6	30	22 /	994				
	9:45	"	"	"	21 /	1013				
	10:20	5.9	"	"	29 /	860				
	10:50	"	"	"	29 /	863	6.2			
	:				/					
12	9:15	4.9	1.6	30	15 /	2650				
	9:45	"	"	"	14 /	2740				
	10:20	5.9	"	"	21 /	2690				
	10:50	"	"	"	21 /	2730	6.3			
	:				/					

PRO; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (M-7-1) DATE Dec. 16, 1991

start  
12:30

TIME	PRESS	F E D			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP	EC	DH	TEMP.(°C)	TEMP.(°C)	IN	OUT		
:	MPa	°C	mS/cm	-	IN	OUT	IN	OUT	No	NAME
12:30	5.5	27.0	47.2	6.46	18.0	21.0	26.8	26.5	1	DTC-80HR
13:10	6.5	25.5	47.4	6.47	12.0	15.5	25.3	26.1	2	" HF
13:40	6.5	26.0	47.4	6.48	11.0	18.5	26.0	25.3	3	NTR759HR
14:10	"	29.0	47.3	6.48	21.0	24.5	29.0	27.3	4	" SW
:									5	SC8000
:									6	NTR759HR

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
					ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> ·day
1	12:30	5.5	1.6	30	33/	307				
	13:10	6.4	"	"	39/	259				
	13:40	"	"	"	41/	252	6.2			
2	12:30	5.5	1.6	30	40/	518				
	13:10	6.4	"	"	50/	460				
	13:40	"	"	"	50/	451	6.4			
3	12:30	5.5	1.6	30	45/	971				
	13:10	6.4	"	"	54/	822				
	13:40	"	"	"	55/	840	6.2			
4	12:30	5.5	1.6	30	35/	740				
	13:10	6.4	"	"	42/	669				
	13:40	"	"	"	43/	671	6.6			
5	12:30	5.5	1.6	30	22/	1750				
	13:10	6.4	"	"	26/	1510				
	13:40	"	"	"	25.5/	1530	5.7			
6	12:30	5.5	"	"	44/	620				
	:	6.4	"	"	52/	527				
	:	"	"	"	52.5/	545	5.9			

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (11-7-2) DATE Dec. 16, 199

TIME	PRESS	F E E D			COOLING SYS.		FEED TANK		CELL	MEMBRANE
		TEMP.	EC	PH	TEMP.(°C)		TEMP.(°C)			
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT	No	NAME
:									7	NTR759SW
:									8	UTC80HR
:									9	UTC80HF
:									11	NTR759SW
:									12	SC 8000

Cell No	TIME	PRESS	BRINE FLUX	time	PERMEATE			CALCULATED		
					Flux	EC	PH	Conc.	Rej	Flux
:	:	MPa	l/min	min	ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
7	12:30	5.5	1.6	30	321	534				
	13:10	6.4	"	"	381	470				
	13:40	"	"	"	391	467	6.0			
8	12:10	5.5	1.6	30	421	812				
	13:10	6.4	"	"	481	742				
	13:40	"	"	"	491	739	7.4			
9	12:30	5.5	1.6	30	441	509				
	13:10	6.4	"	"	531	422				
	13:40	"	"	"	541	435	6.7			
11	12:30	5.5	1.6	30	331	676				
	13:10	6.4	"	"	391	603				
	13:40	"	"	"	401	604	6.5			
12	12:30	5.5	1.6	30	231	2330				
	13:10	6.4	"	"	271	2080				
	13:40	"	"	"	27 <sup>5</sup> 1	2040	6.7			
:					1					
:					1					
:					1					

PRO: 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (4-8-1) DATE 11.12.1991

START  
11:10

TIME	PRESS	FEED			COOLING SYS.		FEED TANK		CELL No	MEMBRANE NAME
		TEMP. °C	EC	pH	TEMP. (°C)	IN	OUT	IN		
11:40	1.5	25.0	2.96	6.56	15.0	21.0	25.2	25.1	1	UTC 70
12:10	1.5	24.0	2.97	6.6	15.0	20.5	24.5	24.2	12	
13:00	1.5	25.0	2.98	6.6	17.0	20.5	25.5			
13:30	1.5	25.0	2.98	6.6	16.0		25.2	25.2		
14:10	1.4									

Cell No	TIME	PRESS	BRINE FLUX	time	P.E. MEAT E			CALCULATED		
					Flux	EC	pH	Conc.	Rej	Flux
					ml/scale	µS/cm	-	mg/l	%	m <sup>3</sup> /m <sup>2</sup> .day
1	11:40	1.5	1.6	30	46.5	106				
	12:10	"	"	"	48.1	99.4				
	13:00	1.5	4.0	31	46.1	75				
2	11:40	1.5	1.6	30	43.1	207				
	12:10	"	"	"	45.1	194				
	13:00	1.5	4.0	31	46.1	75				
3	11:40	1.5	1.6	30	39.1	145				
	12:10	"	"	"	40.1	138				
	13:00	1.5	4.0	31	41.1	99.6				
4	11:40	1.5	1.6	30	38.1	75.7				
	12:10	"	"	"	40.1	71.9				
	13:00	1.5	4.0	31	40.1	54				
5	11:40	1.5	1.6	30	38.1	106				
	12:10	"	"	"	39.1	96.9				
	13:00	1.5	4.0	31	39.1	77				
6	11:40	1.5	1.6	30	38.1	114				
	12:10	"	"	"	39.1	107				
	13:00	1.5	4.0	31	38.1	86				

PRO; 91.11.22 mba

RECORDING SHEET FOR R-6 EXPERIMENT (7-8-2) DATE Dec. 17, 1991

TIME	PRESS	FEED			COOLING SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC $\mu$ S/cm	PH	IN	OUT	IN	OUT		
:	MPa	°C	MS/cm	-	IN	OUT	IN	OUT		
:										
:										
:										
:										
:										

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	PERMEATE			CALCULATED		
					Flux ml/scale	EC $\mu$ S/cm	PH	Conc. mg/l	Rej %	Flux $m^3/m^2 \cdot day$
7	11:40	1.5	1.6	30	40 /	156				
	12:10	"	"	"	41.5 /	150				
	:									
8	11:40	1.5	1.6	30	44 /	165				
	12:10	"	"	"	45 /	154				
	:				1					
9	11:40	1.5	1.6	30	38 /	152				
	12:10	"	"	"	39 /	144				
	13:00	1.5	4.0	31	40 /	112				
10	11:40	1.5	1.6	30	42.5 /	169				
	12:10	"	"	"	44 /	162				
	:				1					
12	11:40	1.5	1.6	30	42 /	134				
	12:10	"	"	"	42.5 /	126				
	13:00	1.5	4.0	31	42 /	100				
	13:30	"	"	39	41 /					
:					1					
:					1					

PRD; 91.11.22

RECORDING SHEET FOR R-6 EXPERIMENT (17-8-3) DATE Dec. 17, 1991

TIME	PRESS	F E E D			COOLING & SYS. TEMP. (°C)		FEED TANK TEMP. (°C)		CELL No	MEMBRANE NAME
		TEMP. °C	EC mS/cm	PH	IN	OUT	IN	OUT		
14:45	1.5	25.5	2.99	6.6	18.0	—	26.0	25.9		
:										
:										
:										
:										
:										

Cell No	TIME	PRESS MPa	BRINE FLUX l/min	time min	P E M E A T E			CALCULATED		
					Flux ml/scale	EC μS/cm	PH	Conc. mg/l	Rej %	Flux m <sup>3</sup> /m <sup>2</sup> ·day
1	13:30	1.5	4.0	30	45/	72.4				
	14:10	1.5	2.0		37.5/	74.2				
	:				/					
3	13:30	1.5	4.0	30	37.5/	98.0				
	:				25.0/	138				
	:				/					
4	13:30	1.5	4.0	30	37/	54.0				
	:				32/	60.7				
	:				/					
5	13:30	1.5	4.0	30	38/	85.4				
	:				32/	102				
	:				/					
6	13:30	1.5	4.0	30	38/	110				
	:				28/	92				
	:				/					
9	13:30	1.5	4.0	30	37.5/	99.1				
	:				/					
	:				/					

PRO; 91.11.22 mba

M9112YY

## RESULT OF EXPERIMENT (MAIN )

DATANO	MEMBLENE	FEED				FEED							
		CONC	PRES	TEMP	CELS	FLUX	EC	FLOW	CONC	REJ	FLUX		
911216B	NTR759HR	30573	6.5	25.5	6	*	52.0	527	1.6	259	99.15	1.628	○
911216B	NTR759HR	30573	6.5	26.0	6	*	52.5	545	1.6	268	99.12	1.643	
911216B	NTR759HR	30573	6.5	25.5	3	*	54.0	822	1.6	411	98.66	1.690	
911216B	NTR759HR	30573	6.5	26.0	3	*	55.0	840	1.6	420	98.63	1.722	
911216B	NTR759HR	30573	5.5	27.0	6	*	44.0	620	1.6	307	99.00	1.377	○
911216B	NTR759HR	30573	5.5	27.0	3	*	45.0	971	1.6	488	98.40	1.409	
911216A	NTR759HR	35589	4.9	25.0	6	*	27.0	929	1.6	466	98.69	0.845	○
911216A	NTR759HR	35589	4.9	26.0	6	*	26.5	933	1.6	468	98.68	0.829	
911216A	NTR759HR	35589	4.9	26.0	3	*	28.0	1488	1.6	759	97.87	0.876	
911216A	NTR759HR	35589	4.9	25.0	3	*	28.0	1511	1.6	772	97.83	0.876	
911216A	NTR759HR	35589	4.9	26.0	10	*	32.0	3350	1.6	1,759	95.06	1.002	
911216A	NTR759HR	35589	4.9	25.0	10	*	32.0	3450	1.6	1,813	94.91	1.002	
911214A	NTR759HR	35547	5.5	25.5	6	*	34.5	770	1.6	384	98.92	1.080	○
911214A	NTR759HR	35547	5.5	25	6	*	35.0	773	1.6	386	98.91	1.096	
911209	NTR759HR	35060	5.5	25	12	*	33.5	1280	1.6	650	98.15	1.049	
911214A	NTR759HR	35547	5.5	25.5	3	*	34.5	1402	1.6	714	97.99	1.080	
911209	NTR759HR	35060	5.5	27	12	*	34.0	1390	1.6	708	97.98	1.064	
911214A	NTR759HR	35547	5.5	25	3	*	34.0	1448	1.6	738	97.92	1.064	
911209	NTR759HR	35060	5.5	25	8	*	35.5	1550	1.6	792	97.74	1.111	
911209	NTR759HR	35060	5.5	27	8	*	36.0	1640	1.6	840	97.60	1.127	
911214A	NTR759HR	35547	5.5	25	12	*	26.0	2630	1.6	1,369	96.15	0.814	
911214A	NTR759HR	35547	5.5	25.5	12	*	36.0	2700	1.6	1,407	96.04	1.127	
911209	NTR759HR	35060	5.5	25	10	*	32.0	2990	1.6	1,564	95.54	1.002	
911209	NTR759HR	35060	5.5	27	10	*	34.0	3140	1.6	1,645	95.31	1.064	
911214A	NTR759HR	35547	5.5	25	10	*	42.0	4540	1.6	2,409	93.22	1.315	
911214A	NTR759HR	35547	5.5	25.5	10	*	41.0	4780	1.6	2,540	92.85	1.283	
911214A	NTR759HR	35547	5.5	26	6	*	34.5	703	4.0	349	99.02	1.080	●
911214A	NTR759HR	35547	5.5	26	6	*	35.0	699	4.0	347	99.02	1.096	
911209	NTR759HR	35060	5.5	25	8	*	37.5	1290	4.0	655	98.13	1.174	
911209	NTR759HR	35060	5.5	26	8	*	37.0	1340	4.0	681	98.06	1.158	
911209	NTR759HR	35060	5.5	25	12	*	39.0	1520	4.0	776	97.79	1.221	
911209	NTR759HR	35060	5.5	26	12	*	39.0	1640	4.0	840	97.60	1.221	
911208	NTR759HR	35076	5.5	27.0	2	*	28.0	2010	4.0	1,037	97.04	1.315	
911208	NTR759HR	35076	5.5	26.0	2	*	27.8	2020	4.0	1,042	97.03	1.305	
911208	NTR759HR	35076	5.5	26.0	2	*	28.5	2040	4.0	1,053	97.00	1.338	
911208	NTR759HR	35076	5.5	26.0	1	*	29.0	2350	4.0	1,219	96.52	1.362	
911208	NTR759HR	35076	5.5	26.0	1	*	28.0	2380	4.0	1,235	96.48	1.315	
911208	NTR759HR	35076	5.5	27.0	1	*	28.0	2460	4.0	1,278	96.36	1.315	
911216A	NTR759HR	35589	5.9	25.0	6	*	38.0	736	1.6	366	98.97	1.189	○
911216A	NTR759HR	35589	5.9	25.0	6	*	39.0	745	1.6	371	98.96	1.221	
911216A	NTR759HR	35589	5.9	25.0	3	*	40.5	1185	1.6	600	98.31	1.268	
911216A	NTR759HR	35589	5.9	25.0	3	*	40.0	1190	1.6	603	98.31	1.252	
911214A	NTR759HR	35547	6.4	26	6	*	45.0	707	1.6	351	99.01	1.409	○
911214A	NTR759HR	35547	6.4	25.5	6	*	45.0	726	1.6	361	98.98	1.409	
911209	NTR759HR	35060	6.4	26	12	*	45.0	1090	1.6	550	98.43	1.409	
911214A	NTR759HR	35547	6.4	26	3	*	43.0	1164	1.6	589	98.34	1.346	
911214A	NTR759HR	35547	6.4	25.5	3	*	44.0	1220	1.6	618	98.26	1.377	
911209	NTR759HR	35060	6.4	26	8	*	50.3	1270	1.6	645	98.16	1.573	
911214A	NTR759HR	35547	6.4	26	12	*	46.0	2120	1.6	1,095	96.92	1.440	
911214A	NTR759HR	35547	6.4	25.5	12	*	47.0	2260	1.6	1,170	96.71	1.471	
911209	NTR759HR	35060	6.4	26	10	*	43.5	2360	1.6	1,224	96.51	1.362	

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RESULT OF EXPERIMENT (MAIN )											
FEED						FEED					
DATANO	MEMBLENE	CONC	PRES	TEMP	CELS	FLUX	EC	FLOW	CONC	REJ	FLUX
911214A	NTR759HR	35547	6.4	27	6 *	49.0	592	4.0	292	99.18	1.534
911208	NTR759HR	35076	6.4	27.0	2 *	36.4	1710	4.0	877	97.50	1.709
911208	NTR759HR	35076	6.4	27.0	2 *	36.0	1770	4.0	909	97.41	1.690
911208	NTR759HR	35076	6.4	27.0	1 *	36.4	2030	4.0	1,047	97.02	1.709
911208	NTR759HR	35076	6.4	27.0	1 *	36.0	2080	4.0	1,074	96.94	1.690
911211B	NTR759HR	40984	6.4	28.0	6 *	39.0	820	4.0	410	99.00	1.221
911211A	NTR759HR	41018	5.5	24.8	6 *	28.0	1090	1.6	550	98.66	0.876
911211A	NTR759HR	41018	5.5	25	6 *	27.5	1090	1.6	550	98.66	0.861
911211A	NTR759HR	41018	5.5	26	6 *	27.0	1090	1.6	550	98.66	0.845
911211A	NTR759HR	41018	5.5	26	12 *	29.0	3390	1.6	1,780	95.66	0.908
911211A	NTR759HR	41018	5.5	24.8	12 *	28.0	3520	1.6	1,851	95.49	0.876
911211A	NTR759HR	41018	5.5	25	12 *	28.0	3580	1.6	1,884	95.41	0.876
911211A	NTR759HR	41018	5.5	25	10 *	24.0	3730	1.6	1,965	95.21	0.751
911211A	NTR759HR	41018	5.5	24.8	10 *	30.0	3850	1.6	2,031	95.05	0.939
911211A	NTR759HR	41018	5.5	26	10 *	30.0	3950	1.6	2,086	94.91	0.939
911211A	NTR759HR	41018	6.4	26	6 *	36.0	890	1.6	446	98.91	1.127
911211A	NTR759HR	41018	6.4	25	6 *	35.5	890	1.6	446	98.91	1.111
911216B	NTR759SW	30573	5.5	27.0	7 *	32.0	534	1.6	263	99.14	1.002
911216B	NTR759SW	30573	5.5	27.0	11 *	33.0	676	1.6	336	98.90	1.033
911216B	NTR759SW	30573	5.5	27.0	4 *	35.0	740	1.6	368	98.80	1.096
911216B	NTR759SW	30573	6.5	25.5	7 *	38.0	470	1.6	230	99.25	1.189
911216B	NTR759SW	30573	6.5	26.0	7 *	39.0	467	1.6	229	99.25	1.221
911216B	NTR759SW	30573	6.5	25.5	11 *	39.0	603	1.6	298	99.03	1.221
911216B	NTR759SW	30573	6.5	26.0	11 *	40.0	604	1.6	299	99.02	1.252
911216B	NTR759SW	30573	6.5	25.5	4 *	42.0	669	1.6	332	98.91	1.315
911216B	NTR759SW	30573	6.5	26.0	4 *	43.0	671	1.6	333	98.91	1.346
911216A	NTR759SW	35589	4.9	26.0	7 *	20.0	948	1.6	476	98.66	0.626
911216A	NTR759SW	35589	4.9	25.0	11 *	22.0	994	1.6	500	98.60	0.689
911216A	NTR759SW	35589	4.9	25.0	7 *	21.0	1000	1.6	503	98.59	0.657
911216A	NTR759SW	35589	4.9	26.0	11 *	21.0	1013	1.6	510	98.57	0.657
911216A	NTR759SW	35589	4.9	25.0	4 *	22.0	1070	1.6	540	98.48	0.689
911216A	NTR759SW	35589	4.9	26.0	4 *	21.0	1102	1.6	557	98.43	0.657
911214A	NTR759SW	35547	5.5	25.5	4 *	27.5	900	1.6	451	98.73	0.861
911214A	NTR759SW	35547	5.5	25	4 *	27.0	931	1.6	467	98.69	0.845
911214A	NTR759SW	35547	5.5	25	11 *	25.0	1260	1.6	639	98.20	0.783
911214A	NTR759SW	35547	5.5	25.5	11 *	24.5	1330	1.6	676	98.10	0.767
911214A	NTR759SW	35547	5.5	25	7 *	26.0	2780	1.6	1,450	95.92	0.814
911214A	NTR759SW	35547	5.5	25.5	7 *	25.0	2990	1.6	1,564	95.60	0.783
911214A	NTR759SW	35547	5.5	26	4 *	29.0	862	4.0	432	98.78	0.908
911214A	NTR759SW	35547	5.5	26	4 *	28.0	880	4.0	441	98.76	0.876
911208	NTR759SW	35076	5.5	26.0	6 *	18.2	2080	4.0	1,074	96.94	0.854
911208	NTR759SW	35076	5.5	26.0	6 *	18.0	2080	4.0	1,074	96.94	0.845
911208	NTR759SW	35076	5.5	27.0	6 *	18.5	2110	4.0	1,090	96.89	0.869
911208	NTR759SW	35076	5.5	26.0	3 *	18.5	2960	4.0	1,547	95.59	0.869
911208	NTR759SW	35076	5.5	26.0	3 *	18.7	3010	4.0	1,574	95.51	0.878
911208	NTR759SW	35076	5.5	27.0	3 *	18.5	3220	4.0	1,688	95.19	0.869
911216A	NTR759SW	35589	5.9	25.0	7 *	29.0	708	1.6	352	99.01	0.908
911216A	NTR759SW	35589	5.9	25.0	7 *	28.5	743	1.6	370	98.96	0.892
911216A	NTR759SW	35589	5.9	25.0	11 *	29.0	860	1.6	431	98.79	0.908
911216A	NTR759SW	35589	5.9	25.0	11 *	29.5	863	1.6	432	98.79	0.923
911216A	NTR759SW	35589	5.9	25.0	4 *	31.0	917	1.6	460	98.71	0.970



M9112YY

DATANO	MEMBLENE	RESULT OF EXPERIMENT (MAIN )						FEED			
		CONC	PRES	STEMP	CELS	FLUX	EC	FLOW	CONC	REJ	FLUX
911216A	NTR759SW	35589	5.9	25.0	4 *	30.5	915	1.6	459	98.71	0.955
911214A	NTR759SW	35547	6.4	25.5	4 *	36.0	875	1.6	438	98.77	1.127
911214A	NTR759SW	35547	6.4	26	4 *	35.0	872	1.6	437	98.77	1.096
911214A	NTR759SW	35547	6.4	26	11 *	32.0	981	1.6	493	98.61	1.002
911214A	NTR759SW	35547	6.4	25.5	11 *	32.0	1056	1.6	533	98.50	1.002
911214A	NTR759SW	35547	6.4	26	7 *	32.0	2300	1.6	1,192	96.65	1.002
911214A	NTR759SW	35547	6.4	25.5	7 *	33.0	2460	1.6	1,278	96.40	1.033
911214A	NTR759SW	35547	6.4	27	4 *	39.0	760	4.0	379	98.93	1.221
911208	NTR759SW	35076	6.4	27.0	6 *	24.0	1830	4.0	941	97.32	1.127
911208	NTR759SW	35076	6.4	27.0	6 *	23.0	1870	4.0	962	97.26	1.080
911211A	NTR759SW	41018	5.5	24.8	4 *	22.0	1430	1.6	729	98.22	0.689
911211A	NTR759SW	41018	5.5	26	4 *	21.0	1460	1.6	745	98.18	0.657
911211A	NTR759SW	41018	5.5	25	4 *	21.5	1540	1.6	787	98.08	0.673
911211A	NTR759SW	41018	5.5	26	11 *	21.0	2990	1.6	1,564	96.19	0.657
911211A	NTR759SW	41018	5.5	26	7 *	23.0	3070	1.6	1,607	96.08	0.720
911211A	NTR759SW	41018	5.5	24.8	11 *	20.0	3120	1.6	1,634	96.02	0.626
911211A	NTR759SW	41018	5.5	24.8	7 *	21.0	3250	1.6	1,704	95.85	0.657
911211A	NTR759SW	41018	5.5	25	11 *	20.0	3340	1.6	1,753	95.73	0.626
911211A	NTR759SW	41018	5.5	25	7 *	22.0	3500	1.6	1,840	95.51	0.689
911211A	NTR759SW	41018	6.4	26	4 *	29.0	1132	1.6	572	98.61	0.908
911211A	NTR759SW	41018	6.4	25	4 *	28.0	1137	1.6	575	98.60	0.876
911216B	SC8000	30573	5.5	27.0	5 *	22.0	1750	1.6	898	97.06	0.689
911216B	SC8000	30573	5.5	27.0	12 *	23.0	2330	1.6	1,208	96.05	0.720
911216B	SC8000	30573	6.5	25.5	5 *	26.0	1510	1.6	771	97.48	0.814
911216B	SC8000	30573	6.5	26.0	5 *	25.5	1530	1.6	782	97.44	0.798
911216B	SC8000	30573	6.5	26.0	12 *	27.5	2040	1.6	1,053	96.56	0.861
911216B	SC8000	30573	6.5	25.5	12 *	27.0	2080	1.6	1,074	96.49	0.845
911216A	SC8000	35589	4.9	25.0	12 *	15.0	2650	1.6	1,380	96.12	0.470
911216A	SC8000	35589	4.9	26.0	5 *	14.0	2670	1.6	1,391	96.09	0.438
911216A	SC8000	35589	4.9	25.0	5 *	14.0	2690	1.6	1,402	96.06	0.438
911216A	SC8000	35589	4.9	26.0	12 *	14.0	2740	1.6	1,428	95.99	0.438
911209	SC8000	35060	5.5	25	6 *	17.0	1640	1.6	840	97.60	0.532
911209	SC8000	35060	5.5	27	6 *	17.0	1700	1.6	872	97.51	0.532
911210B	SC8000	34901	5.5	26	12 *	17.0	1730	1.6	888	97.46	0.532
911210B	SC8000	34901	5.5	26	12 *	17.5	1750	1.6	898	97.43	0.548
911209	SC8000	35060	5.5	25	3 *	17.0	1760	1.6	904	97.42	0.532
911209	SC8000	35060	5.5	27	3 *	17.5	1860	1.6	957	97.27	0.548
911210B	SC8000	34901	5.5	26	11 *	19.0	1860	1.6	957	97.26	0.595
911210B	SC8000	34901	5.5	26	11 *	18.5	1950	1.6	1,005	97.12	0.579
911210A	SC8000	34953	5.5	25	7 *	20.0	2110	1.6	1,090	96.88	0.626
911210B	SC8000	34901	5.5	26	7 *	19.0	2130	1.6	1,101	96.85	0.595
911214A	SC8000	35547	5.5	25	5 *	18.0	2180	1.6	1,128	96.83	0.563
911210A	SC8000	34953	5.5	25	7 *	20.0	2160	1.6	1,117	96.80	0.626
911210A	SC8000	34953	5.5	25	8 *	19.0	2160	1.6	1,117	96.80	0.595
911214A	SC8000	35547	5.5	25.5	5 *	17.5	2220	1.6	1,149	96.77	0.548
911210A	SC8000	34953	5.5	25	7 *	19.0	2190	1.6	1,133	96.76	0.595
911210A	SC8000	34953	5.5	25	8 *	18.5	2200	1.6	1,138	96.74	0.579
911210B	SC8000	34901	5.5	26	7 *	18.0	2210	1.6	1,144	96.72	0.563
911210A	SC8000	34953	5.5	25	8 *	18.0	2240	1.6	1,160	96.68	0.563
911210B	SC8000	34901	5.5	26	5 *	18.5	2240	1.6	1,160	96.68	0.579
911210B	SC8000	34901	5.5	26	8 *	18.0	2250	1.6	1,165	96.66	0.563

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## RESULT OF EXPERIMENT (MAIN )

DATANO	MEMBLENE	FEED					FEED				
		CONC	PRES	STEMP	CELS	FLUX	EC	FLOW	CONC	REJ	FLUX
911210B	SC8000	34901	5.5	26	8	* 17.0	2260	1.6	1.170	96.65	0.532
911210A	SC8000	34953	5.5	25	5	* 19.5	2290	1.6	1.186	96.61	0.610
911210B	SC8000	34901	5.5	26	10	* 19.0	2310	1.6	1.197	96.57	0.595
911210B	SC8000	34901	5.5	26	5	* 17.5	2380	1.6	1.235	96.46	0.548
911210A	SC8000	34953	5.5	25	11	* 20.0	2390	1.6	1.240	96.45	0.626
911210B	SC8000	34901	5.5	26	2	* 18.5	2420	1.6	1.256	96.40	0.579
911210B	SC8000	34901	5.5	26	10	* 18.5	2420	1.6	1.256	96.40	0.579
911210A	SC8000	34953	5.5	25	11	* 19.5	2430	1.6	1.262	96.39	0.610
911210B	SC8000	34901	5.5	26	9	* 19.5	2450	1.6	1.272	96.36	0.610
911210A	SC8000	34953	5.5	25	9	* 19.0	2450	1.6	1.272	96.36	0.595
911210A	SC8000	34953	5.5	25	9	* 20.0	2470	1.6	1.283	96.33	0.626
911210B	SC8000	34901	5.5	26	2	* 18.0	2480	1.6	1.288	96.31	0.563
911210A	SC8000	34953	5.5	25	11	* 19.0	2500	1.6	1.299	96.28	0.595
911210A	SC8000	34953	5.5	25	5	* 18.0	2500	1.6	1.299	96.28	0.563
911210A	SC8000	34953	5.5	25	2	* 18.0	2520	1.6	1.310	96.25	0.563
911210A	SC8000	34953	5.5	25	9	* 19.0	2530	1.6	1.315	96.24	0.595
911210A	SC8000	34953	5.5	25	2	* 18.5	2540	1.6	1.321	96.22	0.579
911210A	SC8000	34953	5.5	25	5	* 17.0	2550	1.6	1.326	96.21	0.532
911210B	SC8000	34901	5.5	26	6	* 18.0	2630	1.6	1.369	96.08	0.563
911210A	SC8000	34953	5.5	25	6	* 19.0	2650	1.6	1.380	96.05	0.595
911210B	SC8000	34901	5.5	26	9	* 18.0	2680	1.6	1.396	96.00	0.563
911210B	SC8000	34901	5.5	26	6	* 18.0	2690	1.6	1.402	95.98	0.563
911210A	SC8000	34953	5.5	25	2	* 18.0	2780	1.6	1.450	95.85	0.563
911210A	SC8000	34953	5.5	25	6	* 18.0	2790	1.6	1.455	95.84	0.563
911210A	SC8000	34953	5.5	25	6	* 18.0	2840	1.6	1.482	95.76	0.563
911210A	SC8000	34953	5.5	25	10	* 18.5	3010	1.6	1.574	95.50	0.579
911210A	SC8000	34953	5.5	25	10	* 19.0	3060	1.6	1.601	95.42	0.595
911210A	SC8000	34953	5.5	25	12	* 19.0	3090	1.6	1.618	95.37	0.595
911210A	SC8000	34953	5.5	25	10	* 18.0	3110	1.6	1.629	95.34	0.563
911210A	SC8000	34953	5.5	25	12	* 19.0	3110	1.6	1.629	95.34	0.595
911210A	SC8000	34953	5.5	25	12	* 19.5	3120	1.6	1.634	95.33	0.610
911210A	SC8000	34953	5.5	25	4	* 19.0	3150	1.6	1.650	95.28	0.595
911210B	SC8000	34901	5.5	26	1	* 19.0	3190	1.6	1.672	95.21	0.595
911210B	SC8000	34901	5.5	26	1	* 18.0	3360	1.6	1.764	94.95	0.563
911210A	SC8000	34953	5.5	25	4	* 18.0	3540	1.6	1.862	94.67	0.563
911210B	SC8000	34901	5.5	26	4	* 18.0	3610	1.6	1.900	94.56	0.563
911210B	SC8000	34901	5.5	26	4	* 18.0	3680	1.6	1.938	94.45	0.563
911210A	SC8000	34953	5.5	25	4	* 18.0	3690	1.6	1.944	94.44	0.563
911210B	SC8000	34901	5.5	26	3	* 18.5	4170	1.6	2.206	93.68	0.579
911210B	SC8000	34901	5.5	26	3	* 18.5	5100	1.6	2.717	92.22	0.579
911210A	SC8000	34953	5.5	25	3	* 21.0	6850	1.6	3.686	89.45	0.657
911210A	SC8000	34953	5.5	25	1	* 20.5	6950	1.6	3.742	89.29	0.642
911210A	SC8000	34953	5.5	25	1	* 21.5	7960	1.6	4.305	87.68	0.673
911210A	SC8000	34953	5.5	25	3	* 21.0	8560	1.6	4.642	86.72	0.657
911210A	SC8000	34953	5.5	25	1	* 20.0	9210	1.6	5.007	85.68	0.626
911210A	SC8000	34953	5.5	25	3	* 21.0	9550	1.6	5.198	85.13	0.657
911209	SC8000	35060	5.5	26	6	* 18.0	2030	4.0	1.047	97.01	0.563
911214A	SC8000	35547	5.5	26	5	* 16.5	2090	4.0	1.079	96.96	0.516
911209	SC8000	35060	5.5	25	6	* 17.0	2070	4.0	1.069	96.95	0.532
911214A	SC8000	35547	5.5	26	5	* 17.0	2130	4.0	1.101	96.90	0.532
911209	SC8000	35060	5.5	25	3	* 19.0	2230	4.0	1.154	96.71	0.595

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DATANO	MEMBLENE	RESULT OF EXPERIMENT (MAIN )					FEED				
		CONC	PRES	STEMP	CELS	FLUX	EC	FLOW	CONC	REJ	FLUX
911209	SC8000	35060	5.5	26	3 *	18.0	2460	4.0	1,278	96.35	0.563
911216A	SC8000	35589	5.9	25.0	5 *	19.5	2130	1.6	1,101	96.91	0.610
911216A	SC8000	35589	5.9	25.0	5 *	19.0	2190	1.6	1,133	96.82	0.595
911216A	SC8000	35589	5.9	25.0	12 *	21.0	2690	1.6	1,402	96.06	0.657
911216A	SC8000	35589	5.9	25.0	12 *	21.0	2730	1.6	1,423	96.00	0.657
911209	SC8000	35060	6.4	26	6 *	22.5	1400	1.6	713	97.97	0.704
911209	SC8000	35060	6.4	26	3 *	24.8	1490	1.6	761	97.83	0.775
911214A	SC8000	35547	6.4	26	5 *	22.0	1938	1.6	998	97.19	0.689
911214A	SC8000	35547	6.4	25.5	5 *	22.0	2000	1.6	1,031	97.10	0.689
911211A	SC8000	41018	5.5	24.8	5 *	15.0	2820	1.6	1,472	96.41	0.470
911211A	SC8000	41018	5.5	26	5 *	15.1	2820	1.6	1,472	96.41	0.473
911211A	SC8000	41018	5.5	25	5 *	14.5	2890	1.6	1,509	96.32	0.454
911211A	SC8000	41018	6.4	26	5 *	20.0	2130	1.6	1,101	97.32	0.626
911211A	SC8000	41018	6.4	25	5 *	19.5	2220	1.6	1,149	97.20	0.610
911217	UTC70	1556	1.5	24.0	4 *	40.0	71.9	1.6	33	97.88	1.252
911217	UTC70	1556	1.5	25.0	4 *	38.0	75.7	1.6	34	97.81	1.189
911217	UTC70	1556	1.5	24.0	5 *	39.0	96.9	1.6	45	97.11	1.220
911217	UTC70	1556	1.5	24.0	1 *	48.0	99.4	1.6	46	97.04	1.502
911217	UTC70	1556	1.5	25.0	5 *	38.0	106	1.6	49	96.85	1.189
911217	UTC70	1556	1.5	25.0	1 *	46.5	106	1.6	49	96.85	1.455
911217	UTC70	1556	1.5	24.0	6 *	39.0	107	1.6	49	96.85	1.220
911217	UTC70	1556	1.5	25.0	6 *	38.0	114	1.6	53	96.59	1.189
911217	UTC70	1556	1.5	24.0	12 *	42.5	126	1.6	59	96.21	1.330
911217	UTC70	1556	1.5	25.0	12 *	42.0	134	1.6	63	95.95	1.314
911217	UTC70	1556	1.5	24.0	3 *	40.0	138	1.6	64	95.89	1.252
911217	UTC70	1556	1.5	24.0	9 *	39.0	144	1.6	67	95.69	1.220
911217	UTC70	1556	1.5	25.0	3 *	39.0	145	1.6	68	95.63	1.220
911217	UTC70	1556	1.5	24.0	7 *	41.5	150	1.6	70	95.5	1.298
911217	UTC70	1556	1.5	25.0	9 *	38.0	152	1.6	71	95.44	1.189
911217	UTC70	1556	1.5	24.0	8 *	45.0	154	1.6	72	95.37	1.408
911217	UTC70	1556	1.5	25.0	7 *	40.0	156	1.6	73	95.31	1.252
911217	UTC70	1556	1.5	24.0	11 *	44	162	1.6	76	95.12	1.377
911217	UTC70	1556	1.5	25.0	8 *	44.0	165	1.6	78	94.99	1.377
911217	UTC70	1556	1.5	25.0	11 *	43.5	169	1.6	80	94.86	1.361
911217	UTC70	1556	1.5	24.0	2 *	45.0	194	1.6	92	94.09	1.408
911217	UTC70	1556	1.5	25.0	2 *	43.0	207	1.6	98	93.7	1.345
911217	UTC70	1556	1.5	25.0	4 *	40.0	54	4.0	24	98.46	1.252
911217	UTC70	1556	1.5	25.0	4 *	37.0	54	4.0	24	98.46	1.158
911217	UTC70	1556	1.5	25.0	1 *	45.0	72.4	4.0	33	97.88	1.408
911217	UTC70	1556	1.5	25.0	1 *	46.0	75	4.0	34	97.81	1.439
911217	UTC70	1556	1.5	25.0	5 *	39.0	77	4.0	35	97.75	1.220
911217	UTC70	1556	1.5	25.0	5 *	38.0	85.4	4.0	39	97.49	1.189
911217	UTC70	1556	1.5	25.0	6 *	34.0	86	4.0	39	97.49	1.064
911217	UTC70	1556	1.5	25.0	3 *	37.5	98	4.0	45	97.11	1.173
911217	UTC70	1556	1.5	25.0	3 *	41.0	99.6	4.0	46	97.04	1.283
911217	UTC70	1556	1.5	25.0	12 *	42.0	100	4.0	46	97.04	1.314
911217	UTC70	1556	1.5	25.0	9 *	37.5	99.1	4.0	46	97.04	1.173
911217	UTC70	1556	1.5	25.0	6 *	33.0	110	4.0	51	96.72	1.032
911217	UTC70	1556	1.5	25.0	9 *	40.0	112	4.0	52	96.66	1.252
911217	UTC70	1556	1.5	25.0	4 *	32.0	60.7	8.0	27	98.26	1.001
911217	UTC70	1556	1.5	25.5	1 *	37.5	74.2	8.0	34	97.81	1.173

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RESULT OF EXPERIMENT (MAIN )  
FEED

DATANO	MEMBLENE	CONC	PRES	TEMP	CELS	FLUX	EC	FEED FLOW	CONC	REJ	FLUX
911217	UTC70	1556	1.5	25.0	6 *	23.0	92	8.0	42	97.3	0.719
911217	UTC70	1556	1.5	25.0	5 *	32.0	102	8.0	47	96.98	1.001
911217	UTC70	1556	1.5	25.0	3 *	25.0	138	8.0	64	95.89	0.782
911216B	UTC80HF	30573	5.5	27.0	9 *	44.0	509	1.6	250	99.18	1.377
911216B	UTC80HF	30573	5.5	27.0	2 *	40.0	518	1.6	255	99.17	1.252
911216B	UTC80HF	30573	6.5	25.5	9 *	53.0	422	1.6	206	99.33	1.659
911216B	UTC80HF	30573	6.5	26.0	9 *	54.0	435	1.6	212	99.31	1.690
911216B	UTC80HF	30573	6.5	26.0	2 *	50.0	451	1.6	221	99.28	1.565
911216B	UTC80HF	30573	6.5	25.5	2 *	50.0	460	1.6	225	99.26	1.565
911216A	UTC80HF	35589	4.9	26.0	9 *	27.0	758	1.6	378	98.94	0.845
911216A	UTC80HF	35589	4.9	25.0	9 *	27.5	768	1.6	383	98.92	0.861
911216A	UTC80HF	35589	4.9	25.0	2 *	25.0	788	1.6	393	98.90	0.783
911216A	UTC80HF	35589	4.9	26.0	2 *	25.0	790	1.6	394	98.89	0.783
911214A	UTC80HF	35547	5.5	25	9 *	35.0	670	1.6	332	99.07	1.096
911214A	UTC80HF	35547	5.5	25.5	9 *	34.5	671	1.6	333	99.06	1.080
911214A	UTC80HF	35547	5.5	25.5	2 *	33.0	685	1.6	340	99.04	1.033
911214A	UTC80HF	35547	5.5	25	2 *	32.0	702	1.6	349	99.02	1.002
911209	UTC80HF	35060	5.5	25	1 *	35.0	1470	1.6	750	97.86	1.096
911209	UTC80HF	35060	5.5	27	1 *	36.0	1570	1.6	803	97.71	1.127
911209	UTC80HF	35060	5.5	25	2 *	38.0	2090	1.6	1,079	96.92	1.189
911209	UTC80HF	35060	5.5	27	2 *	38.0	2370	1.6	1,229	96.49	1.189
911214A	UTC80HF	35547	5.5	26	9 *	39.0	538	4.0	265	99.25	1.221
911214A	UTC80HF	35547	5.5	26	9 *	36.0	572	4.0	282	99.21	1.127
911214A	UTC80HF	35547	5.5	26	2 *	34.0	597	4.0	295	99.17	1.064
911214A	UTC80HF	35547	5.5	26	2 *	34.0	601	4.0	297	99.16	1.064
911209	UTC80HF	35060	5.5	25	1 *	45.5	1390	4.0	708	97.98	1.424
911209	UTC80HF	35060	5.5	26	1 *	44.0	1534	4.0	784	97.76	1.377
911209	UTC80HF	35060	5.5	25	2 *	43.0	2120	4.0	1,095	96.88	1.346
911209	UTC80HF	35060	5.5	26	2 *	42.0	2310	4.0	1,197	96.59	1.315
911216A	UTC80HF	35589	5.9	25.0	9 *	38.5	611	1.6	302	99.15	1.205
911216A	UTC80HF	35589	5.9	25.0	2 *	36.0	620	1.6	307	99.14	1.127
911216A	UTC80HF	35589	5.9	25.0	9 *	39.5	630	1.6	312	99.12	1.236
911216A	UTC80HF	35589	5.9	25.0	2 *	35.0	643	1.6	319	99.10	1.096
911214A	UTC80HF	35547	6.4	26	9 *	45.0	586	1.6	289	99.19	1.409
911214A	UTC80HF	35547	6.4	25.5	9 *	46.0	607	1.6	300	99.16	1.440
911214A	UTC80HF	35547	6.4	26	2 *	41.0	624	1.6	309	99.13	1.283
911214A	UTC80HF	35547	6.4	25.5	2 *	42.0	634	1.6	314	99.12	1.315
911209	UTC80HF	35060	6.4	26	1 *	48.8	1600	1.6	819	97.66	1.526
911209	UTC80HF	35060	6.4	26	2 *	51.0	1890	1.6	973	97.22	1.596
911214A	UTC80HF	35547	6.4	27	9 *	52.0	482	4.0	236	99.34	1.628
911214A	UTC80HF	35547	6.4	27	2 *	45.0	523	4.0	257	99.28	1.409
911211A	UTC80HF	41018	5.5	24.8	2 *	27.0	1047	1.6	528	98.71	0.845
911211A	UTC80HF	41018	5.5	26	2 *	26.5	1060	1.6	535	98.70	0.829
911211A	UTC80HF	41018	5.5	25	2 *	26.0	1108	1.6	560	98.63	0.814
911211A	UTC80HF	41018	5.5	24.8	9 *	28.0	1340	1.6	681	98.34	0.876
911211A	UTC80HF	41018	5.5	25	9 *	28.0	1420	1.6	724	98.23	0.876
911211A	UTC80HF	41018	5.5	26	9 *	27.0	1420	1.6	724	98.23	0.845
911211A	UTC80HF	41018	6.4	26	2 *	36.0	883	1.6	442	98.92	1.127
911211A	UTC80HF	41018	6.4	25	2 *	34.5	907	1.6	455	98.89	1.080
911211A	UTC80HF	41018	6.4	26	9 *	38.0	1095	1.6	553	98.65	1.189
911211A	UTC80HF	41018	6.4	25	9 *	36.5	1113	1.6	562	98.63	1.142

M9112YY

## RESULT OF EXPERIMENT (MAIN )

DATANO	MEMBLNE	FEED				FEED					
		CONC	PRES	STEMP	CELS	FLUX	EC	FLOW	CONC	REJ	FLUX
911211B	UTC80HF	40984	6.4	28.0	2 *	40.0	742	4.0	370	99.10	1.252
911211B	UTC80HF	40984	6.4	28.0	9 *	43.0	945	4.0	475	98.84	1.346
911216B	UTC80HR	30573	5.5	27.0	1 *	33.0	307	1.6	148	99.52	1.033
911216B	UTC80HR	30573	5.5	27.0	8 *	42.0	812	1.6	406	98.67	1.315
911216B	UTC80HR	30573	6.5	26.0	1 *	41.0	252	1.6	121	99.60	1.283
911216B	UTC80HR	30573	6.5	25.5	1 *	39.0	259	1.6	124	99.59	1.221
911216B	UTC80HR	30573	6.5	26.0	8 *	49.0	734	1.6	365	98.81	1.534
911216B	UTC80HR	30573	6.5	25.5	8 *	48.0	742	1.6	370	98.79	1.502
911216A	UTC80HR	35589	4.9	26.0	1 *	20.5	462	1.6	226	99.36	0.642
911216A	UTC80HR	35589	4.9	25.0	1 *	20.0	489	1.6	240	99.33	0.626
911216A	UTC80HR	35589	4.9	26.0	8 *	26.0	1340	1.6	681	98.09	0.814
911216A	UTC80HR	35589	4.9	25.0	8 *	26.0	1445	1.6	737	97.93	0.814
911214A	UTC80HR	35547	5.5	25.5	1 *	27.0	397	1.6	193	99.46	0.845
911214A	UTC80HR	35547	5.5	25	1 *	27.0	436	1.6	213	99.40	0.845
911214A	UTC80HR	35547	5.5	25	8 *	24.0	1550	1.6	792	97.77	0.751
911214A	UTC80HR	35547	5.5	25.5	8 *	23.0	1660	1.6	850	97.61	0.720
911214A	UTC80HR	35547	5.5	26	1 *	27.5	358	4.0	174	99.51	0.861
911214A	UTC80HR	35547	5.5	26	1 *	27.0	376	4.0	183	99.49	0.845
911208	UTC80HR	35076	5.5	26.0	12 *	19.5	820	4.0	410	98.83	0.916
911208	UTC80HR	35076	5.5	27.0	12 *	18.5	845	4.0	423	98.79	0.869
911208	UTC80HR	35076	5.5	26.0	12 *	18.7	1050	4.0	529	98.49	0.878
911208	UTC80HR	35076	5.5	26.0	8 *	19.2	1650	4.0	845	97.59	0.901
911208	UTC80HR	35076	5.5	26.0	8 *	19.2	1680	4.0	861	97.55	0.901
911208	UTC80HR	35076	5.5	27.0	8 *	19.0	1780	4.0	914	97.39	0.892
911216A	UTC80HR	35589	5.9	25.0	1 *	29.0	375	1.6	182	99.49	0.908
911216A	UTC80HR	35589	5.9	25.0	1 *	30.0	373	1.6	181	99.49	0.939
911216A	UTC80HR	35589	5.9	25.0	8 *	37.0	1105	1.6	558	98.43	1.158
911216A	UTC80HR	35589	5.9	25.0	8 *	36.0	1112	1.6	562	98.42	1.127
911214A	UTC80HR	35547	6.4	26	1 *	34.0	350	1.6	170	99.52	1.064
911214A	UTC80HR	35547	6.4	25.5	1 *	35.0	370	1.6	180	99.49	1.096
911214A	UTC80HR	35547	6.4	26	8 *	31.0	1260	1.6	639	98.20	0.970
911214A	UTC80HR	35547	6.4	25.5	8 *	31.0	1360	1.6	692	98.05	0.970
911214A	UTC80HR	35547	6.4	27	1 *	38.0	328	4.0	159	99.55	1.189
911208	UTC80HR	35076	6.4	27.0	12 *	25.2	892	4.0	447	98.73	1.183
911208	UTC80HR	35076	6.4	27.0	12 *	25.0	905	4.0	454	98.71	1.174
911208	UTC80HR	35076	6.4	27.0	8 *	26.0	1520	4.0	776	97.79	1.221
911208	UTC80HR	35076	6.4	27.0	8 *	25.0	1550	4.0	792	97.74	1.174
911211A	UTC80HR	41018	5.5	24.8	1 *	20.0	748	1.6	373	99.09	0.626
911211A	UTC80HR	41018	5.5	26	1 *	19.5	766	1.6	382	99.07	0.610
911211A	UTC80HR	41018	5.5	25	1 *	20.0	802	1.6	401	99.02	0.626
911211A	UTC80HR	41018	5.5	24.8	8 *	20.0	2110	1.6	1,090	97.34	0.626
911211A	UTC80HR	41018	5.5	26	8 *	18.0	2260	1.6	1,170	97.15	0.563
911211A	UTC80HR	41018	5.5	25	8 *	19.0	2290	1.6	1,186	97.11	0.595
911211A	UTC80HR	41018	5.5	26	3 *	18.0	2460	1.6	1,278	96.88	0.563
911211A	UTC80HR	41018	5.5	24.8	3 *	18.0	2470	1.6	1,283	96.87	0.563
911211A	UTC80HR	41018	5.5	25	3 *	18.0	2610	1.6	1,358	96.69	0.563
911211A	UTC80HR	41018	6.4	26	1 *	26.5	568	1.6	280	99.32	0.829
911211A	UTC80HR	41018	6.4	25	1 *	25.5	576	1.6	284	99.31	0.798
911211A	UTC80HR	41018	6.4	26	8 *	27.0	1712	1.6	878	97.86	0.845
911211A	UTC80HR	41018	6.4	25	8 *	25.0	1723	1.6	884	97.84	0.783
911211B	UTC80HR	40984	6.4	28.0	1 *	30.0	493	4.0	242	99.41	0.939





