



APPENDIX

มหาวิทยาลัยขอนแก่น

APPENDIX A ENERGY STORAGE KNO₃

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
0	0.0139	27.00	22.90	23.90	25.15	72.76	-76.40	-40.02	5.60
5	0.0139	27.60	27.90	27.80	29.10	94.59	105.50	101.86	149.16
10	0.0139	31.20	32.10	29.70	34.88	225.56	258.30	170.99	359.56
15	0.0139	31.30	35.30	31.70	50.17	229.20	374.72	243.75	915.66
20	0.0139	39.30	38.40	33.70	67.69	520.24	487.49	316.51	1553.10
25	0.0139	39.85	41.10	61.80	77.51	540.18	585.72	1338.90	1910.18
30	0.0139	53.65	43.20	71.47	89.98	1042.15	662.12	1690.58	2363.87
35	0.0139	60.62	46.40	84.33	95.83	1295.91	778.54	2158.58	2576.79
40	0.0139	72.26	48.60	90.88	105.50	1719.40	858.57	2396.68	2928.54
45	0.0139	77.88	50.90	100.42	110.26	1923.92	942.25	2743.63	3101.87
50	0.0139	86.70	52.90	105.16	118.31	2244.72	1015.01	2916.15	3394.76
55	0.0139	96.87	55.30	110.26	124.79	2614.62	1102.32	3101.65	3630.28
60	0.0139	100.50	69.00	118.82	126.78	2746.70	1600.64	3413.35	3702.93
65	0.0139	103.68	67.07	122.95	132.38	2862.37	1530.58	3563.31	3906.54
70	0.0139	110.47	60.62	124.69	139.64	3109.59	1295.91	3626.69	4170.52
75	0.0139	112.94	66.72	130.10	142.60	3199.25	1517.75	3823.68	4278.29
80	0.0139	114.12	79.42	136.23	144.31	3242.05	1979.92	4046.69	4340.37
85	0.0139	121.04	79.78	138.11	149.79	3493.91	1992.94	4115.06	4539.79
90	0.0139	122.74	86.83	143.77	151.07	3555.71	2249.48	4320.88	4586.45
95	0.0139	128.24	93.61	146.23	155.18	3755.75	2496.08	4410.37	4735.80
100	0.0139	129.56	92.14	148.51	159.12	3803.74	2442.73	4493.40	4879.35

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
100	0.0139	129.56	92.14	148.51	159.12	3803.74	2442.73	4493.40	4879.35
105	0.0139	134.71	96.46	150.63	162.92	3991.36	2599.60	4570.60	5017.66
110	0.0139	136.72	104.57	155.61	163.59	4064.50	2894.70	4751.66	5042.10
115	0.0139	140.60	116.50	160.46	164.15	4205.53	3328.66	4927.90	5062.21
120	0.0139	141.35	113.26	162.18	167.59	4232.96	3210.84	4990.60	5187.51
125	0.0139	145.99	114.87	162.79	171.94	4401.82	3269.34	5012.87	5345.56
130	0.0139	147.53	122.33	167.30	172.19	4457.77	3540.96	5176.93	5354.75
135	0.0139	150.98	124.67	168.72	175.36	4583.00	3625.93	5228.41	5469.98
140	0.0139	151.33	131.88	172.04	176.44	4595.85	3888.38	5349.45	5509.58
145	0.0139	155.60	127.98	172.29	180.46	4751.22	3746.55	5358.39	5655.66
150	0.0139	155.79	135.98	175.46	181.41	4758.27	4037.45	5473.69	5690.11
155	0.0139	159.91	130.88	175.56	185.29	4908.23	3851.84	5477.26	5831.38
160	0.0139	161.97	142.68	179.59	185.11	4982.97	4281.34	5623.93	5824.95
165	0.0139	161.96	139.40	180.56	187.88	4982.65	4162.00	5659.19	5925.62
170	0.0139	165.89	146.04	184.47	187.59	5125.69	4403.51	5801.44	5915.24
175	0.0139	166.77	144.60	184.32	191.26	5157.55	4351.19	5796.17	6048.56
180	0.0139	169.59	146.09	185.12	193.88	5260.25	4405.39	5825.37	6143.80
185	0.0139	171.36	155.51	189.88	192.45	5324.75	4748.14	5998.29	6091.90
190	0.0139	171.09	148.87	189.58	195.98	5314.77	4506.47	5987.61	6220.38
195	0.0139	174.77	163.17	194.25	194.47	5448.68	5026.55	6157.22	6165.51
200	0.0139	171.41	162.40	193.87	197.93	5326.38	4998.81	6143.40	6291.17
205	0.0139	178.01	167.59	197.45	197.35	5566.42	5187.35	6273.65	6270.00
210	0.0139	177.57	163.72	196.99	200.73	5550.39	5046.55	6256.98	6393.11

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
215	0.0139	181.09	162.80	197.49	203.08	5678.54	5013.06	6275.38	6478.65
220	0.0139	180.58	173.83	201.97	201.40	5659.90	5414.40	6438.04	6417.54
225	0.0139	184.03	172.81	202.40	203.69	5785.57	5377.52	6453.98	6500.87
230	0.0139	183.45	165.76	200.81	207.95	5764.55	5120.77	6396.00	6655.94
235	0.0139	186.84	170.66	203.19	208.19	5887.94	5299.05	6482.45	6664.49
240	0.0139	187.21	178.52	206.53	207.40	5901.12	5585.03	6604.22	6635.72
245	0.0139	189.54	174.34	205.85	210.58	5986.04	5433.04	6579.46	6751.56
250	0.0139	187.85	182.13	209.15	209.74	5924.46	5716.28	6699.25	6721.01
255	0.0139	192.13	180.88	209.41	211.88	6080.22	5670.81	6708.97	6798.76
260	0.0139	191.39	179.59	209.66	214.00	6053.17	5624.11	6717.80	6875.71
265	0.0139	194.62	178.28	209.87	216.09	6170.78	5576.21	6725.76	6951.89
270	0.0139	190.83	185.93	213.07	215.16	6032.88	5854.59	6842.04	6918.18
275	0.0139	197.02	193.55	216.24	214.22	6257.98	6131.87	6957.51	6883.76
280	0.0139	198.18	192.14	216.40	216.25	6300.40	6080.67	6963.08	6957.79
285	0.0139	198.33	187.71	215.53	219.27	6305.68	5919.29	6931.52	7067.53
290	0.0139	200.45	195.24	218.64	218.27	6383.01	6193.50	7044.77	7031.10
295	0.0139	198.56	193.75	218.74	220.25	6314.11	6139.32	7048.19	7103.20
300	0.0139	202.65	198.24	220.81	220.21	6462.82	6302.50	7123.69	7101.93
305	0.0139	202.72	193.70	219.87	223.16	6465.35	6137.36	7089.41	7209.23
310	0.0139	204.77	198.14	221.91	223.10	6540.01	6298.79	7163.65	7206.82
315	0.0139	205.80	193.55	220.93	226.02	6577.68	6131.95	7128.13	7313.01
320	0.0139	201.82	200.94	223.94	224.92	6432.85	6400.87	7237.56	7273.15
325	0.0139	207.83	199.31	223.93	226.81	6651.25	6341.58	7237.27	7341.93

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
330	0.0139	206.81	206.66	226.91	225.69	6614.43	6608.95	7345.57	7301.07
335	0.0139	209.79	201.99	225.87	228.55	6722.59	6439.02	7307.82	7405.25
340	0.0139	207.75	200.30	225.82	230.40	6648.33	6377.51	7305.93	7472.58
345	0.0139	211.69	210.59	229.76	228.24	6791.84	6751.87	7449.06	7393.94
350	0.0139	210.62	205.86	228.68	231.07	6752.95	6579.86	7409.79	7496.76
355	0.0139	213.54	216.12	232.58	228.88	6859.11	6952.88	7551.95	7417.26
360	0.0139	211.44	211.35	231.48	231.68	6782.89	6779.57	7511.75	7519.24
365	0.0139	215.34	218.57	234.36	230.48	6924.50	7042.20	7616.62	7475.30
370	0.0139	212.22	213.77	233.23	233.26	6811.01	6867.67	7575.54	7576.49
375	0.0139	217.09	211.96	233.09	235.03	6988.13	6801.69	7570.40	7640.91
380	0.0139	212.94	222.13	236.94	232.79	6837.41	7171.70	7710.38	7559.44
385	0.0139	218.79	220.29	236.78	234.54	7050.09	7104.59	7704.43	7623.14
390	0.0139	217.62	212.43	234.60	238.28	7007.70	6818.65	7625.33	7759.24
395	0.0139	220.45	216.55	236.42	238.01	7110.46	6968.75	7691.37	7749.47
400	0.0139	218.26	223.67	239.22	236.74	7030.93	7227.48	7793.41	7702.99
405	0.0139	222.07	218.76	238.02	239.45	7169.31	7049.14	7749.57	7801.71
410	0.0139	220.86	225.85	240.80	238.15	7125.44	7306.87	7850.89	7754.58
415	0.0139	223.64	223.92	240.58	239.85	7226.73	7236.70	7842.73	7816.29
420	0.0139	222.42	221.98	240.34	241.54	7182.17	7166.07	7834.23	7877.69
425	0.0139	223.19	220.02	240.10	243.22	7210.03	7094.98	7825.40	7938.80
430	0.0139	223.94	227.06	242.85	241.89	7237.56	7350.87	7925.39	7890.47
435	0.0139	222.69	234.08	245.59	240.55	7192.02	7606.32	8025.06	7841.87
440	0.0139	227.43	232.09	245.32	242.21	7364.44	7533.93	8015.29	7902.13

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
445	0.0139	225.16	227.09	244.04	244.86	7281.90	7351.98	7968.83	7998.49
450	0.0139	228.88	234.07	246.76	243.50	7417.35	7606.18	8067.60	7949.08
455	0.0139	227.60	232.05	246.47		7370.60	7532.57	8056.95	
460	0.0139	230.31	236.02	248.16		7469.09	7676.85	8118.77	
465	0.0139	229.01	230.97	246.86		7421.78	7493.33	8071.18	
470	0.0139	231.70	234.92	248.54		7519.72	7636.86	8132.46	
475	0.0139	230.38	229.85	247.22		7471.87	7452.60	8084.33	
480	0.0139	233.06	236.78	249.89		7569.28	7704.55	8181.47	
485	0.0139	230.73	228.69	247.55		7484.54	7410.45	8096.45	
490	0.0139	234.39	229.60	248.21		7617.82	7443.43	8120.33	
495	0.0139	233.05	230.50	248.86		7568.96	7476.07	8143.96	
500	0.0139	235.70	231.39	249.50		7665.38	7508.39	8167.36	
505	0.0139	235.35	232.27			7652.43	7540.38		
510	0.0139	236.98	233.14			7712.00	7572.06		
515	0.0139	236.61	234.00			7698.59	7603.42		
520	0.0139	238.24	234.85			7757.72	7634.49		
525	0.0139	236.86	235.70			7707.48	7665.26		
530	0.0139	239.47	236.54			7802.56	7695.74		
535	0.0139	238.08	237.37			7751.90	7725.93		
540	0.0139	240.68	238.19			7846.56	7755.84		
545	0.0139	239.28	239.00			7795.50	7785.47		
550	0.0139	240.87	239.81			7853.38	7814.83		
555	0.0139	242.46	240.61			7911.06	7843.93		

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560	0.0139	246.04	241.40			8041.32	7872.77		
565	0.0139	244.61	242.19			7989.48	7901.35		
570	0.0139	247.18	242.97			8082.99	7929.68		
575	0.0139	246.75	243.74			8067.17	7957.76		
580	0.0139	246.31	244.50			8051.17	7985.60		
585	0.0139	245.86	245.26			8035.00	8013.20		
590	0.0139	247.41	246.01			8091.41	8040.56		
595	0.0139	246.96	246.76			8074.90	8067.69		
600	0.0139	247.06	247.50			8078.59	8094.60		
605	0.0139	248.34				8125.16			
610	0.0139	249.42				8164.59			
615	0.0139	249.89				8181.55			
620	0.0139	250.45				8201.92			

APPENDIX B ENERGY STORED NACI

Times/Energy Stored	Volume	T(t)	T(t)	T(t)	T(t)	T(t)	T(t)	Energy Stored of Flow rate	Energy Stored of Flow rate	Energy Stored of Flow rate	Energy Stored of Flow rate
		Flow rate 0.58 kg/s	Flow rate 0.87 kg/s	Flow rate 1.16 kg/s	Flow rate 1.45 kg/s	0.58 kg/s	0.87 kg/s	1.16 kg/s	1.45 kg/s		
0	0.0139	29.50	25.40	25.40	27.65	115.00	10.22	10.22	67.83		
5	0.0139	30.10	30.40	29.30	31.60	130.34	138.00	109.89	168.67		
10	0.0139	33.70	34.60	45.20	45.38	222.34	245.34	516.24	520.92		
15	0.0139	33.80	37.80	48.20	56.67	224.90	327.12	592.91	809.35		
20	0.0139	41.80	40.90	50.20	82.69	429.35	406.35	644.02	1474.37		
25	0.0139	42.35	43.60	76.80	98.51	443.36	475.35	1323.90	1878.54		
30	0.0139	56.15	45.70	83.47	106.98	795.98	529.02	1494.28	2095.02		
35	0.0139	63.12	48.90	95.33	118.83	974.24	610.80	1797.48	2397.94		
40	0.0139	74.76	51.10	116.88	124.50	1271.74	667.02	2348.08	2542.81		
45	0.0139	90.38	53.40	126.42	133.26	1670.97	725.80	2591.81	2766.80		
50	0.0139	99.20	55.40	131.16	137.31	1896.32	776.91	2713.00	2870.32		
55	0.0139	109.37	57.80	136.26	141.79	2156.17	838.25	2843.31	2984.65		
60	0.0139	113.00	61.50	144.82	149.78	2248.95	932.74	3062.27	3189.03		
65	0.0139	116.18	63.57	148.95	153.38	2330.21	985.75	3167.61	3280.95		
70	0.0139	122.97	61.12	150.69	154.64	2503.88	923.13	3212.14	3313.05		
75	0.0139	125.44	68.22	156.10	159.60	2566.86	1104.52	3350.52	3439.87		
80	0.0139	126.62	75.92	162.23	165.31	2596.92	1301.40	3507.18	3585.70		
85	0.0139	133.54	79.28	164.11	166.79	2773.85	1387.22	3555.21	3623.57		
90	0.0139	135.24	86.33	169.77	172.07	2817.27	1567.44	3699.79	3758.57		
95	0.0139	140.74	90.11	172.23	174.18	2957.79	1664.00	3762.66	3812.37		
100	0.0139	142.06	93.64	174.51	176.12	2991.51	1754.30	3820.98	3862.10		

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy Stored of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
105	0.0139	147.21	96.96	176.63	177.92	3123.30	1838.94	3875.22	3908.15
110	0.0139	149.22	103.07	181.61	182.59	3174.68	1995.13	4002.41	4027.54
115	0.0139	153.10	109.00	186.46	187.15	3273.75	2146.64	4126.21	4143.90
120	0.0139	153.85	111.76	188.18	188.59	3293.02	2217.22	4170.26	4180.80
125	0.0139	158.49	113.37	188.79	188.94	3411.64	2258.31	4185.90	4189.61
130	0.0139	160.03	118.83	193.30	193.19	3450.95	2398.01	4301.15	4298.28
135	0.0139	163.48	121.17	194.72	194.36	3538.92	2457.69	4337.32	4328.12
140	0.0139	163.83	125.38	198.04	197.44	3547.95	2565.39	4422.35	4407.05
145	0.0139	168.10	126.48	198.29	197.46	3657.09	2593.54	4428.62	4407.44
150	0.0139	168.29	130.48	201.46	200.41	3662.04	2695.67	4509.62	4482.76
155	0.0139	172.41	131.38	201.56	200.29	3767.38	2718.62	4512.13	4479.77
160	0.0139	174.47	136.18	205.59	204.11	3819.89	2841.44	4615.16	4577.48
165	0.0139	174.46	137.90	206.56	204.88	3819.66	2885.39	4639.93	4597.09
170	0.0139	178.39	142.54	210.47	208.59	3920.15	3003.93	4739.86	4692.01
175	0.0139	179.27	143.10	210.32	208.26	3942.53	3018.29	4736.15	4683.45
180	0.0139	182.09	144.59	211.12	208.88	4014.67	3056.36	4756.66	4699.24
185	0.0139	183.86	150.01	215.88	213.45	4059.98	3194.91	4878.14	4816.12
190	0.0139	183.59	150.37	215.58	212.98	4052.97	3204.04	4870.64	4804.15
195	0.0139	187.27	155.67	220.25	217.47	4147.04	3339.37	4989.79	4918.94
200	0.0139	183.91	155.90	219.87	216.93	4061.13	3345.45	4980.08	4904.99
205	0.0139	190.51	160.09	223.45	220.35	4229.75	3452.33	5071.57	4992.34
210	0.0139	190.07	160.22	222.99	219.73	4218.49	3455.65	5059.87	4976.60
215	0.0139	193.59	161.30	223.49	220.08	4308.51	3483.24	5072.79	4985.58

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy Stored of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
220	0.0139	193.08	166.33	227.97	224.40	4295.42	3611.83	5187.06	5095.99
225	0.0139	196.53	167.31	228.40	224.69	4383.70	3637.04	5198.25	5103.41
230	0.0139	195.95	166.26	226.81	222.95	4368.93	3610.01	5157.53	5059.00
235	0.0139	199.34	169.16	229.19	225.19	4455.61	3684.14	5218.25	5116.12
240	0.0139	199.71	173.02	232.53	228.40	4464.87	3782.81	5303.79	5198.14
245	0.0139	202.04	172.84	231.85	227.58	4524.52	3778.27	5286.40	5177.29
250	0.0139	200.35	176.63	235.15	230.74	4481.27	3875.01	5370.55	5258.05
255	0.0139	204.63	177.38	235.41	230.88	4590.68	3894.18	5377.38	5261.56
260	0.0139	203.89	178.09	235.66	231.00	4571.68	3912.48	5383.58	5264.50
265	0.0139	207.12	178.78	234.87	231.09	4654.30	3929.95	5363.62	5266.90
270	0.0139	203.33	182.43	239.07	234.16	4557.43	4023.28	5470.85	5345.45
275	0.0139	209.52	186.05	240.24	237.22	4715.55	4115.84	5500.86	5423.49
280	0.0139	210.68	186.64	242.40	237.25	4745.35	4130.98	5555.89	5424.38
285	0.0139	210.83	186.21	238.53	236.27	4749.07	4119.85	5457.05	5399.25
290	0.0139	212.95	189.74	244.64	239.27	4803.38	4210.24	5613.27	5475.89
295	0.0139	211.06	190.25	243.74	239.25	4754.99	4223.30	5590.11	5475.42
300	0.0139	215.15	192.74	246.81	241.21	4859.45	4286.81	5668.71	5525.64
305	0.0139	215.22	192.20	243.87	240.16	4861.23	4273.04	5593.52	5498.79
310	0.0139	217.27	194.64	247.91	242.10	4913.68	4335.32	5696.78	5548.21
315	0.0139	218.30	194.05	244.93	241.02	4940.14	4320.35	5620.72	5520.59
320	0.0139	214.32	197.44	249.94	243.92	4838.40	4407.03	5748.70	5594.81
325	0.0139	220.33	197.81	247.93	243.81	4991.82	4416.49	5697.39	5592.01
330	0.0139	219.31	201.16	252.91	246.69	4965.96	4502.09	5824.58	5665.53

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy Stored of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
335	0.0139	222.29	200.49	249.87	245.55	5041.94	4484.94	5746.95	5636.49
340	0.0139	220.25	200.80	251.82	245.40	4989.77	4492.85	5796.73	5632.68
345	0.0139	224.19	205.09	255.76	249.24	5090.58	4602.49	5897.27	5730.77
350	0.0139	223.12	204.36	254.68	248.07	5063.26	4583.88	5869.69	5700.78
355	0.0139	226.04	208.62	255.58	251.88	5137.83	4692.59	5892.89	5798.27
360	0.0139	223.94	207.85	253.48	250.68	5084.30	4673.06	5839.09	5767.68
365	0.0139	227.84	211.07	256.36	253.48	5183.78	4755.33	5912.76	5839.04
370	0.0139	224.72	210.27	254.23	252.26	5104.05	4734.95	5858.34	5807.90
375	0.0139	229.59	210.46	253.09	252.03	5228.47	4739.71	5829.18	5802.04
380	0.0139	225.44	214.63	255.94	255.79	5122.60	4846.30	5901.95	5898.15
385	0.0139	231.29	214.79	254.78	253.54	5272.00	4850.26	5872.22	5840.67
390	0.0139	230.12	212.93	251.60	251.28	5242.22	4802.74	5791.09	5782.94
395	0.0139	232.95	215.05	252.42	252.01	5314.40	4857.07	5811.93	5801.63
400	0.0139	230.76	218.17	255.22	254.74	5258.54	4936.59	5883.61	5871.21
405	0.0139	234.57	217.26	254.02	253.45	5355.75	4913.54	5852.81	5838.33
410	0.0139	233.36	220.35	256.80	255.15	5324.93	4992.37	5923.99	5881.89
415	0.0139	236.14	220.42	256.58	254.85	5396.09	4994.19	5918.26	5874.13
420	0.0139	234.92	220.48	256.34	253.54	5364.78	4995.68	5912.29	5840.59
425	0.0139	235.69	220.52	251.10	251.22	5384.35	4996.86	5778.30	5781.29
430	0.0139	236.44	223.56	254.85	253.89	5403.69	5074.39	5874.10	5849.57
435	0.0139	235.19	226.58	257.59	256.55	5371.70	5151.61	5944.12	5917.65
440	0.0139	239.93	226.59	254.32	255.21	5492.82	5151.87	5860.58	5883.31
445	0.0139	237.66	225.59	250.04	254.86	5434.84	5126.28	5751.28	5874.34

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy Stored of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
450	0.0139	241.38	228.57	252.76	254.50	5529.99	5202.63	5820.66	5865.18
455	0.0139	240.10	228.55	252.47		5497.15	5202.03	5813.18	
460	0.0139	242.81	230.52	254.16		5566.34	5252.27	5856.61	
465	0.0139	241.51	229.47	252.86		5533.10	5225.58	5823.17	
470	0.0139	244.20	231.42	254.54		5601.90	5275.29	5866.22	
475	0.0139	242.88	230.35	251.22		5568.29	5248.08	5781.30	
480	0.0139	245.56	233.28	254.89		5636.72	5322.84	5875.09	
485	0.0139	243.23	231.19	251.55		5577.19	5269.58	5789.82	
490	0.0139	246.89	232.10	250.21		5670.82	5292.74	5755.48	
495	0.0139	245.55	233.00	250.86		5636.49	5315.68	5772.08	
500	0.0139	248.20	233.89	250.50		5704.23	5338.38	5762.96	
505	0.0139	247.85	234.77			5695.13	5360.85		
510	0.0139	249.48	235.64			5736.98	5385.10		
515	0.0139	249.11	236.50			5727.55	5405.14		
520	0.0139	250.74	237.35			5769.09	5426.96		
525	0.0139	249.36	238.20			5733.80	5448.58		
530	0.0139	251.97	239.04			5800.59	5469.99		
535	0.0139	250.58	239.87			5765.01	5491.19		
540	0.0139	250.18	240.69			5754.83	5512.21		
545	0.0139	251.78	241.50			5795.63	5533.02		
550	0.0139	250.37	242.31			5759.62	5553.65		
555	0.0139	250.96	243.11			5774.59	5574.09		
560	0.0139	250.54	243.90			5763.86	5594.35		

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy Stored of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
565	0.0139	251.11	244.69			5778.56	5614.43		
570	0.0139	250.68	245.47			5767.58	5634.33		
575	0.0139	251.25	246.24			5782.02	5654.05		
580	0.0139	250.81	247.00			5770.78	5673.61		
585	0.0139	250.36	247.76			5759.42	5693.00		
590	0.0139	250.91	248.51			5773.50	5712.22		
595	0.0139	251.46	249.26			5787.45	5731.28		
600	0.0139	251.56	250.00			5790.05	5750.18		
605	0.0139	250.36				5759.28			
610	0.0139	250.93				5773.95			
615	0.0139	250.35				5759.23			
620	0.0139	249.47				5736.51			

APPENDIX C ENERGY STORED NANO₃

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
0	0.0139	23.94	19.86	18.84	22.12	-36.84	-178.06	-213.39	-99.67
5	0.0139	24.54	24.86	22.74	26.07	-16.06	-4.97	-78.38	36.94
10	0.0139	28.14	29.06	24.64	31.85	108.57	140.43	-12.60	237.16
15	0.0139	28.24	32.26	26.64	47.14	112.03	251.22	56.64	766.34
20	0.0139	36.24	35.36	28.64	49.26	388.98	358.54	125.88	839.79
25	0.0139	36.78	38.06	56.74	59.07	407.96	452.01	1098.79	1179.58
30	0.0139	50.58	40.16	66.41	71.54	885.64	524.71	1433.45	1611.31
35	0.0139	57.56	43.36	69.27	77.40	1127.11	635.49	1532.60	1813.94
40	0.0139	69.20	45.56	75.81	87.07	1530.11	711.65	1759.17	2148.66
45	0.0139	74.82	47.86	85.35	91.83	1724.73	791.28	2089.33	2313.60
50	0.0139	68.64	49.86	90.09	99.88	1510.71	860.52	2253.50	2592.31
55	0.0139	78.81	52.26	95.19	106.35	1862.70	943.60	2430.02	2816.43
60	0.0139	82.44	35.95	103.76	108.35	1988.39	379.22	2726.64	2885.57
65	0.0139	85.62	42.03	107.88	113.95	2098.46	589.51	2869.33	3079.32
70	0.0139	92.41	51.58	109.62	121.20	2333.72	920.11	2929.65	3330.52
75	0.0139	94.88	54.68	115.04	124.17	2419.04	1027.35	3117.11	3433.08
80	0.0139	96.05	54.38	121.17	125.87	2459.76	1017.10	3329.32	3492.15
85	0.0139	102.97	65.74	123.05	131.35	2699.43	1410.30	3394.38	3681.92
90	0.0139	104.67	64.79	128.71	132.64	2758.24	1377.47	3590.24	3726.33
95	0.0139	110.17	72.57	131.17	136.74	2948.60	1646.76	3675.40	3868.44
100	0.0139	111.49	80.10	133.45	140.69	2994.27	1907.56	3754.41	4005.04

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
105	0.0139	116.65	87.41	135.57	144.49	3172.81	2160.70	3827.87	4136.67
110	0.0139	118.66	85.52	140.55	145.16	3242.41	2095.32	4000.17	4159.92
115	0.0139	122.54	83.45	145.39	145.71	3376.61	2023.61	4167.88	4179.06
120	0.0139	123.29	90.21	147.11	149.16	3402.71	2257.68	4227.54	4298.29
125	0.0139	127.93	99.82	147.73	153.50	3563.40	2590.30	4248.74	4448.69
130	0.0139	129.47	97.29	152.24	153.76	3616.65	2502.59	4404.86	4457.43
135	0.0139	132.91	103.62	153.65	156.92	3735.81	2721.92	4453.85	4567.09
140	0.0139	133.26	103.84	156.98	158.01	3748.05	2729.33	4569.03	4604.78
145	0.0139	137.54	112.94	157.22	162.03	3895.90	3044.42	4577.53	4743.78
150	0.0139	137.73	112.94	160.39	162.97	3902.61	3044.29	4687.25	4776.57
155	0.0139	141.85	121.83	160.49	166.86	4045.30	3352.33	4690.65	4911.00
160	0.0139	143.91	118.64	164.52	166.68	4116.43	3241.75	4830.22	4904.88
165	0.0139	143.90	124.36	165.49	169.45	4116.12	3439.76	4863.77	5000.68
170	0.0139	147.83	121.00	169.40	169.16	4252.24	3323.38	4999.14	4990.79
175	0.0139	148.70	129.56	169.26	172.83	4282.56	3619.79	4994.12	5117.67
180	0.0139	151.53	135.05	170.06	175.44	4380.29	3809.84	5021.91	5208.29
185	0.0139	153.30	128.47	174.81	174.02	4441.66	3582.10	5186.46	5158.91
190	0.0139	153.03	136.83	174.52	177.55	4432.17	3871.41	5176.30	5281.17
195	0.0139	156.71	130.12	179.18	176.04	4559.60	3639.32	5337.70	5228.96
200	0.0139	153.34	138.36	178.80	179.50	4443.22	3924.50	5324.55	5348.53
205	0.0139	159.94	134.54	182.38	178.91	4671.63	3792.33	5448.49	5328.39
210	0.0139	159.50	142.67	181.92	182.30	4656.38	4073.78	5432.64	5445.54
215	0.0139	163.02	147.75	182.43	184.65	4778.33	4249.63	5450.14	5526.94

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
220	0.0139	162.51	140.78	186.90	182.97	4760.59	4008.40	5604.93	5468.79
225	0.0139	165.97	145.77	187.34	185.26	4880.18	4181.01	5620.09	5548.09
230	0.0139	165.39	156.71	185.75	189.52	4860.17	4559.84	5564.93	5695.65
235	0.0139	168.78	155.61	188.12	189.76	4977.59	4521.78	5647.19	5703.78
240	0.0139	169.14	151.47	191.47	188.97	4990.14	4378.48	5763.07	5676.40
245	0.0139	171.48	159.30	190.79	192.15	5070.95	4649.28	5739.51	5786.64
250	0.0139	169.78	155.08	194.08	191.31	5012.35	4503.38	5853.50	5757.57
255	0.0139	174.07	159.83	194.35	193.45	5160.57	4667.83	5862.75	5831.56
260	0.0139	173.32	164.55	194.59	195.56	5134.83	4831.10	5871.15	5904.78
265	0.0139	176.55	169.23	194.81	197.66	5246.74	4993.24	5878.72	5977.27
270	0.0139	172.76	164.88	198.01	196.73	5115.52	4842.71	5989.37	5945.20
275	0.0139	178.95	160.51	201.18	195.78	5329.72	4691.14	6099.26	5912.44
280	0.0139	180.12	165.10	201.33	197.82	5370.09	4850.13	6104.56	5982.88
285	0.0139	180.26	172.66	200.47	200.84	5375.12	5112.00	6074.53	6087.31
290	0.0139	182.39	168.20	203.58	199.83	5448.70	4957.50	6182.29	6052.65
295	0.0139	180.49	172.71	203.67	201.82	5383.14	5113.66	6185.54	6121.26
300	0.0139	184.58	171.20	205.75	201.78	5524.65	5061.22	6257.40	6120.06
305	0.0139	184.65	178.66	204.81	204.73	5527.06	5319.51	6224.77	6222.16
310	0.0139	186.70	177.09	206.85	204.66	5598.10	5265.41	6295.42	6219.87
315	0.0139	187.74	184.51	205.87	207.58	5633.95	5522.08	6261.62	6320.92
320	0.0139	183.76	179.90	208.88	206.49	5496.13	5362.55	6365.75	6282.99
325	0.0139	189.76	184.27	208.87	208.38	5703.96	5513.84	6365.47	6348.43
330	0.0139	188.75	179.62	211.85	207.25	5668.92	5352.84	6468.54	6309.55

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
335	0.0139	191.72	186.95	210.81	210.12	5771.85	5606.57	6432.61	6408.69
340	0.0139	189.68	191.26	210.76	211.97	5701.18	5755.76	6430.81	6472.76
345	0.0139	193.63	183.55	214.69	209.81	5837.75	5488.85	6567.01	6397.93
350	0.0139	192.56	190.82	213.61	212.63	5800.74	5740.59	6529.65	6495.78
355	0.0139	195.48	183.07	217.52	210.45	5901.76	5472.41	6664.93	6420.12
360	0.0139	193.38	190.31	216.42	213.25	5829.23	5722.92	6626.67	6517.17
365	0.0139	197.27	185.53	219.30	212.04	5963.99	5557.41	6726.47	6475.35
370	0.0139	194.15	192.73	218.17	214.83	5855.99	5806.76	6687.37	6571.64
375	0.0139	199.02	196.92	218.03	216.60	6024.54	5951.68	6682.49	6632.95
380	0.0139	194.88	189.09	221.87	214.36	5881.11	5680.64	6815.69	6555.42
385	0.0139	200.73	193.24	221.71	216.11	6083.49	5824.49	6810.02	6616.03
390	0.0139	199.56	203.38	219.54	219.85	6043.16	6175.54	6734.75	6745.54
395	0.0139	202.38	201.51	221.35	219.58	6140.94	6110.66	6797.59	6736.25
400	0.0139	200.20	196.62	224.16	218.30	6065.26	5941.43	6894.70	6692.02
405	0.0139	204.00	203.72	222.95	221.02	6196.95	6187.16	6852.98	6785.96
410	0.0139	202.80	198.80	225.74	219.72	6155.20	6016.98	6949.40	6741.12
415	0.0139	205.58	202.88	225.51	221.42	6251.59	6157.93	6941.63	6799.84
420	0.0139	204.36	206.93	225.28	223.10	6209.18	6298.43	6933.54	6858.27
425	0.0139	205.12	210.98	225.04	224.78	6235.69	6438.50	6925.14	6916.41
430	0.0139	205.88	206.01	227.78	223.46	6261.89	6266.57	7020.29	6870.43
435	0.0139	204.63	201.03	230.52	222.12	6218.55	6094.22	7115.14	6824.18
440	0.0139	209.37	205.05	230.26	223.78	6382.63	6233.05	7105.84	6881.52
445	0.0139	207.10	212.04	228.98	226.43	6304.09	6475.34	7061.63	6973.22

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
450	0.0139	210.82	207.03	231.69	225.07	6432.98	6301.81	7155.62	6926.20
455	0.0139	209.54	211.01	231.40	223.71	6388.49	6439.48	7145.48	6879.17
460	0.0139	212.24	208.97	233.10	224.35	6482.22	6369.06	7204.31	6901.39
465	0.0139	210.94	215.93	231.79	224.99	6437.20	6609.85	7159.02	6923.60
470	0.0139	213.63	213.87	233.48	225.63	6530.40	6538.72	7217.33	6945.82
475	0.0139	212.32	220.81	232.15	226.28	6484.86	6778.81	7171.54	6968.03
480	0.0139	215.00	215.74	234.82	226.92	6577.56	6603.13	7263.97	6990.25
485	0.0139	212.67	225.65	232.49	227.56	6496.92	6946.42	7183.07	7012.46
490	0.0139	216.33	226.56	233.14	228.20	6623.75	6977.80	7205.79	7034.68
495	0.0139	214.99	227.45	233.79	228.84	6577.26	7008.86	7228.28	7056.89
500	0.0139	217.64	228.34	234.44	229.48	6669.01	7039.61	7250.55	7079.11
505	0.0139	217.28	229.22	235.08	230.13	6656.68	7070.05	7272.81	7101.32
510	0.0139	218.92	230.09	235.72	230.77	6713.37	7100.20	7295.08	7123.54
515	0.0139	218.55	230.96	236.37	231.41	6700.61	7130.05	7317.34	7145.75
520	0.0139	220.18	231.81	237.01	232.05	6756.87	7159.61	7339.61	7167.96
525	0.0139	218.80	232.66	237.65	232.69	6709.07	7188.89	7361.87	7190.18
530	0.0139	221.41	233.49	238.29	233.33	6799.54	7217.89	7384.13	7212.39
535	0.0139	220.02	234.32	238.94	233.98	6751.34	7246.62	7406.40	7234.61
540	0.0139	222.62	235.14	239.58	234.62	6841.42	7275.08	7428.66	7256.82
545	0.0139	221.21	235.96	240.22	235.26	6792.83	7303.28	7450.93	7279.04
550	0.0139	222.81	236.77	240.87	235.90	6847.91	7331.23	7473.19	7301.25
555	0.0139	224.39	237.57	241.51	236.54	6902.80	7358.92	7495.46	7323.47
560	0.0139	227.97	238.36	242.15	237.18	7026.75	7386.36	7517.72	7345.68

Times/Energy Stored	Volume	T(t) Flow rate 0.58 kg/s	T(t) Flow rate 0.87 kg/s	T(t) Flow rate 1.16 kg/s	T(t) Flow rate 1.45 kg/s	Energy Stored of Flow rate 0.58 kg/s	Energy of Flow rate 0.87 kg/s	Energy Stored of Flow rate 1.16 kg/s	Energy Stored of Flow rate 1.45 kg/s
565	0.0139	226.55	239.14	242.80	237.83	6977.42	7413.55	7539.99	7367.90
570	0.0139	229.12	239.92	243.44	238.47	7066.40	7440.51	7562.25	7390.11
575	0.0139	228.68	240.70	244.08	239.11	7051.35	7467.23	7584.51	7412.33
580	0.0139	228.24	241.46	244.73	239.75	7036.12	7493.73	7606.78	7434.54
585	0.0139	227.80	242.22	245.37	240.39	7020.73	7519.99	7629.04	7456.76
590	0.0139	229.35	242.97	246.01	241.03	7074.42	7546.03	7651.31	7478.97
595	0.0139	228.89	243.72	246.66	241.68	7058.70	7571.85	7673.57	7501.18
600	0.0139	229.00	244.46	247.30	242.32	7062.22	7597.45	7695.84	7523.40
605	0.0139	233.50	245.20	247.94	242.96	7218.01	7623.06	7718.10	7545.61
610	0.0139	234.93	245.94	248.58	243.60	7267.65	7648.66	7740.37	7567.83
615	0.0139	235.57	246.68	249.23	244.24	7289.77	7674.26	7762.63	7590.04
620	0.0139	235.95	247.41	249.87	244.88	7302.79	7699.87	7784.89	7612.26