

Supporting Data

Incubation 1 (Fig. 3)

					FDA activity	Ammonium	Nitrate	
Sample	Treatment	Abb r	Re p	Wee k	mg F/ kg soil/3 hr	NH4 mg/kg	NO3 mg/kg	pH
1	Control	Ctrl	1	0	50.98	14.88	1.92	6.22
2	Control	Ctrl	2	0	49.06	13.61	1.95	6.25
3	Control	Ctrl	3	0	39.89	13.69	1.95	6.2
4	23% VM corncob biochar	H-Ch	1	0	46.26	12.54	1.87	5.9
5	23% VM corncob biochar	H-Ch	2	0	57.35	13.95	1.64	5.89
6	23% VM corncob biochar	H-Ch	3	0	40.76	14.54	1.57	6.22
7	7% VM corncob biochar	L-Ch	1	0	57.32	13.68	1.88	6.04
8	7% VM corncob biochar	L-Ch	2	0	73.94	13.79	1.41	5.88
9	7% VM corncob biochar	L-Ch	3	0	61.95	14.21	1.81	6
10	23% VM kiawe biochar	K-Ch	1	0	55.12	13.95	1.40	6.03
11	23% VM kiawe biochar	K-Ch	2	0	64.40	13.51	1.69	6.27
12	23% VM kiawe biochar	K-Ch	3	0	59.19	12.63	1.91	6.28
13	raw corncob husks	cc-r	1	0	121.23	19.88	1.15	5.53
14	raw corncob husks	cc-r	2	0	94.29	20.45	1.31	5.63
15	raw corncob husks	cc-r	3	0	183.68	18.21	1.33	5.69
16	raw kiawe wood	K-r	1	0	139.62	21.10	1.27	5.91
17	raw kiawe wood	K-r	2	0	168.95	22.39	1.27	5.84
18	raw kiawe wood	K-r	3	0	167.65	20.23	1.30	6.09
19	Extracted HVM cc	H-ext	1	0	54.62	14.61	1.45	6.05
20	Extracted HVM cc	H-ext	2	0	69.03	13.32	1.45	6.19

21	Extracted HVM cc	H-ext	3	0	73.88	14.76	1.49	6.02
22	Activated charcoal	AC	1	0	26.00	14.52	1.64	6.3
23	Activated charcoal	AC	2	0	21.06	14.66	1.78	6.27
24	Activated charcoal	AC	3	0	32.59	13.73	1.76	6.24
25	Control	Ctrl	1	1	242.09	19.78	3.58	6.39
26	Control	Ctrl	2	1	241.63	22.89	3.01	6.19
27	Control	Ctrl	3	1	255.64	19.33	2.73	6.27
28	23% VM corncob biochar	H-Ch	1	1	371.80	12.65	2.70	6.13
29	23% VM corncob biochar	H-Ch	2	1	415.78	13.05	2.63	5.99
30	23% VM corncob biochar	H-Ch	3	1	362.38	12.26	2.51	6.29
31	7% VM corncob biochar	L-Ch	1	1	198.70	12.77	2.52	6.27
32	7% VM corncob biochar	L-Ch	2	1	190.06	7.67	2.46	6.43
33	7% VM corncob biochar	L-Ch	3	1	196.37	8.04	2.67	6.44
34	23% VM kiawe biochar	K-Ch	1	1	194.82	14.74	2.68	6.5
35	23% VM kiawe biochar	K-Ch	2	1	201.40	16.51	2.58	6.49
36	23% VM kiawe biochar	K-Ch	3	1	226.51	13.24	3.57	6.63
37	raw corncob husks	cc-r	1	1	961.96	3.12	2.54	5.62
38	raw corncob husks	cc-r	2	1	930.30	5.77	2.37	5.53
39	raw corncob husks	cc-r	3	1	948.18	3.80	2.77	5.7
40	raw kiawe wood	K-r	1	1	738.70	6.83	3.23	6.06
41	raw kiawe wood	K-r	2	1	482.53	2.44	2.48	6.15
42	raw kiawe wood	K-r	3	1	759.21	12.41	2.38	6.23
43	Extracted HVM cc	H-ext	1	1	232.75	9.93	2.66	6.39
44	Extracted HVM cc	H-ext	2	1	206.41	9.97	2.66	6.34

45	Extracted HVM cc	H-ext	3	1	276.73	23.34	2.78	6.3
46	Activated charcoal	AC	1	1	35.14	13.32	2.63	6.34
47	Activated charcoal	AC	2	1	36.63	15.89	2.68	6.33
48	Activated charcoal	AC	3	1	28.21	5.34	2.75	6.66
49	Control	Ctrl	1	2	169.08	19.84	2.29	6.2
50	Control	Ctrl	2	2	191.00	20.02	1.86	6.06
51	Control	Ctrl	3	2	193.84	25.46	2.57	6.11
52	23% VM corncob biochar	H-Ch	1	2	292.29	17.48	1.75	6.25
53	23% VM corncob biochar	H-Ch	2	2	303.23	17.56	2.05	6.12
54	23% VM corncob biochar	H-Ch	3	2	292.82	13.80	1.61	6.09
55	7% VM corncob biochar	L-Ch	1	2	202.65	14.37	2.41	6.03
56	7% VM corncob biochar	L-Ch	2	2	176.74	12.47	2.46	6
57	7% VM corncob biochar	L-Ch	3	2	248.18	15.40	2.59	6.01
58	23% VM kiawe biochar	K-Ch	1	2	202.12	16.74	1.75	6.36
59	23% VM kiawe biochar	K-Ch	2	2	205.70	16.92	2.00	6.45
60	23% VM kiawe biochar	K-Ch	3	2	167.70	18.13	1.59	6.39
61	raw corncob husks	cc-r	1	2	720.13	1.83	1.58	5.02
62	raw corncob husks	cc-r	2	2	852.90	1.45	1.28	4.88
63	raw corncob husks	cc-r	3	2	815.54	3.58	1.31	4.91
64	raw kiawe wood	K-r	1	2	728.26	1.92	1.11	5.75
65	raw kiawe wood	K-r	2	2	680.83	37.97	1.16	5.52
66	raw kiawe wood	K-r	3	2	739.86	1.56	1.47	5.92
67	Extracted HVM cc	H-ext	1	2	278.25	21.88	2.19	6.03
68	Extracted HVM cc	H-ext	2	2	198.55	14.17	1.61	5.93

69	Extracted HVM cc	H-ext	3	2	232.07	15.01	1.62	6.15
70	Activated charcoal	AC	1	2	15.52	12.73	2.78	6.36
71	Activated charcoal	AC	2	2	21.16	13.09	2.74	6.42
72	Activated charcoal	AC	3	2	23.67	9.71	3.23	6.48
73	Control	Ctrl	1	4	142.94	31.64	1.92	5.89
74	Control	Ctrl	2	4	125.80	26.70	1.64	6.09
75	Control	Ctrl	3	4	110.26	32.00	2.07	6.14
76	23% VM corncob biochar	H-Ch	1	4	222.55	19.30	2.26	6.07
77	23% VM corncob biochar	H-Ch	2	4	277.71	16.87	1.58	6.05
78	23% VM corncob biochar	H-Ch	3	4	332.40	19.79	1.62	6.02
79	7% VM corncob biochar	L-Ch	1	4	179.42	8.60	2.60	6.02
80	7% VM corncob biochar	L-Ch	2	4	186.48	20.18	2.61	6.08
81	7% VM corncob biochar	L-Ch	3	4	136.42	21.09	2.97	5.98
82	23% VM kiawe biochar	K-Ch	1	4	109.66	20.37	2.60	6
83	23% VM kiawe biochar	K-Ch	2	4	163.25	25.77	1.69	6.25
84	23% VM kiawe biochar	K-Ch	3	4	136.22	19.03	2.14	6.16
85	raw corncob husks	cc-r	1	4	985.40	0.99	1.66	5.16
86	raw corncob husks	cc-r	2	4	1000.75	1.29	1.29	5.19
87	raw corncob husks	cc-r	3	4	1005.59	1.25	1.12	5.34
88	raw kiawe wood	K-r	1	4	442.95	2.64	1.30	5.7
89	raw kiawe wood	K-r	2	4	477.79	4.29	1.26	5.56
90	raw kiawe wood	K-r	3	4	589.68	1.74	1.18	5.61
91	Extracted HVM cc	H-ext	1	4	191.60	14.16	1.60	5.8
92	Extracted HVM cc	H-ext	2	4	194.99	14.05	1.62	5.84

93	Extracted HVM cc	H-ext	3	4	263.27	15.63	1.59	6.04
94	Activated charcoal	AC	1	4	52.65	12.79	2.91	6.18
95	Activated charcoal	AC	2	4	51.33	13.11	2.84	6.2
96	Activated charcoal	AC	3	4	51.08	9.66	2.81	6.25
97	Control	Ctrl	1	6	205.51	31.26	1.81	6.1
98	Control	Ctrl	2	6	191.45	34.81	1.46	6.05
99	Control	Ctrl	3	6	185.45	32.90	1.40	6.05
100	23% VM corncob biochar	H-Ch	1	6	273.37	21.33	1.24	6.05
101	23% VM corncob biochar	H-Ch	2	6	276.76	23.25	1.30	6
102	23% VM corncob biochar	H-Ch	3	6	252.22	22.31	1.05	6.05
103	7% VM corncob biochar	L-Ch	1	6	178.38	21.54	2.92	5.82
104	7% VM corncob biochar	L-Ch	2	6	227.22	19.03	2.80	5.84
105	7% VM corncob biochar	L-Ch	3	6	224.70	20.68	2.76	5.9
106	23% VM kiawe biochar	K-Ch	1	6	195.78	23.90	1.33	6.32
107	23% VM kiawe biochar	K-Ch	2	6	139.58	22.52	1.25	6.17
108	23% VM kiawe biochar	K-Ch	3	6	172.67	24.36	1.05	6.07
109	raw corncob husks	cc-r	1	6	872.49	2.19	0.68	5.12
110	raw corncob husks	cc-r	2	6	832.77	1.76	0.68	5.17
111	raw corncob husks	cc-r	3	6	903.84	1.59	0.63	5.19
112	raw kiawe wood	K-r	1	6	622.19	1.71	0.61	5.57
113	raw kiawe wood	K-r	2	6	729.86	1.56	0.65	5.53
114	raw kiawe wood	K-r	3	6	726.13	1.63	0.60	5.66
115	Extracted HVM cc	H-ext	1	6	236.95	20.26	1.07	5.89
116	Extracted HVM cc	H-ext	2	6	252.16	19.92	1.15	6.06

117	Extracted HVM cc	H-ext	3	6	306.87	20.77	1.21	5.95
118	Activated charcoal	AC	1	6	31.38	15.30	0.00	6.01
119	Activated charcoal	AC	2	6	35.80	17.84	0.00	6
120	Activated charcoal	AC	3	6	28.89	20.94	0.00	5.93
121	Control	Ctrl	1	8	166.29	36.54	3.05	6.08
122	Control	Ctrl	2	8	187.69	40.13	2.92	6.18
123	Control	Ctrl	3	8	119.54	38.86	2.81	5.9
124	23% VM corncob biochar	H-Ch	1	8	229.83	26.24	2.26	6.15
125	23% VM corncob biochar	H-Ch	2	8	347.12	25.69	2.74	6
126	23% VM corncob biochar	H-Ch	3	8	258.60	27.70	2.08	5.9
127	7% VM corncob biochar	L-Ch	1	8	85.21	15.90	3.16	5.96
128	7% VM corncob biochar	L-Ch	2	8	115.37	10.57	4.49	5.98
129	7% VM corncob biochar	L-Ch	3	8	95.71	17.24	3.09	5.89
130	23% VM kiawe biochar	K-Ch	1	8	173.35	22.04	1.75	6.35
131	23% VM kiawe biochar	K-Ch	2	8	179.62	24.69	2.04	6.24
132	23% VM kiawe biochar	K-Ch	3	8	164.04	33.17	2.03	6.39
133	raw corncob husks	cc-r	1	8	1144.23	3.08	1.36	5.25
134	raw corncob husks	cc-r	2	8	1064.13	3.20	1.22	5.41
135	raw corncob husks	cc-r	3	8	969.22	2.97	1.22	5.21
136	raw kiawe wood	K-r	1	8	440.02	3.13	1.31	5.82
137	raw kiawe wood	K-r	2	8	557.41	2.54	1.18	5.84
138	raw kiawe wood	K-r	3	8	288.43	4.14	1.24	5.69
139	Extracted HVM cc	H-ext	1	8	464.27	19.26	2.08	6.24
140	Extracted HVM cc	H-ext	2	8	267.85	24.15	2.52	6.2

141	Extracted HVM cc	H-ext	3	8	274.33	23.00	2.13	6.22
142	Activated charcoal	AC	1	8	35.57	16.61	2.28	5.94
143	Activated charcoal	AC	2	8	41.60	19.96	2.27	6.08
144	Activated charcoal	AC	3	8	32.14	21.41	2.78	6

Incubation 2 (Fig. 4)

					FDA activ ity	Ammon ium	Nitr ate	Water extract able C	Water extract able N
observa tion	id	treatment	nitroge n	D ay	mg F/ kg soil/ 3 hr	NH4 mg/kg	NO3 mg/ kg	mg C/ kg soil	mg N/ kg soil
1	1	Control	No	0	131. 66	5.54	1.65	288.91	10.35
2	2	Control	No	0	132. 12	5.60	1.83	286.84	10.95
3	3	Control	No	0	142. 80	6.01	2.08	300.85	10.11
4	4	Control	Yes	0	126. 87	37.10	25.4 1	256.86	36.91
5	5	Control	Yes	0	136. 13	45.69	26.5 5	266.40	36.78
6	6	Control	Yes	0	135. 09	43.57	24.6 6	272.04	36.38
7	7	34% VM corncob biochar	No	0	147. 17	6.87	2.32	350.79	19.54
8	8	34% VM corncob biochar	No	0	137. 97	7.50	2.07	348.16	14.90
9	9	34% VM corncob biochar	No	0	141. 33	7.34	2.09	365.10	16.85
10	10	34% VM corncob biochar	Yes	0	158. 82	39.85	28.4 5	364.12	49.52
11	11	34% VM corncob biochar	Yes	0	150. 71	38.76	27.2 4	348.63	43.70
12	12	34% VM corncob biochar	Yes	0	133. 62	34.42	26.1 9	355.83	44.59
13	13	7% VM corncob biochar	No	0	142. 07	6.39	2.27	331.94	14.52
14	14	7% VM corncob biochar	No	0	142. 50	6.56	2.13	328.95	15.78
15	15	7% VM corncob biochar	No	0	151. 60	6.45	1.94	333.19	16.53
16	16	7% VM corncob biochar	Yes	0	150. 45	35.43	26.6 5	328.61	42.26
17	17	7% VM corncob biochar	Yes	0	138. 50	41.12	26.9 8	322.82	47.61
18	18	7% VM corncob biochar	Yes	0	134. 35	36.43	25.5 4	331.11	50.13

19	1	Control	No	1	126.21	5.95	2.07	296.20	15.56
20	2	Control	No	1	116.12	4.85	2.19	277.52	14.91
21	3	Control	No	1	135.86	5.33	2.23	299.90	14.21
22	4	Control	Yes	1	128.86	40.34	27.67	296.90	43.30
23	5	Control	Yes	1	121.40	33.92	26.82	268.83	43.18
24	6	Control	Yes	1	115.74	33.04	26.50	279.66	40.93
25	7	34% VM corncob biochar	No	1	128.40	2.65	2.46	360.93	19.89
26	8	34% VM corncob biochar	No	1	128.18	2.12	2.19	361.55	18.72
27	9	34% VM corncob biochar	No	1	127.17	3.22	2.27	354.32	22.26
28	10	34% VM corncob biochar	Yes	1	130.58	35.78	27.00	340.76	47.23
29	11	34% VM corncob biochar	Yes	1	149.06	40.45	27.96	353.38	52.22
30	12	34% VM corncob biochar	Yes	1	122.08	35.79	27.02	352.44	48.73
31	13	7% VM corncob biochar	No	1	128.29	5.87	2.27	323.17	21.06
32	14	7% VM corncob biochar	No	1	131.66	5.16	2.04	341.26	22.06
33	15	7% VM corncob biochar	No	1	148.00	6.45	2.01	340.56	22.92
34	16	7% VM corncob biochar	Yes	1	127.53	42.31	26.90	348.42	63.34
35	17	7% VM corncob biochar	Yes	1	120.83	38.35	26.60	327.00	51.32
36	18	7% VM corncob biochar	Yes	1	144.83	44.17	26.08	319.16	50.30
37	1	Control	No	3	127.30	4.21	2.37	293.87	9.99
38	2	Control	No	3	112.37	4.32	2.76	262.35	8.23
39	3	Control	No	3	110.85	4.63	2.82	273.63	10.94
40	4	Control	Yes	3	113.79	30.08	37.69	250.81	35.18
41	5	Control	Yes	3	108.84	28.91	33.78	267.13	37.47

42	6	Control	Yes	3	111.04	30.25	33.38	260.27	36.20
43	7	34% VM corncob biochar	No	3	137.14	1.51	1.91	303.29	11.04
44	8	34% VM corncob biochar	No	3	133.52	0.79	1.74	309.87	10.07
45	9	34% VM corncob biochar	No	3	139.56	1.11	1.57	323.42	10.79
46	10	34% VM corncob biochar	Yes	3	147.25	22.71	35.65	309.80	39.47
47	11	34% VM corncob biochar	Yes	3	164.41	27.36	34.19	303.01	39.54
48	12	34% VM corncob biochar	Yes	3	158.22	39.30	32.36	302.77	40.43
49	13	7% VM corncob biochar	No	3	110.86	4.76	2.26	331.93	15.78
50	14	7% VM corncob biochar	No	3	111.63	5.69	2.28	312.63	17.05
51	15	7% VM corncob biochar	No	3	125.44	5.95	2.18	310.13	15.02
52	16	7% VM corncob biochar	Yes	3	120.54	35.62	34.14	309.11	42.97
53	17	7% VM corncob biochar	Yes	3	99.40	32.02	33.78	331.85	47.49
54	18	7% VM corncob biochar	Yes	3	103.37	30.59	31.85	327.13	46.70
55	1	Control	No	7	179.95	7.75	2.30	281.87	11.24
56	2	Control	No	7	171.64	7.53	2.62	295.71	14.19
57	3	Control	No	7	157.77	7.48	2.65	284.68	10.40
58	4	Control	Yes	7	146.98	48.16	33.92	265.04	38.99
59	5	Control	Yes	7	156.98	38.60	31.52	264.94	38.40
60	6	Control	Yes	7	125.07	49.29	31.61	214.54	37.49
61	7	34% VM corncob biochar	No	7	226.35	0.83	0.47	321.43	12.90
62	8	34% VM corncob biochar	No	7	267.04	0.19	0.25	329.07	14.76
63	9	34% VM corncob biochar	No	7	274.41	0.92	0.31	328.92	11.24
64	10	34% VM corncob biochar	Yes	7	476.91	27.57	25.95	297.90	37.62

65	11	34% VM corncob biochar	Yes	7	418.98	28.46	26.79	318.25	41.25
66	12	34% VM corncob biochar	Yes	7	365.54	28.75	25.98	295.64	38.06
67	13	7% VM corncob biochar	No	7	198.81	10.58	1.87	363.27	19.42
68	14	7% VM corncob biochar	No	7	188.38	10.66	1.86	372.72	17.94
69	15	7% VM corncob biochar	No	7	164.64	11.53	1.83	335.08	17.80
70	16	7% VM corncob biochar	Yes	7	155.36	60.84	29.26	347.82	48.07
71	17	7% VM corncob biochar	Yes	7	140.59	57.41	27.54	339.90	48.24
72	18	7% VM corncob biochar	Yes	7	151.69	60.49	26.43	356.26	47.26
73	1	Control	No	10	139.26	7.55	2.35	266.68	10.34
74	2	Control	No	10	133.44	6.18	2.74	264.98	12.02
75	3	Control	No	10	126.86	6.64	2.52	269.87	14.22
76	4	Control	Yes	10	121.85	42.62	35.22	234.77	40.02
77	5	Control	Yes	10	128.48	36.08	30.81	266.91	41.21
78	6	Control	Yes	10	121.01	38.11	33.70	244.32	38.88
79	7	34% VM corncob biochar	No	10	238.62	0.13	0.37	278.81	12.09
80	8	34% VM corncob biochar	No	10	263.90	0.00	0.07	296.51	14.33
81	9	34% VM corncob biochar	No	10	292.62	0.04	0.00	298.53	8.68
82	10	34% VM corncob biochar	Yes	10	408.26	20.79	24.11	280.32	34.81
83	11	34% VM corncob biochar	Yes	10	603.58	16.11	22.26	328.05	42.17
84	12	34% VM corncob biochar	Yes	10	464.98	18.63	25.04	302.68	36.22
85	13	7% VM corncob biochar	No	10	147.39	7.79	1.52	327.80	21.14
86	14	7% VM corncob biochar	No	10	131.77	9.53	1.58	326.71	19.32
87	15	7% VM corncob biochar	No	10	150.32	8.09	1.74	337.51	20.24

88	16	7% VM corncob biochar	Yes	10	131.65	43.95	27.26	332.43	47.95
89	17	7% VM corncob biochar	Yes	10	146.42	37.38	25.44	344.63	44.39
90	18	7% VM corncob biochar	Yes	10	125.97	36.79	23.00	325.11	43.69
91	1	Control	No	14	210.05	6.54	2.13	203.69	8.07
92	2	Control	No	14	187.64	6.79	2.40	217.90	6.88
93	3	Control	No	14	202.92	7.24	2.52	230.13	14.04
94	4	Control	Yes	14	179.10	39.56	34.35	209.57	37.78
95	5	Control	Yes	14	189.41	40.72	30.03	187.82	36.73
96	6	Control	Yes	14	199.51	33.79	31.92	187.50	35.99
97	7	34% VM corncob biochar	No	14	416.91	1.00	0.16	221.22	5.86
98	8	34% VM corncob biochar	No	14	394.99	0.95	0.00	253.12	8.66
99	9	34% VM corncob biochar	No	14	401.83	1.52	0.00	199.54	6.81
100	10	34% VM corncob biochar	Yes	14	683.30	13.37	21.59	231.49	29.13
101	11	34% VM corncob biochar	Yes	14	865.52	18.93	20.97	228.85	28.50
102	12	34% VM corncob biochar	Yes	14	602.90	9.66	19.16	238.17	26.28
103	13	7% VM corncob biochar	No	14	185.17	10.11	1.35	293.90	16.12
104	14	7% VM corncob biochar	No	14	224.80	9.11	1.52	259.12	18.13
105	15	7% VM corncob biochar	No	14	189.37	13.70	1.38	292.50	16.06
106	16	7% VM corncob biochar	Yes	14	182.07	56.41	24.74	278.49	43.74
107	17	7% VM corncob biochar	Yes	14	194.64	67.93	25.47	284.45	45.19
108	18	7% VM corncob biochar	Yes	14	185.27	37.11	21.96	265.67	42.16
109	1	Control	No	21	118.43	9.53	2.31	198.34	6.87
110	2	Control	No	21	139.78	7.06	2.41	228.50	6.53

111	3	Control	No	21	108.17	10.21	2.41	208.01	8.37
112	4	Control	Yes	21	104.78	28.16	26.96	184.03	38.36
113	5	Control	Yes	21	104.97	46.49	27.02	231.84	37.29
114	6	Control	Yes	21	85.53	41.77	29.33	168.54	32.64
115	7	34% VM corncob biochar	No	21	243.10	0.00	0.62	241.99	8.46
116	8	34% VM corncob biochar	No	21	262.12	0.00	0.10	224.79	3.47
117	9	34% VM corncob biochar	No	21	378.71	0.00	0.00	235.42	12.03
118	10	34% VM corncob biochar	Yes	21	793.75	4.43	16.07	222.34	22.85
119	11	34% VM corncob biochar	Yes	21	726.92	6.68	16.03	241.55	27.84
120	12	34% VM corncob biochar	Yes	21	911.72	6.54	17.52	229.96	22.57
121	13	7% VM corncob biochar	No	21	114.17	9.84	1.49	272.73	14.07
122	14	7% VM corncob biochar	No	21	78.60	11.75	1.54	258.92	13.24
123	15	7% VM corncob biochar	No	21	115.81	11.10	1.56	247.05	15.25
124	16	7% VM corncob biochar	Yes	21	115.11	33.37	22.33	267.52	42.50
125	17	7% VM corncob biochar	Yes	21	119.64	31.24	22.49	263.35	40.70
126	18	7% VM corncob biochar	Yes	21	97.35	28.10	21.58	238.12	41.29
127	1	Control	No	28	161.17	13.75	2.90	223.99	11.70
128	2	Control	No	28	120.66	10.21	2.86	203.84	7.96
129	3	Control	No	28	145.01	12.10	2.89	218.73	6.58
130	4	Control	Yes	28	196.38	20.71	29.75	184.87	33.45
131	5	Control	Yes	28	189.04	18.14	28.08	198.80	34.51
132	6	Control	Yes	28	201.41	18.28	30.20	193.93	32.71
133	7	34% VM corncob biochar	No	28	279.02	0.00	0.74	249.66	10.09

134	8	34% VM corncob biochar	No	28	394.12	0.00	0.00	266.98	7.71
135	9	34% VM corncob biochar	No	28	351.27	0.08	0.00	240.94	9.51
136	10	34% VM corncob biochar	Yes	28	811.76	4.67	17.97	234.14	27.01
137	11	34% VM corncob biochar	Yes	28	878.55	5.91	16.37	235.52	23.28
138	12	34% VM corncob biochar	Yes	28	697.80	6.28	16.04	229.90	23.25
139	13	7% VM corncob biochar	No	28	155.59	9.65	1.53	286.50	17.27
140	14	7% VM corncob biochar	No	28	141.67	10.88	1.51	347.63	16.17
141	15	7% VM corncob biochar	No	28	159.64	11.52	1.42	277.83	14.97
142	16	7% VM corncob biochar	Yes	28	180.39	41.30	21.46	284.88	44.08
143	17	7% VM corncob biochar	Yes	28	150.53	28.05	20.76	288.29	47.61
144	18	7% VM corncob biochar	Yes	28	159.74	34.35	18.39	318.18	45.28

Incubation 3 (Fig. 5)

			FDA	Fungal counts
Material	Treatment		mg F/ flask/3 hr	cfu (10 ⁴)
Ctrl	No biochar	1	0.497880863	3
Ctrl	No biochar	2	0.608728052	5
Ctrl	No biochar	3	0.704671417	4
23% corncon biochar	Untreated	1	1.355782218	20
23% corncon biochar	Untreated	2	1.67015975	13
23% corncon biochar	Untreated	3	1.37254902	28
23% corncon biochar	Water extracted	1	0.786176703	26
23% corncon biochar	Water extracted	2	1.426109636	15
23% corncon biochar	Water extracted	3	1.579805319	9
23% corncon biochar	Acetone extracted	1	0.858832844	19
23% corncon biochar	Acetone extracted	2	1.345070095	20
23% corncon biochar	Acetone extracted	3	0.777327558	14
Extract from biochar	Water	1	1.104280192	3
Extract from biochar	Water	2	1.155046342	0
Extract from biochar	Water	3	1.118718271	44
Extract from biochar	Acetone	1	2.159657212	31
Extract from biochar	Acetone	2	1.758651204	29
Extract from biochar	Acetone	3	2.250477388	37

Corn Cob Char made by Flash Carbonization, Michael Antal at Univ. Hawaii
High volatile matter content
56.6mg
4mm MAS probe. 7 kHz MAS. Cross Polarization

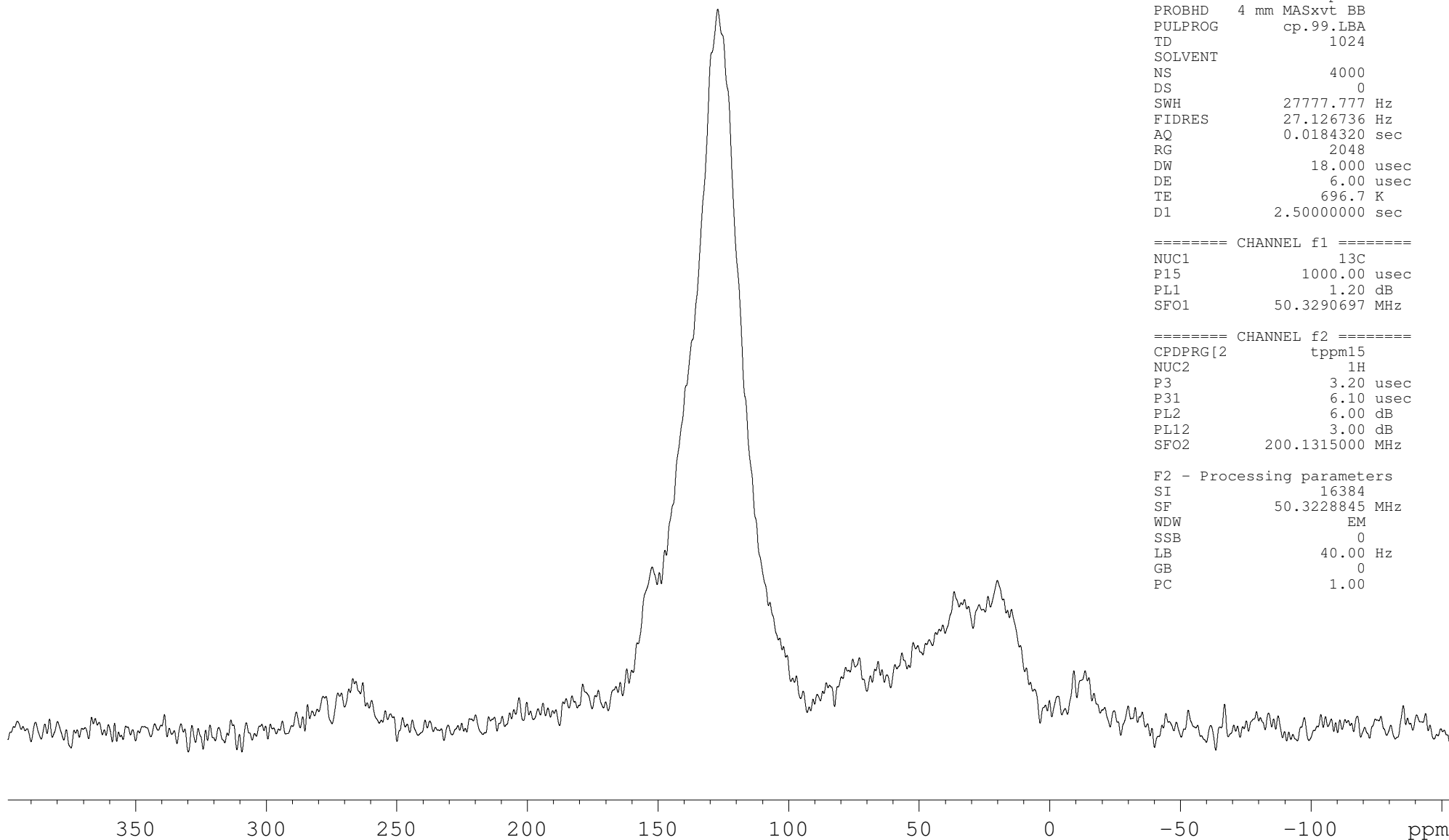
Current Data Parameters
NAME Deenik_HighVM_CobChar03
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20090328
Time 17.53
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG cp.99.LBA
TD 1024
SOLVENT
NS 4000
DS 0
SWH 27777.777 Hz
FIDRES 27.126736 Hz
AQ 0.0184320 sec
RG 2048
DW 18.000 usec
DE 6.00 usec
TE 696.7 K
D1 2.5000000 sec

===== CHANNEL f1 =====
NUC1 13C
P15 1000.00 usec
PL1 1.20 dB
SFO1 50.3290697 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 1H
P3 3.20 usec
P31 6.10 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228845 MHz
WDW EM
SSB 0
LB 40.00 Hz
GB 0
PC 1.00



Corn Cob Char made by Flash Carbonization, Michael Antal at Univ. Hawaii
High volatile matter content
56.6mg
4mm MAS probe. NOTE: Spin Rate was 7 kHz MAS.
Direct Polarization 20 degree 13C pulse (1ms) with TPPM decoupling

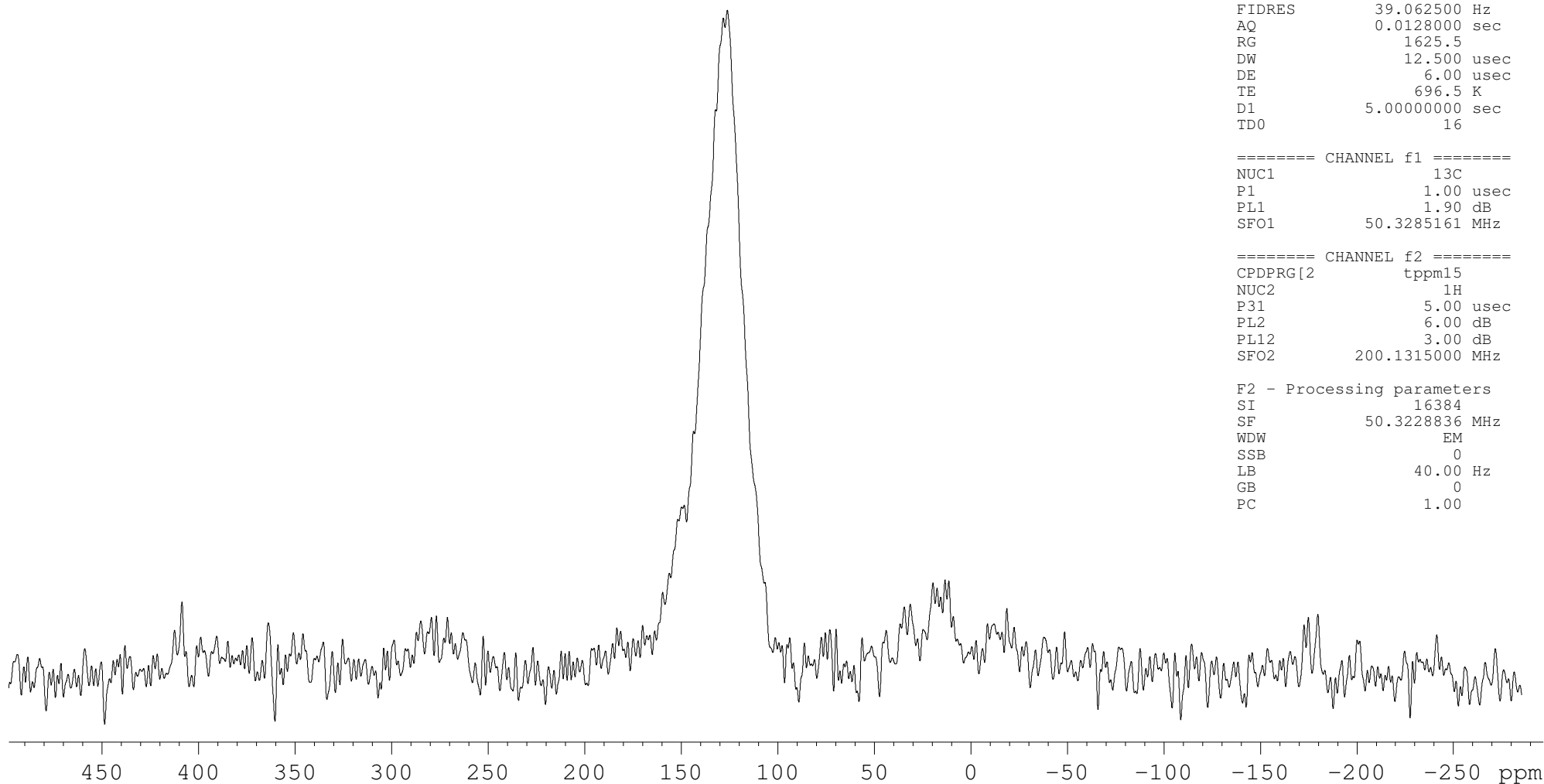
Current Data Parameters
NAME Deenik_HighVM_CobChar03
EXPNO 2
PROCNO 2

F2 - Acquisition Parameters
Date_ 20090328
Time 22.03
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG hpdec_BH30_tppm
TD 1024
SOLVENT
NS 8000
DS 2
SWH 40000.000 Hz
FIDRES 39.062500 Hz
AQ 0.0128000 sec
RG 1625.5
DW 12.500 usec
DE 6.00 usec
TE 696.5 K
D1 5.00000000 sec
TD0 16

===== CHANNEL f1 =====
NUC1 13C
P1 1.00 usec
PL1 1.90 dB
SFO1 50.3285161 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 1H
P31 5.00 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228836 MHz
WDW EM
SSB 0
LB 40.00 Hz
GB 0
PC 1.00



Corn Cob Char made by Flash Carbonization, Michael Antal at Univ. Hawaii
spectrum of Volatile matter obtained by difference (High VM - Low VM)

4mm MAS probe. 7 kHz MAS. Cross Polarization

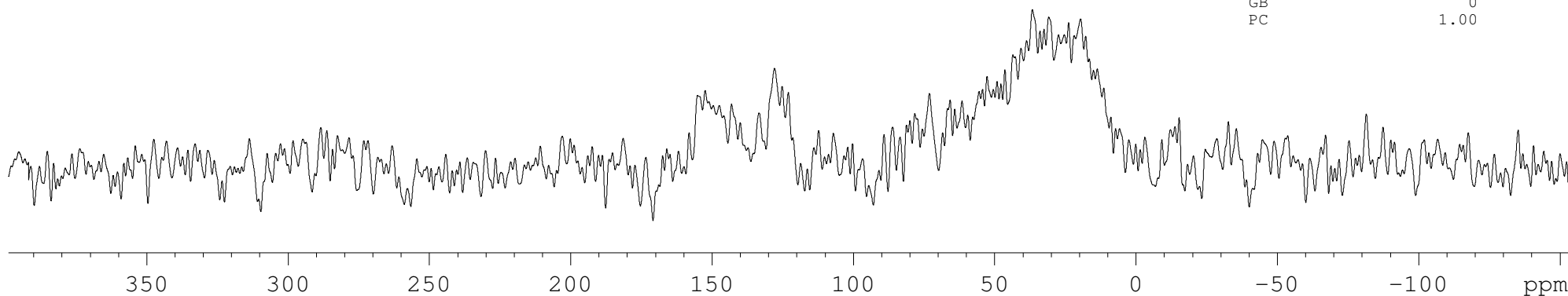
Current Data Parameters
NAME Deenik_HighVM_CobChar03
EXPNO 1
PROCNO 2

F2 - Acquisition Parameters
Date_ 20090328
Time 17.53
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG cp.99.LBA
TD 1024
SOLVENT
NS 4000
DS 0
SWH 27777.777 Hz
FIDRES 27.126736 Hz
AQ 0.0184320 sec
RG 2048
DW 18.000 usec
DE 6.00 usec
TE 696.7 K
D1 2.5000000 sec

===== CHANNEL f1 =====
NUC1 13C
P15 1000.00 usec
PL1 1.20 dB
SFO1 50.3290697 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 1H
P3 3.20 usec
P31 6.10 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228845 MHz
WDW EM
SSB 0
LB 40.00 Hz
GB 0
PC 1.00



Corn Cob Char made by Flash Carbonization Michael Antal at Univ. Hawaii
63.5mg
4mm MAS probe. 7 kHz MAS. Cross Polarization

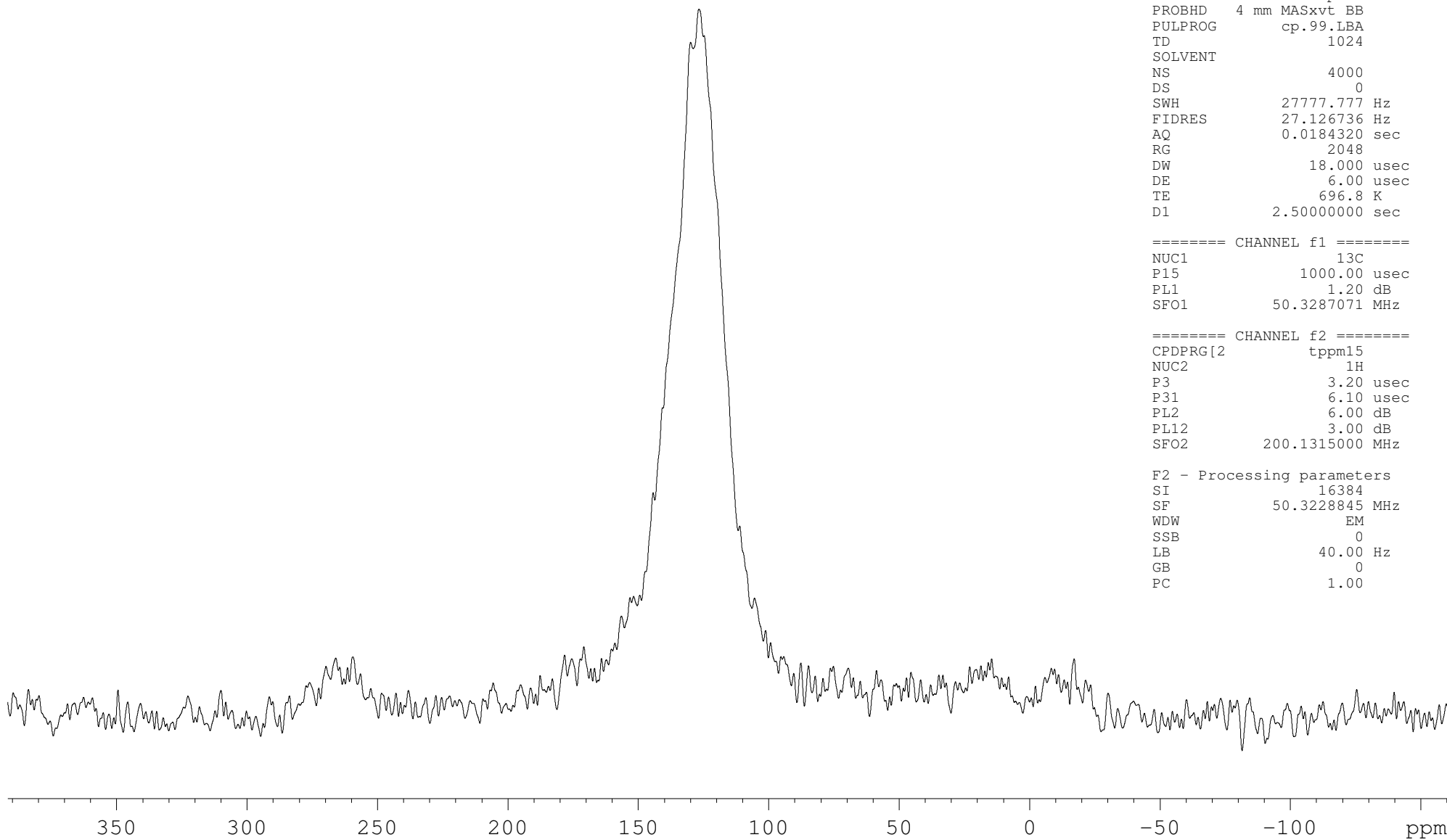
Current Data Parameters
NAME Deenik_LowVM_CobChar032
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20090327
Time 15.52
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG cp.99.LBA
TD 1024
SOLVENT
NS 4000
DS 0
SWH 27777.777 Hz
FIDRES 27.126736 Hz
AQ 0.0184320 sec
RG 2048
DW 18.000 usec
DE 6.00 usec
TE 696.8 K
D1 2.5000000 sec

===== CHANNEL f1 =====
NUC1 13C
P15 1000.00 usec
PL1 1.20 dB
SFO1 50.3287071 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 1H
P3 3.20 usec
P31 6.10 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228845 MHz
WDW EM
SSB 0
LB 40.00 Hz
GB 0
PC 1.00



Corn Cob Char made by Flash Carbonization Michael Antal at Univ. Hawaii
63.5mg
4mm MAS probe. 10 kHz MAS.
Direct Polarization 20 degree ¹³C pulse (1ms) with TPPM decoupling

AFTER ROTOR BACKGROUND SUBTRACTION, PHASE AND BASELINE CORRECTION

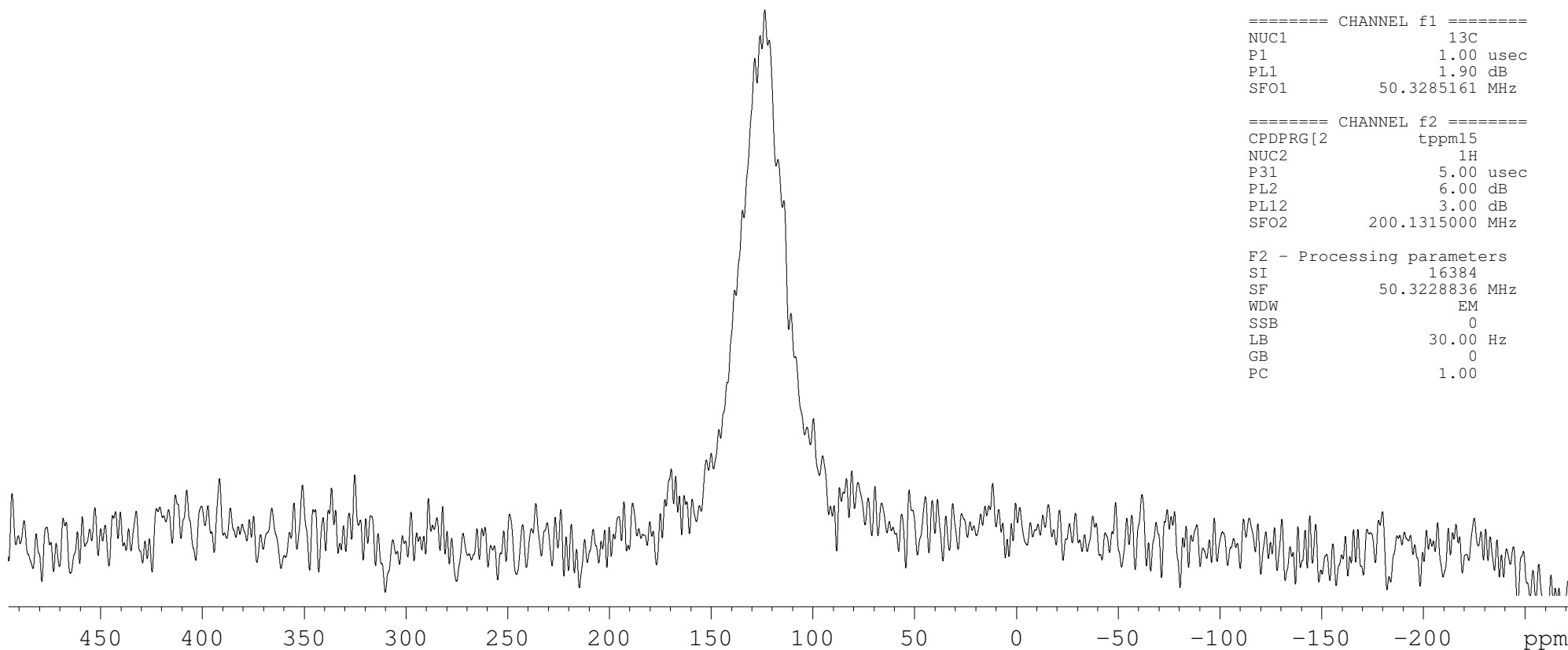
Current Data Parameters
NAME Deenik_LowVM_CobChar032
EXPNO 2
PROCNO 2

F2 - Acquisition Parameters
Date_ 20090327
Time 18.44
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG hpdec_BH30_tppm
TD 1024
SOLVENT
NS 8000
DS 2
SWH 40000.000 Hz
FIDRES 39.062500 Hz
AQ 0.0128000 sec
RG 1625.5
DW 12.500 usec
DE 6.00 usec
TE 697.0 K
D1 5.00000000 sec
TD0 16

===== CHANNEL f1 =====
NUC1 ¹³C
P1 1.00 usec
PL1 1.90 dB
SFO1 50.3285161 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 ¹H
P31 5.00 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228836 MHz
WDW EM
SSB 0
LB 30.00 Hz
GB 0
PC 1.00



Kiawe char from U Hawaii group (Tai McClellan)
traditionally made HI charcoal
70.9 mg
4mm MAS probe. 7 kHz MAS. Cross Polarization

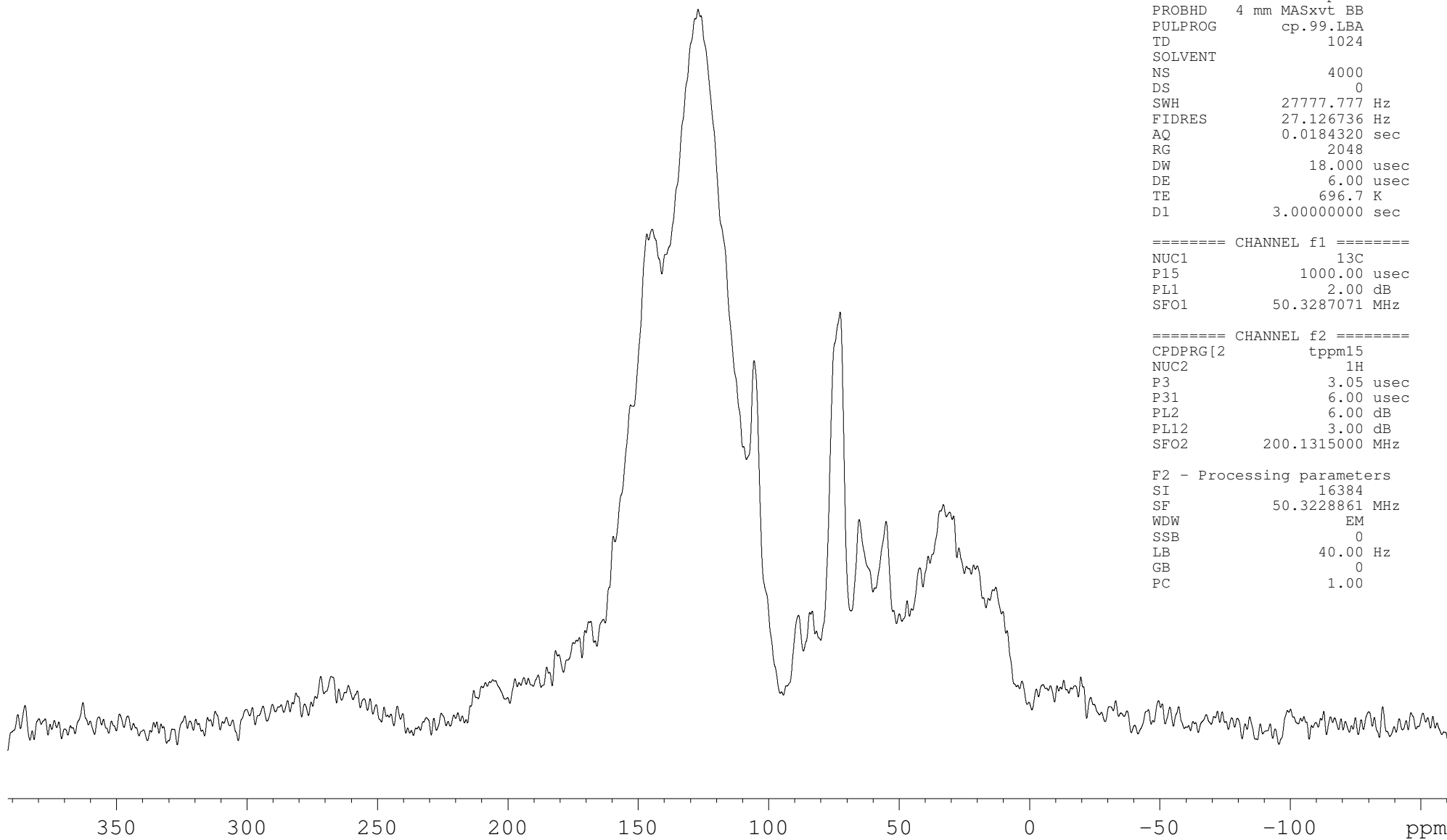
Current Data Parameters
NAME Kiawe_Char_042509
EXPNO 1
PROCNO 1

F2 - Acquisition Parameters
Date_ 20090425
Time 17.52
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG cp.99.LBA
TD 1024
SOLVENT
NS 4000
DS 0
SWH 27777.777 Hz
FIDRES 27.126736 Hz
AQ 0.0184320 sec
RG 2048
DW 18.000 usec
DE 6.00 usec
TE 696.7 K
D1 3.00000000 sec

===== CHANNEL f1 =====
NUC1 13C
P15 1000.00 usec
PL1 2.00 dB
SFO1 50.3287071 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 1H
P3 3.05 usec
P31 6.00 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228861 MHz
WDW EM
SSB 0
LB 40.00 Hz
GB 0
PC 1.00



Kiawe charcoal from Tai McClellan, U Hawaii
traditionally made HI charcoal
70.9 mg
4mm MAS probe. 7 kHz MAS.
d1=7 sec
Direct Polarization 20 degree 13C pulse (1ms) with TPPM decoupling

Current Data Parameters
NAME Kiawe_Char_042509
EXPNO 3
PROCNO 2

F2 - Acquisition Parameters
Date_ 20090426
Time 11.57
INSTRUM spect
PROBHD 4 mm MASxvt BB
PULPROG hpdec_BH30_tppm
TD 1024
SOLVENT
NS 10000
DS 2
SWH 40000.000 Hz
FIDRES 39.062500 Hz
AQ 0.0128000 sec
RG 4096
DW 12.500 usec
DE 6.00 usec
TE 696.7 K
D1 5.00000000 sec
TD0 20

===== CHANNEL f1 =====
NUC1 13C
P1 1.00 usec
PL1 1.90 dB
SFO1 50.3285161 MHz

===== CHANNEL f2 =====
CPDPRG[2] tppm15
NUC2 1H
P31 5.00 usec
PL2 6.00 dB
PL12 3.00 dB
SFO2 200.1315000 MHz

F2 - Processing parameters
SI 16384
SF 50.3228849 MHz
WDW EM
SSB 0
LB 50.00 Hz
GB 0
PC 1.00

