Supplementary Information

Synthesis and Purification of Poly (L-lactic acid) Using A One Step Benign Process

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Supplementary Tables

S.Table 1. Multiple comparison among levels using Tukey Simultaneous Tests with response variable M_n

	Levels	Mean difference	Standard Error of Difference	Adjusted P value
Temperature	1-2	209.6 **	57.76	0.0046
	1-3	308.7***	57.76	0.0001
	2-3	99.11	57.76	0.2240
Time	1-2	298.2***	57.76	0.0001
	1-3	184.0*	57.76	0.0124
	2-3	-114.2	57.76	0.1438
Pressure	1-2	88.7	57.76	0.2964
	1-3	-132.1	57.76	0.0809
	2-3	-220.8**	57.76	0.0029

* The mean difference is significant at 95% confidence interval ** The mean difference is significant at 99% confidence interval, ***The mean difference is significant at 99.9% confidence interval

S.Table 2. Multiple comparison among levels using Tukey Simultaneous Tests with response variable yield

	Levels	Mean difference	Standard Error of Difference	Adjusted P value
Temperature	1-2	8.989*	3.031	0.0200
	1-3	11.061**	3.031	0.0044
	2-3	2.072	3.031	0.7756
Time	1-2	6.028	3.031	0.1409
	1-3	9.822**	3.031	0.109
	2-3	3.794	3.031	0.47378
Pressure	1-2	4.406	3.031	0.3338
	1-3	-4.322	3.031	0.3470
	2-3	-8.728*	3.031	0.0241

* The mean difference is significant at 95% confidence interval ** The mean difference is significant at 99% confidence interval

S.Table 3. Multiple comparison among levels using Tukey Simultaneous Tests with response variable PDI

	Levels	Mean difference	Standard Error of Difference	Adjusted P value
Temperature	1-2	0.09667*	0.02997	0.0113
	1-3	0.18111***	0.02997	0.0000
	2-3	0.08444*	0.02997	0.0275
Time	1-2	0.02222	0.02997	0.7422
	1-3	0.06556	0.02997	0.0979
	2-3	0.04333	0.02997	0.3375

Pressure	1-2	-0.01111	0.02997	0.9273
	1-3	0.01556	0.02997	0.8630
	2-3	0.02667	0.02997	0.6528

* The mean difference is significant at 95% confidence interval ** *The mean difference is significant at 99.9% confidence interval

S.Table 4. ANOVA results of S/N ratio for M_n

Source	Degree of Freedom	Sequential Sum of Squares	Adjusted Mean Square	F Value	Percentage contribution (%)
Temperature	2	4.3951	2.1975	4.74	29.61
Time	2	1.0938	2.0469	4.41	27.04
Pressure	2	2.2893	1.1446	2.47	11.64
Error	2	0.9278	0.4639		
Total	8	11.7059			

S.Table 5 ANOVA results of S/N ratio for yield

Source	Degree of Freedom	Sequential Sum of Squares	Adjusted Mean Square	F Value	Percentage contribution (%)
Temperature	2	2.4079	2.4079	6.14	34.689
Time	2	1.7133	1.7133	4.37	22.715
Pressure	2	1.2947	1.2947	3.30	15.522
Error	2	0.3922	0.3922		
Total	8	5.8081			

S.Table 6. ANOVA results of S/N ratio for PDI

Source	Degree of Freedom	Sequential Sum of Squares	Adjusted Mean Square	F Value	Percentage contribution (%)
Temperature	2	2.3601	1.1701	20.81	80.21
Time	2	0.2931	0.1465	2.61	7.19
Pressure	2	0.0459	0.0229	0.41	0.00
Error	2	0.1125	0.0562		
Total	8	2.7915			

S. Table 7. Comparison of PLLA characteristics produced by experiment and predicted by model

	Condition	T (°C)	t (hrs)	P (bars)	M_n (g/mol)	Yield (%)	PDI
Prediction	1	80	17	160	1940±140	93.0±4.6	1.23±0.05
Experiment	1	80	17	160	2180	94.3	1.28
	2[a]	100	17	160	13700	92.5	1.26

[a] PLLA synthesized with 100:1 L-LA:DEG molar ratio

^{1}HNMR Spectra

Table 2. Runs A

Table 2. Runs C

7.26

5.22 5.20 5.19 5.17 5.15 5.14 4.36 4.34 4.27 4.26 3.67 3.65 3.64 2.11 2.09 2.05 2.03 1.74 1.73 1.68 1.66 1.64 1.60 1.58 1.56 1.54 1.52 1.50 1.49 1.48 1.42 1.40 1.25 0.93 0.89
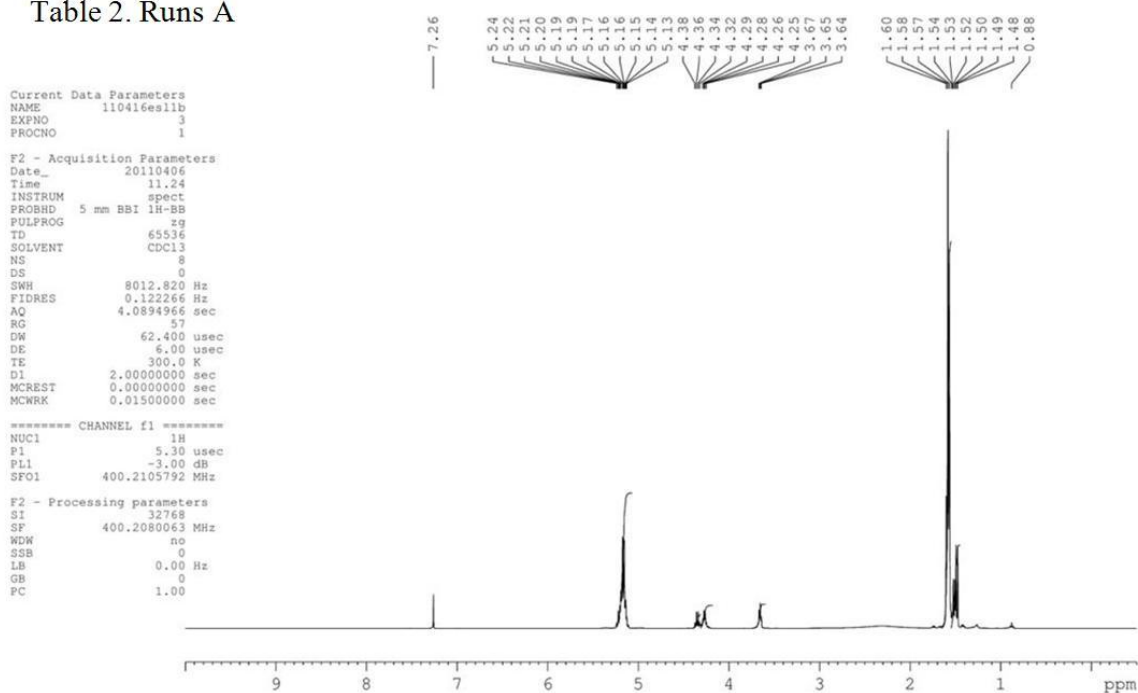
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PROCNO                      1

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PULPROG                    zg
TD                      65536
SOLVENT                 CDC13
NS                          8
DS                          0
SWH                8012.820 Hz
FIDRES           0.122266 Hz
AQ              4.0894966 sec
RG                         64
DW                 62.400 usec
DE                  6.00 usec
TE                    300.0 K
D1            2.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                       1H
P1                 5.30 usec
PL1                -3.00 dB
SFO1         400.2105792 MHz

F2 - Processing parameters
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SF           400.2080063 MHz
WDW                        no
SSB                         0
LB                  0.00 Hz
GB                          0
PC                      1.00
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9 8 7 6 5 4 3 2 1 ppm

Table 3. Runs 3

7.26

5.22 5.21 5.20 5.18 5.17 5.16 5.15 5.14 5.03 5.02 4.36 4.34 4.28 4.26 3.67 3.66

1.68 1.67 1.60 1.58 1.57 1.52 1.51 1.49 1.48

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EXPNO                       3
PROCNO                      1

F2 - Acquisition Parameters
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PULPROG                    zg
TD                      65536
SOLVENT                 CDC13
NS                          4
DS                          0
SWH                8012.820 Hz
FIDRES           0.122266 Hz
AQ              4.0894966 sec
RG                       90.5
DW                 62.400 usec
DE                  6.00 usec
TE                    300.6 K
D1            2.00000000 sec
MCREST        0.00000000 sec
MCWRK         0.01500000 sec

======== CHANNEL f1 ========
NUC1                       1H
P1                 5.30 usec
PL1                -3.00 dB
SFO1         400.2105792 MHz

F2 - Processing parameters
SI                      32768
SF           400.2080063 MHz
WDW                        no
SSB                         0
LB                  0.00 Hz
GB                          0
PC                      1.00
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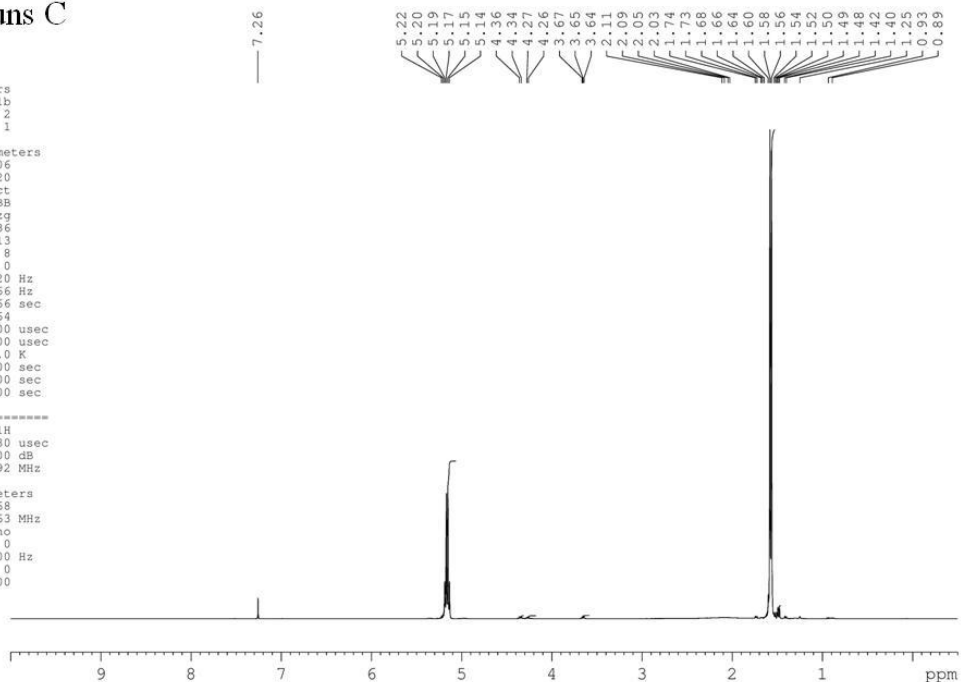
9 8 7 6 5 4 3 2 1 ppm