

Supplement Table 3 Molecular products of cellulose slow pyrolysis in various thermal-decomposition stages

No	RT (min)	Compounds	Formula	Area Pect (%)			
				300-325 °C	325-350 °C	350-400 °C	400-500 °C
1	4.119	2,3-Pentanedione	C ₅ H ₈ O ₂			0.19	
2	4.803	1-Propen-3-ol	C ₃ H ₆ O			0.22	
3	5.059	1,4-dimethyl-benzen	C ₈ H ₁₀				1.58
4	5.060	3-Penten-2-one	C ₅ H ₈ O			0.39	
5	6.705	2-Methylfuran	C ₅ H ₆ O		0.08		
6	7.976	1,2,4-trimethyl-Benzene	C ₉ H ₁₂				2.08
7	8.564	1-Hydroxy-2-propanone	C ₃ H ₆ O ₂	0.30	0.25	1.66	0.60
8	9.140	Hydroxyacetaldehyde	C ₂ H ₄ O ₂	0.34	0.10	2.30	
9	9.888	2-Cyclopenten-1-one	C ₅ H ₆ O		0.14	2.23	3.33
10	10.155	2-Methyl-2-cyclopentene-1-one	C ₆ H ₈ O			1.27	2.62
11	10.369	1-Hydroxy-2-butanone	C ₄ H ₈ O ₂		0.06	0.32	
12	10.679	Methyl hydroxyacetate	C ₃ H ₆ O ₃		0.09		
13	11.021	β-methoxy-(S)-2-Furanethanol	C ₇ H ₁₀ O ₃	8.77	9.74	3.45	
14	11.117	2,3-dihydroxy-Propanoic acid	C ₃ H ₆ O ₄		0.06		
15	11.266	5-Methyl-2(5H)-furanone	C ₅ H ₆ O ₂		0.78	2.82	1.27
16	12.217	2-Propylfuran	C ₇ H ₁₀ O		0.26		
17	12.228	3-Ethyl-2-cyclopenten-1-one	C ₇ H ₁₀ O			1.84	
18	12.479	Acetic acid	C ₂ H ₄ O ₂	0.64	1.64	16.18	9.19
19	12.810	Furfural	C ₅ H ₄ O ₂	9.14	1.51	6.26	1.16
20	12.906	(5S)-Hydroxymethyl-5H-furan-2-one	C ₅ H ₆ O ₃	0.36			1.79
21	12.976	2(5H)-Furanone	C ₄ H ₄ O ₂	0.28	1.05	6.79	1.58
22	13.916	2-Acetyl furan	C ₆ H ₆ O ₂		1.29	5.76	
23	14.161	3-Methyl-2-cyclopenten-1-one	C ₆ H ₈ O			1.11	
24	14.375	Benzaldehyde	C ₇ H ₆ O				0.75
25	14.856	Propionic acid	C ₃ H ₆ O ₂		0.31	2.56	1.45
26	15.443	1,3-Cyclopentanedione	C ₅ H ₆ O ₂			0.19	
27	15.561	3-Methylenedihydro-2(3H)-furanone	C ₅ H ₆ O ₂		0.17	0.73	
28	15.828	5-Methyl-2-furaldehyde	C ₆ H ₆ O ₂		0.81	2.89	
29	15.849	2-Methylindene	C ₁₀ H ₁₀				1.62
30	16.159	2-Cyclopentene-1,4-dione	C ₅ H ₄ O ₂		0.19	0.88	
31	16.287	2-Methylbenzofuran	C ₉ H ₈ O			0.78	4.20

32	16.501	3-Methylindene	C ₁₀ H ₁₀				1.79
33	16.928	5-Methyl-2-acetylfuran	C ₇ H ₈ O ₂			0.37	
34	17.035	1-(3-Hydroxy-2-furyl)ethanone	C ₆ H ₆ O ₃		0.15		
35	17.537	2-Propenoic acid	C ₃ H ₄ O ₂			0.80	
36	17.975	5-methyl-2-Furanmethanol	C ₆ H ₈ O ₂		0.06		
37	18.488	5-Methyl-2(5H)-furanone	C ₅ H ₆ O ₂		0.09	0.92	
38	19.717	2-Cyclohexene-1,4-dione	C ₆ H ₆ O ₂		0.04	0.73	
39	20.165	3-Methyl-1,2-cyclopentanedione	C ₆ H ₈ O ₂		0.06		
40	20.358	1,2-Cyclopentanedione	C ₅ H ₆ O ₂	0.68	0.85	1.49	
41	21.052	2-Furylmethanol	C ₅ H ₆ O ₂		0.36	1.48	
42	21.736	2(3H)-Furanone,dihydro-4-hydroxy-	C ₄ H ₆ O ₃		0.38		
43	21.896	4-Hydroxy-2,5-dimethyl-3(2H)furanone	C ₆ H ₈ O ₃		1.03		
44	23.392	2-Hydroxy-3-methyl-2-cyclopentene-1-one	C ₆ H ₈ O ₂		0.72		
45	23.541	Maltol	C ₆ H ₆ O ₃		0.57		
46	23.958	Levogluconenone	C ₆ H ₆ O ₃	10.41	10.72	3.56	
47	24.161	2-Furyl hydroxymethyl ketone	C ₆ H ₆ O ₃		2.12		
48	24.449	3-Furancarboxylic acid methyl ester	C ₆ H ₆ O ₃	1.35	0.77		
49	27.440	2,3-Dihydro-3,5-dihydroxy-6-methyl-4(4H)-pyranone	C ₆ H ₈ O ₄	0.51	0.80		
50	27.499	3-Methyl-1,2-cyclopentenediol	C ₆ H ₁₂ O ₂	0.68			
51	27.772	2-Methyl-3,5-dihydroxy-4H-pyran-4-one	C ₆ H ₆ O ₄	0.36	2.58	0.62	
52	28.990	1,4:3,6-Dianhydro-α-D-glucopyranose	C ₆ H ₈ O ₄	7.22	9.42	10.50	4.60
53	29.139	2-Furancarboxylic acid	C ₅ H ₄ O ₃		0.47		
54	30.015	5-Hydroxymethylfurfural	C ₆ H ₆ O ₃	1.12	1.34	0.66	
55	34.080	D-Mannose	C ₆ H ₁₂ O ₆	4.31			
56	44.763	1,6-anhydro-beta-d-glucopyranos	C ₆ H ₁₀ O ₅	53.54	48.99	18.05	59.33