

Table S1 Relative abundance of categorized holocellulose pyrolysis products as a % of total holocellulose.

Reference samples								
holocellulose	ref pine	ref maple	ref birch	arch pine	head post N-124	sled pull N-17		
furans	12.6	2.6	3.4	17.8	6.8	8.0		
cyclopentenones	26.0	47.2	35.4	28.4	53.1	57.3		
pyranones	16.9	12.0	17.7	19.0	19.8	11.3		
hydroxybenzenes	17.5	14.0	5.0	7.3	9.1	5.4		
anhydrosugars	21.5	24.2	32.6	24.1	11.4	18.0		
Danish, Dejbjerg collection								
holocellulose	D-A1624	D-B1624	D-C1628	D-D1626-A	D-D1626-B	D-E1622-A	D-E1622-B	D-F1629
furans	5.4	4.1	0.4	5.3	2.8	7.4	2.1	2.0
cyclopentenones	12.8	7.1	5.0	11.5	5.6	23.9	5.3	5.4
pyranones	9.4	10.4	1.2	5.4	2.6	10.1	3.5	2.2
hydroxybenzenes	6.7	8.1	9.1	7.0	7.1	19.6	5.4	10.5
anhydrosugars	65.7	70.3	84.3	70.8	82.0	39.1	83.7	80.0
Norwegian, Oseberg collection								
holocellulose	N-187D	N-187L	N-207-A	N-207-B	N-250F	N-250K		
furans	12.5	41.1	4.3	1.2	1.3	7.9		
cyclopentenones	19.2	24.5	9.0	10.3	1.6	11.2		
pyranones	-	-	21.3	9.5	9.2	11.1		
hydroxybenzenes	32.0	-	2.7	5.3	2.6	1.4		
anhydrosugars	36.4	34.5	62.7	73.7	85.3	68.3		
Swedish, Glimmingehus collection								
holocellulose	S-5T	S-125h Retreated	S-125k	S-346 Retreated	S-346d	S-346e	S-383	S-383c
furans	1.1	3.4	1.6	6.0	6.2	5.8	3.2	-
cyclopentenones	3.8	27.6	3.6	21.0	12.2	8.7	2.9	0.7
pyranones	4.5	8.6	3.2	10.0	8.3	8.0	1.5	0.4
hydroxybenzenes	0.8	8.0	0.8	3.8	7.1	10.4	4.1	1.4
anhydrosugars	89.8	52.5	90.8	59.2	66.2	67.2	88.3	97.5

Table S2 Relative abundance of categorized lignin pyrolysis products as a % of total lignin.

Reference samples								
lignin	ref pine	ref maple	ref birch	arch pine	head post N-124	sled pull N-17		
demethylated	5.2	15.3	8.2	3.2	4.6	2.3		
monomers	31.4	42.3	47.6	38.2	34.3	30.0		
short chain (C0, C1, C2)	34.7	16.1	19.4	23.3	17.2	14.9		
long chain (C3)	14.0	8.0	5.5	15.6	13.8	9.4		
carbonyl	14.3	14.8	17.0	18.2	21.21	34.63		
carboxyl	0.4	3.1	2.4	1.4	8.94	8.93		
oxidised*	14.7	18.4	19.3	19.6	30.1	43.6		
Danish, Dejbjerg collection								
lignin	D-A1624	D-B1624	D-C1628	D-D1626-A	D-D1626-B	D-E1622-A	D-E1622-B	D-F1629
demethylated	4.3	2.9	5.5	6.5	4.8	4.4	3.0	3.7
monomers	33.4	41.1	28.9	29.3	33.8	24.3	31.2	29.7
short chain (C0, C1, C2)	28.2	23.3	35.2	28.1	25.5	26.4	21.3	27.5
long chain (C3)	7.3	6.1	10.5	5.8	5.1	7.7	4.6	10.8
carbonyl	20.5	21.4	13.7	24.8	23.1	29.3	26.4	20.9
carboxyl	6.4	5.2	6.3	5.5	7.7	7.8	13.5	7.4
oxidised*	26.9	26.6	20.0	30.3	30.9	37.2	39.9	28.2
Norwegian, Oseberg collection								
lignin	N-187D	N-187L	N-207-A	N-207-B	N-250F	N-250K		
demethylated	3.6	-	5.6	5.5	24.3	4.8		
monomers	5.2	1.5	25.9	31.6	27.8	39.6		
short chain (C0, C1, C2)	15.2	11.1	21.7	26.4	18.5	25.8		
long chain (C3)	2.7	2.2	6.1	7.4	7.0	9.5		
carbonyl	4.5	10.6	15.9	8.1	6.0	17.2		
carboxyl	68.8	74.6	24.8	21.0	16.4	3.1		
oxidised*	73.3	85.2	40.7	29.2	22.4	20.3		
Swedish, Glimmingehus collection								
lignin	S-5T	S-125h Retreated	S-125k	S-346 Retreated	S-346d	S-346e	S-383	S-383c
demethylated	2.1	4.5	13.4	21.8	4.4	4.6	1.5	1.3
monomers	31.1	26.3	22.0	7.3	25.3	23.5	27.0	33.5
short chain (C0, C1, C2)	40.4	37.0	38.8	38.9	30.5	28.3	31.9	21.1
long chain (C3)	9.1	18.9	11.5	23.5	11.2	12.4	7.0	11.2
carbonyl	13.7	11.6	9.4	6.2	17.1	19.3	16.1	21.3
carboxyl	3.6	1.7	4.9	2.3	11.5	11.9	16.6	11.7
oxidised*	17.3	13.3	14.3	8.5	28.6	31.3	32.7	33.1

* the 'oxidised' group represent the sum of pyrolysis products with carbonyl and carboxyl functionalities