

Catalytic Fast Pyrolysis of Kraft Lignin over Hierarchical HZSM-5 and H β Zeolites

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Table S1: The main products of non-catalytic fast pyrolysis of Kraft lignin determined by Py-GC/MS.
Experimental conditions: pyrolysis temperature of 500 °C, Kraft lignin 0.3 mg.

No	R.T. (min)	Compound
1	14.783	4-methyl phenol
2	15.197	2-methoxy phenol
3	17.553	4-ethyl phenol
4	18.336	2-methoxy-4-methyl phenol
5	18.54	1,2-benzenediol
6	19.057	2,3-dihydro benzofuran
7	20.277	3-methoxy-1,2-benzenediol
8	20.785	4-ethyl-2-methoxy phenol
9	21.099	4-methyl-1,2-benzenediol
10	21.752	2-methyl-4-vinyl phenol
11	22.754	2,4-dimethoxy phenol
12	22.972	3,4-dimethoxy phenol
13	23.582	4-ethyl-1,3-benzenediol
14	23.976	3-hydroxy-4-methoxy-benzaldehyde
15	25.222	1,2,4-Trimethoxy benzene
16	26.188	1-(4-hydroxy-3-methoxyphenyl) ethanone
17	27.16	4-ethyl biphenyl
18	27.279	4-hydroxy-3-methoxy benzenacetic acid
19	28.084	4-methyl-2,5-dimethoxybenzaldehyde
20	30.244	4-hydroxy-3,5-dimethoxy benzaldehyde
21	31.155	2,6-dimethoxy-4-(2-propenyl) phenol
22	31.873	1-(4-hydroxy-3,5-dimethoxyphenyl) ethanone
23	32.68	3,5-dimethoxy-4-hydroxyphenylacetic acid
24	36.456	H-hexadecanoic acid

Table S2: The main products of catalytic fast pyrolysis of Kraft lignin over HZSM-5 zeolite determined by Py-GC/MS. Experimental conditions: pyrolysis temperature of 500 °C, Kraft lignin 0.3 mg, catalyst-to-lignin ratio of 10:1.

No	R.T.(min)	Compound
1	2.184	benzene
2	4.338	toluene
3	7.643	<i>p</i> -oxylene
4	8.436	<i>o</i> -oxylene
5	11.959	1,2,4-trimethyl benzene
6	18.005	naphthalene
7	18.135	naphthalene
8	18.299	naphthalene
9	20.281	3-methyl-1,2-benzenediol
10	21.19	1-methyl naphthalene
11	22.728	2,6-dimethoxy phenol
12	22.967	3,4-dimethoxy phenol
13	24.139	2,6-dimethyl naphthelene
14	25.23	1,2,4-trimethoxybenzene
15	27.172	5-tetr-butylpyrogallol
16	28.081	undefined
17	31.168	2,6-dimethoxy-4-(2-propenyl) phenol
18	31.883	1-(4-hydroxy-3,5-dimethoxyphenyl) ethanone
19	33.05	phenanthrene
20	35.489	2-methyl phenanthrene