

Elemental Analysis of Lignin

Lignin	wt %					O/C	H/C
	C	H	N	S	calcd O		
Lignins isolated after steam explosion of wood and milled wood lignin							
BI	54.1	5.5	0.2	2.2	38.0	0.53	1.21
NS	61.2	5.8	0.2	1.1	31.7	0.39	1.13
AS mwl	58.7	5.9	0.0	0.1	35.3	0.45	1.20
NS mwl	59.2	6.0	0.1	0.1	34.6	0.44	1.21
Industrial lignin sources							
AL: alkaline lignin	48.2	3.4	0.0	1.1	47.3	0.74	0.84
OS: organosolv lignin	66.3	5.3	0.2	0.3	27.9	0.32	0.95
LS: lignosulfonate	42.0	4.6	0.0	6.3	47.1	0.84	1.31
HL: hydrolysis lignin	47.6	4.3	0.0	0.4	47.7	0.75	1.07
lignin from ethanol plant	55.2	6.0	0.1	0.1	38.6	0.52	1.30
lignin from ethanol plant	63.3	4.7	0.0	0.6	31.3	0.37	0.88
Commercially available standards							
G: guaiacol	67.7	6.5	0.0	0.0	25.8	0.29	1.14
S: syringol	62.3	6.5	0.0	0.0	31.1	0.38	1.25
GGE: guaiacylglyceryl ether	60.6	7.1	0.0	0.0	32.3	0.40	1.40
cellulose	43.8	6.3	0.0	0.0	49.9	0.83	1.67
Plain wood for comparison							
AS wood, Populus tremula	39.0	4.0	0.1	5.5	51.4	0.99	1.21
NS wood, Picea abies	44.6	6.4		0.6	48.4	0.82	1.70
BI wood, Betula verrucosa	46.6	6.4	0.1	0.1	46.9	0.76	1.63