Electronic Supplementary Material (ESI) for RSC Advances.

Table of peak positions of functional groups

Functional group	Peak /cm^{-1}	Peak position attribution	Proportion of peak area before nFeS-lignite reaction	Proportion of peak area after nFeS-lignite reaction	Proportion of peak area before lignite reaction	Proportion of peak area after lignite reaction
Aromatic hydrocarbon	900 ~ 700	Benzene ring disubstitution	72.16	61.64	72.26	54.66
		Benzene ring trisubstitution	17.26	13.97	23.52	40.7
		Benzene ring tetra substitution	10.58	24.62	4.22	4.65
Oxygenated functional group	1800 ~ 1000	Alkyl ethers	6.15	1.59	2.81	2.76
		C-O phenols, ethers	28.81	21.51	21.41	22.39
		C-O in aryl ethers	6.51	8.41	8.73	8.75
		Aymmetric Ar-CH_3	8.86	11.76	11.9	11.95
		Asymmetric -CH_3, -CH_2	8.22	9.91	9.25	9.7
		Aromatic C=C	34.43	39.02	38.82	36.34
		-COOH	7.02	7.79	7.09	8.10
Aliphatic hydrocarbon	3000 ~ 2800	Symmetric R_2CH_2	19.09	34.23	23.81	28.72
		R_3CH	35.45	22.6	18.21	19.24
		Asymmetric R_2CH_2	31.66	29.86	42.41	36.88
		Asymmetric RCH_3	13.81	13.32	15.58	15.16
Hydroxyl	3600 ~ 3000	OH-N	6.89	6.18	9.8	14.14
		Ring hydroxyl	16.13	24.86	19.8	25.57
		Phenol OH	48.73	35.94	46.83	34.1
		OH-π	28.26	33.02	23.57	26.2