Supporting Information

Thermogravimetric Study on Peat Catalytic Pyrolysis for Potential Hydrocarbon Generation

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Table S1. Kinetic parameters of peat pyrolysis process in the presence and absence of Iron tallates obtained by the model approach of non-isothermal kinetics during experiments.

Multi-step model	Model	Peat Pyrolysis kinetic parameters	Catalytic peat Pyrolysis kinetic parameters
Fn-Fn	Fn	E=135 kJ·mole^{-1}, LnA=10.8 s^{-1}, ReactOrder n=3.9	E=34.2 kJ·mole^{-1}, LnA=1.1 s^{-1}, ReactOrder n=1.55
	Fn	E=70.8 kJ·mole^{-1}, LnA=3.4 s^{-1}, ReactOrder n=3.81	E=52.2 kJ·mole^{-1}, LnA=1.5 s^{-1}, ReactOrder n=1.8
	R^2	0.99934	0.99935
	F-test	3.353	1.673
Fn-Bna	Fn	E=124.6 kJ·mole^{-1}, LnA=9.7 s^{-1}, ReactOrder n=2.54	E=39.8 kJ·mole^{-1}, LnA=1.5 s^{-1}, ReactOrder n=4
	Bna	E=99.3 kJ·mole^{-1}, LnA=5.6 s^{-1}, ReactOrder n=4, AutocatOrder 0.01	E=78.6 kJ·mole^{-1}, LnA=7.7 s^{-1}, ReactOrder n=1.45, AutocatOrder 1.99
	R^2	0.99910	0.99860
	F-test	4.459	3.601
Fn-Cnm	Fn	E=143.2 kJ·mole^{-1}, LnA=11.3 s^{-1}, ReactOrder n=6.78	E=32.8 kJ·mole^{-1}, LnA=0.67 s^{-1}, ReactOrder n=2.9
	Cnm	E=112.1 kJ·mole^{-1}, LnA=11.8 s^{-1}, ReactOrder n=2.5, AutocatOrder1.1, AutocatPower m=7.1	E=178.6 kJ·mole^{-1}, LnA=10.2 s^{-1}, ReactOrder n=0.03, AutocatOrder 1.95, AutocatPower m=1.76
	R^2	0.99772	0.99899
	F-test	11.631	2.592
Fn-An	Fn	E=141.7 kJ·mole^{-1}, LnA=11.6 s^{-1}, ReactOrder n=3.17	E=35.8 kJ·mole^{-1}, LnA=1.4 s^{-1}, ReactOrder n=1.26
	An	E=160 kJ·mole^{-1}, LnA=9.8 s^{-1}, Dimension n=0.23	E=66 kJ·mole^{-1}, LnA=2.5 s^{-1}, Dimension n=0.55
	R^2	0.99944	0.99941
	F-test	2.839	1.529

Bna-Fn	Bna	E=148.8 kJ·mole^{-1}, LnA=12.2 s^{-1}, ReactOrder n=3.76, AutocatOrder 0.01	E=36.6 kJ·mole^{-1}, LnA=1.3 s^{-1}, ReactOrder n=2.64, AutocatOrder 0.01
	Fn	E=95 kJ·mole^{-1}, LnA=5.3 s^{-1}, ReactOrder n=3.48	E=80.2 kJ·mole^{-1}, LnA=3.7 s^{-1}, ReactOrder n=1.25
	R^2	0.99912	0.99941
	F-test	4.483	1.518
Bna-Bna	Bna	E=149.5 kJ·mole^{-1}, LnA=12.3 s^{-1}, ReactOrder n=3.74, AutocatOrder 0.01	E=33.7 kJ·mole^{-1}, LnA=1.06 s^{-1}, ReactOrder n=1.37, AutocatOrder 0.01
	Bna	E=84.5 kJ·mole^{-1}, LnA=4.5 s^{-1}, ReactOrder n=3.71, AutocatOrder 0.01	E=48.4 kJ·mole^{-1}, LnA=1.2 s^{-1}, ReactOrder n=1.9, AutocatOrder 0.01
	R^2	0.99915	0.99932
	F-test	4.337	1.742
Bna-Cnm	Bna	E=140 kJ·mole^{-1}, LnA=11.3 s^{-1}, ReactOrder n=2.75, AutocatOrder 0.01	E=37.1 kJ·mole^{-1}, LnA=1.6 s^{-1}, ReactOrder n=1.21, AutocatOrder 0.01
	Cnm	E=113.2 kJ·mole^{-1}, LnA=6.5 s^{-1}, ReactOrder n=4, AutocatOrder 0.02, AutocatPower m=0.01	E=75 kJ·mole^{-1}, LnA=4.4 s^{-1}, ReactOrder n=6.54, AutocatOrder 2.96, AutocatPower m=10
	R^2	0.99883	0.99959
	F-test	5.967	1.052
Bna-An	Bna	E=145.4 kJ·mole^{-1}, LnA=12 s^{-1}, ReactOrder n=3.4, AutocatOrder 0.01	E=35.8 kJ·mole^{-1}, LnA=1.4 s^{-1}, ReactOrder n=1.34, AutocatOrder
	An	E=167.1 kJ·mole^{-1}, LnA=10.4 s^{-1}, Dimension n=0.22	E=65.8 kJ·mole^{-1}, LnA=2.5 s^{-1}, Dimension n=0.55
	R^2	0.99941	0.99939
	F-test	2.998	1.582
Cnm-Fn	Cnm	E=187.2 kJ·mole^{-1}, LnA=16.3 s^{-1}, ReactOrder n=6.06, AutocatOrder 2.35, AutocatPower m=10	E=38.1 kJ·mole^{-1}, LnA=1.6 s^{-1}, ReactOrder n=2.02, AutocatOrder 1.26, AutocatPower m=10
	Fn	E=128.3 kJ·mole^{-1}, LnA=8.2 s^{-1}, ReactOrder n=3.5	E=61.2 kJ·mole^{-1}, LnA=2.3 s^{-1}, ReactOrder n=1.78
	R^2	0.99953	0.99941
	F-test	2.414	1.512
Cnm-Bna	Cnm	E=193 kJ·mole^{-1}, LnA=16.9 s^{-1}, ReactOrder n=6.03, AutocatOrder 2.33, AutocatPower m=10	E=58.1 kJ·mole^{-1}, LnA=3.5 s^{-1}, ReactOrder n=4.1, AutocatOrder 9.92, AutocatPower m=5.2
	Bna	E=135.8 kJ·mole^{-1}, LnA=8.9 s^{-1}, ReactOrder n= 3.77, AutocatOrder 0.01	E=64.8 kJ·mole^{-1}, LnA=11.3 s^{-1}, ReactOrder n=3.46, AutocatOrder 0.117
	R^2	0.99945	0.99297

	F-test	2.816	18.090
Cnm-Cnm	Cnm	E=178.3 kJ·mole^{-1}, LnA=15.4 s^{-1}, ReactOrder n=5.7, AutocatOrder 2.27, AutocatPower m=10	E=39.2 kJ·mole^{-1}, LnA=1.8 s^{-1}, ReactOrder n=1.72, AutocatOrder 0.85, AutocatPower m=10
	Cnm	E=240.1 kJ·mole^{-1}, LnA=18.7 s^{-1}, ReactOrder n=9.5, AutocatOrder 2.74, AutocatPower m=9.47	E=89.7 kJ·mole^{-1}, LnA=5.4 s^{-1}, ReactOrder n=5.76, AutocatOrder 2.74, AutocatPower m=10
	R^2	0.99968	0.99961
	F-test	1.635	1.000
Cnm-An	Cnm	E=197.6 kJ·mole^{-1}, LnA=17.5 s^{-1}, ReactOrder n=6.5, AutocatOrder 2.27, AutocatPower m=9.16	E=40.1 kJ·mole^{-1}, LnA=1.9 s^{-1}, ReactOrder n=2.05, AutocatOrder 1.18, AutocatPower m=9.56
	An	E=264.9 kJ·mole^{-1}, LnA=18.7 s^{-1}, Dimension n=0.15	E=89.6 kJ·mole^{-1}, LnA=4.5 s^{-1}, Dimension n=0.48
	R^2	0.99966	0.99952
	F-test	1.715	1.247
An-Fn	An	E=153.3 kJ·mole^{-1}, LnA=12 s^{-1}, Dimension n=0.5	E=37.2 kJ·mole^{-1}, LnA=1.4 s^{-1}, Dimension n=0.82
	Fn	E=143.2 kJ·mole^{-1}, LnA=9 s^{-1}, ReactOrder n=4.54	E=54.3 kJ·mole^{-1}, LnA=1.7 s^{-1}, ReactOrder n=1.8
	R^2	0.99980	0.99943
	F-test	1.000	1.476
An-Bna	An	E=160.4 kJ·mole^{-1}, LnA=12.7 s^{-1}, Dimension n=0.5	E=37.3 kJ·mole^{-1}, LnA=1.4 s^{-1}, Dimension n=0.81
	Bna	E=144.1 kJ·mole^{-1}, LnA=9.2 s^{-1}, ReactOrder n=4.6, AutocatOrder 0.01	E=54.6 kJ·mole^{-1}, LnA=1.7 s^{-1}, ReactOrder n=1.8, AutocatOrder 0.01
	R^2	0.99973	0.99943
	F-test	1.391	1.468
An-Cnm	An	E=159.7 kJ·mole^{-1}, LnA=12.7 s^{-1}, Dimension n=0.5	E=42.4 kJ·mole^{-1}, LnA=1.8 s^{-1}, Dimension n=0.7
	Cnm	E=129 kJ·mole^{-1}, LnA=7.6 s^{-1}, ReactOrder n=4.5, AutocatOrder 0.013, AutocatPower m=0.01	E=89.2 kJ·mole^{-1}, LnA=4.6 s^{-1}, ReactOrder n=3.6, AutocatOrder 1.79, AutocatPower m=6.52
	R^2	0.99980	0.99952
	F-test	1.041	1.237
An-An	An	E=159.2 kJ·mole^{-1}, LnA=12.7 s^{-1}, Dimension n=0.49	E=39.4 kJ·mole^{-1}, LnA=1.7 s^{-1}, Dimension n=0.82
	An	E=172.3 kJ·mole^{-1}, LnA=10.6 s^{-1}, Dimension n=0.32	E=72.5 kJ·mole^{-1}, LnA=3 s^{-1}, Dimension n=0.56
	R^2	0.99974	0.99949
	F-test	1.318	1.300