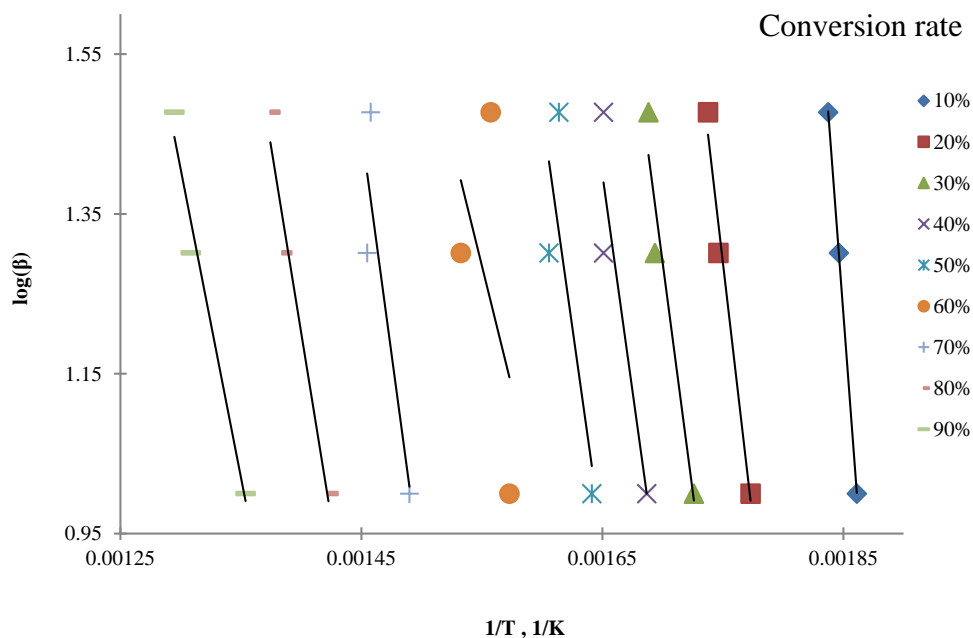
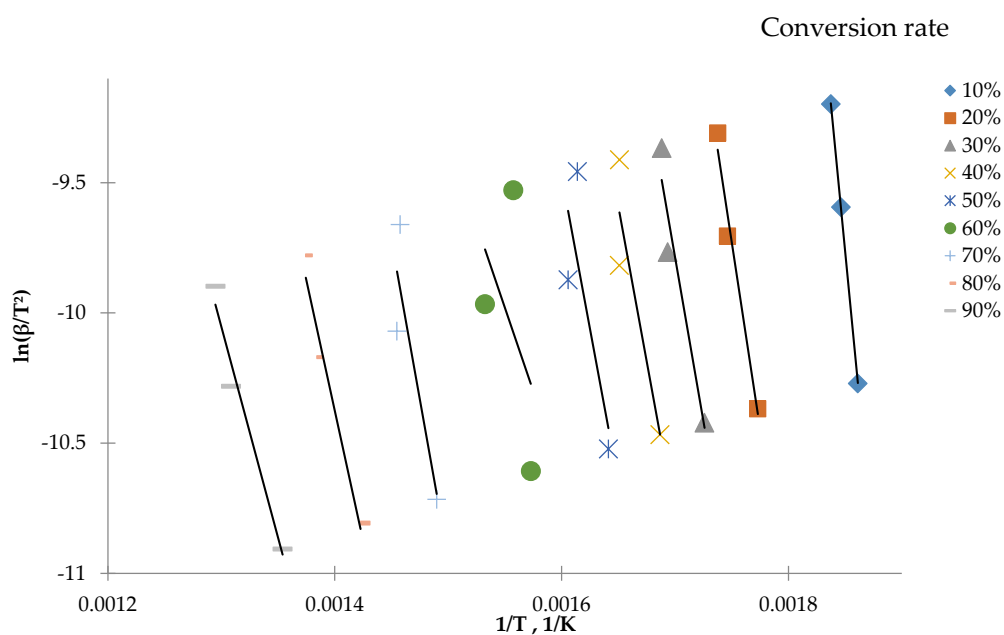


# Supplementary Material: Thermogravimetric Study of Refuse Derived Fuel Produced from Municipal Solid Waste of Kazakhstan

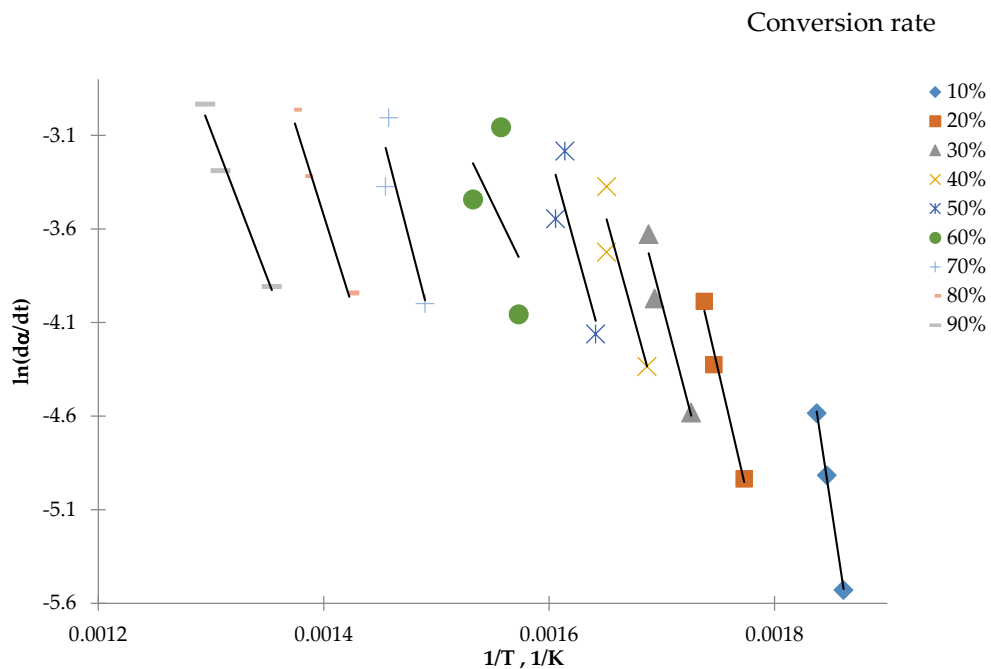
Botagoz Kuspangaliyeva <sup>1,2</sup>, Botakoz Suleimenova <sup>1,2</sup>, Dhawal Shah <sup>1</sup> and Yerbol Sarbasov <sup>1,2,\*</sup>



(a)

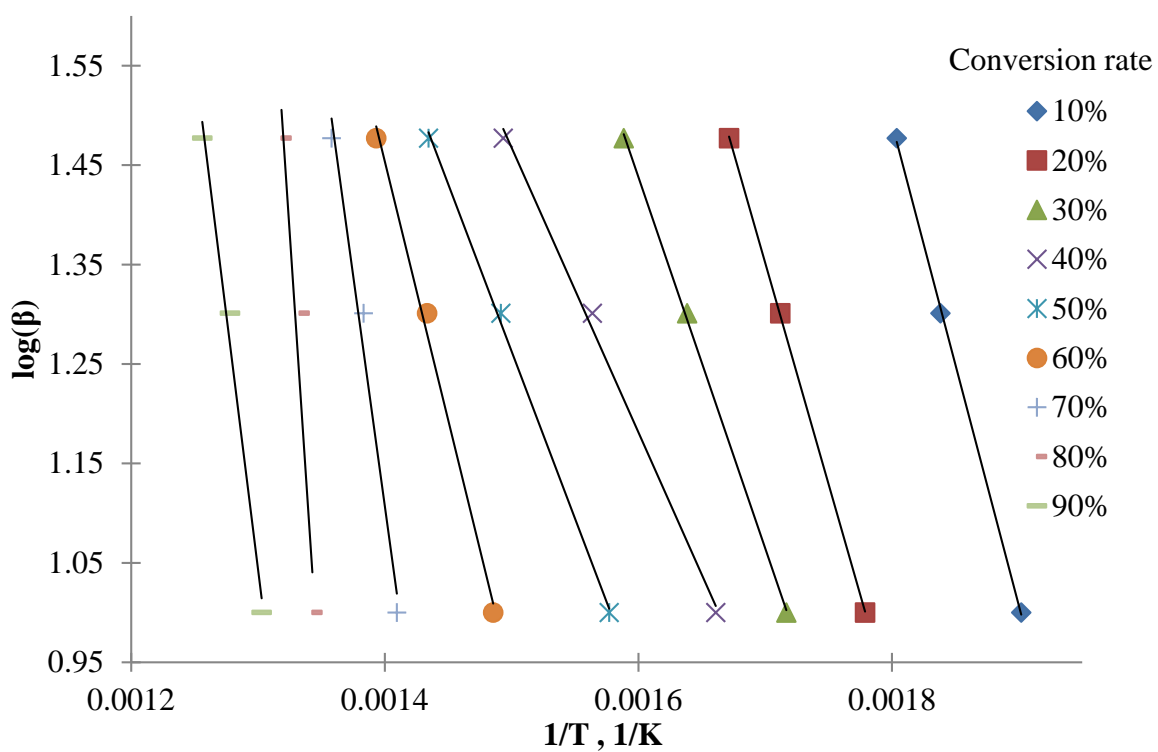


(b)



(c)

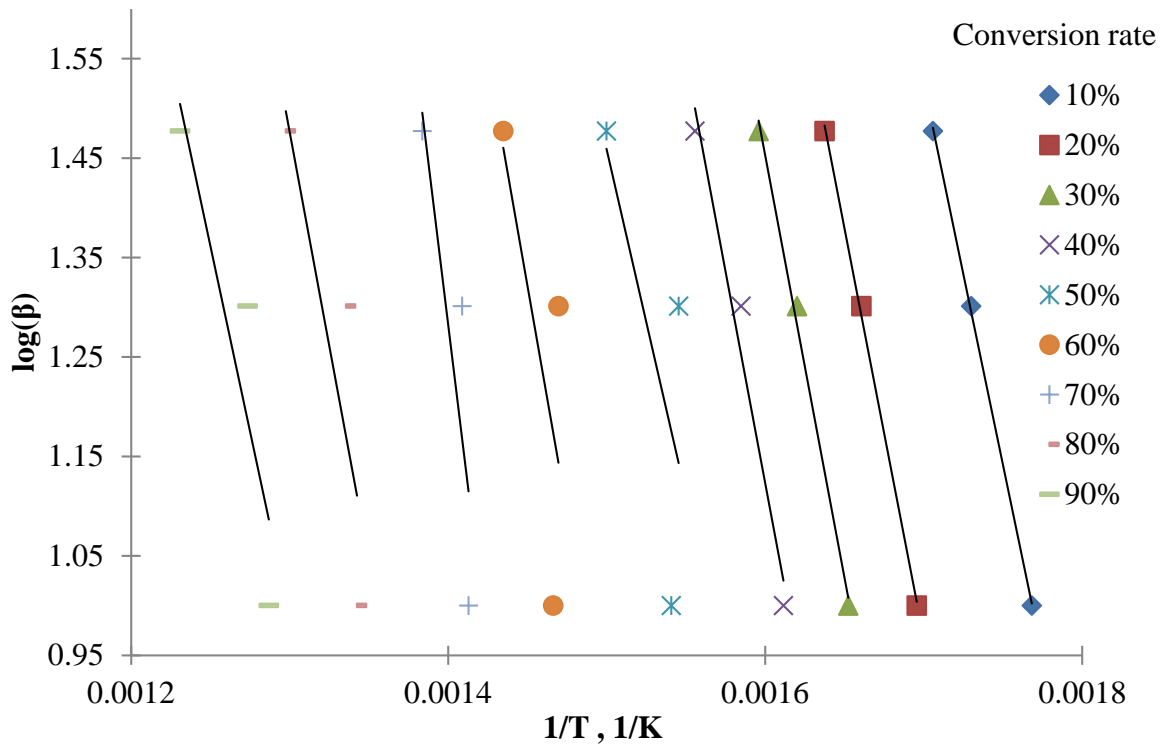
**Figure S1.** (a) Linear plots of  $\log\beta$  vs.  $1/T$  by using FWO method for RDF; (b) Linear plots of  $\ln(\beta/T^2)$  vs.  $1/T$  by using KAS method for RDF; (c) Linear plots of  $\ln(da/dt)$  vs.  $1/T$  by using Friedman method for RDF.



**Figure S2.** Linear plots of  $\log\beta$  vs.  $1/T$  by using FWO method for plastic

**Table S1.** Kinetic parameters of plastic fraction by FWO.

$\alpha$	FWO		
	A (min <sup>-1</sup> )	E <sub>a</sub> (kJ/mol)	R <sup>2</sup>
0.1	3.33 × 10 <sup>7</sup>	88.18	1.00
0.2	3.99 × 10 <sup>6</sup>	81.12	1.00
0.3	2.30 × 10 <sup>5</sup>	67.94	1.00
0.4	4.48 × 10 <sup>4</sup>	52.08	1.00
0.5	3.93 × 10 <sup>4</sup>	61.20	1.00
0.6	8.92 × 10 <sup>6</sup>	94.62	0.99
0.7	1.60 × 10 <sup>12</sup>	169.19	0.98
0.8	4.46 × 10 <sup>24</sup>	348.53	0.94
0.9	4.85 × 10 <sup>12</sup>	186.45	0.99
Mean	4.96 × 10 <sup>23</sup>	127.70	
SD	1.50 × 10 <sup>24</sup>	95.18	



**Figure S3.** Linear plots of  $\log\beta$  vs.  $1/T$  by using FWO method for textile

**Table S2.** Kinetic parameters of textile fraction by FWO.

$\alpha$	FWO		
	A (min <sup>-1</sup> )	E <sub>a</sub> (kJ/mol)	R <sup>2</sup>
0.1	4.74 × 10 <sup>11</sup>	139.62	1.00
0.2	2.48 × 10 <sup>12</sup>	150.14	1.00
0.3	4.19 × 10 <sup>12</sup>	154.42	1.00
0.4	3.15 × 10 <sup>12</sup>	154.99	0.97
0.5	7.09 × 10 <sup>9</sup>	126.44	0.52
0.6	3.17 × 10 <sup>12</sup>	165.75	0.52
0.7	3.03 × 10 <sup>17</sup>	237.42	0.73
0.8	8.12 × 10 <sup>10</sup>	156.66	0.74
0.9	1.43 × 10 <sup>9</sup>	135.88	0.82

Mean	$3.37 \times 10^{16}$	157.92
SD	$1.01 \times 10^{17}$	32.164

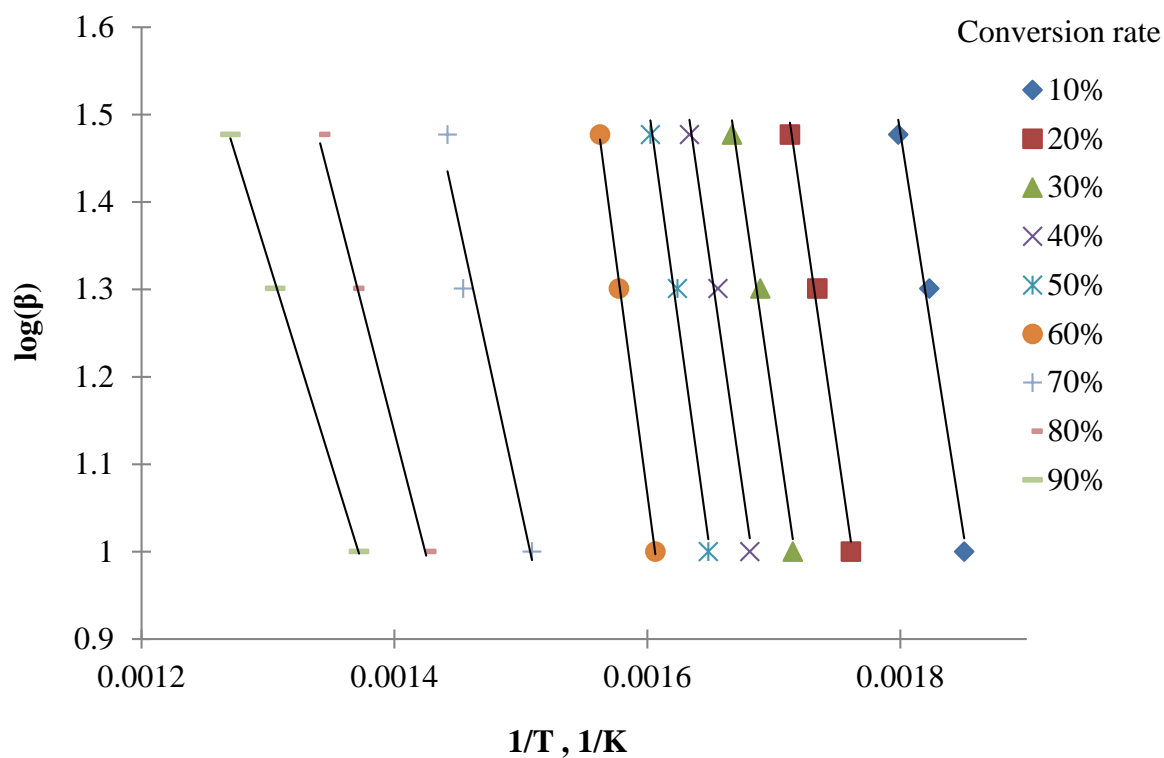


Figure. S4. Linear plots of  $\log\beta$  vs.  $1/T$  by using FWO method for Paper

Table S3. Kinetic parameters of paper by FWO.

$\alpha$	FWO		
	A ( $\text{min}^{-1}$ )	$E_a$ (kJ/mol)	$R^2$
0.1	$1.10 \times 10^{35}$	365.27	1.00
0.2	$1.55 \times 10^{21}$	236.04	0.98
0.3	$1.71 \times 10^{18}$	208.55	0.94
0.4	$8.90 \times 10^{16}$	197.52	0.87
0.5	$2.66 \times 10^{16}$	195.28	0.69
0.6	$7.94 \times 10^8$	111.15	0.27
0.7	$4.78 \times 10^{15}$	203.62	0.81
0.8	$2.69 \times 10^{12}$	169.23	0.67
0.9	$7.52 \times 10^9$	140.31	0.98
Mean	$1.22 \times 10^{34}$	203	
SD	$3.67 \times 10^{34}$	71.63	