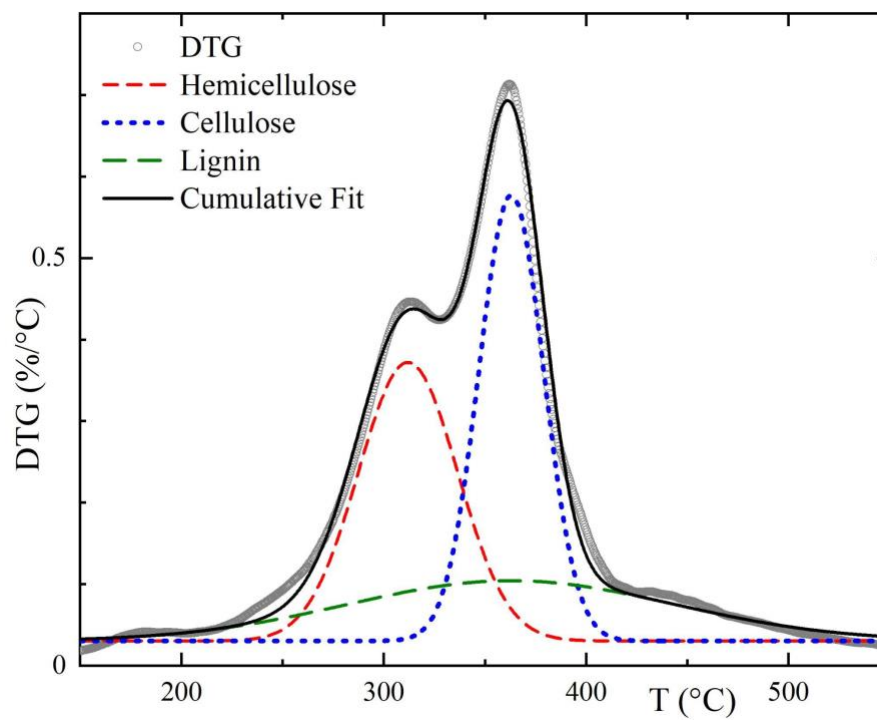


## Supplementary materials



**Fig. S1:** DTG curves fitted with nonlinear least squares method for PEFB at 50 °C/min

**Table S1:** Linear regression equations at different heating rates using the CR method for n=1; 1.5; 2

Coats - Redfern method							
Heating rate	Conversion rates	Equation of the regression line $n = 1$		Equation of the regression line $n = 1.5$		Equation of the regression line $n = 2$	
		slope	y-intercept	slope	y-intercept	slope	y-intercept
10°C/min	$\alpha = [0 ; 1]$	-1842	- 9.7688	-2926.6	- 4.2194	-3374.5	- 5.8295
	[0 ; 0.2]	-857.58	- 12.361	509.27	- 13.003	-910.48	- 12.177
	[0.2 ; 0.8]	-6146.6	- 2.5963	-7306.7	1.4335	-8735.6	2.2604
	$\alpha > 0,8$	-1183.3	- 10.425	-12200	9.246	-7981.7	1.0395
20°C/min	$\alpha = [0 ; 1]$	-1970.4	- 9.5847	-2991.6	- 4.1995	-3525.6	- 5.6489
	[0 ; 0.2]	-1116.3	- 11.796	481.03	- 12.936	-1175.2	- 11.597
	[0.2 ; 0.8]	-6002.3	- 2.9155	-7027.3	0.8658	-8492.7	1.7439
	$\alpha > 0.8$	-1181.9	- 10.438	-12206	9.1877	-7985.2	0.9992
30°C/min	$\alpha = [0 ; 1]$	-2098.4	- 9.4961	-2791.2	- 4.731	-3551.4	- 5.8125
	[0 ; 0.2]	-1148	- 11.958	507.35	- 13.055	-1203.9	- 11.777
	[0.2 ; 0.8]	-6316.4	- 2.6063	-7593.3	1.5707	-9010.6	2.3217
	$\alpha > 0.8$	-1548.1	- 9.9805	-13908	11.31	-9178.2	2.4878
40°C/min	$\alpha = [0 ; 1]$	-2087.4	- 9.5282	-2682.3	- 5.0213	-3481.8	- 5.9935
	[0 ; 0.2]	-992.42	- 12.345	530.8	- 13.118	-1045.3	- 12.172
	[0.2 ; 0.8]	-6316	- 2.723	-7525.3	1.314	-8981.5	2.1119
	$\alpha > 0.8$	-1914.7	- 9.396	-16035	14.616	-10633	4.7548
50°C/min	$\alpha = [0 ; 1]$	-2103.8	- 9.5155	-2377.3	- 5.5444	-3381.1	- 6.1749
	[0 ; 0.2]	-1568.1	- 10.92	498.53	- 13.01	-1623.1	- 10.736
	[0.2 ; 0.8]	-5900.9	- 3.5198	-7133.2	0.5508	-8464.8	1.1141
	$\alpha > 0.8$	-1959	- 9.4514	-16187	14.254	-10743	4.5085

**Table S2:** Linear regression equations at different conversion rates using the KAS and OFW iso conversion method

	OFW		KAS	
Conversion rates ( $\alpha$ )	Equation of the regression line		Equation of the regression line	
	slope	y-intercept	slope	y-intercept
0.2	-16816	21.63	-17900	36.221
0.3	-19472	24.956	-20604	39.633
0.4	-19704	24.305	-20870	39.041
0.5	-19452	22.88	-20652	37.674
0.6	-18925	21.294	-20151	36.131
0.7	-18445	19.995	-19691	34.864
0.8	-17344	17.695	-18614	32.603

**Table S3:** Kinetic parameters of PEFB by Coast-Redfern method

Conversion rates	Coats - Redfern Method														
	Heating rate														
	10°C/min			20°C/min			30°C/min			40°C/min			50°C/min		
	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>
For n=1	$\ln \left[ \frac{\ln(1-\alpha)}{T^2} \right] = \ln \frac{AR}{\beta E_a} - \frac{E_a}{RT}$														
$\alpha$	16.531	1.3484	0.8714	14.738	1.6935	0.8225	17.437	4.7183	0.8819	17.346	6.0612	0.843	17.506	8.3325	0.8429
[0 ; 0,2]	8.639	0.060851	0.4566	7.504	0.090451	0.3631	9.603	0.2259	0.6234	8.331	0.1785	0.5567	11.823	0.8436	0.5248
[0,2 ; 0,8]	48.355	2 337.5	0.9875	46.275	2 451.1	0.9836	52.538	14 098	0.9916	52.569	16 855	0.9926	51.080	11 919	0.9898
$\alpha > 0,8$	12.979	0.7230	0.9338	12.347	1.2410	0.8954	12.695	2.0590	0.8692	15.639	20.017	0.8474	14.733	5.2781	0.8653
For n=1.5	$\ln \left\{ \frac{2[(1-\alpha)^{1.5} - 1]}{T^2} \right\} = \ln \frac{AR}{\beta E_a} - \frac{E_a}{RT}$														
$\alpha$	24.917	420.07	0.8320	22.655	453.51	0.8580	23.027	700.33	0.8338	22.062	657.93	0.8503	20.195	461.76	0.8613
[0 ; 0,2]	4.076	0.011306	0.5351	4.073	0.023564	0.8164	4.213	0.032591	0.8537	4.406	0.042707	0.859	4.180	0.054814	0.8419
[0,2 ; 0,8]	60.517	2.7978e+05	0.9938	53.941	1.0338e+05	0.9892	63.352	1.1550e+06	0.9943	62.912	1.2138e+06	0.9924	60.196	6.3889e+05	0.993
$\alpha > 0,8$	113,571	8.4579e+09	0.8549	112.212	1.1642e+10	0.8322	113.853	2.7350e+10	0.8022	129.992	7.8435e+11	0.7529	125.841	2.4239e+11	0.8029
For n=2	$\ln \left\{ \frac{[1/(1-\alpha)] - 1}{T^2} \right\} = \ln \frac{AR}{\beta E_a} - \frac{E_a}{RT}$														

$\alpha$	29,460	119.12	0.7896	26.701	121.41	0.7465	29.424	309.26	0.7819	28.812	333.63	0.7336	28.251	323.90	0.7633
$[0 ; 0,2]$	9,128	0.078064	0.4834	7.989	0.1176	0.3904	10.069	0.2838	0.646	8,771	0.2234	0.5809	12.301	1.0581	0.5448
$[0,2 ; 0,8]$	70,240	4.6591e+05	0.9632	65.627	2.6397e+05	0.9568	75.034	2.8394e+06	0.9721	74,877	3.1170e+06	0.9731	72.505	1.6920e+06	0.9674
$\alpha > 0,8$	75,106	8.6393e+05	0.8618	73.982	1.3849e+06	0.8372	75.121	2.6625e+06	0.62868	86,189	3.2854e+07	0.7573	83/281	1.5328e+07	0.8075

**Table S4:** Kinetic parameters of PEFB by KAS method

Conversion rates	KAS Method														
	Heating rate														
	10°C/min			20°C/min			30°C/min			40°C/min			50°C/min		
	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>	Ea (kJ/mol)	A (min <sup>-1</sup> )	R <sup>2</sup>
$\alpha$	8.272	4.87E-03	0.981	8.323	9.84E-03	0.980	8.282	1.48E-02	0.981	8.162	1.98E-02	0.981	8.07	2.49E-02	0.981
[0 ; 0.2]	6.527	1.47E-03	0.994	6.56	2.96E-03	0.994	6.670	4.38E-03	0.993	6.732	5.78E-03	0.993	6.563	7.23E-03	0.993
[0.2 ; 0.8]	9.547	7.52E-03	0.999	9.588	1.49E-02	0.999	9.797	2.21E-02	0.999	9.886	2.92E-02	0.999	9.973	3.59E-02	0.999
$\alpha > 0.8$	12.280	4.18E-02	0.998	12.304	8.35E-02	0.998	12.251	1.26E-01	0.998	12.064	1.68E-01	0.998	12.409	2.07E-01	0.998