Electronic Supplementary Material (ESI) for RSC Advances.

Novel bio–based flexible epoxy resin from diglycidyl ether of bisphenol A cured with castor oil maleate

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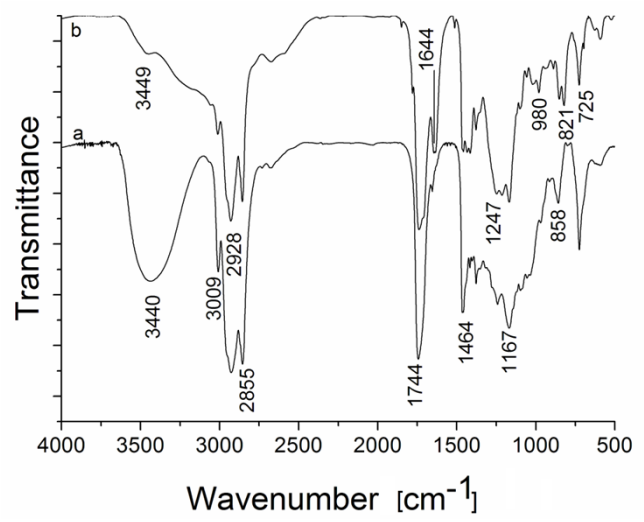

Fig. S1. FTIR spectra of CO (a) and COMA (b).

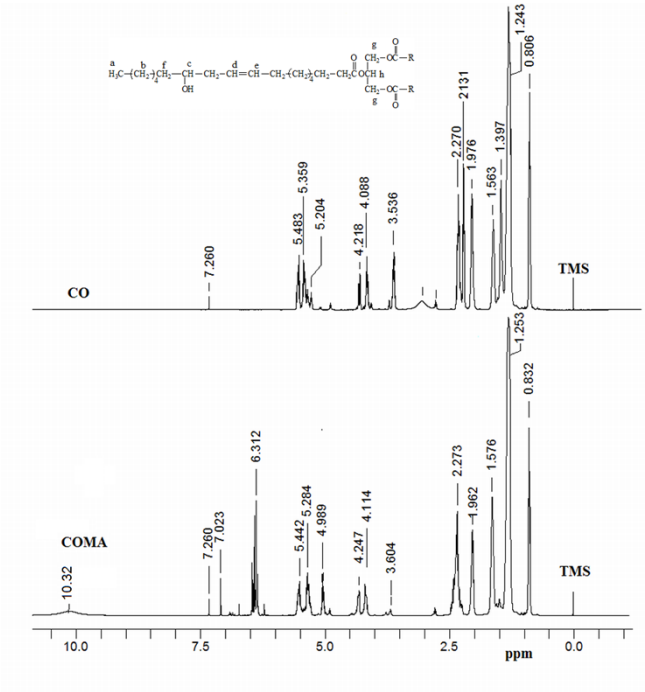

Fig. S2. ^{1}H–NMR spectra of CO and COMA.

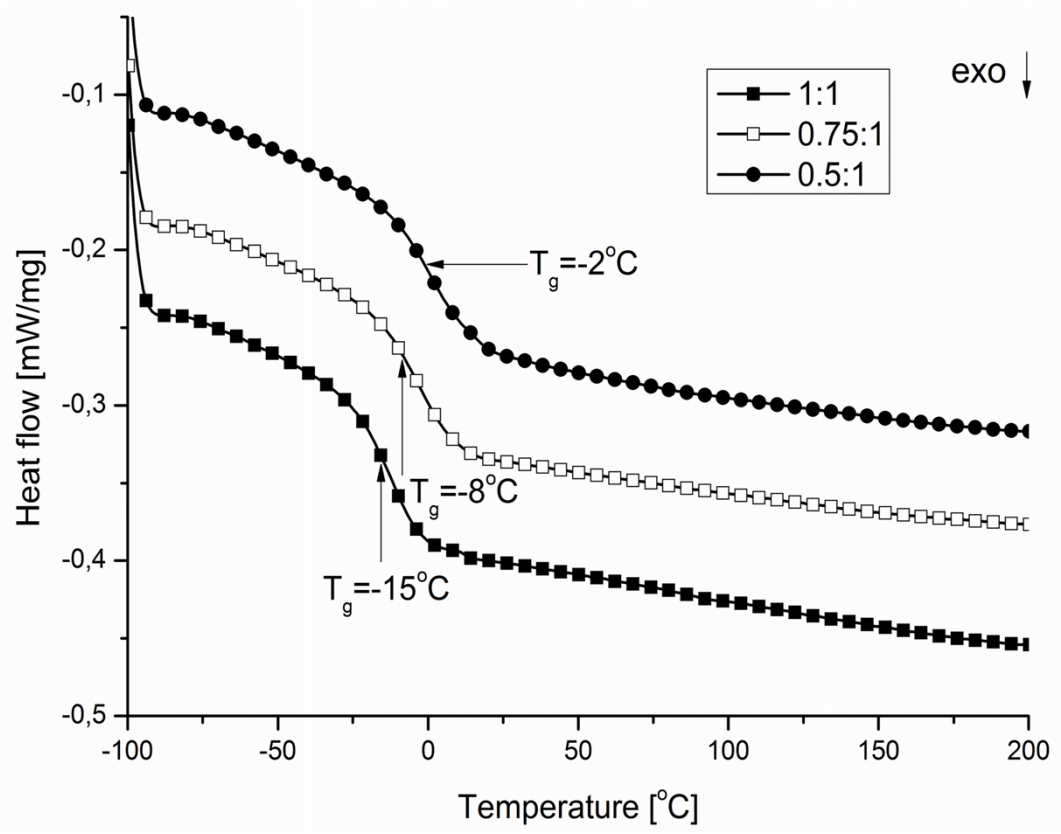

Fig. S3. DSC heating curves

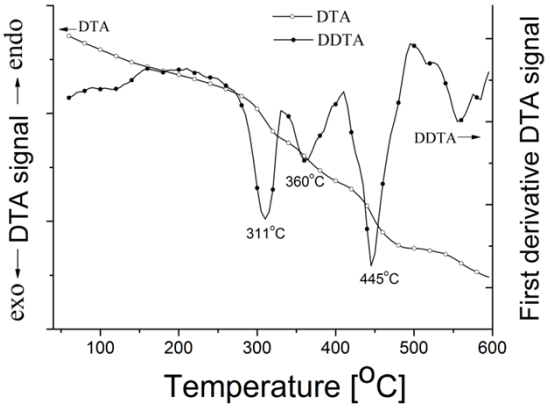

Fig. S4. DTA and DDTA curves of the studied sample.

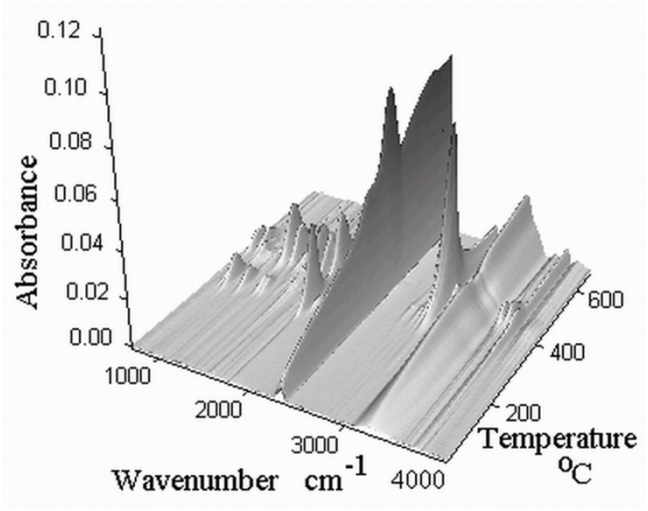

Fig. S5. FTIR 3D plot of evolved gaseous compounds.

Table S1. Some data evaluated from TG and DTG curves.

Heating rate (^oC min^{-1})	$T_{5\%}$ (^oC)	$T_{50\%}$ (^oC)	T_{mI} (^oC)	W_{mI} (%)	T_{mII} (^oC)	W_{mII} (%)	T_f (^oC)	$T_f - T_i$ (^oC)	W_{rez} (%)
5	299	407	288	3.6	414	57	540	241	4.1
7.5	312	418	298	3.2	416	47	540	228	8.6
10	320	420	312	3.9	423	51	540	220	7.1

$T_{5\%}$ - temperature corresponding to 5% mass loss;

$T_{50\%}$ - temperature corresponding to 50% mass loss;

T_{mI}, T_{mII} - temperatures corresponding to the maximum thermal degradation rates (i.e. first derivative curve peak temperatures);

W_{mI}, W_{mII} - mass loss corresponding to T_{mI} and T_{mII} values;

T_f - final thermal decomposition temperature;

$T_f - T_i$ - thermal decomposition range;

W_{rez} = amount of residue remained at the end of the thermal degradation process (600^{o}C).

Table S2. Reaction types and conversion functions f(e, p), where: *e* = start concentration of the reactant and *p* = concentration of the final product.

Reactions type	code	f(e,p)
First-order reaction	F1	e
Second-order reaction	F2	e^2
n^{th}-order reaction	Fn	e^n
Two-dimentional phase boundary	R2	$2 \cdot e^{0.5}$
Three-dimensional phase boundary reaction	R3	$3 \cdot e^{0.67}$
One-dimensional diffusion	D1	$0.5/(1-e)$
Two-dimensional diffusion	D2	$-1/\ln(e)$
Three-dimensional diffusion (Jander's type)	D3	$1.5 \cdot e^{0.33} (e^{-0.33} - 1)$
Four-dimensional diffusion (Ginstling–Brounstein type)	D4	$1.5 / (e^{-0.33} - 1)$
Simple Prout–Tompkins equation	B1	$e \cdot p$
Expanded Prout–Tompkins equation	Bna	$e^n \cdot p^a$
First-order reaction with autocatalysis	C1-X	$e \cdot (1+Kcat \cdot X)$
Through the reactands, X	Cn-X	$e^n \cdot (1+Kcat \cdot X)$
Two-dimensional nucleation	A2	$2 \cdot e \cdot [-\ln(e)]^{0.5}$
Three-dimensional nucleation	A3	$3 \cdot e \cdot [-\ln(e)]^{0.67}$
n-Dimensional nucleation/nucleus growth according to Avrami/Erofeev	An	$n \cdot e [-\ln(e)]^{(n-1)/n}$

Table S3. Lifetime prediction from thermochemical data.

Temperature [^{o}C]	Lifetime for 5% mass loss [h]	Lifetime for 10% mass loss [h]
130	3000	13000
135	1833	8333
140	1217	5333
145	783	3500
150	516	2166
155	333	1483
160	217	1000
165	153	666
170	104	450
175	71	316
180	49	200
185	34	150
190	24	105
195	17	74
200	12	53