

Electronic Supplementary Information for:

# High Thermal Stability of Bio-based Polycarbonates Containing Cyclic Ketal Moieties

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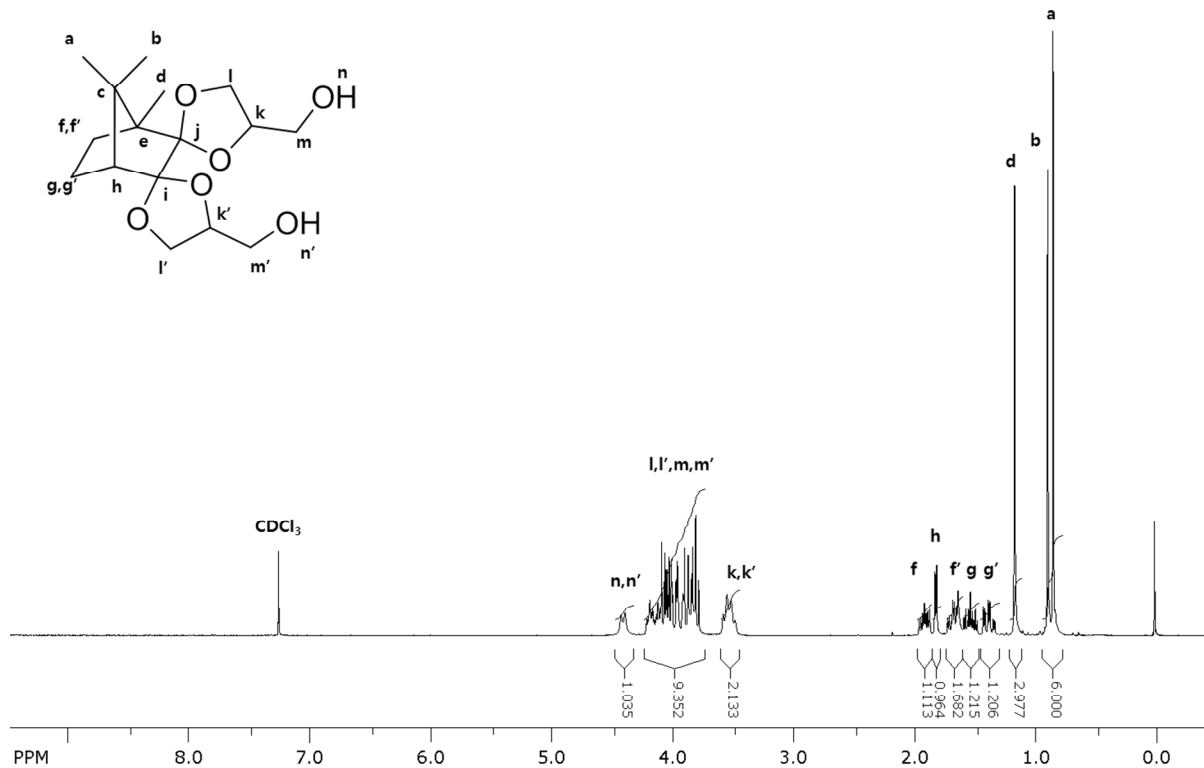
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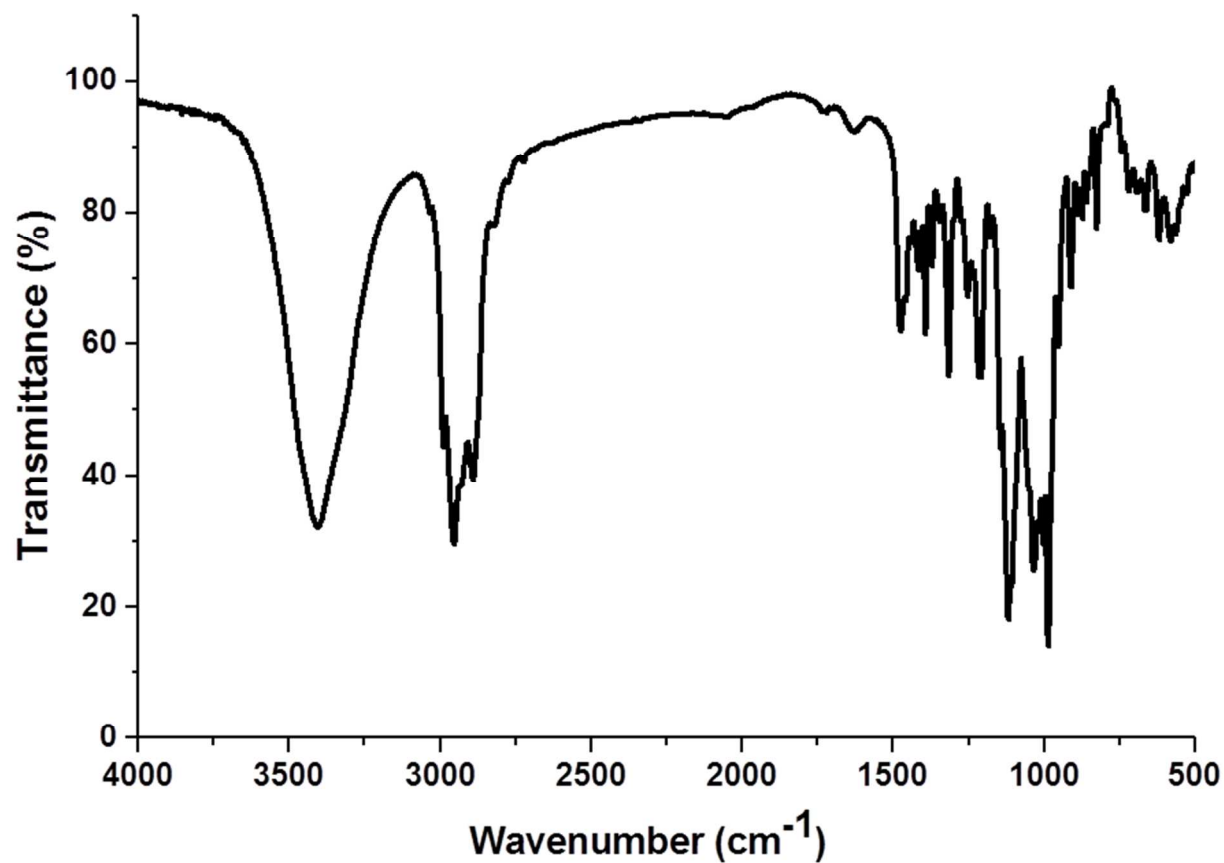
## Characterization of CaG diol monomer

**Figure S1.**  $^1\text{H}$  NMR spectra of CaG diol monomer.



$^1\text{H}$  NMR (299.9 MHz,  $\text{CDCl}_3$ ),  $\delta$  (ppm): 4.42 (d, 2H, OH), 4.23-3.73 (m, 8H,  $\text{OCH}_2\text{CH}$ ), 3.55 (m, 2H, OCH), 1.91 (m, 1H,  $\text{CCH}_2\text{CH}_2$ ), 1.81(d, 1H, CCH), 1.67(m, 1H,  $\text{CHCH}_2\text{CH}_2$ ), 1.53(m, 1H,  $\text{CCH}_2\text{CH}_2$ ), 1.38(m, 1H,  $\text{CHCH}_2\text{CH}_2$ ), 1.16(s, 3H,  $\text{CCH}_3$ ), 0.89(s, 3H,  $\text{CCH}_3$ ), 0.84(s, 3H,  $\text{CCH}_3$ )

**Figure S2.** FT- IR spectrum of CaG diol monomer recorded at room temperature. The spectrum shows frequency ranges from 500 to 4000  $\text{cm}^{-1}$



FT-IR:  $\nu$  ( $\text{cm}^{-1}$ ) = 3430, 2954, 2894, 1476, 1392, 1315, 1209, 1119, 1035, 986.

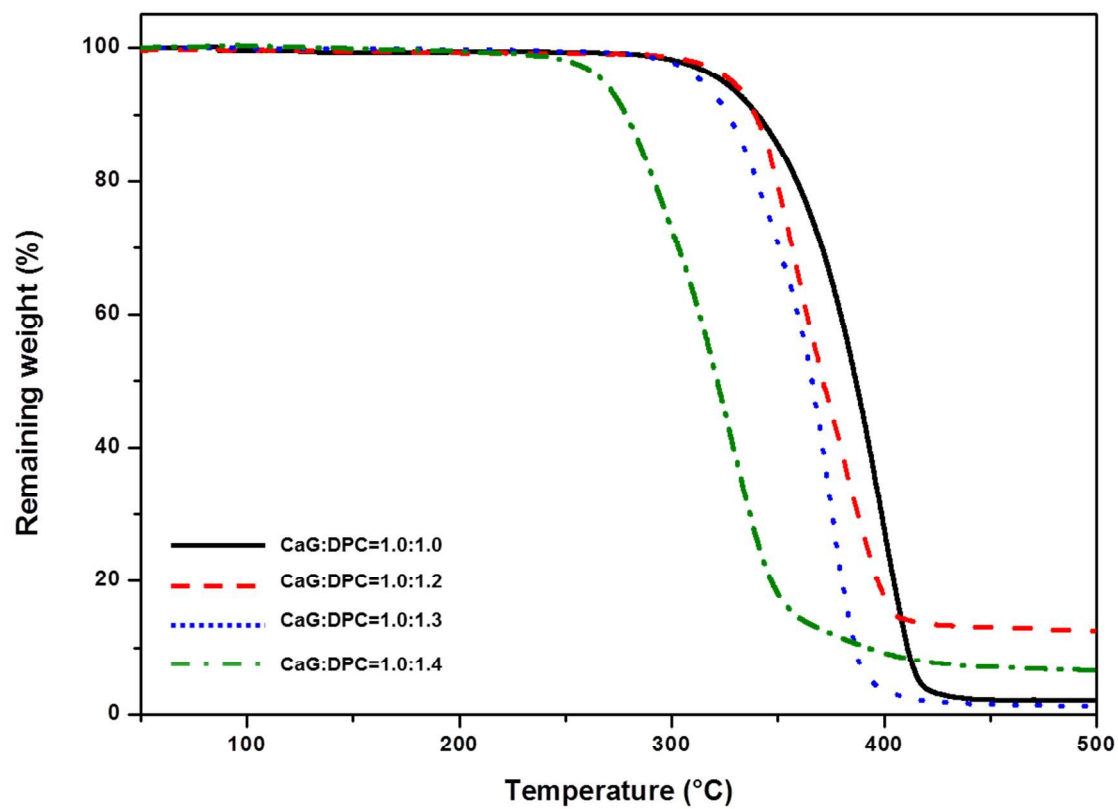
## Characterization of PCaGC homopolymers

**Table S1.** Molar composition, yield, molecular weight and thermal properties of PCaGCs.

Entry	Molar composition		Yield (%)	Molecular weight			Thermal properties (°C)		
	CaG	DPC		Mn <sup>a</sup>	Mw <sup>a</sup>	D <sup>a</sup>	T <sub>5%</sub> <sup>b</sup>	T <sub>d</sub> <sup>c</sup>	T <sub>g</sub> <sup>d</sup>
1	1.0	1.0	37.8	7664	14105	1.84	324.0	399.0	127.3
2	1.0	1.1	46.0	8283	18652	2.25	298.0	357.7	128.3
3	1.0	1.2	42.5	7573	14480	1.91	328.4	357.8	125.6
4	1.0	1.3	51.0	5629	9019	1.62	314.5	376.1	119.8
5	1.0	1.4	29.0	6583	11050	1.68	267.8	326.8	127.8

<sup>a</sup>Number-average and weight-average molecular weights in g mol<sup>-1</sup> and dispersities measured by GPC in THF against PS standards. <sup>b</sup>Temperature at which 5% weights loss was observed. <sup>c</sup>Temperature for the maximum degradation rate. <sup>d</sup>Glass-transition temperature taken as the inflection point of the heating DSC traces.

**Figure S3.** TGA traces of PCaGCs recorded from 50 to 500 °C at 10 °C/min under N<sub>2</sub> atmosphere.



**Figure S4.** DSC curves of PCaGCs. The experiments were carried out from 60 to 200 °C at a heating rate of 10 °C/min

