Elastomeric/antibacterial properties in novel random *Ricinus communis* based-copolyesters

Grazia Totaro,[a] Laura Sisti,*[a] Nicole Bozzi Cionci,[b] Gonzalo A. Martinez,[a] Diana Di Gioia,[b] Annamaria Celli.[a]

[a]Dipartimento di Ingegneria Civile, Chimica, Ambientale e dei Materiali, Università di Bologna, Via Terracini 28, 40131 Bologna, Italy. [b]Dipartimento di Scienze e Tecnologie Agroalimentari, Università di Bologna, Viale Fanin 44, 40127 Bologna, Italy

Corresponding Author: laura.sisti@unibo.it

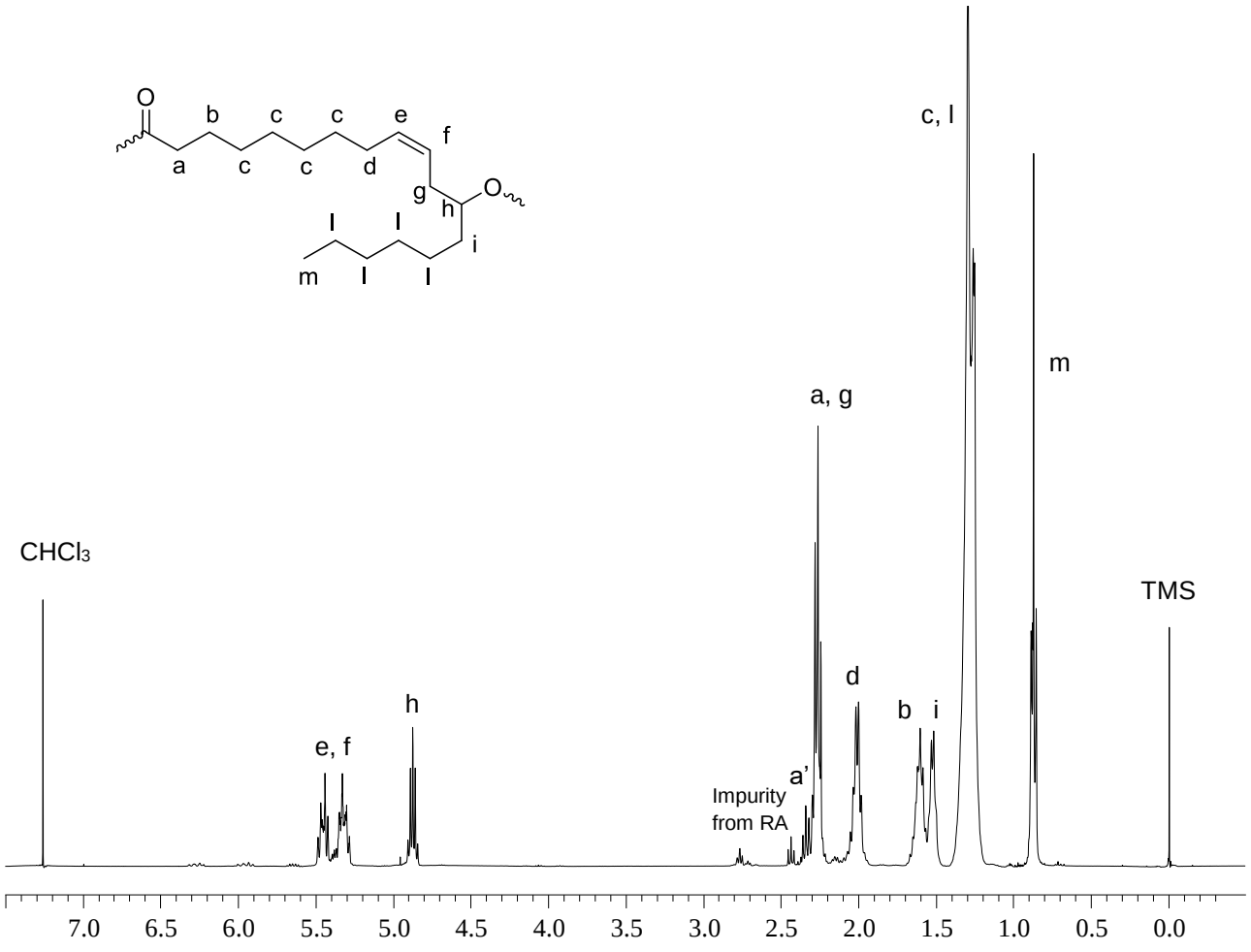

Figure S1. ^{1}H NMR (400 MHz) spectrum of poly(ricinoleic acid) in $CDCl_3$ (a' end group).

^{1}H NMR (400 MHz, $CDCl_3$, δ): 0.80-0.88 (t, 3H; $C^{m}H_3$), 1.20-1.38 (m, 16H; $C^{c}H_2$ and $C^{l}H_2$),1.42-1.56 and 1.56-1.70 (m, 2H; $C^{i}H_2$ and $C^{b}H_2$), 1.95-2.10 (m, 2H; $C^{d}H_2$), 2.23-2.40 (m, 4H; $C^{a}H_2$ and $C^{g}H_2$), 4.82-4.92 (m, 1H; $C^{h}H$), 5.28-5.36 and 5.40-5.50 (2m, 2H; $C^{f}H$ and $C^{e}H$).

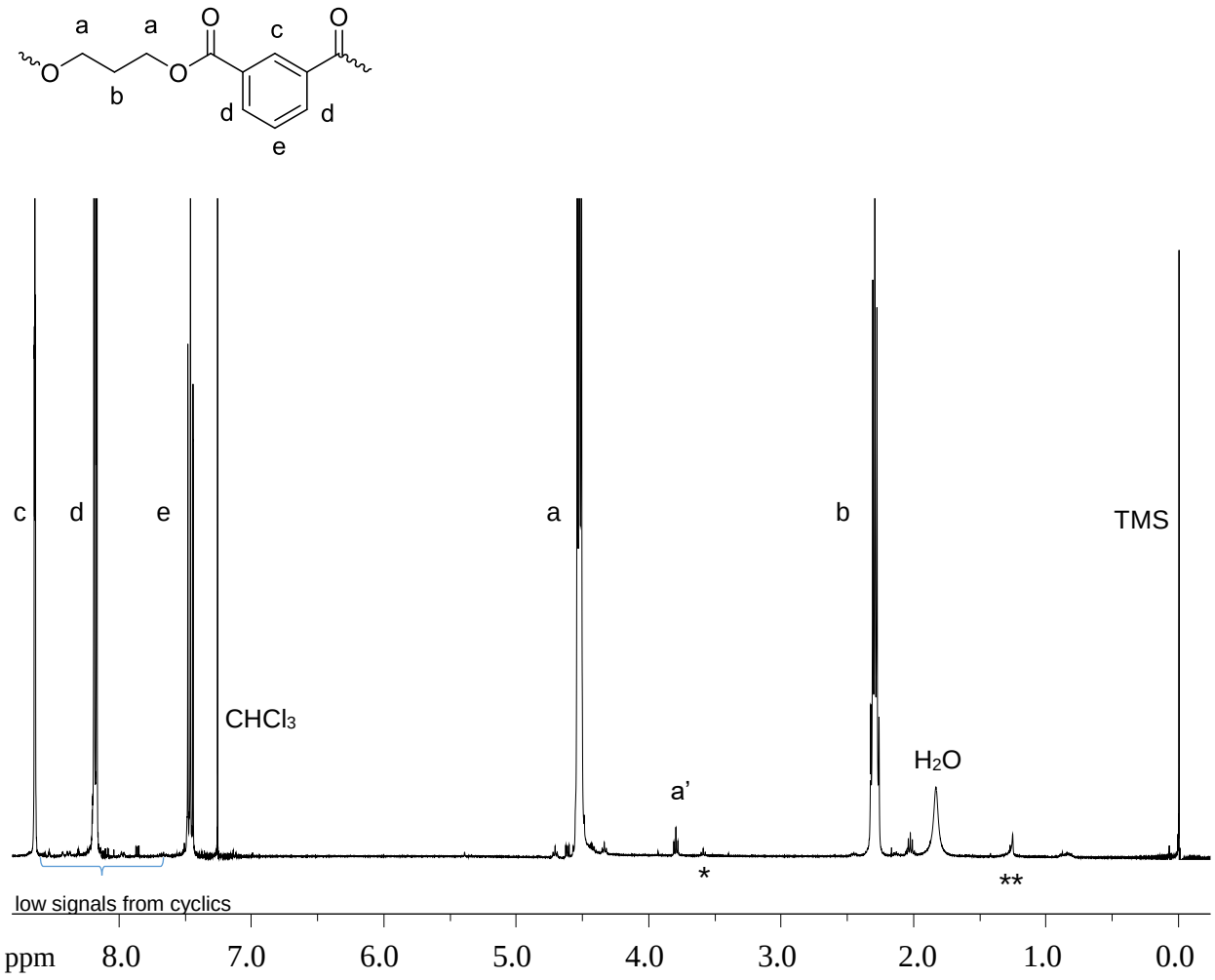

Figure S2. ^{1}H NMR (400 MHz) spectrum of poly(propylene isophthalate) in $CDCl_3$ (a' end group, * ether linkages PD-PD, ** impurity).

^{1}H NMR (400 MHz, $CDCl_3$ δ): 2.22-2.34 (m, 2H; $C^{b}H_2$), 4.47-4.56 (t, 4H; $C^{a}H_2$), 7.43-7.49 (t, 1H; $C^{e}H$), 8.15-8.20 (d, 2H; $C^{d}H$), 8.62-8.66 (t, 1H; $C^{c}H$).

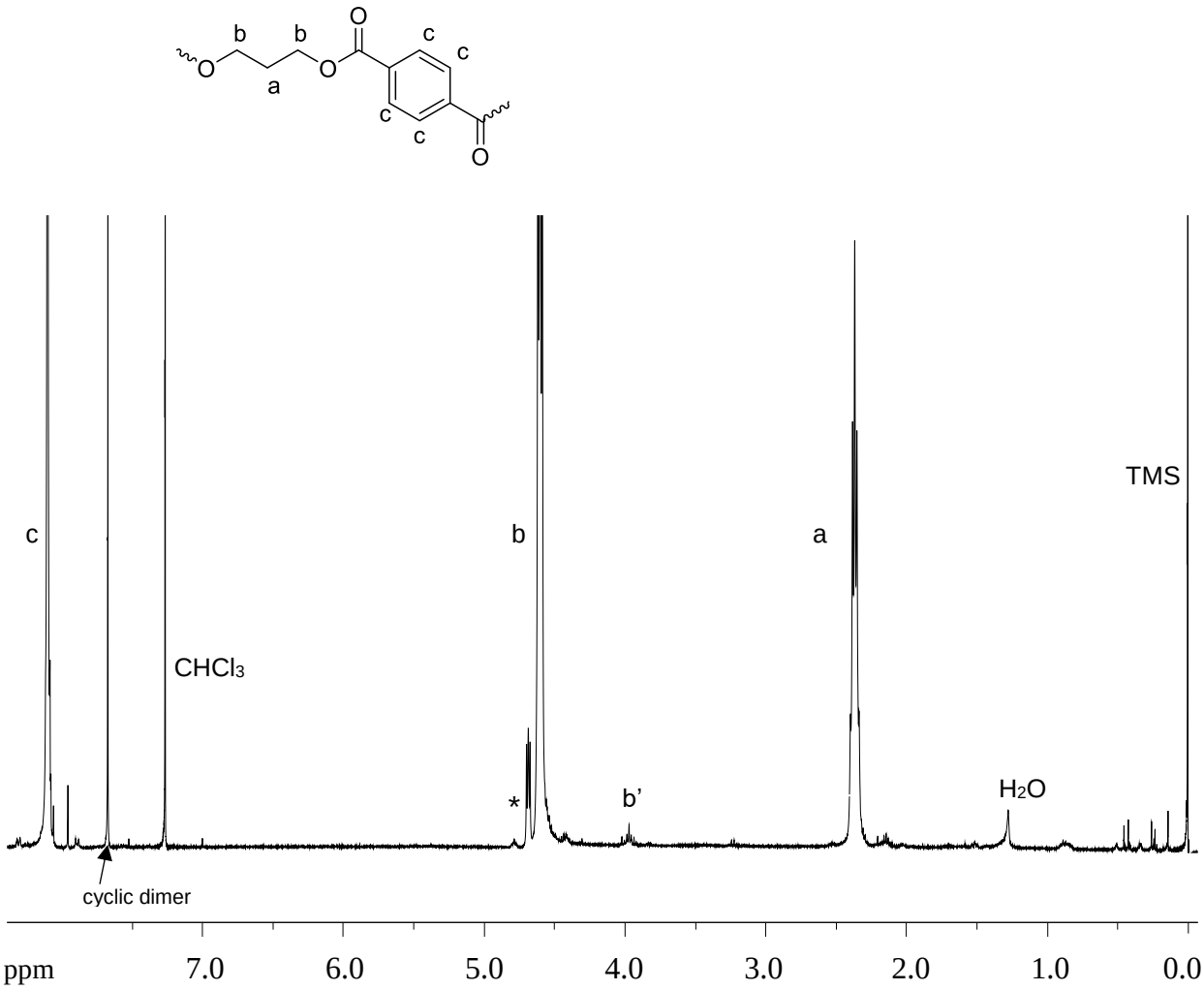

Figure S3. ^{1}H NMR (400 MHz) spectrum of poly(propylene terephthalate) in $CDCl_3$/TFA (b' end group, * cyclics) [1].

^{1}H NMR (400 MHz, $CDCl_3$/TFA, δ): 2.24-2.52 (m, 2H; C^aH_2), 4.45-4.66 (m, 4H; C^bH_2), 7.98-8.26 (s, 4H; C^cH_2).

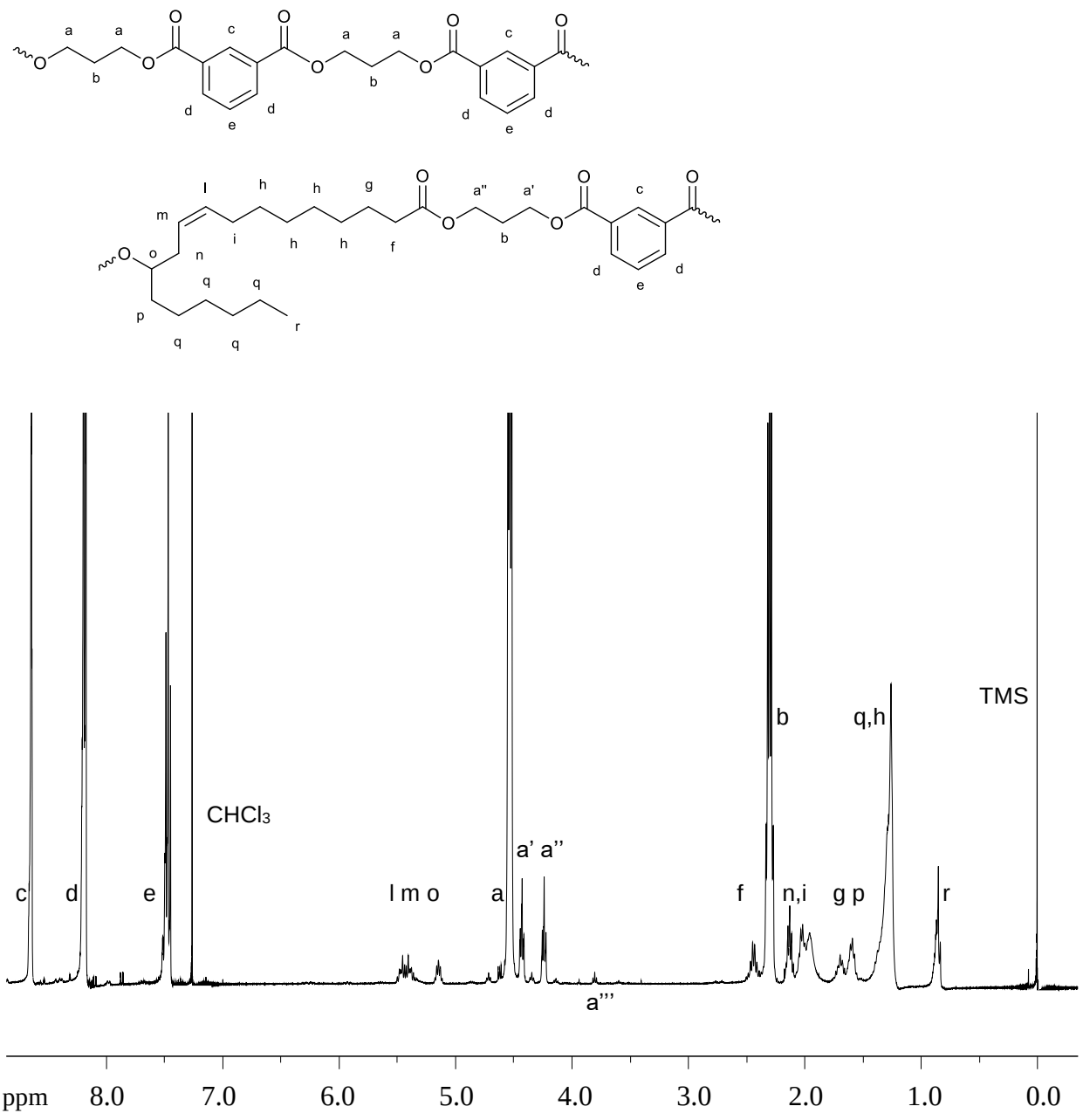

Figure S4. ^{1}H NMR (400 MHz) spectrum of poly(propylene isophthalate-*co*-ricinoleic acid) (P(PI-*co*-RA) 90/10) in $CDCl_3$/TFA (a''' end group).

^{1}H NMR (400 MHz, $CDCl_3$/TFA, δ): 0.80-0.95 (t, 3H; C^rH_3), 1.20-1.48 (m, 16H; C^qH_2 and C^hH_2),1.55-1.65 and 1.65-1.75 (m, 2H; C^pH_2 and C^gH_2), 1.80-2.10 (m, 2H; C^iH_2), 2.10-2.20 (m, 2H; C^nH_2), 2.23-2.40 (m, 2H; C^bH_2), 2.40-2.50 (m, 2H; C^fH_2), 4.15-4.30 (m, 2H; $C^{a''}H_2$), 4.35-4.45 (m, 2H; $C^{a'}H_2$), 4.45-4.55 (m, 4H; C^aH_2), 5.10-5.20 (m, 1H; C^oH), 5.35-5.45 and 5.45-5.50 (2m, 2H; C^mH and C^lH), 7.42-7.55 (m, 1H; C^eH), 8.15-8.25 (d, 2H; C^dH), 8.60-8.72 (s, 1H; C^cH).

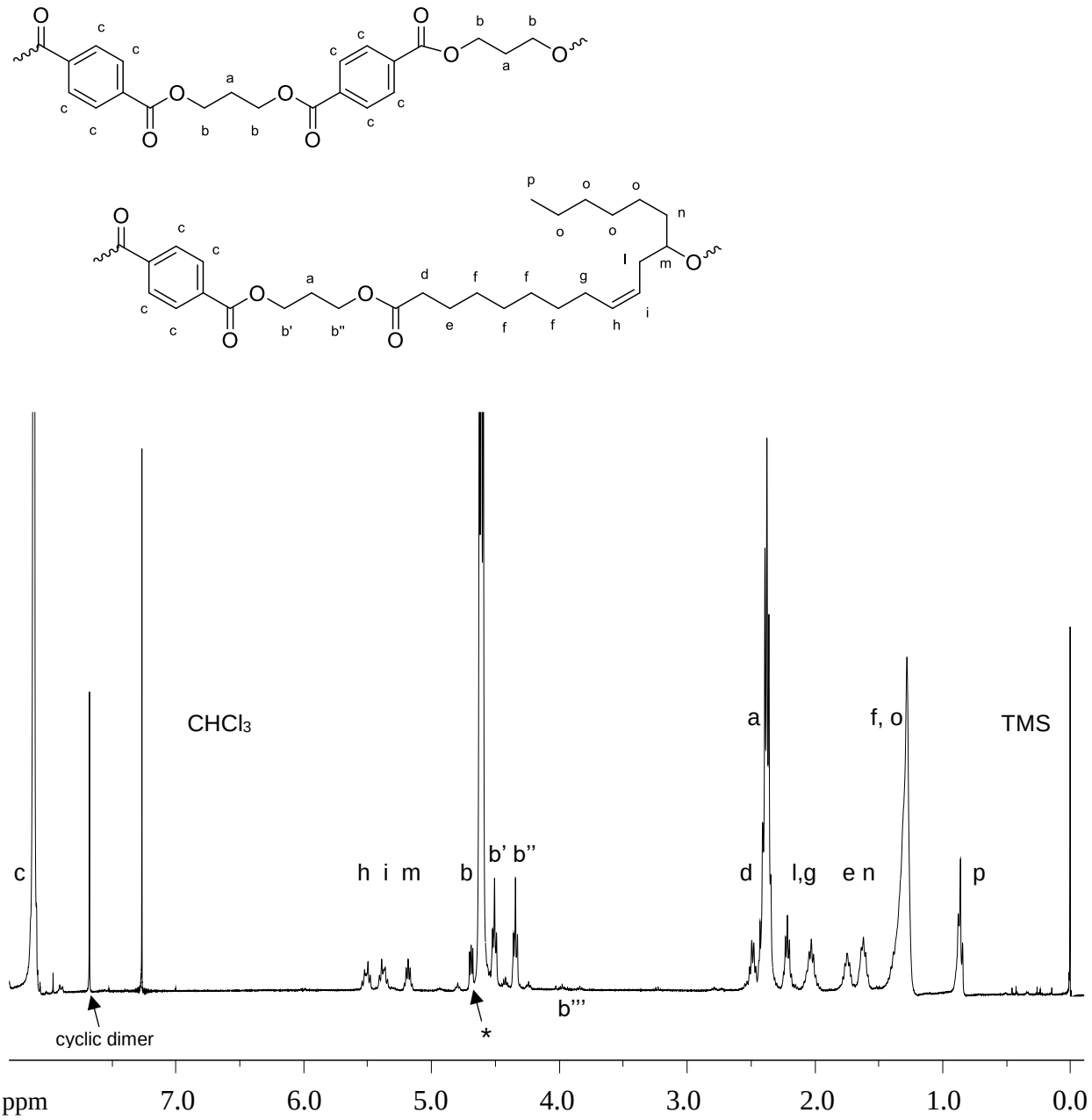

Figure S5. ^{1}H NMR (400 MHz) spectrum of poly(propylene terephthalate-*co*-ricinoleic acid) (P(PT-*co*-RA) 90/10) in $CDCl_3$/TFA (b''' end group, * cyclics) [1].

^{1}H NMR (400 MHz, $CDCl_3$/TFA, δ): 0.86 (t, 3H; C^pH_3), 1.20-1.50 (m, 16H; C^fH_2 and C^oH_2), 1.54-1.69 (m, 2H; C^nH_2), 1.68-1.82 (m, 2H; C^eH_2), 1.94-2.10 (m, 2H; C^gH_2), 2.14-2.26 (m, 4H; C^lH_2), 2.26-2.45 (m, 2H; C^aH_2), 2.45-2.56 (m, 4H; C^dH_2), 4.30-4.40 (m, 2H; $C^{b''}H_2$), 4.45-4.52 (m, 2H; $C^{b'}H_2$), 4.53-4.75 (m, 4H; C^bH_2), 5.09-5.25 (m, 1H; C^mH), 5.25-5.44 and 5.45-5.60 (2m, 2H; C^iH and C^hH), 7.93-8.29 (s, 4H; C^cH_2).

Table S1. Average number of viable cells obtained after 24 h of contact with samples as described in section 2.2.7. The values regarding the bacterial cell suspensions used as positive controls have also been reported.

Sample	*E.coli*	*S.aureus*
PRA	0	0
P(PI-*co*-RA)-75/25	5.0×10^2	6.1×10^4
P(PI-*co*-RA)-82/18	7.8×10^4	1.7×10^6
P(PI-*co*-RA)-90/10	1.9×10^5	3.8×10^6
PPI	1.0×10^6	2.3×10^6
P(PT-*co*-RA)-75/25	8.0×10^4	6.4×10^4
P(PT-*co*-RA)-90/10	1.4×10^5	2.3×10^6
PPT	2.2×10^5	2.6×10^6
Bacterial cell suspension	1.2×10^5	3.0×10^6

References

[1] B. Min, B. Ho Lim, S. Yen Ko, Separation and Identification of Cyclic Oligomers in Poly (trimethylene terephthalate). Journal of the Korean Magnetic Resonance Society 10 (2006) 38 – 45.