Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Electronic Supplementary Information

Charge generation by ultra-stretchable elastomeric electrets

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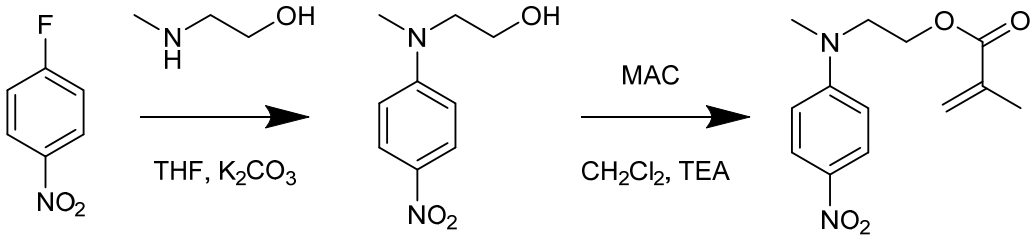

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Scheme S1. Synthesis of the methacrylate functionalized nitroaniline derivate

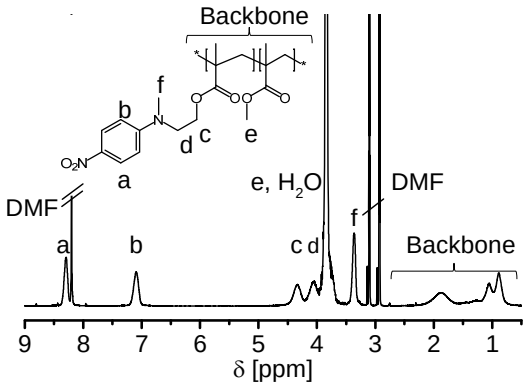

Figure S1. ^{1}H NMR spectrum of PMMA-*co*-NAMA in DMF-d7.

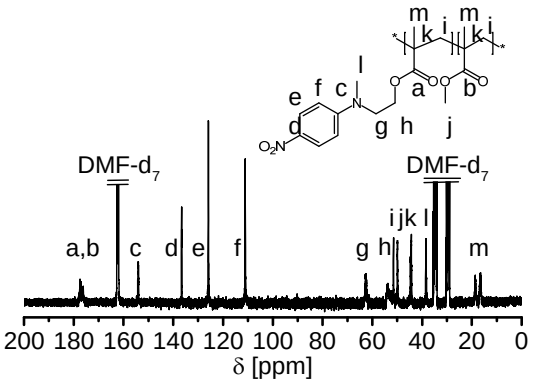

Figure S2. ^{13}C NMR spectrum of PMMA-*co*-NAMA in DMF-d7.

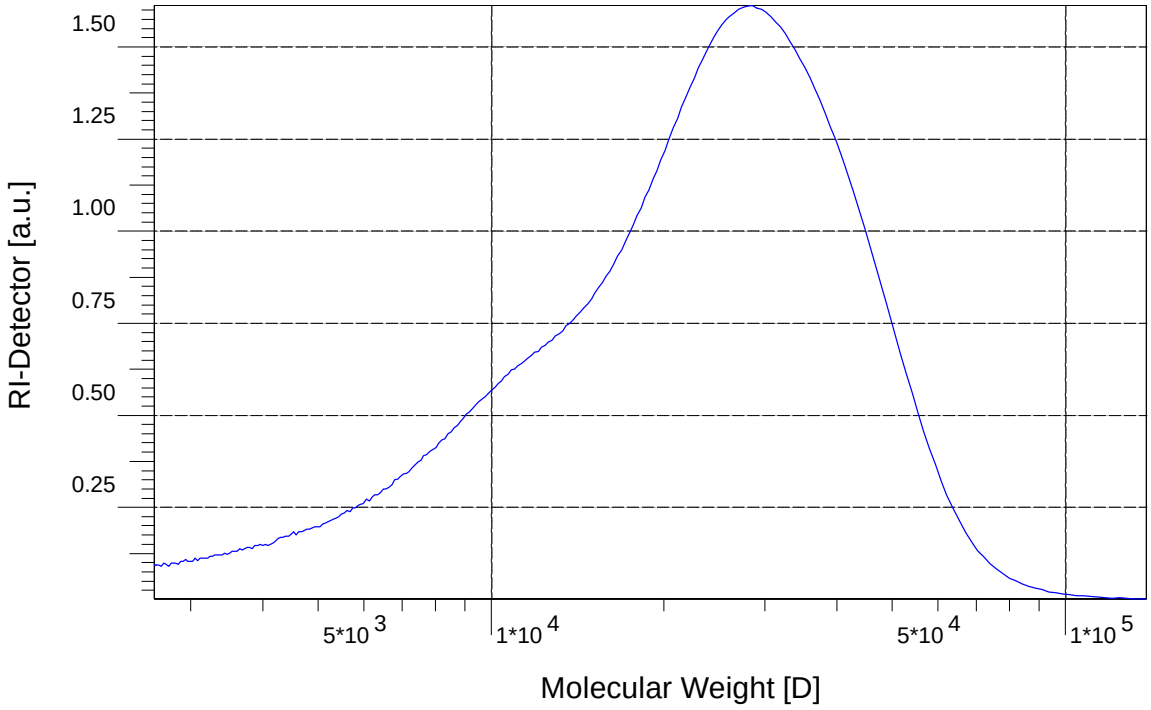

Figure S3. GPC curve of PMMA-*co*-NAMA in THF measured against a PMMA standard.

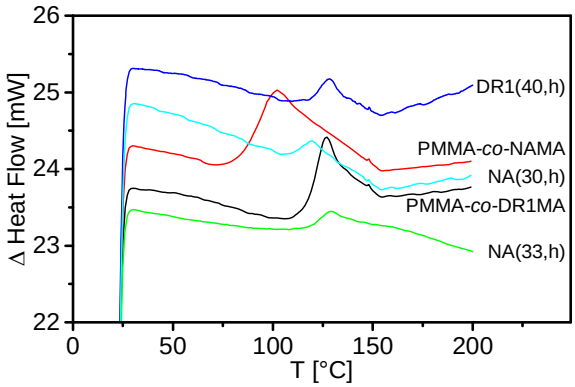

Figure S4. Second DSC run of the copolymers and the composite.

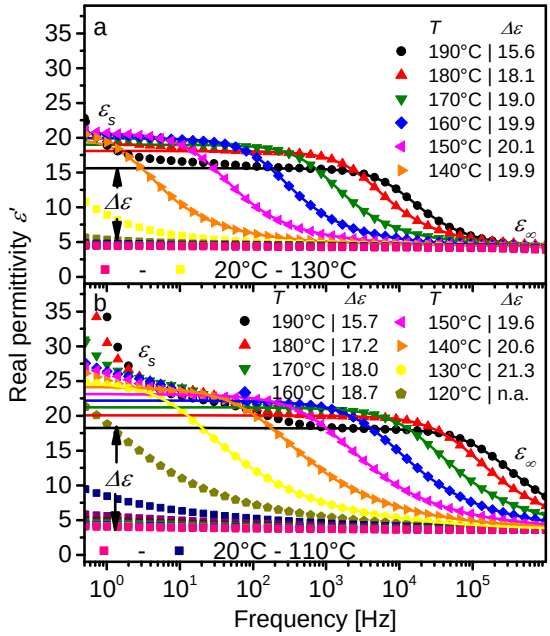

Figure S5. Real permittivity of the PMMA-*co*-DR1MA (a) and PMMA-*co*-NAMA (b). The measurements are represented by dots; the HN-fit is represented by lines. The corresponding $\Delta\varepsilon$ is noted next to the temperature. (a) is reproduced with permission from reference 1

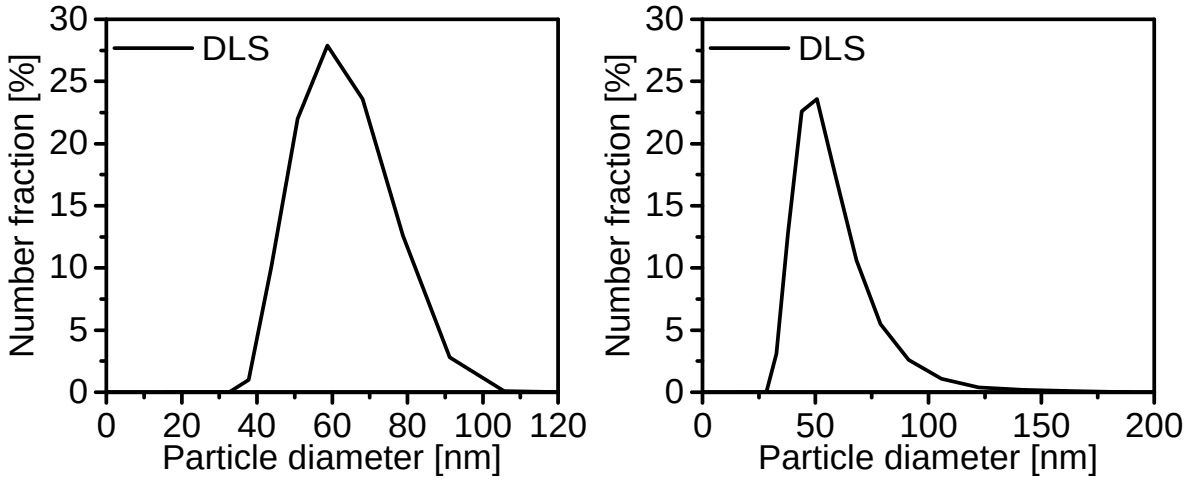

Figure S6. Dynamic light scattering measurement of PMMA-*co*-DR1MA (left) and PMMA-*co*-NAMA (right) particles after nanoprecipitation using a Malvern Zetasizer Nano ZS and averaged from 3 individual samples. The number average diameter of the particles are 56.6 nm and 58.3 nm with a standard deviation of 15.7 nm and 15.4 nm respectively.

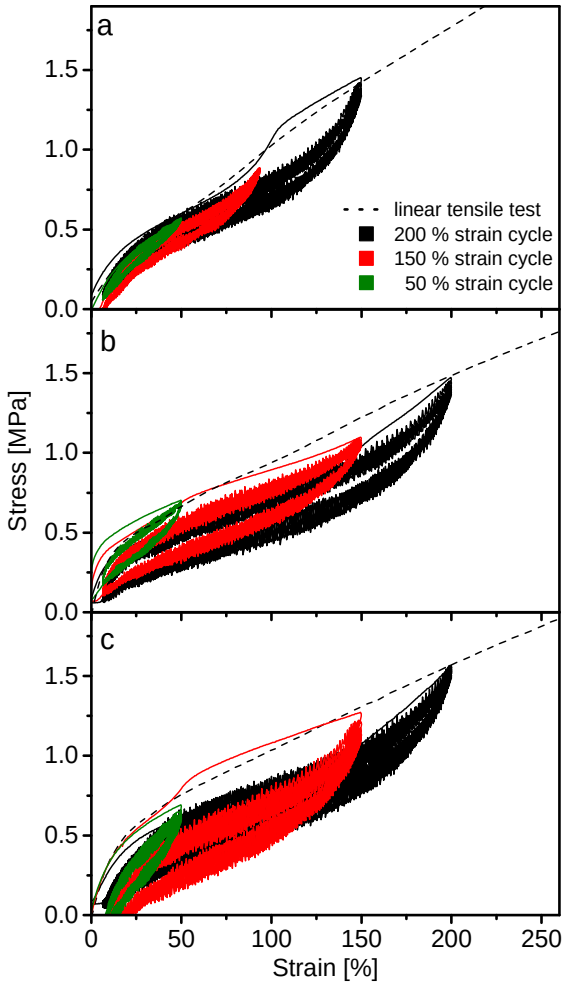

Figure S7. Representative cyclic mechanical tests of DR1(33,l) (a), DR1(40,h) (b), and NA(33,h) (c).

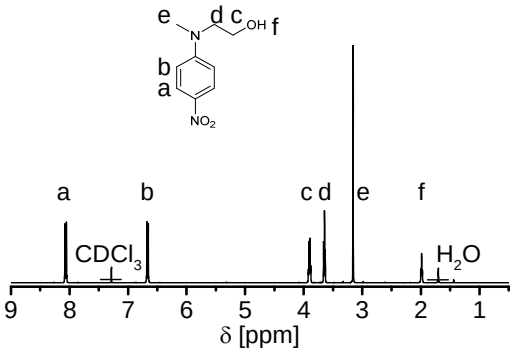

Figure S8. ^{1}H NMR spectrum of 2-methyl(4-nitrophenyl)amine)ethanol in $CDCl_3$.

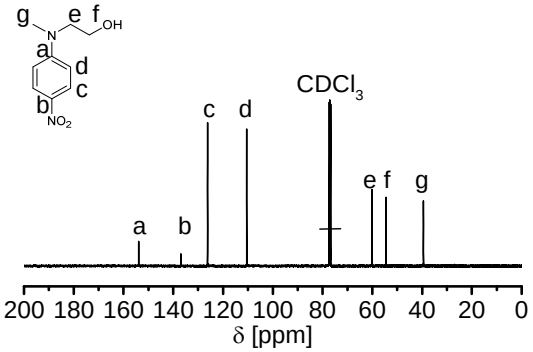

Figure S9. ^{13}C NMR spectrum of 2-methyl(4-nitrophenyl)amine)ethanol in $CDCl_3$.

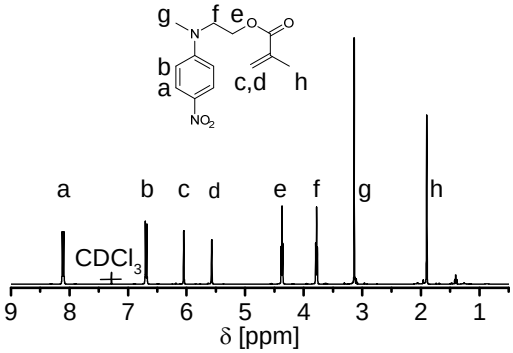

Figure S10. ^{1}H NMR spectrum of NAMA in $CDCl_3$.

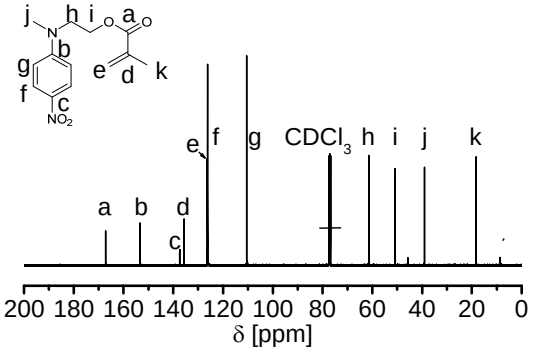

Figure S11. ^{13}C NMR spectrum of NAMA in $CDCl_3$.

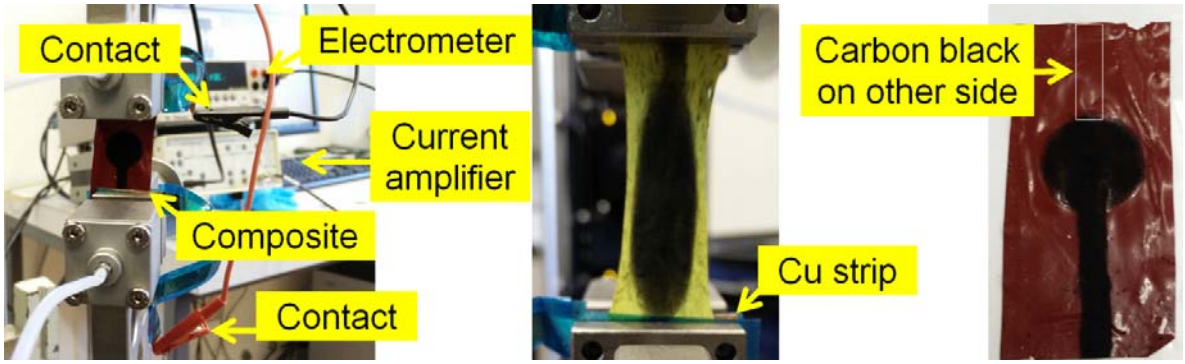

Figure S12. d_{31} test setup with a DR1(33,l) sample before testing (left), a NA(33,h) sample dur-ing testing at 150 % strain (middle) and a DR1(40,h) sample after the carbon black electrodes were applied (right).

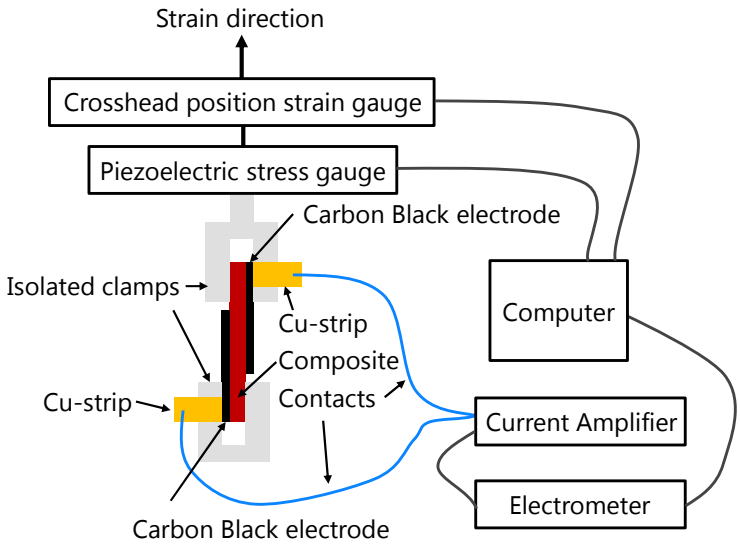

Figure S13. Schematic representation of the d_{31} test setup.

Table S1. HN-fit parameter for PMMA-*co*-NAMA at 130 °C to 190 °C together with the standard error.

T [°C]	ε_∞	$\Delta\varepsilon$	α	β	τ [s]
190	2.55 ± 0.73	15.69 ± 0.78	0.16 ± 0.02	0.56 ± 0.07	$7.87 \times 10^{-7} \pm 1.01 \times 10^{-7}$
180	2.84 ± 0.14	17.22 ± 0.13	0.15 ± 0.01	0.53 ± 0.01	$2.21 \times 10^{-6} \pm 0.07 \times 10^{-6}$
170	3.27 ± 0.07	17.95 ± 0.07	0.17 ± 0.01	0.55 ± 0.01	$7.04 \times 10^{-6} \pm 0.16 \times 10^{-6}$
160	3.45 ± 0.03	18.74 ± 0.03	0.19 ± 0.01	0.55 ± 0.01	$2.76 \times 10^{-5} \pm 0.04 \times 10^{-5}$
150	3.53 ± 0.02	19.60 ± 0.02	0.21 ± 0.01	0.54 ± 0.01	$1.40 \times 10^{-4} \pm 0.02 \times 10^{-4}$
140	3.57 ± 0.01	20.62 ± 0.02	0.23 ± 0.01	0.51 ± 0.01	$1.02 \times 10^{-3} \pm 0.01 \times 10^{-3}$
130	3.51 ± 0.05	21.31 ± 0.07	0.18 ± 0.01	0.42 ± 0.01	$1.37 \times 10^{-2} \pm 0.05 \times 10^{-2}$

Table S2. HN-fit parameter for DR1(33,l) at 140 °C to 190 °C together with the standard error.

T [°C]	ε_∞	$\Delta\varepsilon$	α	β	τ [s]
190	2.33 ± 0.01	1.35 ± 0.01	0.15 ± 0.01	0.56 ± 0.01	$9.27 \times 10^{-6} \pm 0.25 \times 10^{-6}$
180	2.37 ± 0.01	1.39 ± 0.01	0.16 ± 0.01	0.57 ± 0.01	$2.70 \times 10^{-5} \pm 0.07 \times 10^{-6}$
170	2.42 ± 0.01	1.45 ± 0.01	0.21 ± 0.02	0.62 ± 0.04	$9.38 \times 10^{-5} \pm 0.88 \times 10^{-5}$
160	2.45 ± 0.01	1.51 ± 0.01	0.18 ± 0.01	0.54 ± 0.01	$5.54 \times 10^{-4} \pm 0.12 \times 10^{-4}$
150	2.48 ± 0.01	1.60 ± 0.01	0.21 ± 0.01	0.53 ± 0.01	$3.73 \times 10^{-3} \pm 0.09 \times 10^{-3}$
140	2.54 ± 0.01	1.64 ± 0.01	0.23 ± 0.01	0.53 ± 0.01	$3.89 \times 10^{-2} \pm 0.09 \times 10^{-2}$

Table S3. HN-fit parameter for DR1(40,h) at 140 °C to 190 °C together with the standard error.

T [°C]	ε_∞	$\Delta\varepsilon$	α	β	τ [s]
190	2.63 ± 0.02	2.28 ± 0.02	0.11 ± 0.01	0.46 ± 0.02	$1.17 \times 10^{-5} \pm 0.06 \times 10^{-5}$
180	2.74 ± 0.01	2.28 ± 0.01	0.12 ± 0.01	0.48 ± 0.01	$3.37 \times 10^{-5} \pm 0.13 \times 10^{-5}$
170	2.82 ± 0.01	2.32 ± 0.01	0.12 ± 0.01	0.49 ± 0.02	$1.28 \times 10^{-4} \pm 0.05 \times 10^{-4}$
160	2.89 ± 0.01	2.39 ± 0.01	0.15 ± 0.01	0.52 ± 0.01	$5.81 \times 10^{-4} \pm 0.11 \times 10^{-4}$
150	2.96 ± 0.01	2.50 ± 0.01	0.20 ± 0.01	0.55 ± 0.01	$3.71 \times 10^{-3} \pm 0.05 \times 10^{-3}$
140	2.96 ± 0.04	2.59 ± 0.04	0.41 ± 0.05	0.37 ± 0.04	$5.58 \times 10^{-2} \pm 0.59 \times 10^{-2}$

Table S4. HN-fit parameter for NA(33,h) at 130 °C to 180 °C together with the standard error.

T [°C]	ε_∞	$\Delta\varepsilon$	α	β	τ [s]
180	2.25 ± 0.27	2.09 ± 0.27	0.29 ± 0.04	0.46 ± 0.16	$1.65 \times 10^{-6} \pm 0.66 \times 10^{-6}$
170	2.40 ± 0.09	2.05 ± 0.09	0.29 ± 0.03	0.45 ± 0.07	$6.25 \times 10^{-6} \pm 1.25 \times 10^{-6}$
160	2.52 ± 0.04	2.04 ± 0.04	0.30 ± 0.02	0.46 ± 0.04	$2.56 \times 10^{-5} \pm 0.33 \times 10^{-5}$
150	2.60 ± 0.01	2.08 ± 0.01	0.31 ± 0.01	0.45 ± 0.02	$1.41 \times 10^{-4} \pm 0.08 \times 10^{-4}$
140	2.66 ± 0.01	2.15 ± 0.01	0.33 ± 0.01	0.43 ± 0.01	$1.10 \times 10^{-3} \pm 0.02 \times 10^{3}$
130	2.66 ± 0.03	2.27 ± 0.03	0.26 ± 0.03	0.32 ± 0.03	$2.03 \times 10^{-2} \pm 0.20 \times 10^{-2}$

References

1 Y. S. Ko, F. A. Nüesch, D. Damjanovic and D. M. Opris, *Adv. Mater.*, 2017, **29**, 1603813.