Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information for

Simultaneously improved dielectric and mechanical properties of silicone elastomer by designing dual crosslinking network

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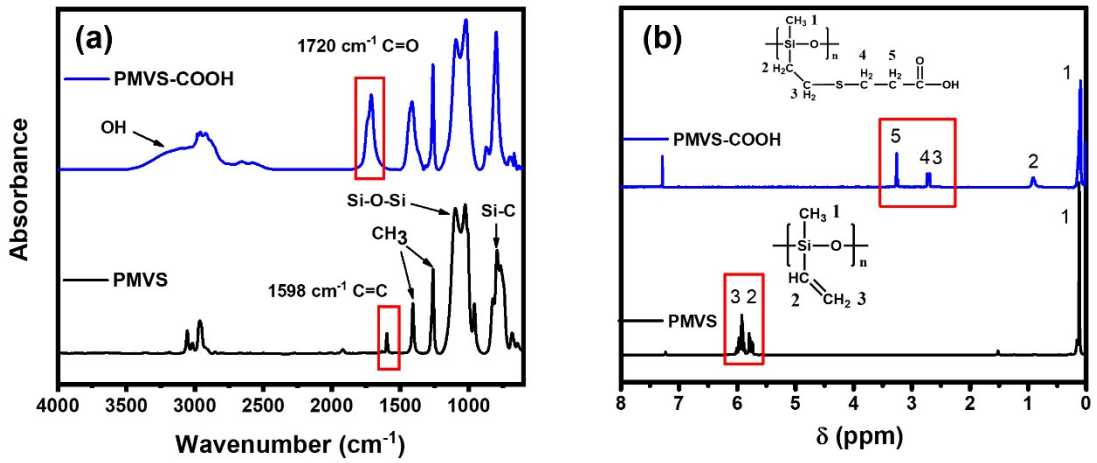

Figure S1. (a) FTIR and (b) ^{1}H NMR spectra of PMVS and PMVS-COOH.

Table S1. DSC and TGA data of reference SiR and SiR-DN.

Samples	T_m (°C)	T_c (°C)	χ_c (%)	$T_{15\%}$ (°C)	T_{max} (°C)
Reference SiR	-50.0	-90.0	62.6	410	538
SiR-DN 0.5/1	-46.4	-77.3	58.9	408	570
SiR-DN 1/1	-45.1	-77.2	34.1	367	574
SiR-DN 1.5/1	-43	-73.3	33.9	367	567
SiR-DN 2/1	-40.9	-72.6	32.2	341	540

Table S2. Actuation performance of several silicone-based DE.

Samples	Maximum actuated strain (%)	**Actuated strain at 15 kV/mm (%)**	Breakdown strength (kV/mm)
Elastosil RT 745[1)]	11.5	**2.1**	31
Sylgard 186[1)]	29	**0.5**	132
N-allyl-N-methyl-p-nitroaniline grafted silicone (Elastosil RT625 base)[1]	2	**-**	10
Azobenzenes grafted silicon rubber[2]	16.7	**<3**	70±2
N-allyl-N-methyl-p-nitroaniline grafted silicone (DMS-V31 base)[3]	-	**<1.25**	39±4
Cyanopropyl grafted silicone[4]	1.7	**<1.2**	19
Nitrile grafted silicone[5]	21	**-**	12
Reference SiR	2.1	**1.4**	23.5
SiR-DN 1.5/1	9.3	**7.0**	20.2
SiR-DN 2/1	12	**11.2**	15.7

1) Self measured according to section 2.5 and the results are consistent with literature[5, 6].

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