Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Electronnic supporting Information for:

Dual Crosslinked PMMA/$BaTiO_3$ Polymer Nanocomposite Dielectrics for Flexible Film Capacitors

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1. GPC results

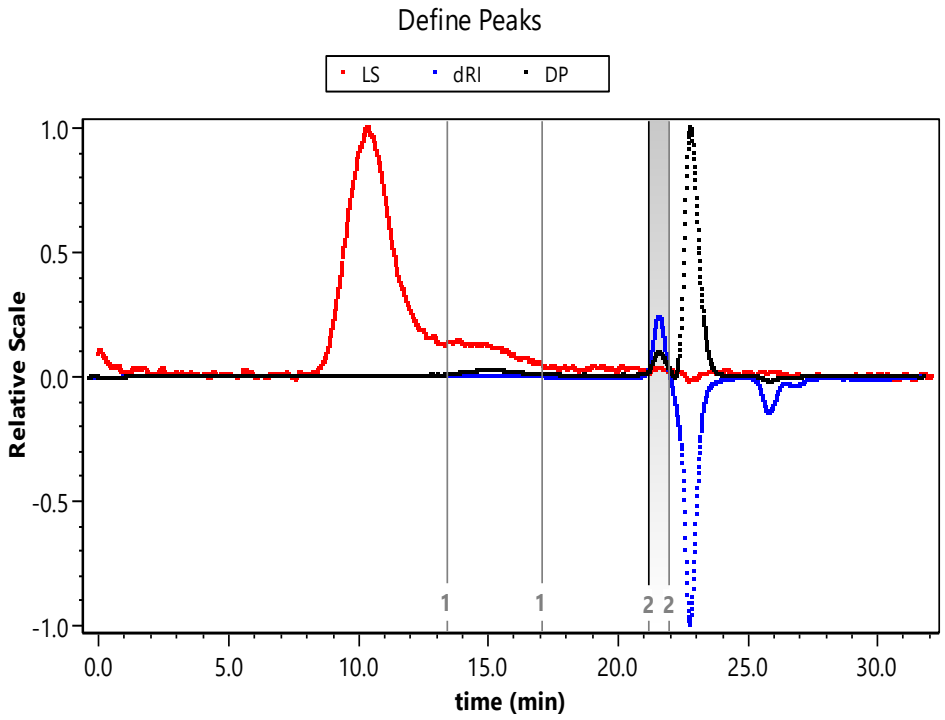

Figure S1. GPC of PMMA-BT(8 wt%)

File Name: Experiment16
Collection Operator: JiangNanUni-PC\JiangNan Uni (JiangNanUni-PC\JiangNan Uni (JiangNan Uni))
Processing Operator: JiangNanUni-PC\JiangNan Uni (JiangNan Uni)

Sample: untitled

Configuration

Notes:

Concentration Source: RI
Flow Rate: 1.000 mL/min

Light Scattering Instrument: HELEOS
Cell Type: Fused Silica
Wavelength: 664.0 nm
Calibration Constant: 3.1929×10^{-5} 1/(V cm)

RI Instrument: rEX

Viscometer: ViscoStar
Dilution Factor: 0.4994

Solvent: DMF
Temperature Correction Enabled: no
Refractive Index: 1.431

Results

Peak Results

	Peak 1	Peak 2
Hydrodynamic radius (v) moments (nm)		
Rh(v)n	13.245 (±2.477%)	0.767 (±6.290%)
Rh(v)w	14.725 (±2.950%)	0.803 (±6.528%)
Rh(v)z	21.537 (±6.357%)	0.864 (±6.884%)
Masses		
Calculated Mass (µg)	2.65	127.42
Mass Recovery (%)	n/a	n/a
Mass Fraction (%)	2.0	98.0
Molar mass moments (g/mol)		
Mn	3.552×10^{5} (±6.027%)	1.402×10^{3} (±18.583%)
Mp	2.561×10^{5} (±5.875%)	1.202×10^{3} (±16.221%)
Mv	4.092×10^{5} (±1.106%)	1.510×10^{3} (±2.915%)
Mw	4.452×10^{5} (±5.999%)	1.554×10^{3} (±19.951%)
Mz	8.669×10^{5} (±13.121%)	1.810×10^{3} (±46.645%)
Polydispersity		
Mw/Mn	1.253 (±8.504%)	1.109 (±27.265%)
Mz/Mn	2.441 (±14.439%)	1.292 (±50.210%)
rms radius moments (nm)		
Rn	15.7 (±75.6%)	n/a
Rw	16.7 (±67.1%)	n/a
Rz	17.3 (±62.7%)	n/a
Intrinsic viscosity moments (mL/g)		
[η]n	42.745 (±4.350%)	2.076 (±0.898%)
[η]w	50.16 (±6.97%)	2.17 (±1.01%)
[η]z	91.035 (±22.678%)	2.337 (±1.165%)

Mark-Houwink-Sakurada a: 0.545 (±0.134%)
Mark-Houwink-Sakurada K: 4.057×10^{-2} (±0.588%) mL/g

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2. NMR

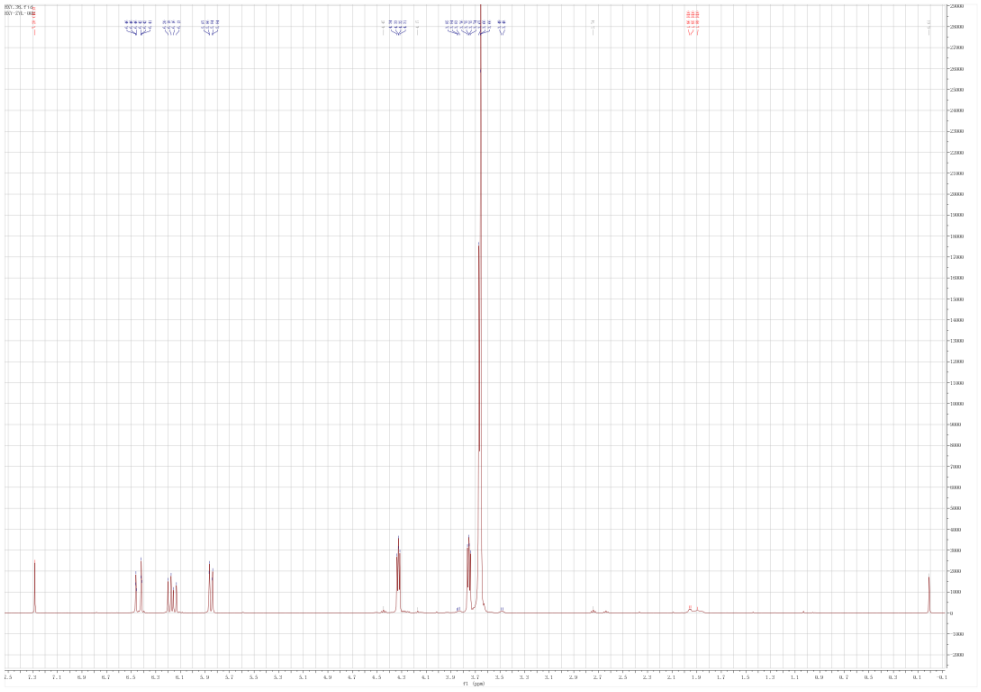

Figure S2. NMR of Phosphate

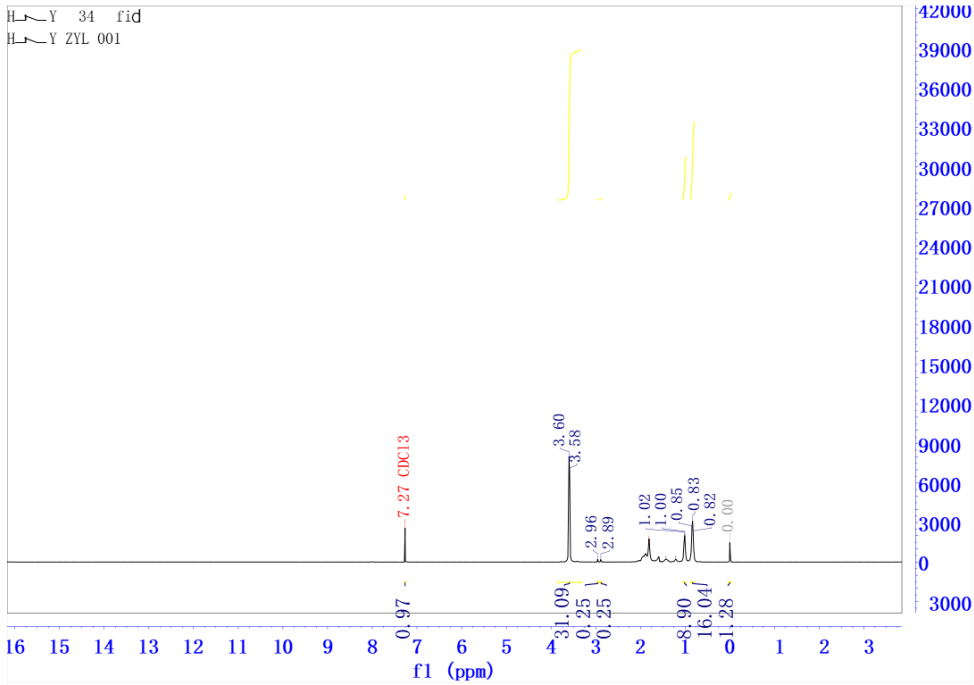

Figure S3. NMR of PMMA-BT(8 wt%)

3. Calculation of m-BT vol%

m-BT vol% was calculated by formula (1):

$$\mathrm{m-BT\ vol\%} = \frac{V_{m-BT}}{V_{PMMA-BT}} \times 100\% \quad (1)$$

where ρ_{PMMA}, ρ_P and ρ_{BT} were the densities of PMMA, the phosphate and BT, which are equal to 1.17g/cm^3, 1.387g/cm^3 and 6.017g/cm^3, respectively.

4. Dielectric constant and dielectric loss

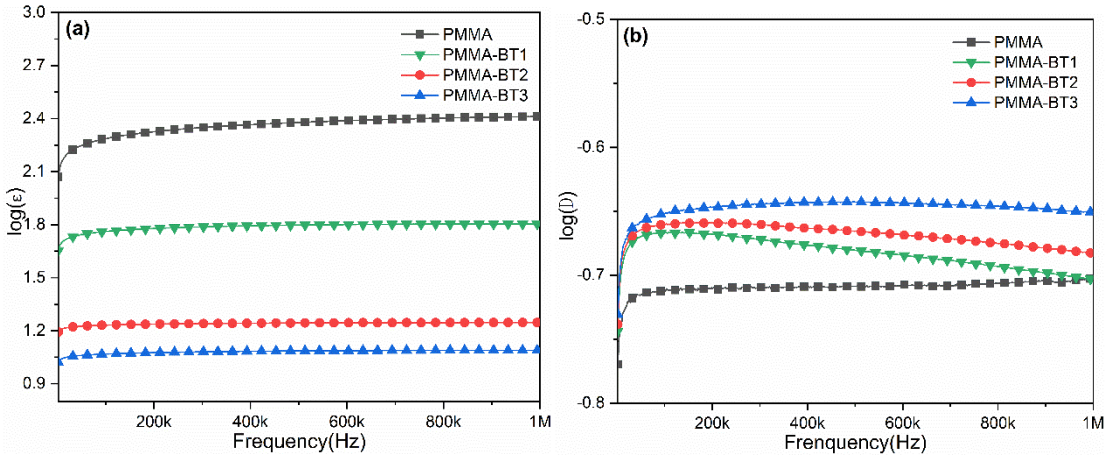

Figure S4. The logarithm of dielectric constant (a) and dielectric loss (b) of Pure PMMA and PMMA-BT film with frequency from 1 KHz to 1 MHz.

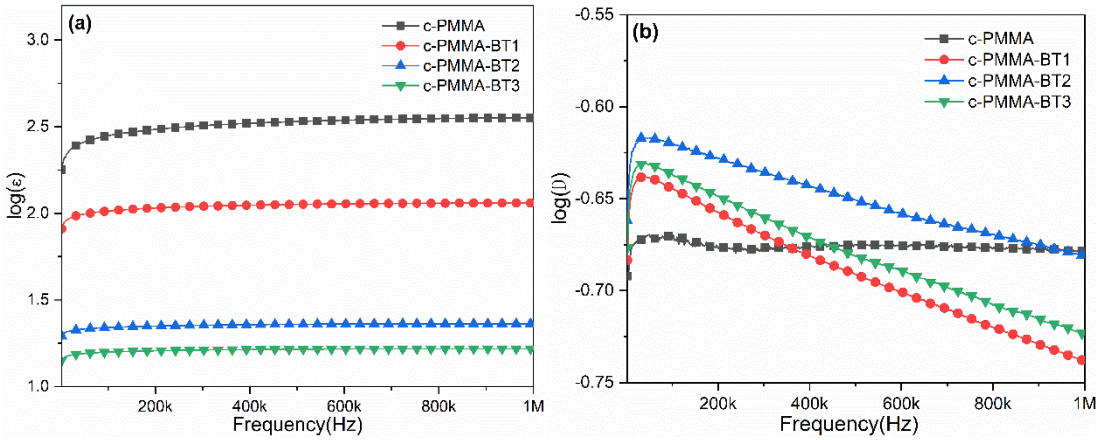

Figure S5. The logarithm of dielectric constant (a) and dielectric loss, (b) of c-PMMA and c-PMMA-BT film with frequency from 1 KHz to 1 MHz.