Electronic Supplementary Material (ESI) for Polymer Chemistry.

Surface-Initiated Reversible Addition Fragmentation Chain Transfer of fluoromonomers: an efficient tool to improve interfacial adhesion in piezoelectric composites

Supporting Information

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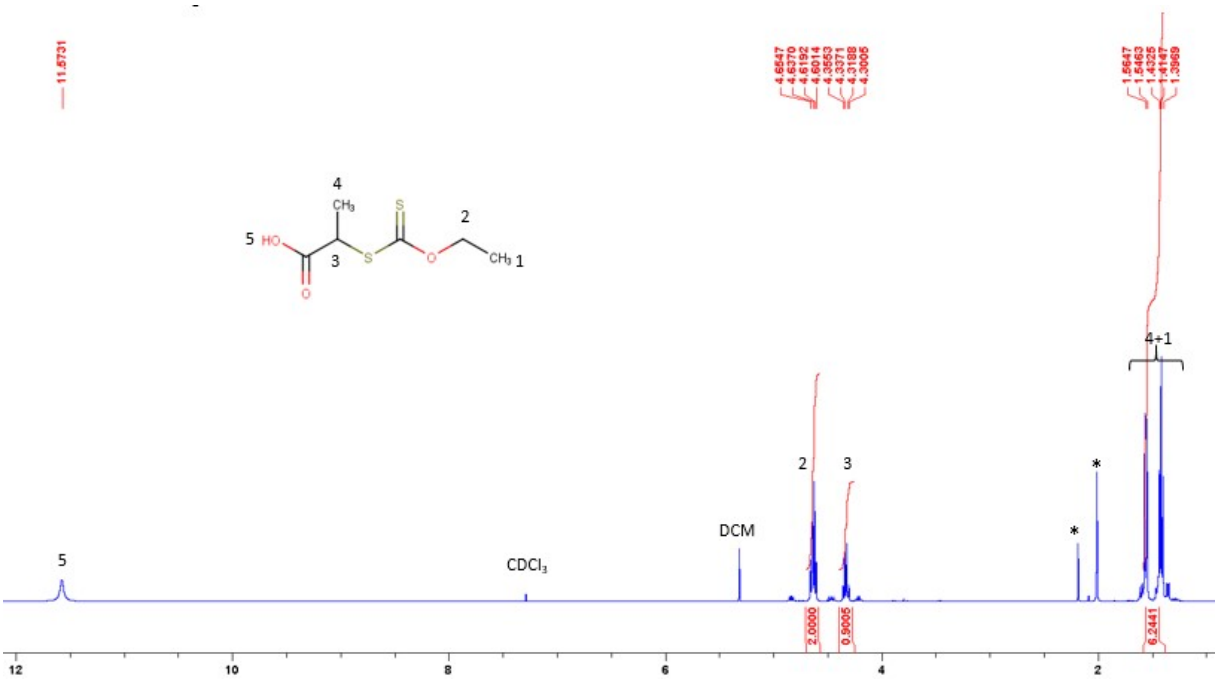

*Figure S1. ^{1}H NMR spectrum of XA-acid recorded in $CDCl_3$. * signals of residual acetone and 2-bromopropionic acid.*

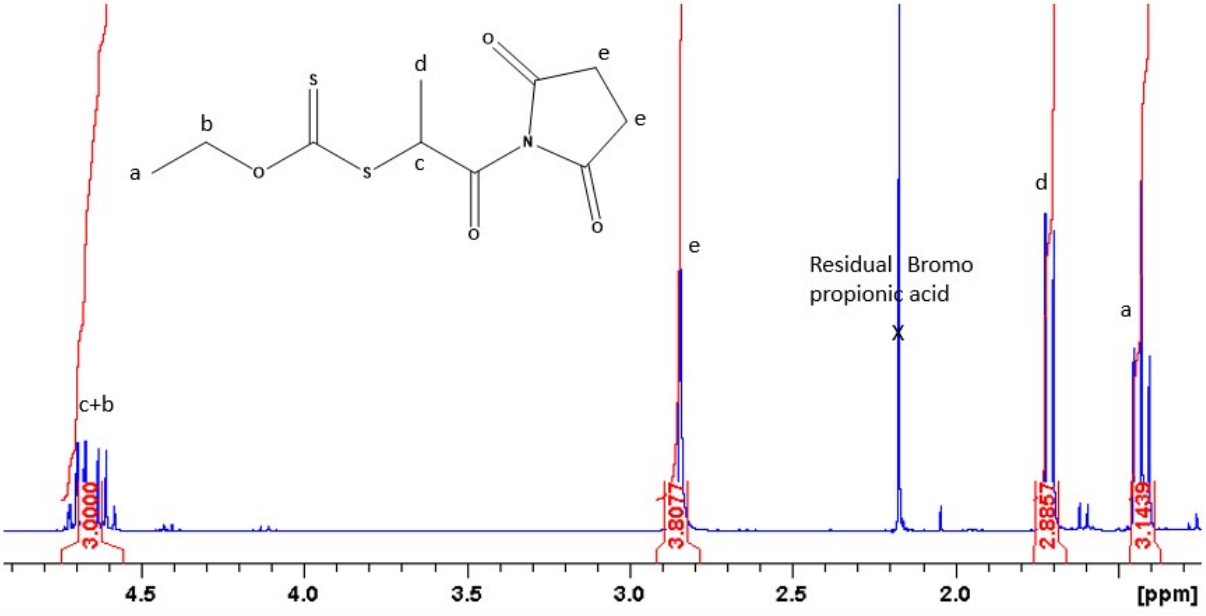

Figure S2. ^{1}H NMR spectrum of NHS-XA recorded in $CDCl_3$.

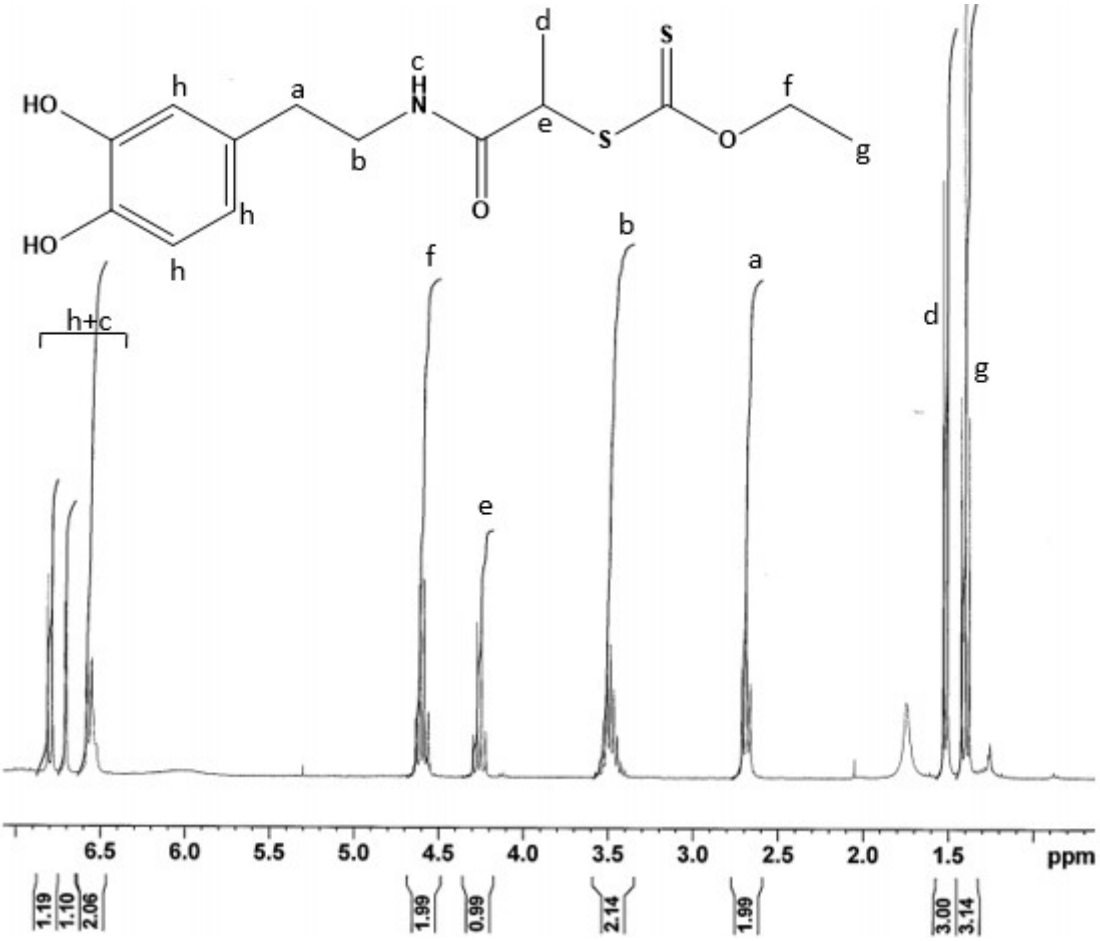

Figure S3. ^{1}H NMR spectrum of the DOPA-XA, recorded in $CDCl_3$.

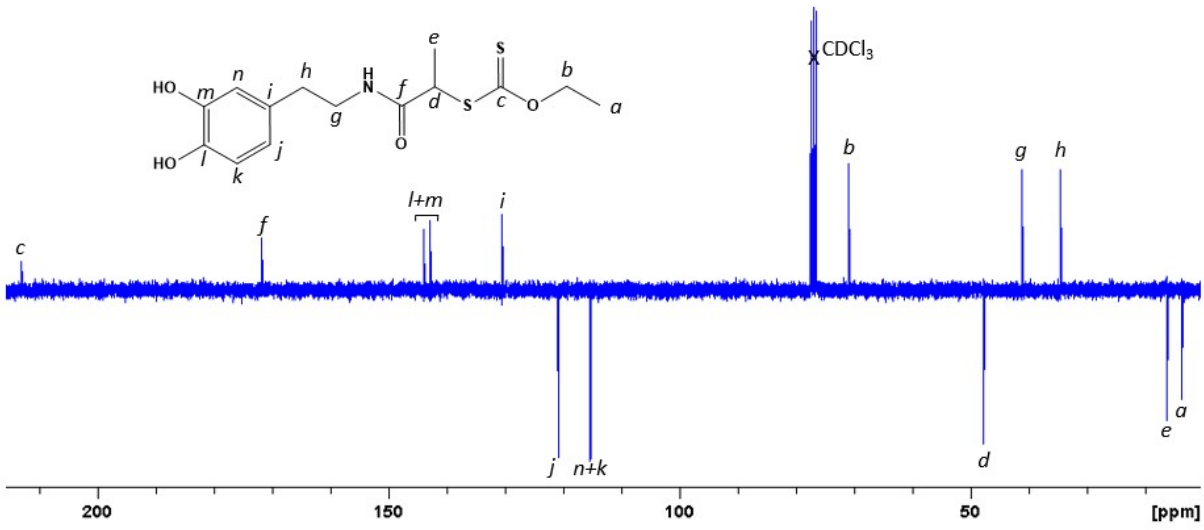

Figure S4. ^{13}C APT NMR experiment of the DOPA-XA, recorded in $CDCl_3$.

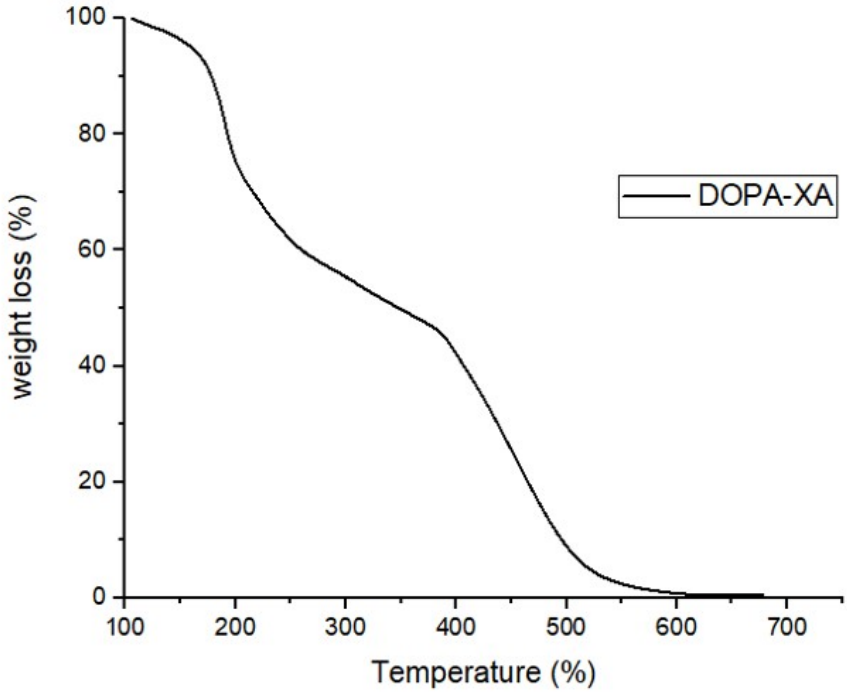

Figure S5. TGA thermogram of DOPA-XA.

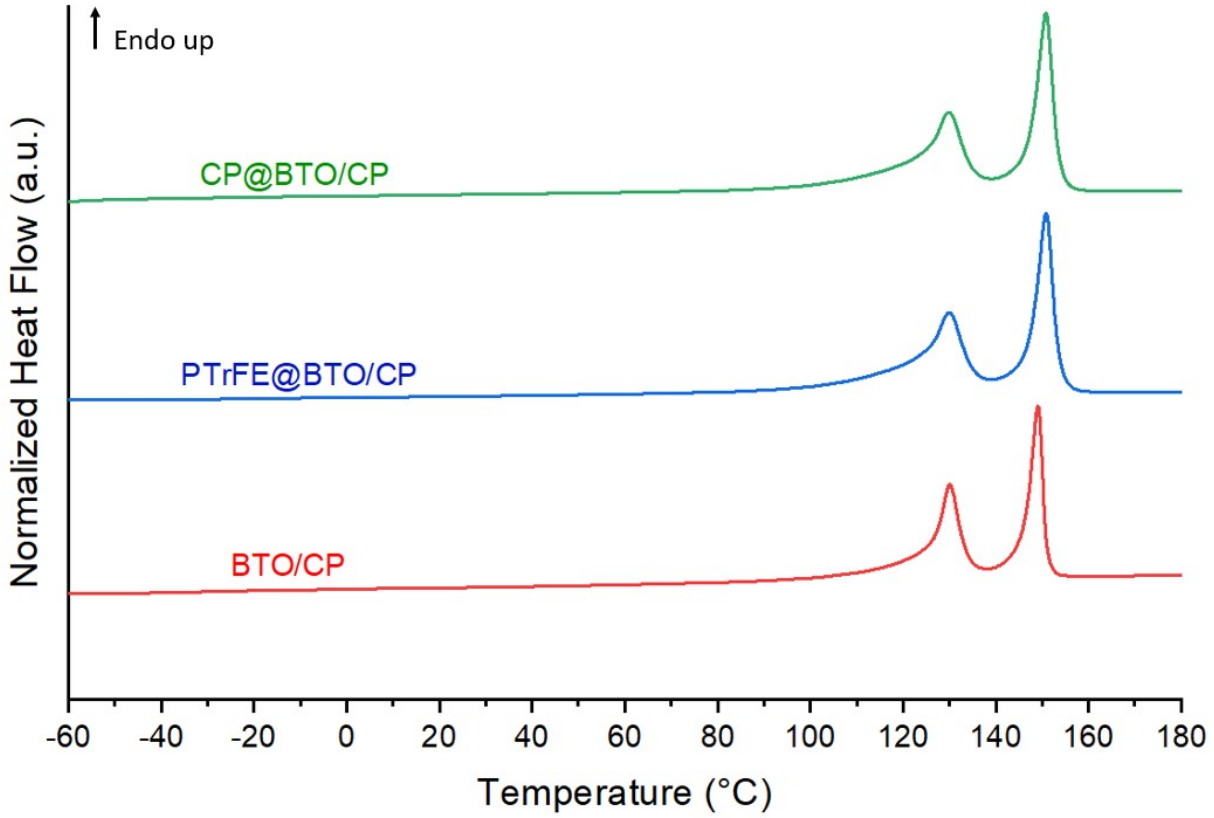

Figure S6. DSC thermograms of the composites with non-modified BTO particles, the PTrFE@BTO particles and with P(VDF-co-TrFE)@BTO particles. The filler content is around 20wt%.

Table S1. XPS quantification (%) of the functionnalized particles.

Sample	***BTO***	***DOPA-XA@BTO***	***PTrFE@BTO***	***P(VDF-co-PTrFE)@BTO***
O 1s	*38.6*	*27.0*	*16.7*	*24.7*
C 1s	*41.4*	*61.8**	*42.0*	*41.0*
Ba 3d	*9.0*	*2.7*	*3.8*	*6.1*
Ti 2p	*11.1*	*4.1*	*5.1*	*8.3*
N 1s	-	*1.3*	*0.8*	*0.8*
S 2p	-	*3.1*	*1.5*	*1.5*
F 1s	-	-	*30.1*	*17.6*

* The relatively high carbon ratio of DOPA-XA surface is probably due to contamination of the sample. It affects the relative atomic ratio and increases the apparent “masking effect” of DOPA-XA on the BTO surface.

Equation S1. Grafting density calculations. Weight losses are calculated using TGA. WL(polymer) stands for polymer weight loss and WL(residue) stands for weight loss of raw BTO.

$$Graft\ density\ (Polymer) = \frac{N(polymer)}{S\ (BTO)}$$ S (BTO) = Surface BTO

$$Graft\ density\ (Polymer) = \frac{n(polymer) * Na}{S\ (BTO)}$$ Na = $6.022*10^{23}$

$$Graft\ density\ (Polymer) = \frac{m(polymer) * Na}{S\ (BTO) * Mn\ (polymer)}$$

$$Graft\ density\ (Polymer) = \frac{m(polymer) * Na}{S\ (BTO) * Mn\ (polymer)}$$

$$\frac{m(polymer)}{m(BTO)} = \frac{WL(polymer) - \frac{WL(residue)}{100 - WL(residue)} * (100 - WL(Polymer))}{100 - WL(polymer)}$$

$$Graft\ density\ (Polymer) = \frac{m(BTO) * Na}{S\ (BTO) * Mn\ (polymer)} * \frac{WL(polymer) - \frac{WL(residue)}{100 - WL(residue)} * (100 - WL(Polymer))}{100 - WL(polymer)}$$

$$Graft\ density\ (Polymer) = \frac{Specific\ surface\ (BTO) * Na}{Mn\ (polymer)} * \frac{WL(polymer) - \frac{WL(residue)}{100 - WL(residue)} * (100 - WL(Polymer))}{100 - WL(polymer)}$$