Electronic Supplementary Information

Synthesis and Property of Well-Defined Copolymer of Chlorotrifluoroethylene and *N*-Vinylpyrrolidone by Xanthate-Mediated Radical Copolymerization under ^{60}Co γ-ray Irradiation

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Synthesize of S-benzyl O-ethyl dithiocarbonate (BEDTC)

BEDTC was synthesized according to a previous literature.[1] The synthesis was conducted by stirring 40 mL ethanol and 5.6 g KOH (0.10 mol) until a clear solution was formed. 20 mL CS_2 (0.33 mol) was slowly added into the solution, and the mixture was stirred for 10 h at room temperature before excess CS_2 was distilled off at 70 °C. Then 10 mL Benzyl chloride (0.087 mol) in 20 mL of ethanol was added to the residual solution, and the mixture was further stirred at 60 °C for 5 h. After removal of the inorganic salt and most of the ethanol, 50 mL water was added and the solution was extracted with diethyl ether (3×40 mL). The combined organic layer was dried over anhydrous Na_2SO_4. Removal of the inorganic salt and evaporation of the solvent afforded a yellow oil product: 12.1 g, 65.8%. ^{1}H and ^{13}C NMR spectra are shown in Fig. S1 and Fig. S2, respectively.

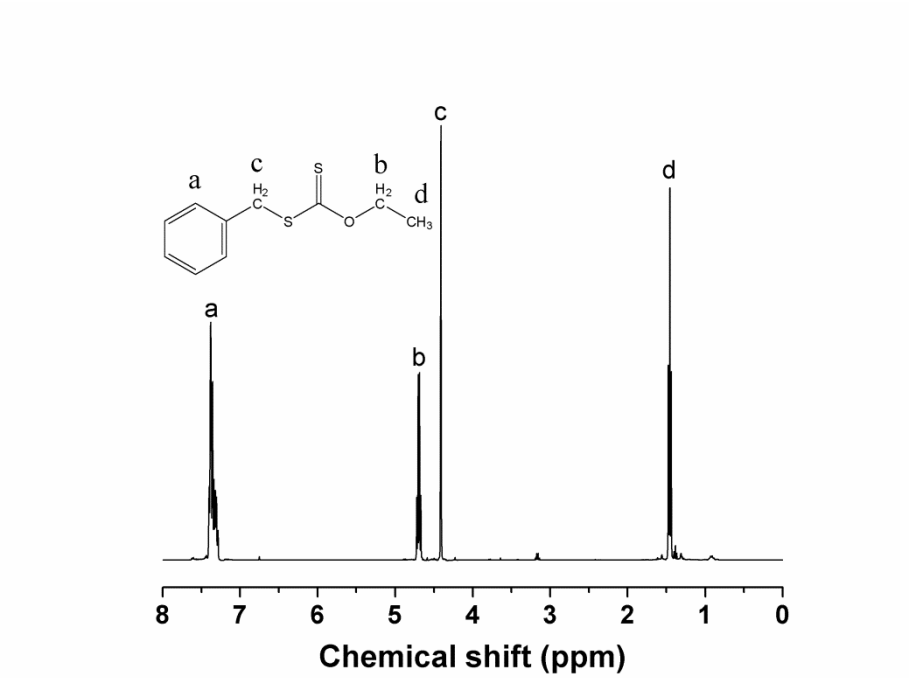

Fig. S1 ^{1}H NMR spectrum of BEDTC recorded in $CDCl_3$ at room tempreture.

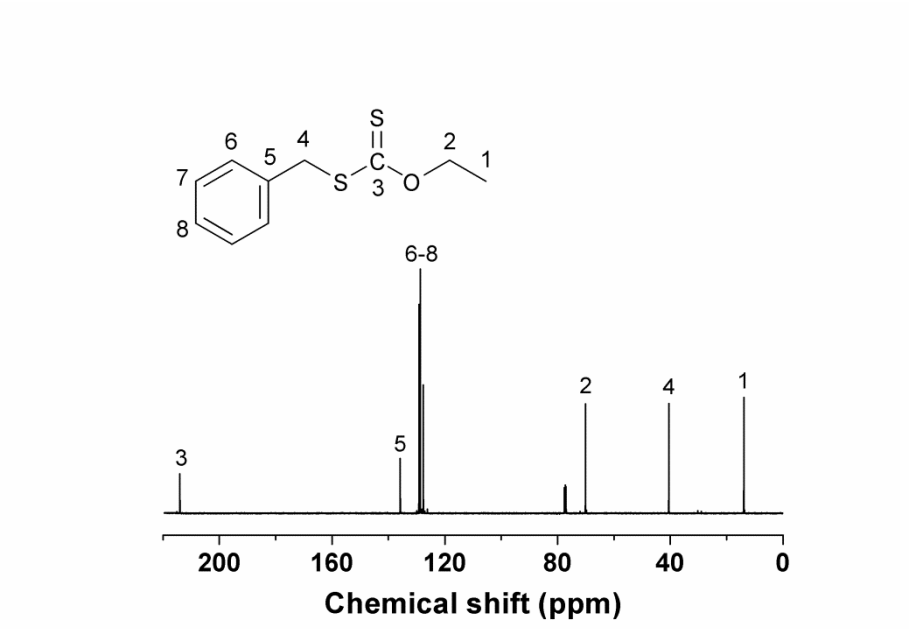

Fig. S2 ^{13}C NMR spectrum of BEDTC recorded in $CDCl_3$ at room tempreture.

Molecular weight of the resulted copolymer

The molecular weights determined by GPC ($M_{n,GPC}$) are higher than the theoretical values, which is shown in Fig. S3.

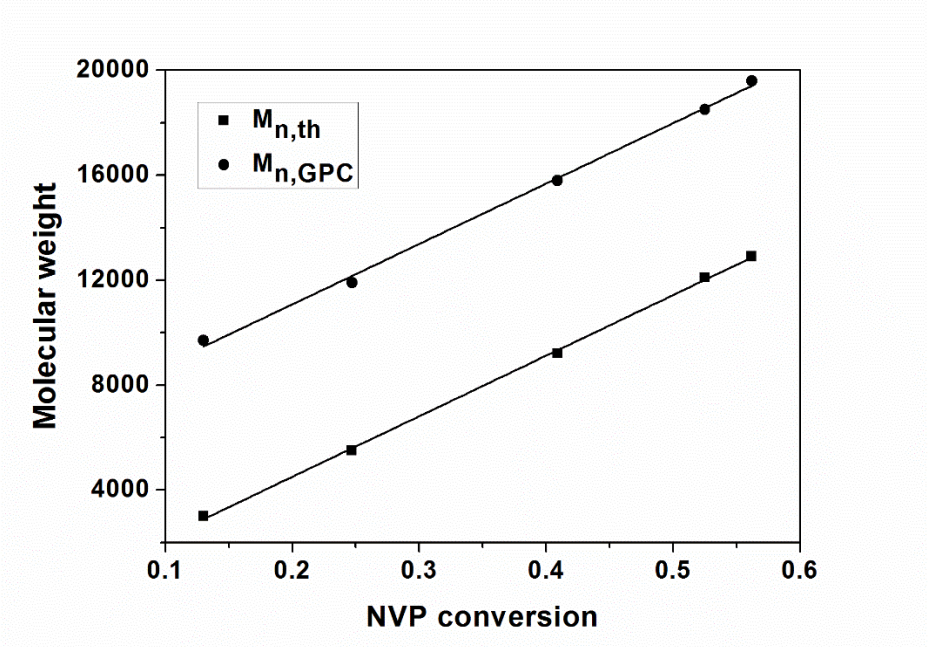

Fig. S3 The molecular weights determined by GPC ($M_{n,GPC}$) and the theoretical values ($M_{n,th}$) as a function of NVP conversion for the copolymerization of CTFE and NVP.

In vitro cytotoxicity of the fluorinated amphiphilic block copolymer

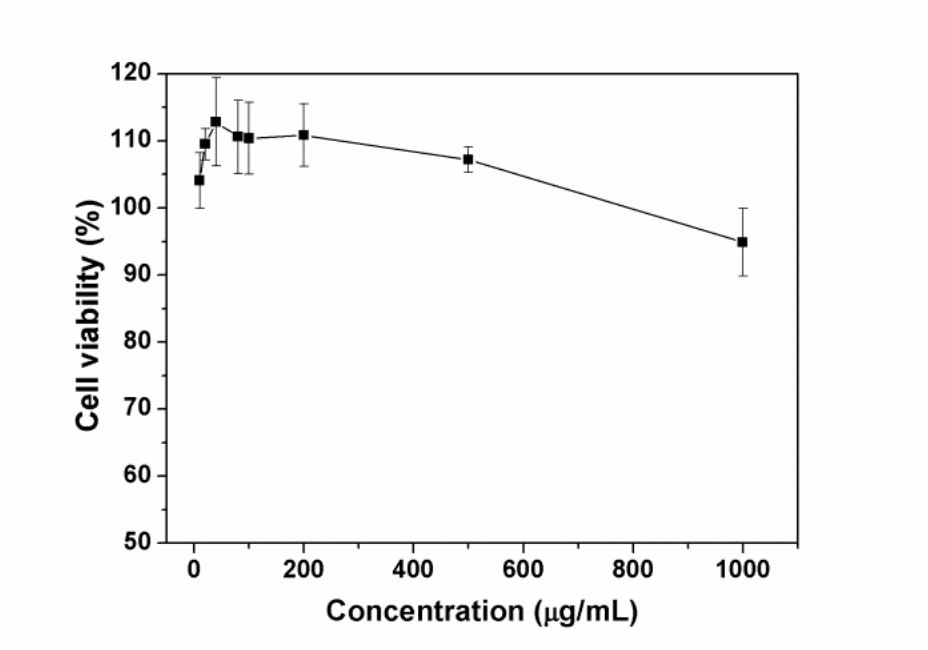

Fig. S4 Cytotoxicity of the fluorinated amphiphilic block copolymer in L929 cells.

References:

[1] D. C. Wan, K. Satoh, M. Kamigaito, Y. Okamoto, *Macromolecules*, 2005, **38**, 10397.