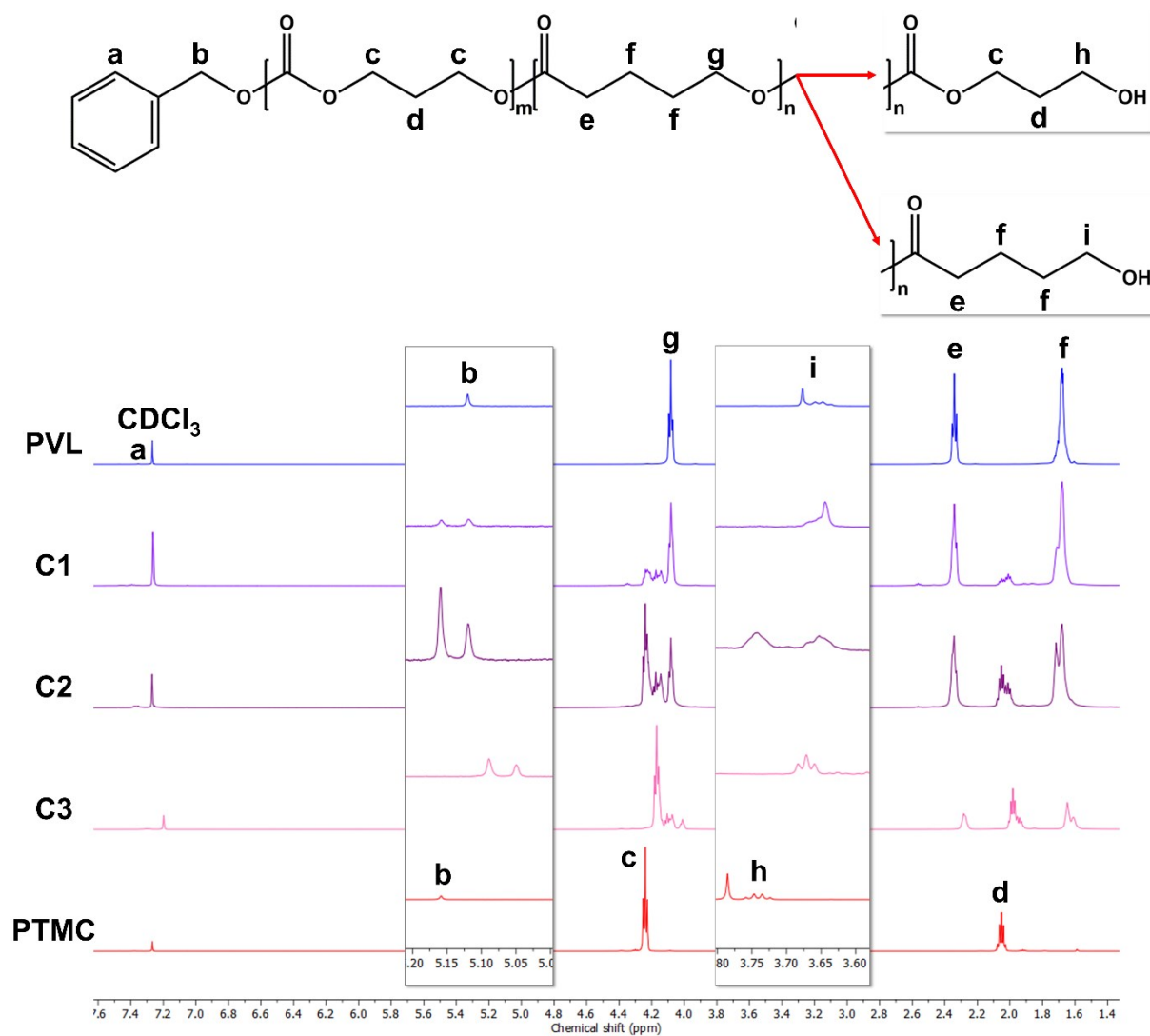
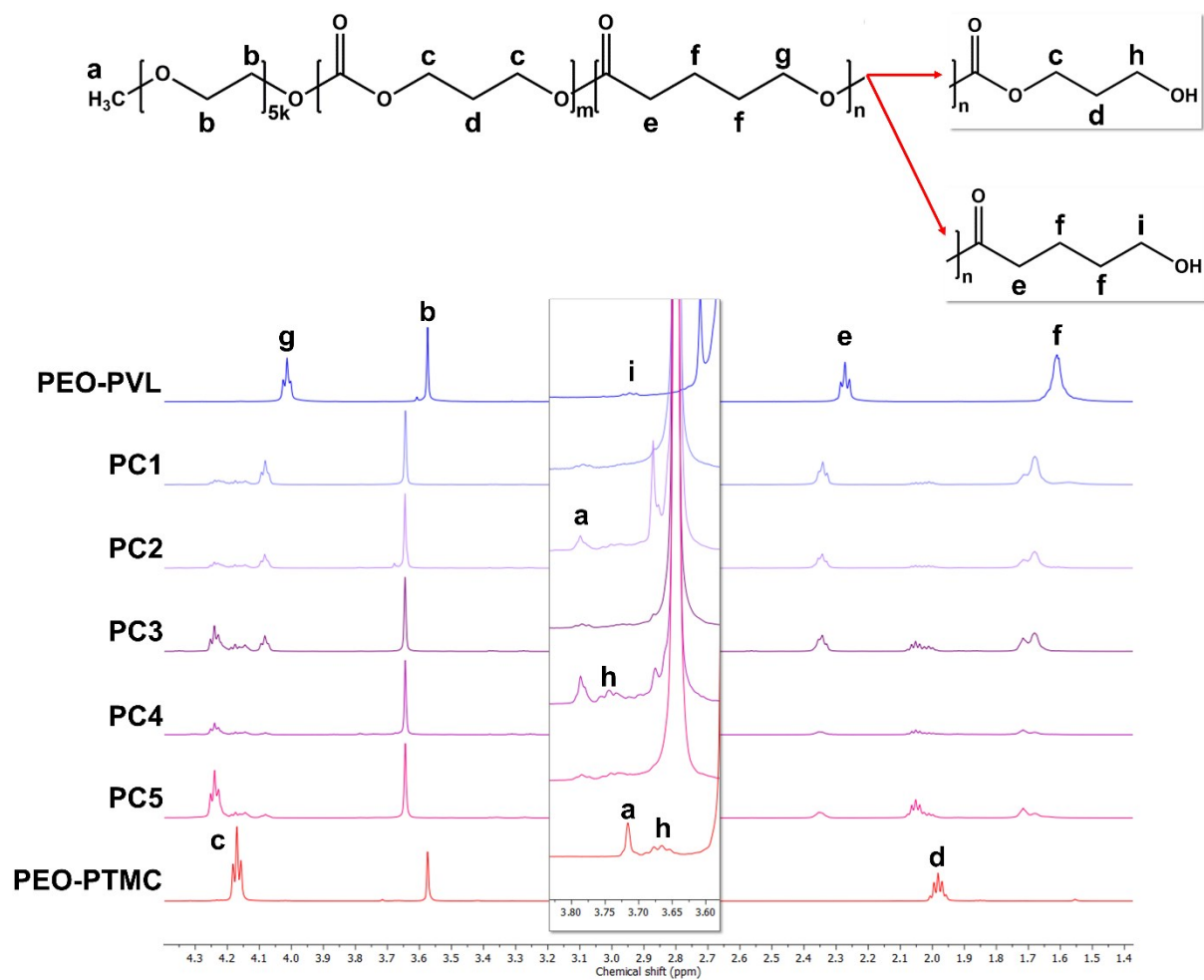


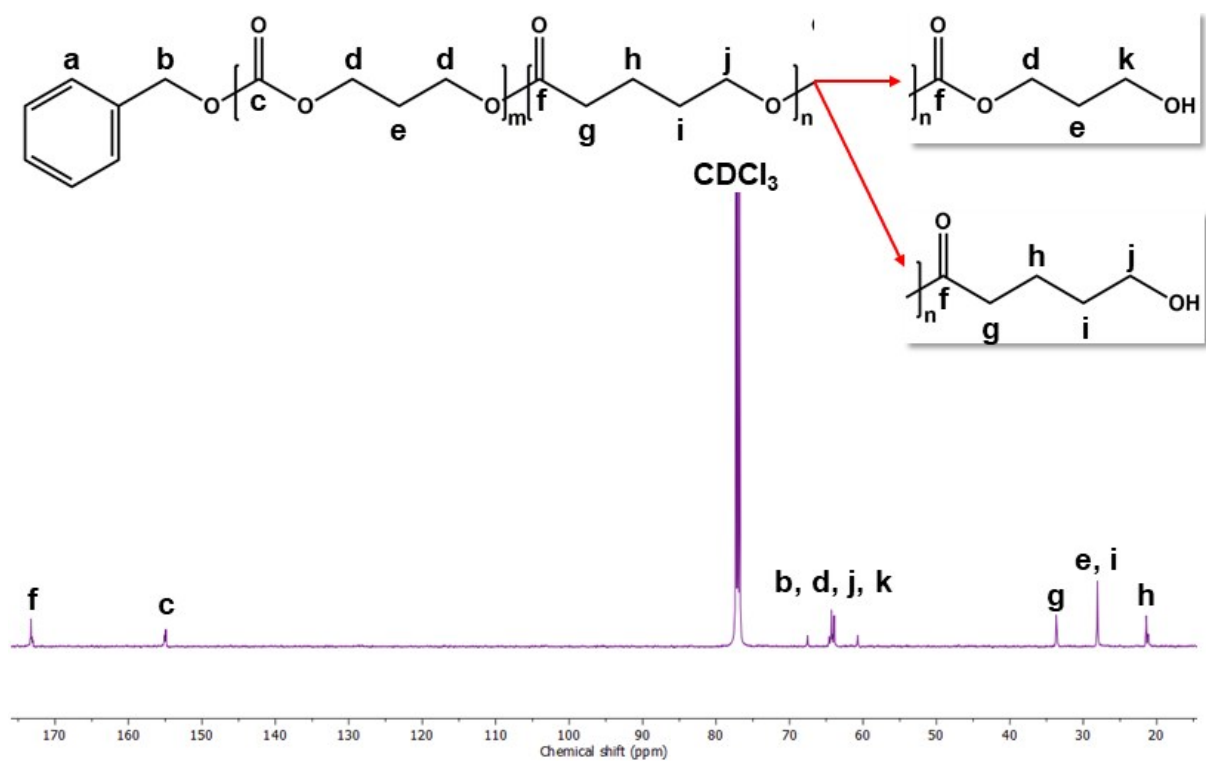
## Supporting information



**Figure S1**  $^1\text{H}$  NMR spectra of random copolymers



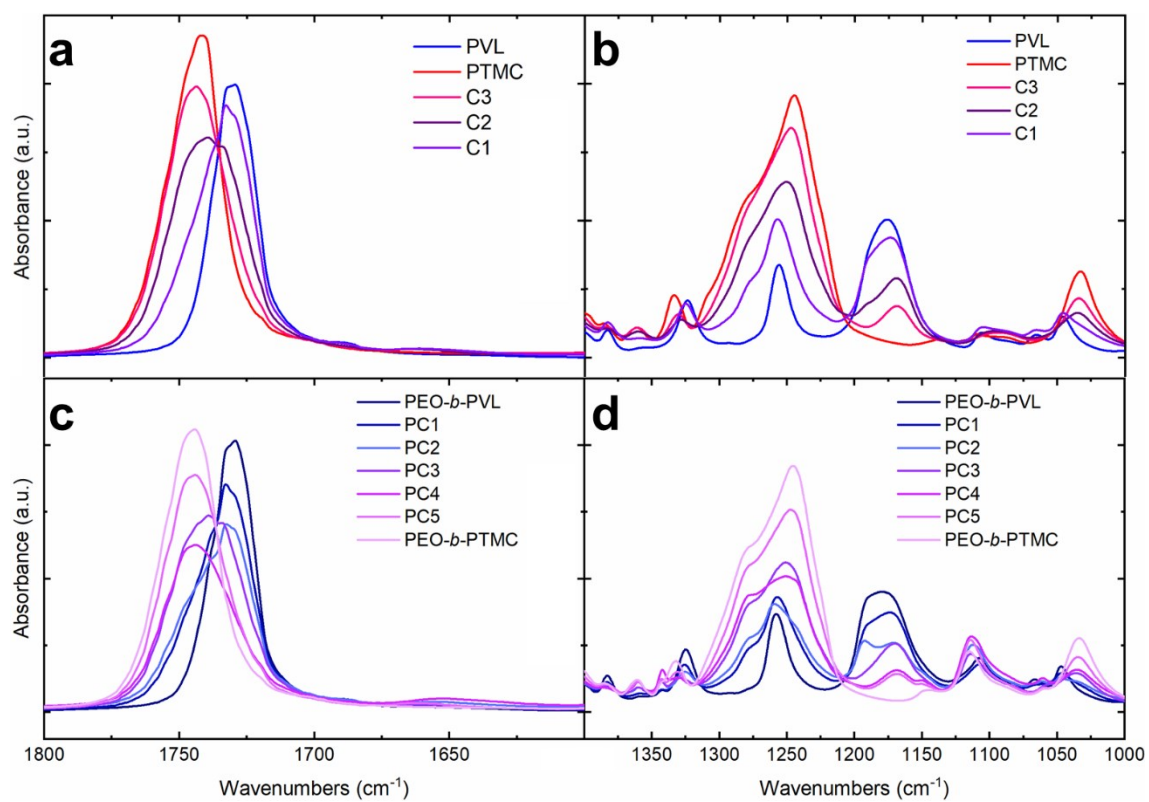
**Figure S2**  $^1\text{H}$  NMR spectra of mPEO-*b*-random copolymer block



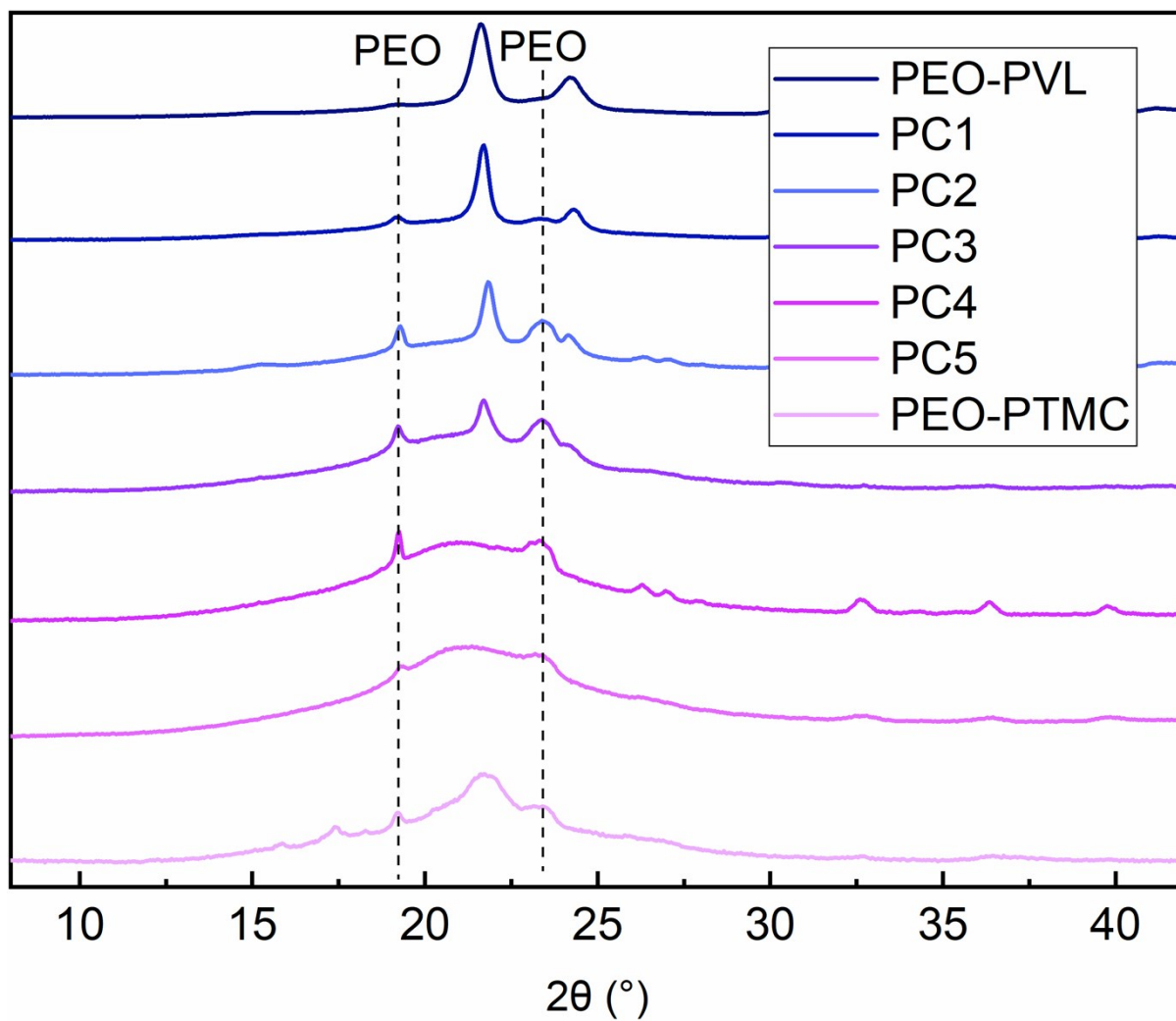
**Figure S3**  $^{13}\text{C}$  NMR spectra of C2 copolymer

**Table S1** ATR FTIR wavenumbers for characteristic bands

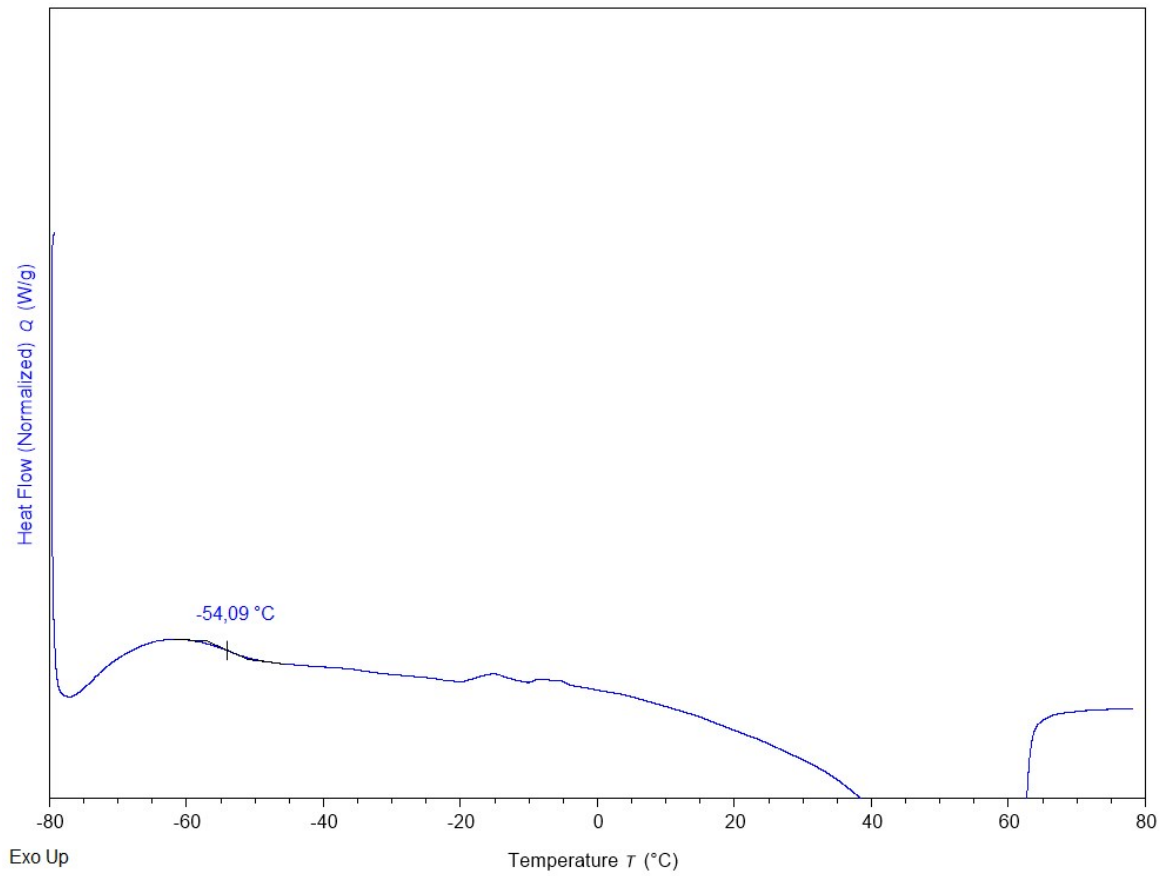
Sample	Wavenumber				
	C=O stretch (cm <sup>-1</sup> )	C-O-C stretch (cm <sup>-1</sup> )	O-C-O stretch (cm <sup>-1</sup> )	O-C-C stretch (cm <sup>-1</sup> )	C-O-C stretch (cm <sup>-1</sup> )
PVL	1730	1256/1176	-	1046	-
C1	1733	1250/1174	1250	1046	-
C2	1740	1251/1169	1251	1035	-
C3	1744	1247/1169	1247	1035	-
PTMC	1742	-	1245	1033	-
PEO- <i>b</i> -PVL	1729	1258/1179	-	1047	1108
PC1	1733	1257/1174	1257	1047	1107
PC2	1733	1259/1171	1259	1048	1112
PC3	1739	1251/1170	1251	1036	1114
PC4	1744	1251/1169	1251	1035	1113
PC5	1744	1247/1169	1247	1035	1114
PEO- <i>b</i> -PTMC	1744	-	1245	1034	1115



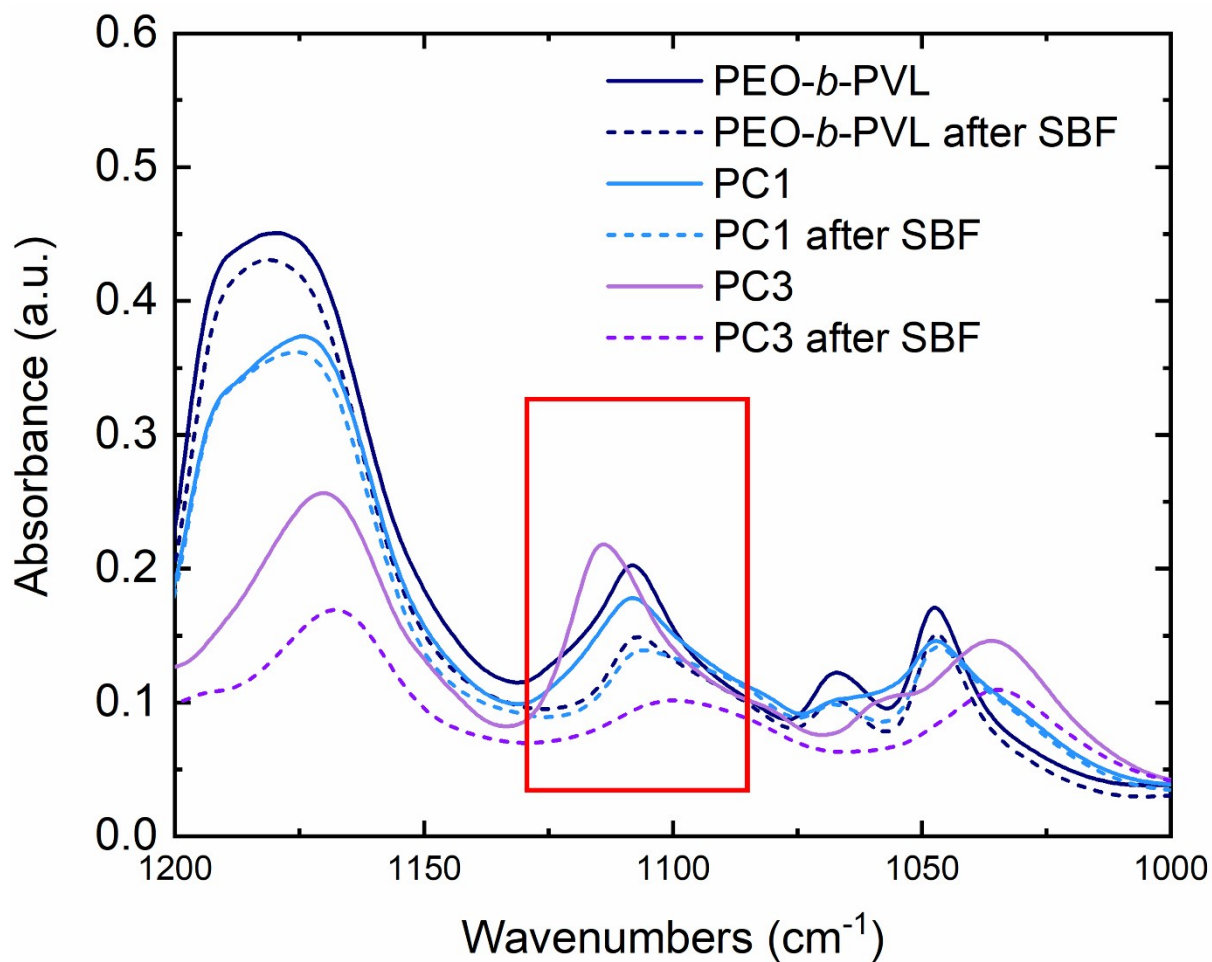
**Figure S4** ATR FTIR spectra of P(TMC-co-VL) copolymers; (a) carbonyl stretching region of random copolymers (b) C-O stretching region of random copolymers, (c) carbonyl stretching region of PEO-*b*-random copolymers, (d) C-O stretching region of PEO-*b*-random copolymers



**Figure S5** WAXD patterns of PEO-*b*-random copolymers, peaks assigned to crystalline PEO around 19 and 23°.

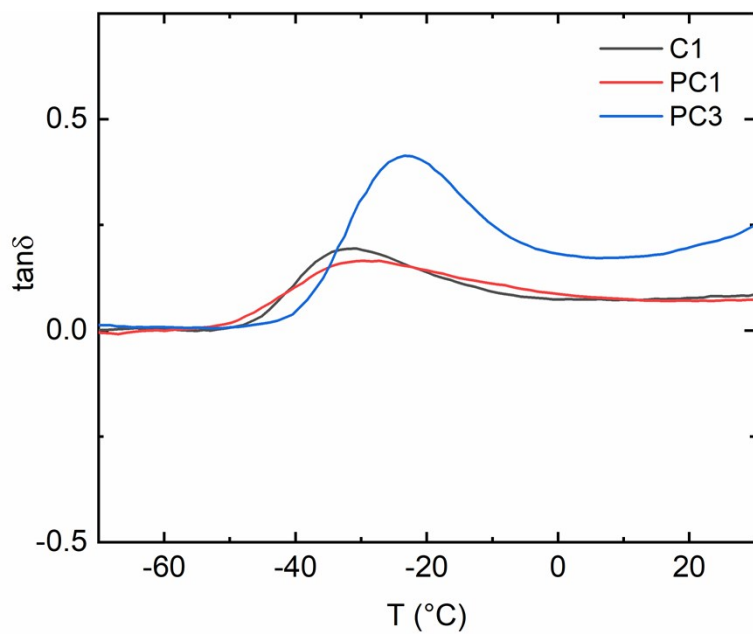


**Figure S6 PVL glass transition; DSC curve zoom-in**



**Figure S7 ATR IR spectra of PEO-block copolymers; comparison of PEO asymmetric C-O-C stretching band intensity before and after incubation with SBF**





**Figure S8** Temperature dependence of  $\tan\delta$  obtained by DMA