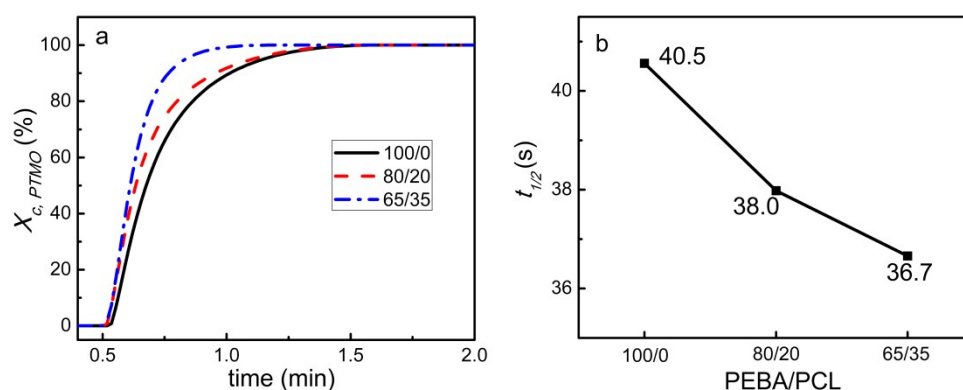
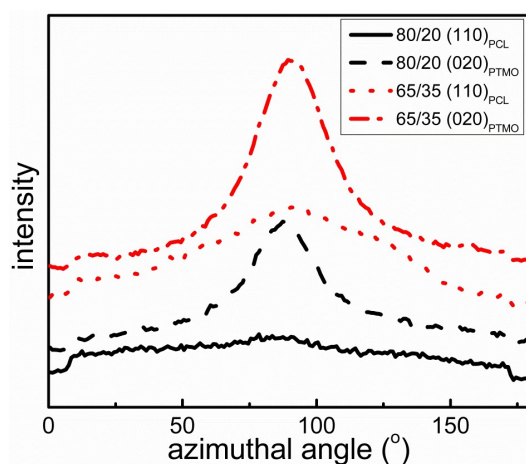


### Supporting information



**Fig.S1** The relative crystallinity ( $X_{c,PTMO}$ ) as a function of crystallization time and the half crystallization time ( $t_{1/2}$ ) for PEBA/PCL samples isothermally crystallized at  $-5$  °C.



**Fig.S2** The azimuthal scanning profiles of (110)<sub>PCL</sub> and (020)<sub>PTMO</sub> plane reflection for samples 80/20 and 65/35 at  $\epsilon=100\%$  strain and 0 °C.

It is clear that no matter for sample 80/20 or 65/35, the peak width at half height ( $PWHH$ ) of the corresponding azimuthal scanning profiles for (110)<sub>PCL</sub> is much lower than that for (020)<sub>PTMO</sub> (Fig.S2). In other words, the orientation degree of PTMO is greatly higher than that of PCL in both samples 80/20 and 65/35. As a consequence, it can be concluded that the PCL deforms little, and the PTMO parts of PEBA account for the majority of deformation during the stretching process.