Supporting Information

1. FT-IR measurement of PSBS

The FT-IR spectrum of PSBS was shown in Figure S1. The bands at 1253 cm\(^{-1}\), 1160 cm\(^{-1}\) and 1068 cm\(^{-1}\) belongs to the wagging vibrations of S=O, which confirm the existence of sulfonate monomers. The bands at 2960, 2873, 1731 and 1452 cm\(^{-1}\) belong to vibration absorbance of -CH\(_3\), -CH\(_2\), C=O and -CH\(_3\) respectively, which confirm the existedes of butyl acrylate monomer unit. The bands at 761 and 701 cm\(^{-1}\) indicate the existence of styrene monomer. Thus, this spectrum confirm the terpolymer components qualitatively.

![Figure 3.4 FTIR spectrum of poly (St-co-BA-co-SAS) film](image)

2. X-ray diffraction (XRD) pattern of poly (St-co-BA-co-SAS) film

Figure SI2 shows the X-ray diffraction (XRD) pattern of PSBS. The typical broad band is clearly shown around 2\(\theta\)=20\(^\circ\) which indicates that PSBS is noncrystalline structure in solid state.
Figure 3.5 X-ray diffraction (XRD) result of poly (St-co-BA-co-SAS) film