

Supporting Information

Ionic Crosslinked Polypropylene-based Thermoplastic Elastomers with Excellent Mechanical Properties

Xiaohui Mao, Fei Wang, Li Pan,* Zhe Ma, and Yuesheng Li*

Tianjin Key Laboratory of Composite and Functional Materials, and School of Materials Science and Engineering, Tianjin University, Tianjin 300072, P.R. China

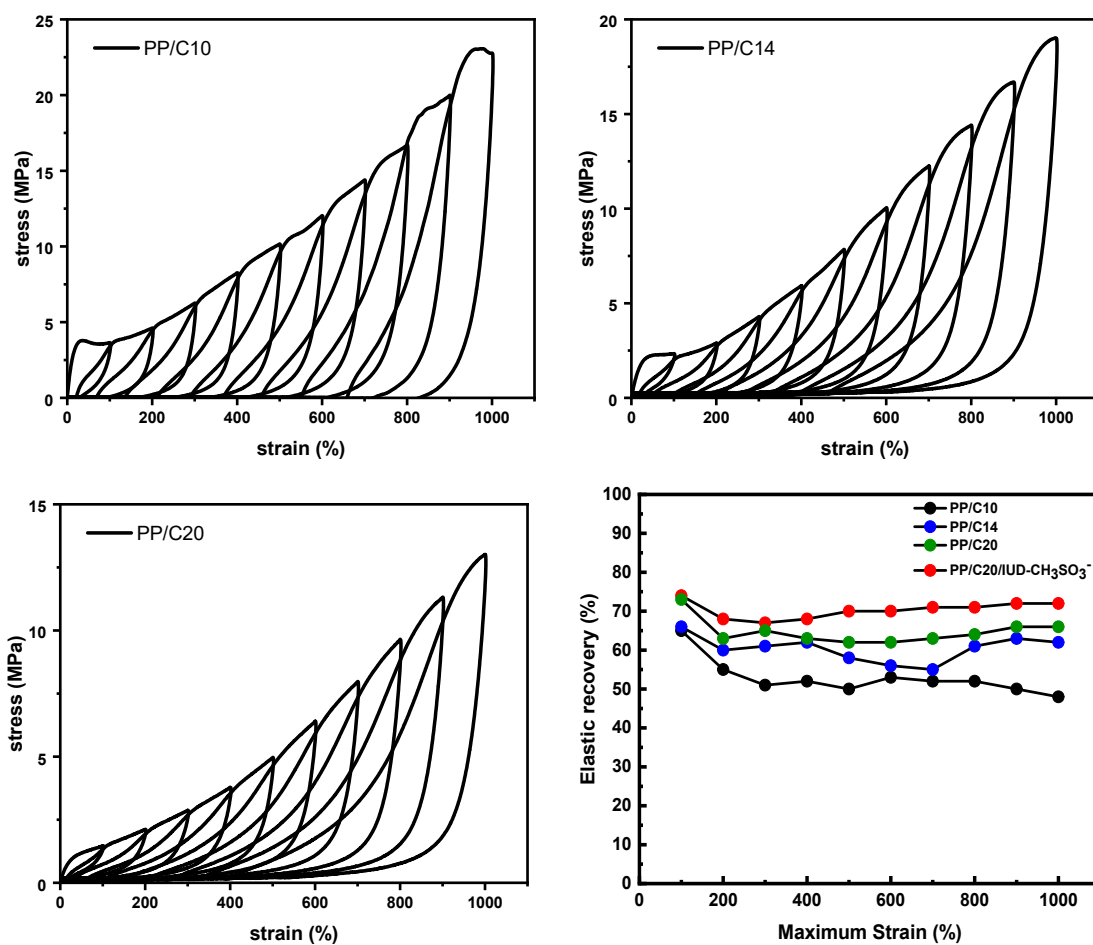


Figure S1. Elastic recovery (%) of PP/C10 (SR = 52.6%), PP/C14 (SR = 60.4%), PP/C20 (SR = 64.7%).

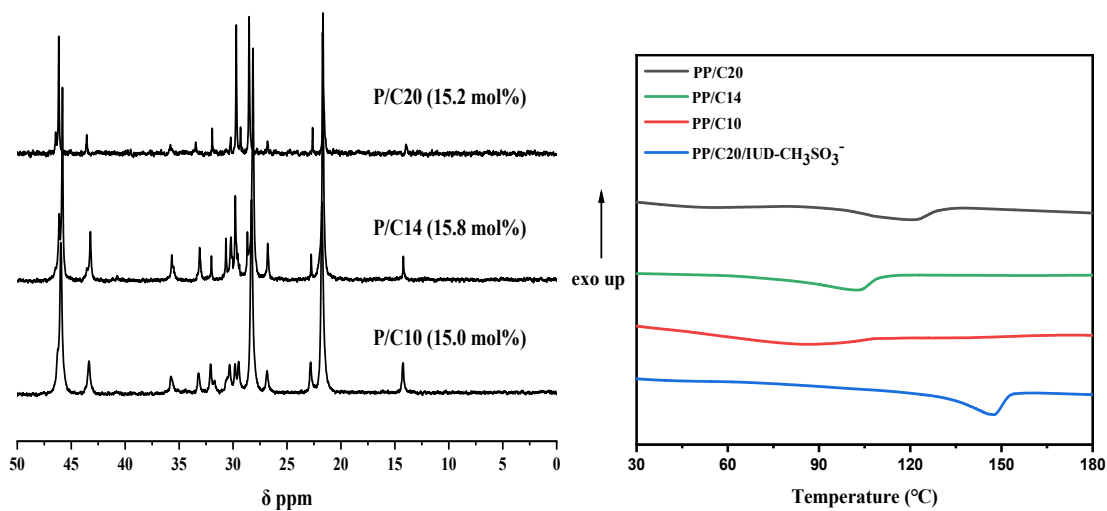


Figure S2. ^{13}C NMR spectrum and DSC curves of PP/C10, PP/C14, PP/C20 and PP/C20/IUD- CH_3SO_3^- .

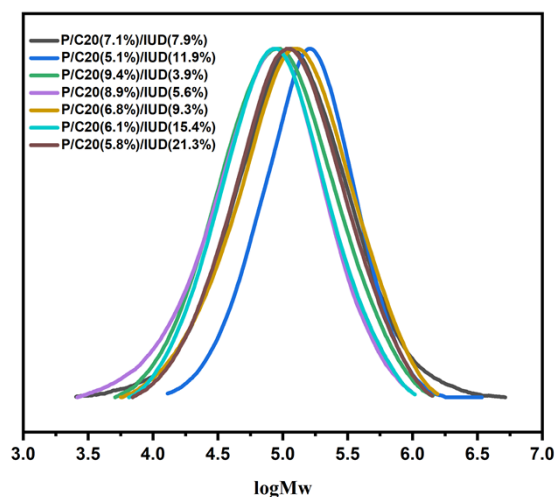


Figure S3. GPC elution curves of propylene/IUD/C20 copolymers with different compositions.

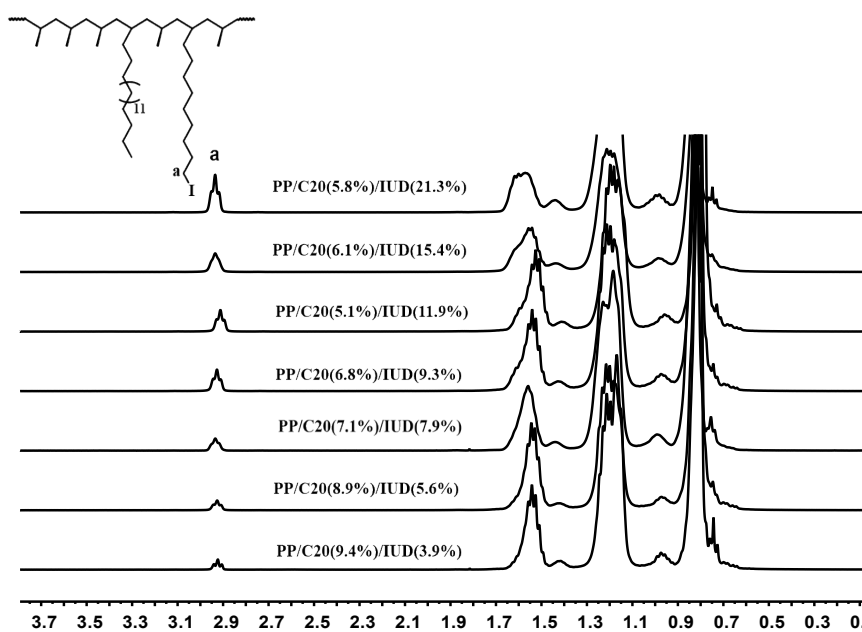


Figure S4. ^1H NMR spectrum of propylene/IUD/C20 copolymers with different compositions.

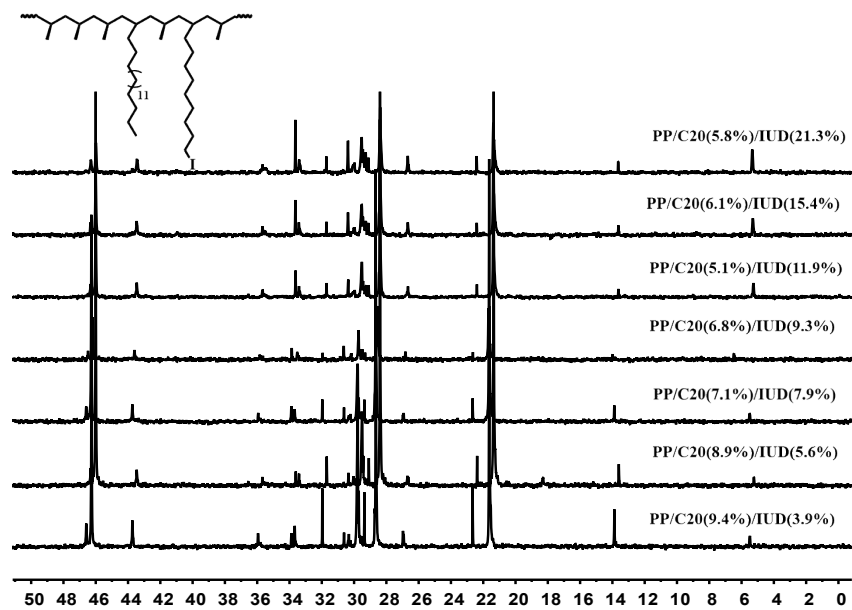


Figure S5. ¹³C NMR spectrum of propylene/IUD/C20 copolymers with different compositions.

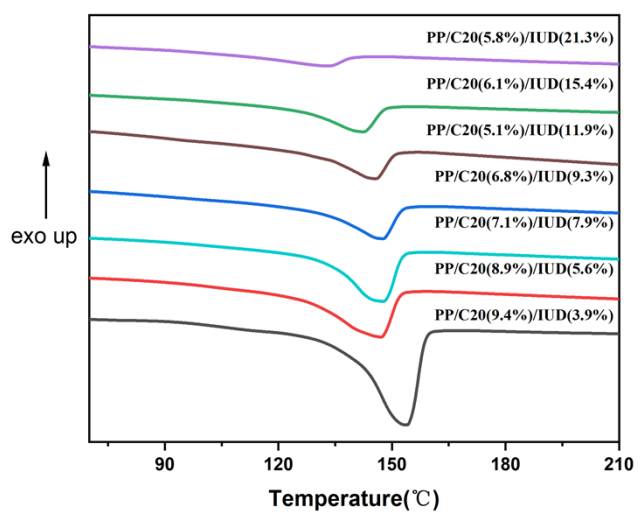


Figure S6. DSC curves of P/IUD/C20 copolymers with different compositions in the second heating process.

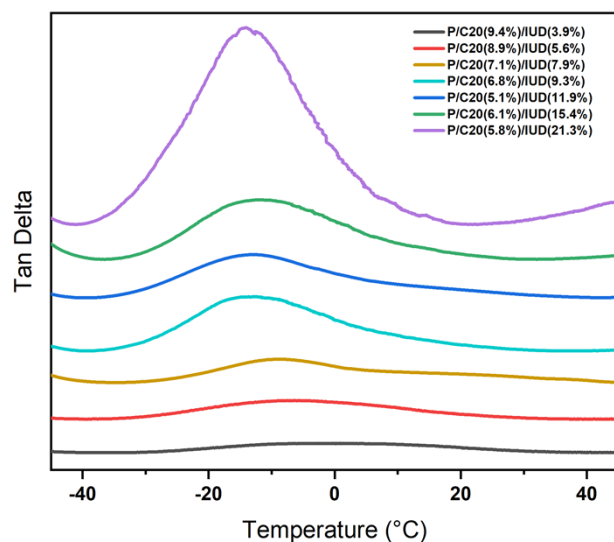


Figure S7. DMA curves of propylene/IUD/C20 copolymers with different compositions.

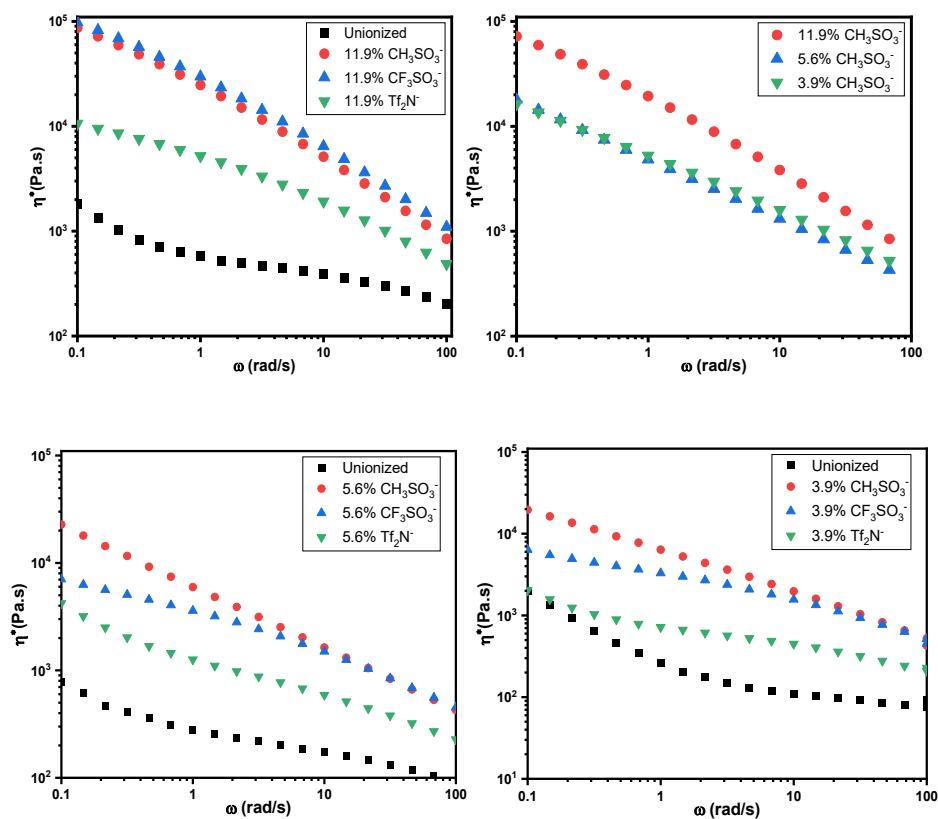


Figure S8. Complex viscosity (η^*) of copolymers and ionomers plotted as functions of frequency for different ion contents at 180 °C.

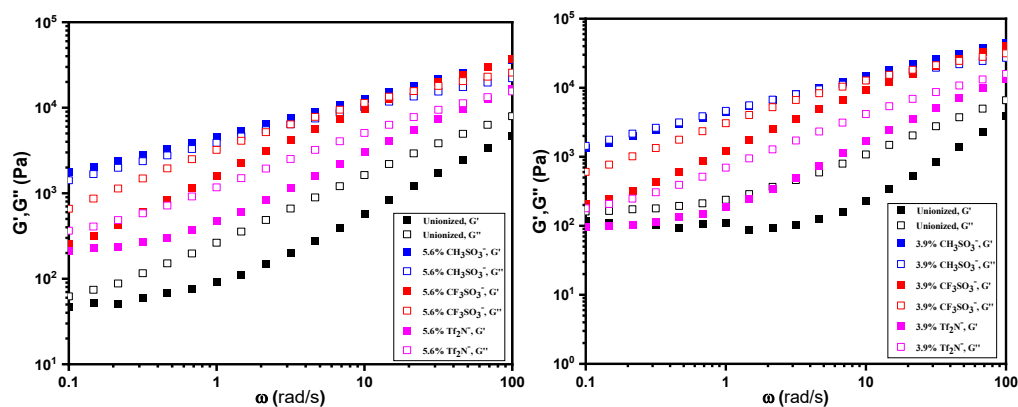


Figure S9. Storage modulus (G') and loss modulus (G'') of copolymers and ionomers paired with different counteranions plotted as functions of frequency at 180 °C.

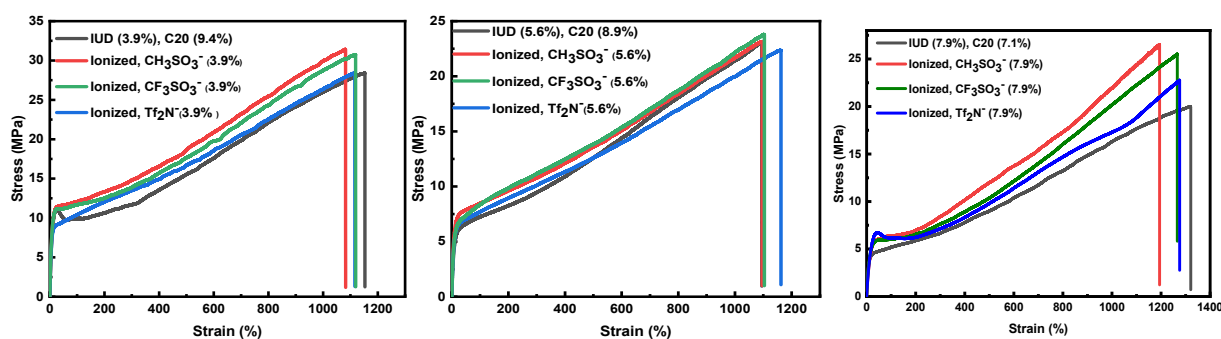


Figure S10. Stress-strain curves of unionized and ionized samples.

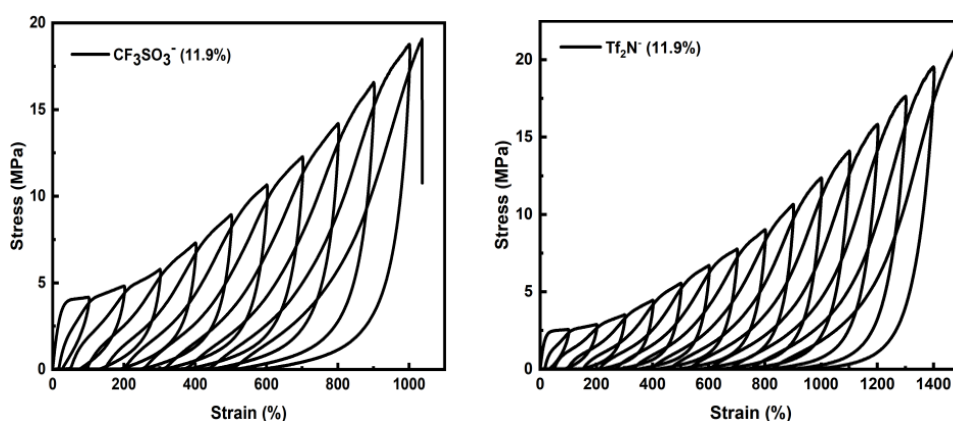


Figure S11. Plot of hysteresis experiment of propylene/IUD/C20 copolymer (11.9% IUD, 5.1% C20, SR=61.8%) and the corresponding ionomers with different counteranions (SR- CH_3SO_3^- =70.4%, SR- CF_3SO_3^- =68.6%, SR- Tf_2N^- =62.3%).

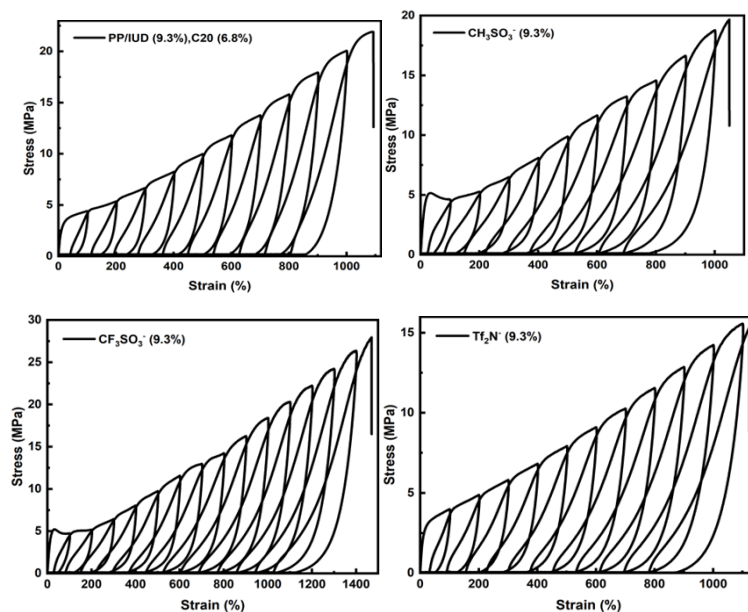


Figure S12. Plot of hysteresis experiment of propylene/IUD/C20 copolymer (9.3% IUD, 6.8% C20, SR=41.3%) and the corresponding ionomers with different counteranions (SR- CH_3SO_3^- =50.8%, SR- CF_3SO_3^- =51.6%, SR- Tf_2N^- =44.7%).

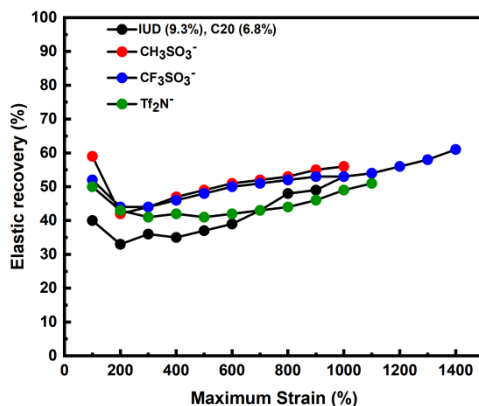


Figure S13. Elastic recovery (%) of unionized sample (9.3% IUD, 6.8% C20) and ionized samples with different counteranions (9.3% ion content).

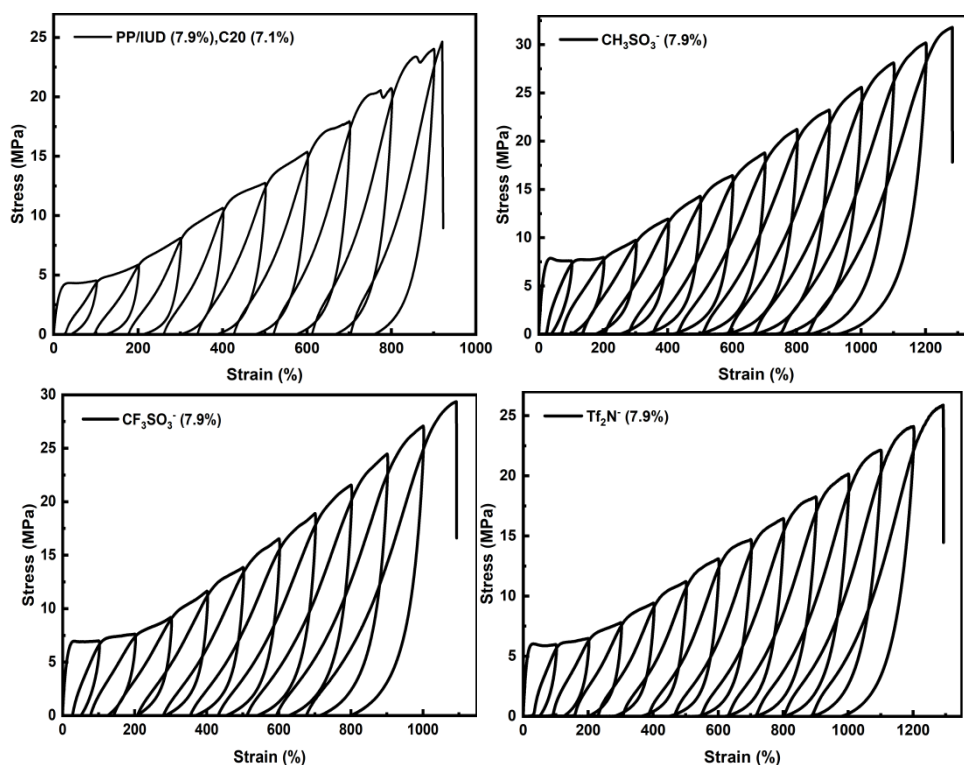


Figure S14. Plot of hysteresis experiment of propylene/IUD/C20 copolymer (7.9% IUD, 7.1% C20, SR=49.0%) and the corresponding ionomers with different counteranions (SR- CH_3SO_3^- =56.6%, SR- CF_3SO_3^- =56.2%, SR- Tf_2N^- =52.3%).

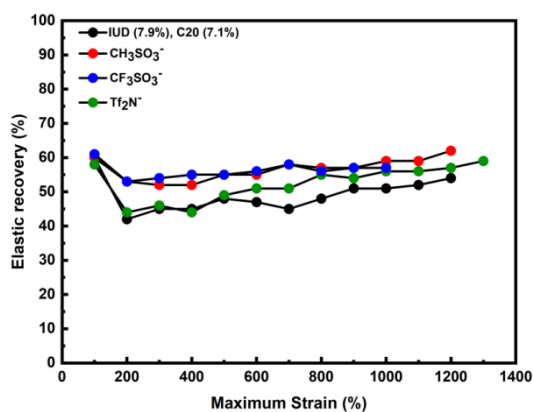


Figure S15. Elastic recovery (%) of unionized sample (7.9% IUD, 7.1% C20) and ionized samples with different counteranions (7.9% ion content).