

## Supporting Information

### Balanced toughening and strengthening of ethylene-propylene rubber toughened isotactic polypropylene by using poly(styrene-*b*-ethylene/propylene) diblock copolymer

Feng Chen, Biwei Qiu, Bo Wang, Yonggang Shangguan,\* Qiang Zheng

*MOE Key Laboratory of Macromolecular Synthesis and Functionalization, Department of Polymer Science and Engineering, Zhejiang University, Hangzhou 310027, People's Republic of China*

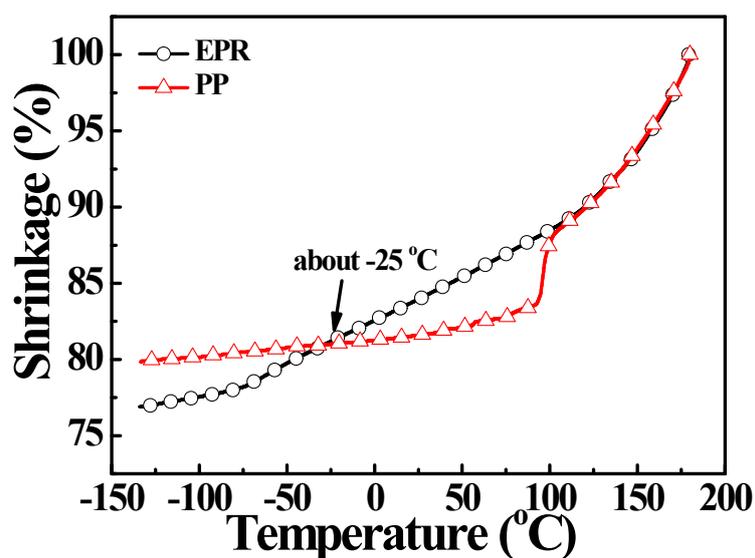


Fig. S1. Shrinkage curves of EPR and PP.

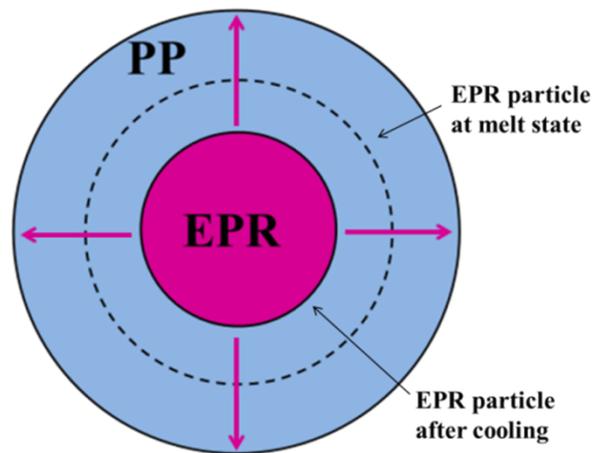
Fig. S1 gives the shrinkage behavior of EPR and PP upon cooling. Cooling from melt-state, PP firstly shrinks faster than EPR due to the crystallization process. At about -25 °C, EPR conversely has the larger shrinkage than PP. When EPR is dispersed in PP matrix, the shrinkage of EPR is larger than PP below -25 °C, meaning

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\*Corresponding authors. Department of Polymer Science and Engineering, Zhejiang University, Hangzhou 310027, PR China. Tel./fax: +86 571 8795 3075.

E-mail: [shangguan@zju.edu.cn](mailto:shangguan@zju.edu.cn) (Y.G. Shangguan).

PP will give EPR particle a tension providing the interface is not broken, as indicated by **Fig. S2**. This tension resulting from the mismatch of thermal expansion coefficients increases the free volume fraction of EPR and leads to a lower glass transition temperature than pure EPR in **Fig. 6A**.



**Fig. S2.** Stress model of PP/EPR. The arrows in which stand for the thermal stress.