

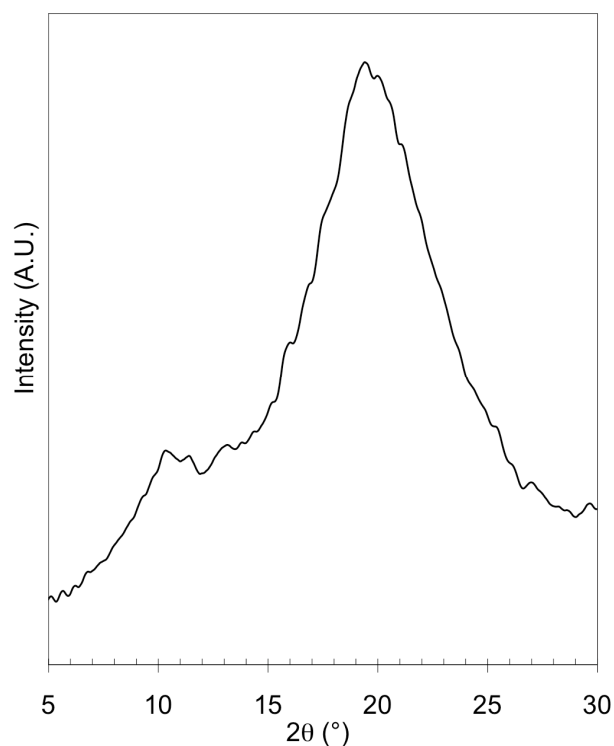
# Supporting information for

## $\beta$ to $\alpha$ form transition observed in the crystalline structure of syndiotactic polystyrene (sPS)

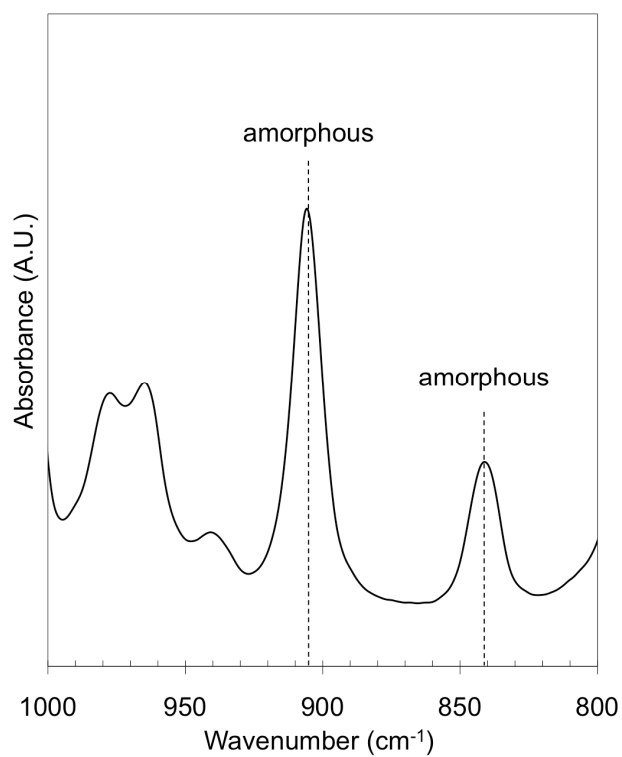
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**Figure S1.** X-ray diffraction profile of amorphous specimen.



**Figure S2.** FTIR spectrum of amorphous specimen.

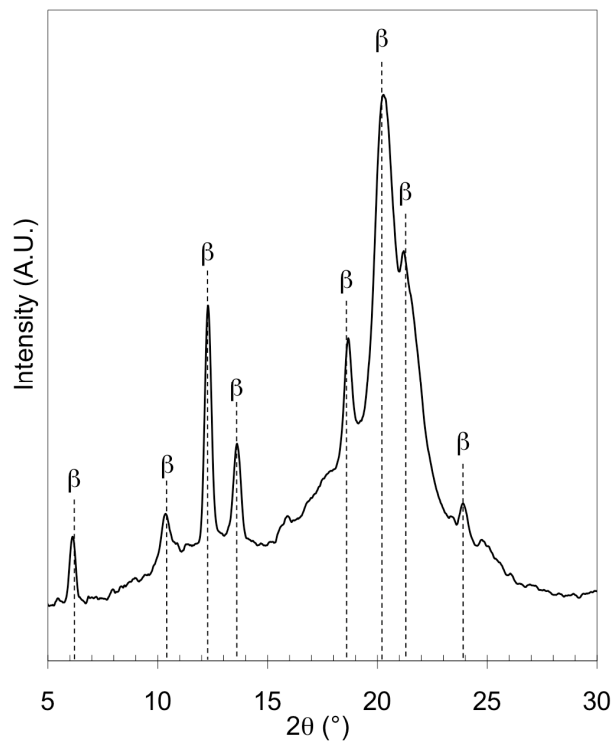
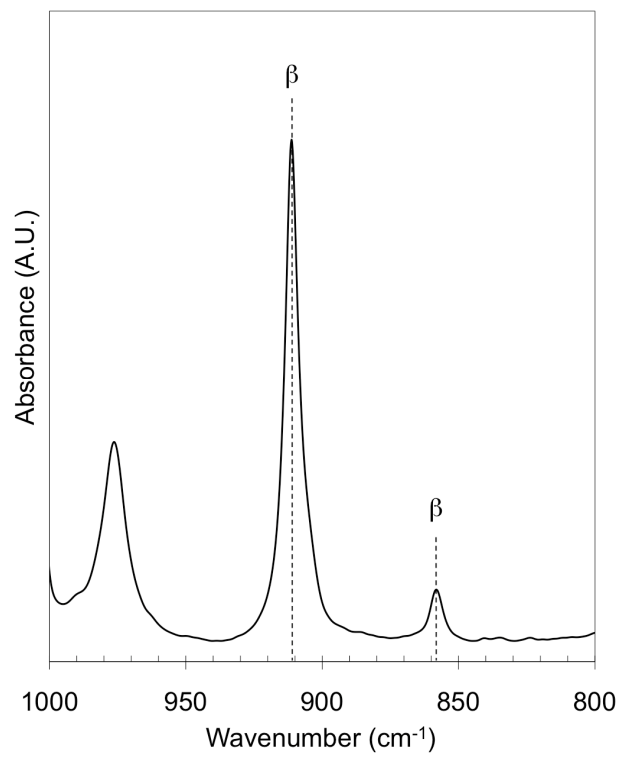
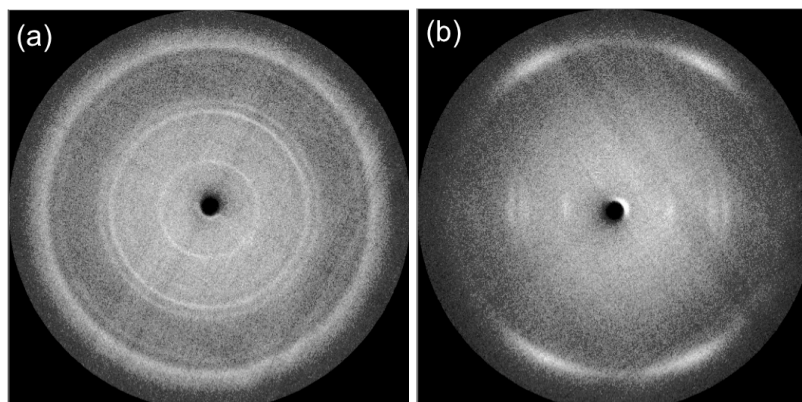


Figure S3. X-ray diffractogram of  $\beta$  specimen.

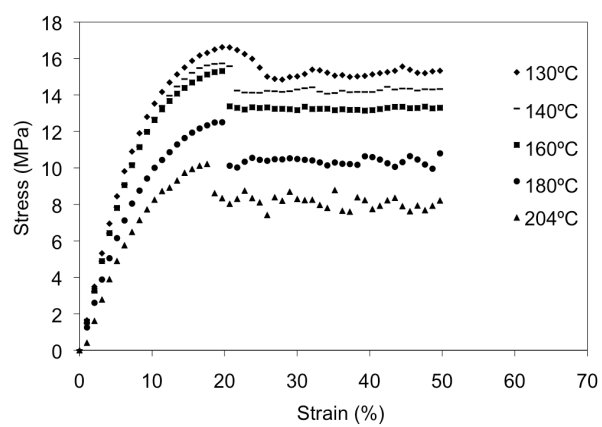
**Figure S3.** X-ray diffraction profile of  $\beta$  specimen.



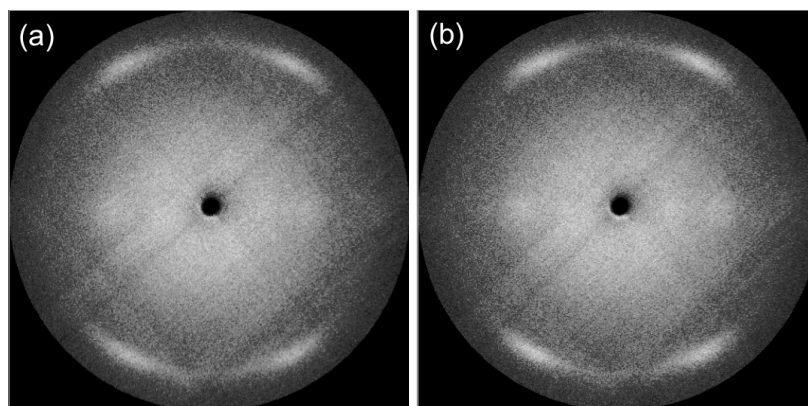
**Figure S4.** FTIR difference spectrum of  $\beta$  specimen.



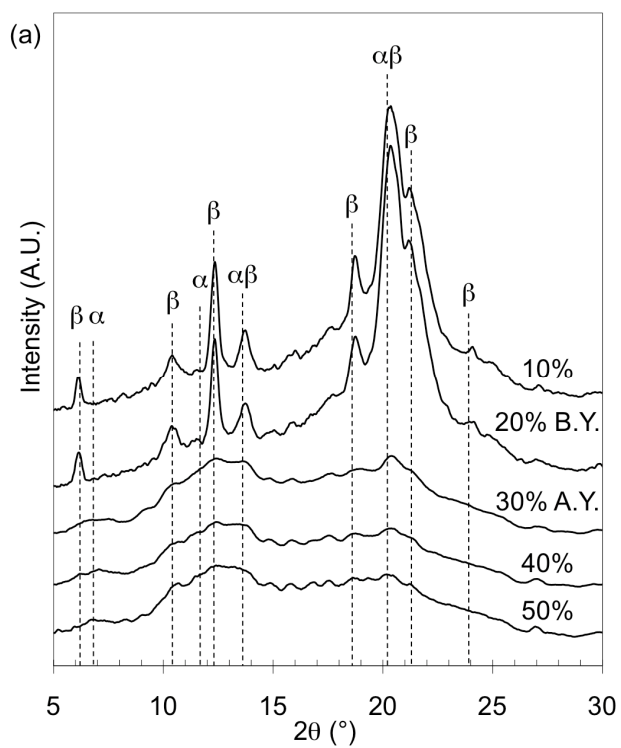
**Figure S5.** WAXS images: (a) 0% strain, and (b) 218°C 25% strain.

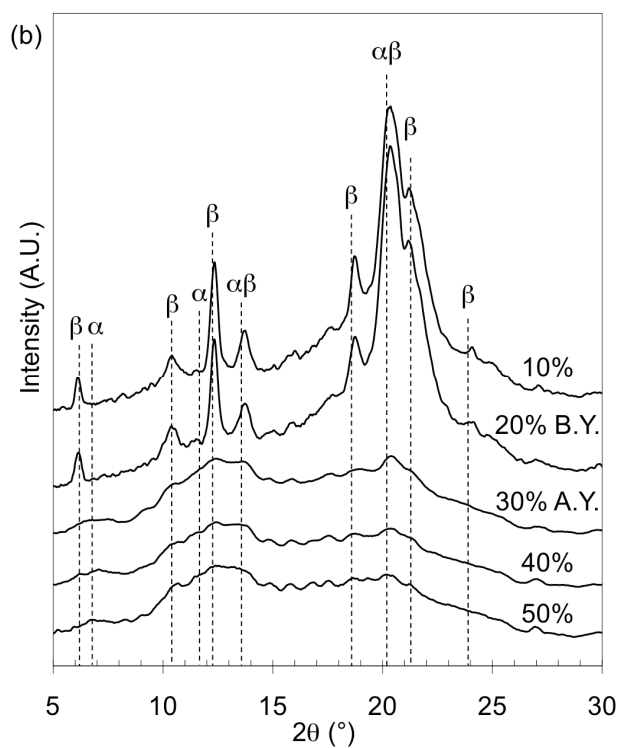


**Figure S6.** Stress-strain curves at different temperatures.

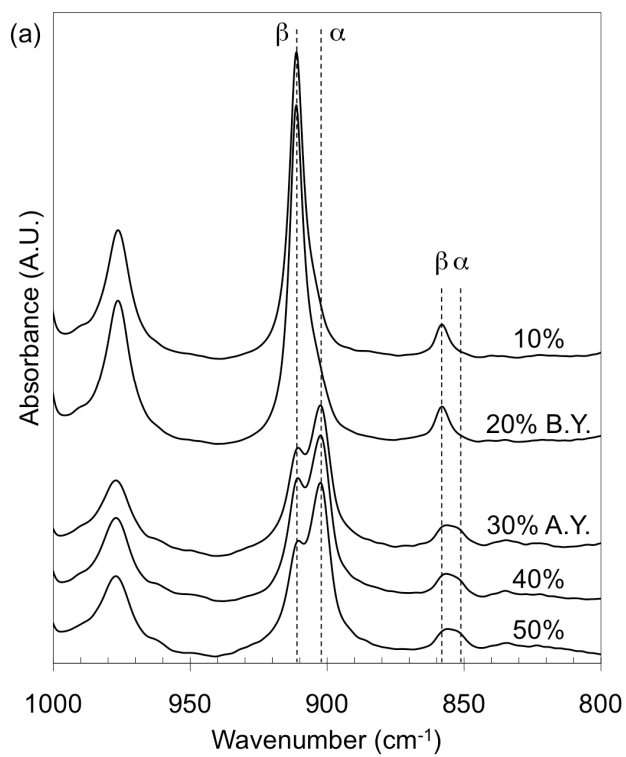


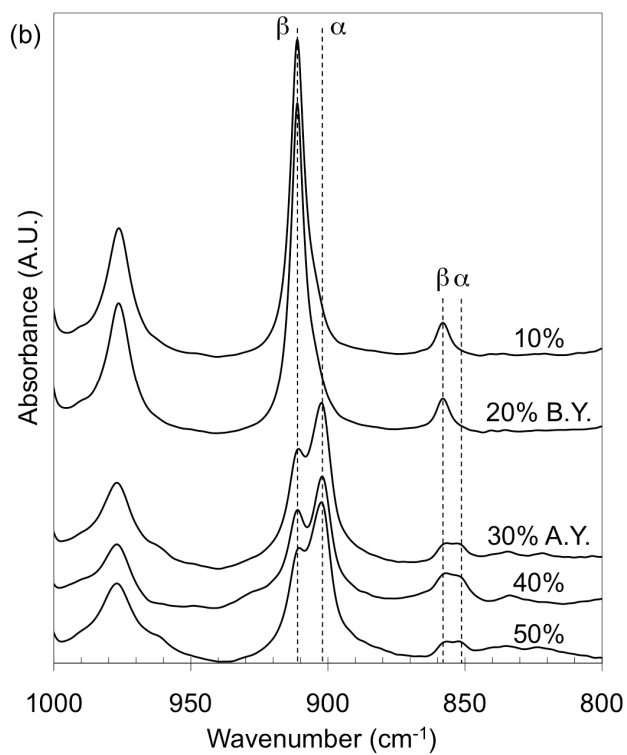
**Figure S7.** WAXS images of specimens after yielding at different temperatures of (a) 140°C and (b) 160°C.



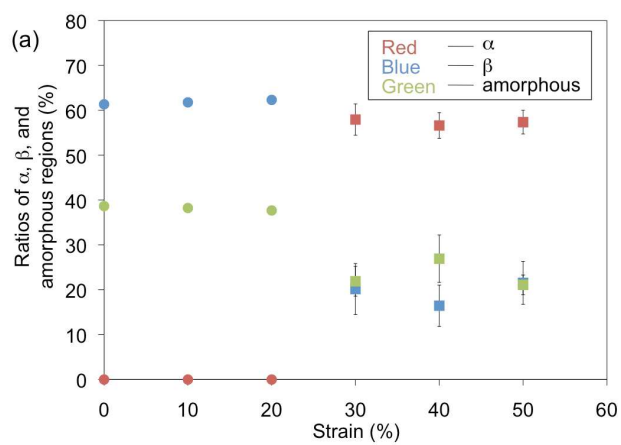


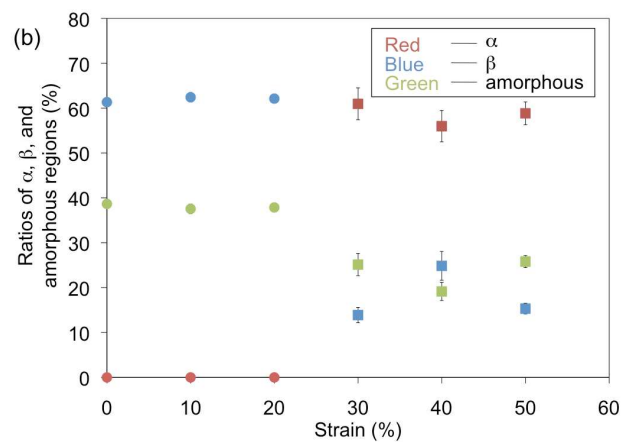
**Figure S8.** X-ray diffraction profiles by changing strains at different temperatures of (a) 140°C and (b) 160°C. B.Y. and A.Y. stand for “before yielding” and “after yielding” respectively.





**Figure S9.** FTIR difference spectra as a function of strain at temperatures of (a) 140°C and (b) 160°C. B.Y. and A.Y. stand for “before yielding” and “after yielding” respectively.





**Figure S10.** The ratios of  $\alpha$  (red),  $\beta$  (blue), and amorphous (green) regions as a function of strain at temperatures of (a) 140°C and (b) 160°C, before yielding (circles) and after yielding (squares).