Response to Reviewer 2 Comments

Point 1: There are many grammar mistakes in the manuscript.

Response 1:
Thanks for your suggestion. We have got help from a native English speaker to improve our English express in this manuscript. And this article has been carefully checked repeatedly, the grammatical and wording errors you mentioned had been corrected and marked using "Track Changes" function in the revised manuscript.

Point 2: In the experimental section, the exact procedures of the experiments need to be described so that the experiments could be reproduced.

Response 2:
First, I really apologize for the inconvenience for you caused by our not exhaustive description of the experimental procedures.

Firstly, we have further improved the description of synthesis process of the PS-b-PB parpared by Li/PSLi/B system as follows “A detailed polymerization procedure (PS-b-PB-1, provided in Table 1) was described as a typical example. First, styrene polymerization was conducted in Schlenk tube with a rubber septum in following steps: styrene solution (10 mmol, 2M in cyclohexane, [St]/[Li]=200), Li (0.05 mmol, 2.5 M in n-hexane, [Li]/[Ni]=5), polymerization was carried out at 50°C for 1 hour, and viscous orange liquid was obtained. When the Ni solution (0.01 mmol, 0.025M in cyclohexane) was added, the system became deep red by stirring at 50°C. After 15 min, B (0.05 mmol, [B]/[Li]=1) was added, and aged with stirring at 50°C for 15 min, and a dark brown-colored catalyst Ni/PSLi/B, was successfully obtained. Then butadiene (10 mmol, 1.9 M solution in hexane, [Bd]/[Ni]=1000) and aforementioned prepared catalyst Ni/PSLi/B solution was injected into the Schlenk tube. This polymerization was carried out at 50°C for 3 hours and then quenched by adding 2 ml ethanol containing antiager 264 (1%, w.t) as a stabilizer. The product was precipitated in methanol and repeatedly washed with ethanol, followed by extraction with methyl ethyl ketone and n-hexane, respectively. Then, the product was dried under vacuum at 40 °C for getting a constant weight. Finally, a white solid had been obtained. A series of other copolymers, such as PS-b-PB-1, PS-b-PB-2, PS-b-PB-3, PS-b-PB-5, PS-b-PB-6 (as shown in Table 2 for details), were synthesized by changing the amount of butadiene added in the second step of the polymerization with above synthesis process.” (Line 103-118 in the revised manuscript)

Secondly, the experimental description of PS-b-PB synthesized by n-butyllithium catalyst system was supplemented (Line 124-140 in the revised manuscript) as follows “2.3 The synthesis of PS-b-PB via n-butyllithium catalyst systems. All syntheses were conducted in a dry argon atmosphere. The specific experimental process (PS-b-PB-2, provided in Table 1) is as follows. First, styrene polymerization was conducted in Schlenk tube with a rubber septum in following steps: styrene solution (15 mmol, 2M in cyclohexane, [St]/[Li]=300), Li (0.05mmol, 2.5 M in n-hexane, [Li]/[Ni]=5), polymer synthesis was carried out at 50°C for 1 hour, and viscous orange liquid was obtained. Then butadiene (50 mmol, 1.9 M solution in
hexane, [Bd]/[Li]=1000) was injected into the Schlenk tube. This polymerization was carried out at 50°C for 12 hours and then quenched by adding 2 ml ethanol containing antiager 264 (1 wt %) as a stabilizer. The product was precipitated in methanol and repeatedly washed with ethanol, followed by extraction with methyl ethyl ketone and n-hexane, respectively. Then, the product was dried under vacuum at 40°C for getting a constant weight. Finally, a white solid has been obtained.”

Finally, the experimental description of homopomerization of butadiene via Ni/Li/B catalyst system was supplemented (Line 141-153 in the revised manuscript) as follow “2.4. Homopolymerization of butadiene. All syntheses were conducted in a dry argon atmosphere. The specific experimental process (PB-1, provided in Table 1) is as follows. “First, the alkylation process of nickel naphthenate was conducted in Schlenk tube with a rubber septum in following steps: Ni (0.01 mmol, 0.025M in cyclohexane), Li (0.05 mmol, 2.5 M in n-hexane, [Li]/[Ni]=5). The reaction was carried out at 50°C for 15 min, then the B (0.05 mmol, [B]/[Li]=1) was added by a micro-injector and aged with stirring at 50°C for 15 min, and a dark brown-colored catalyst Ni/Li/B, was successfully obtained. Then butadiene (10 mmol, 1.9 M solution in hexane, [Bd]/[Ni]=1000) was injected into the Schlenk tube. This Apolymerization was carried out at 50°C for 3 hours and then quenched by adding 2 ml ethanol containing antiager 264 (1 wt %). The product was precipitated in methanol and repeatedly washed with ethanol. Then, the product was dried under vacuum at 40°C for getting a constant weight. Finally, a white solid has been obtained.”

In addition, in order to avoid repetition, the caption of Fig.1, Fig.2, Fig.3, Fig.4, Fig.5 and Fig.6 in the original manuscript and the footnote of Table 1 and Table 2 were revised, and please see the revised manuscript for details.

Point 3: All reaction products should be listed and numbered with their reactant ratio, molecular weight, and molecular weight distribution provided, so the readers could understand which product is being described in the figures and tables.

Response 3:

This suggestion is very useful to us. We have numbered the polymers involved in the paper according to the reviewer’s proposal according to the catalyst system and the ratio of monomer feed, such as “PS-b-PB-1” and so on. (as shown in the Table 1 and Table 2 of the revised manuscript). The description of the figure caption and the table footnote and the expression in the main text has been modified. And I really apologize for the inconvenience for you caused by this problem.