

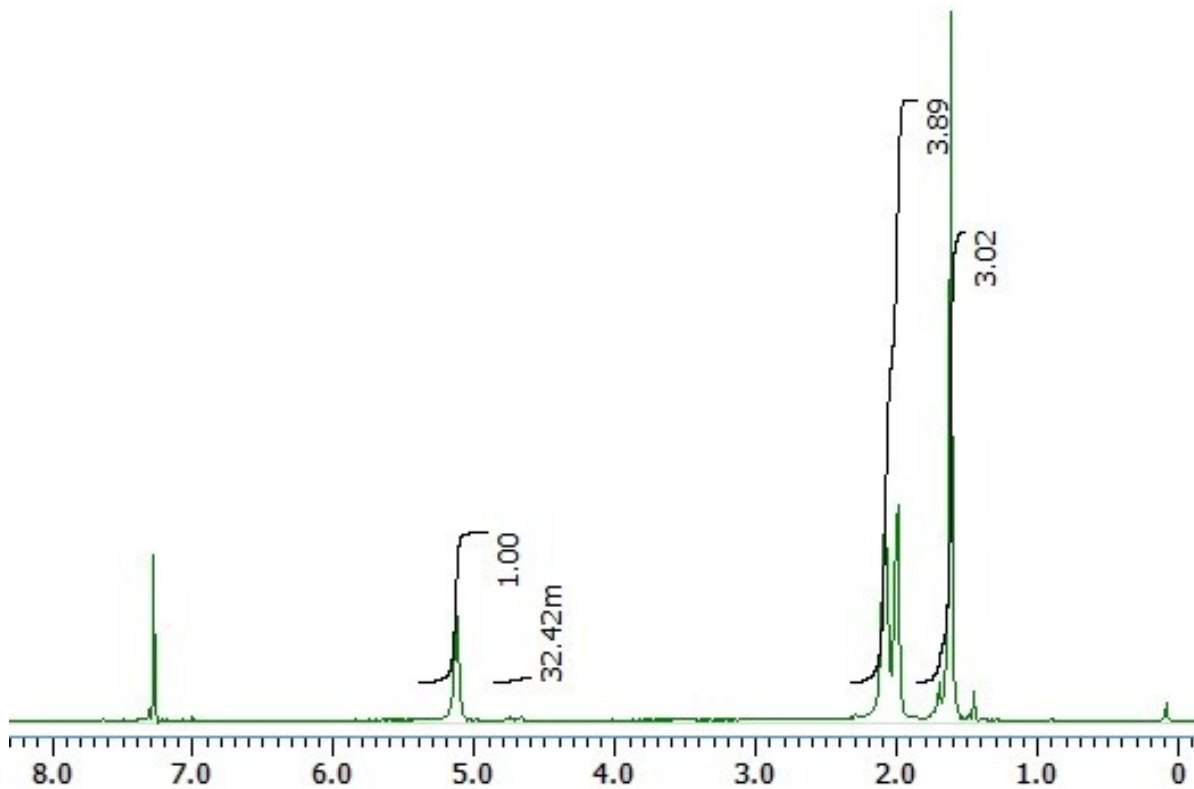
## Supporting Information

Synthesis of stereodiblock polyisoprene consisting of *cis*-1,4 and *trans*-1,4 sequences by neodymium catalyst: change of the stereospecificity triggered by aluminum compound

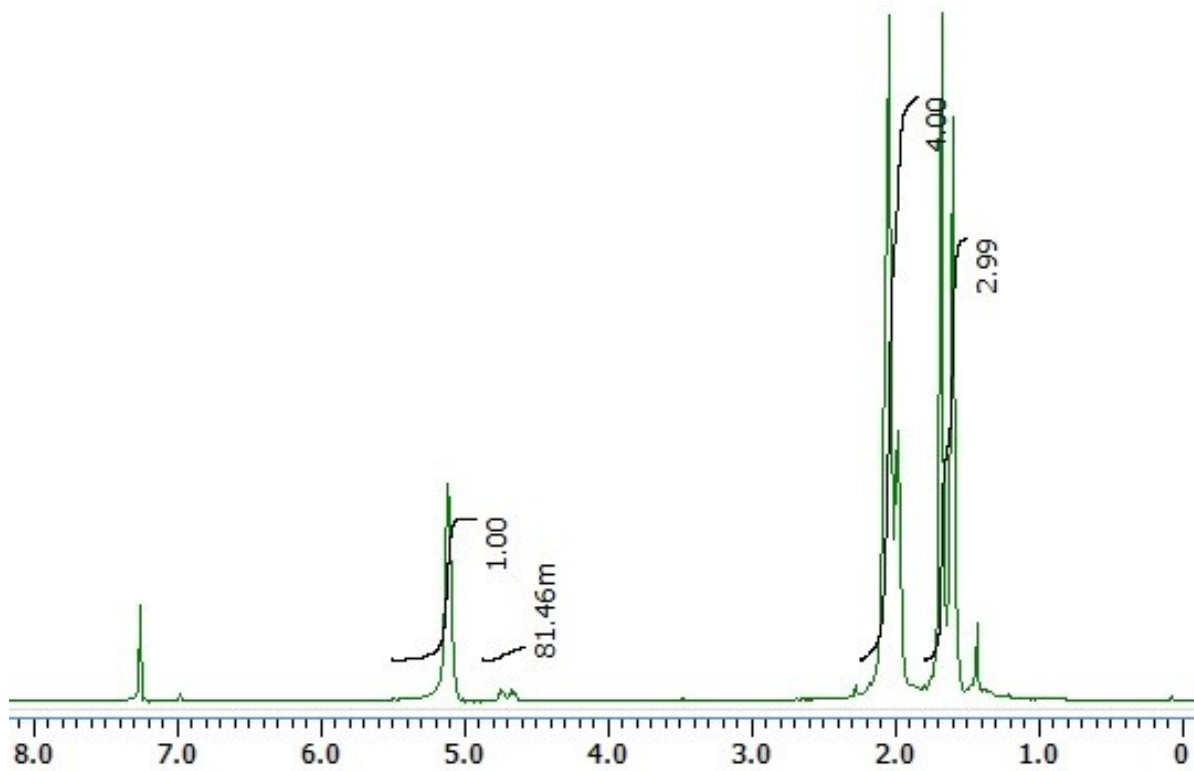
*Ryo Tanaka, Kaede Yuuya, Hiroki Sato, Peter Eberhardt, Yuushou Nakayama and Takeshi Shiono\**

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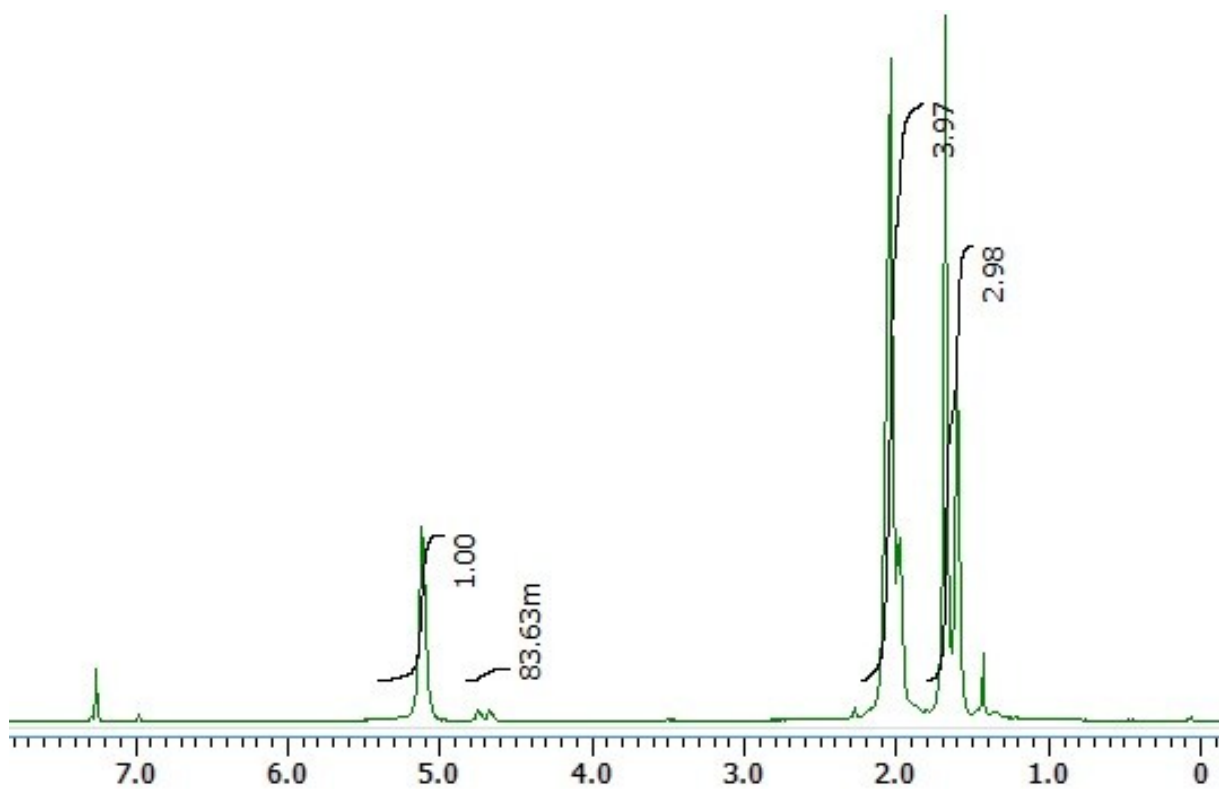
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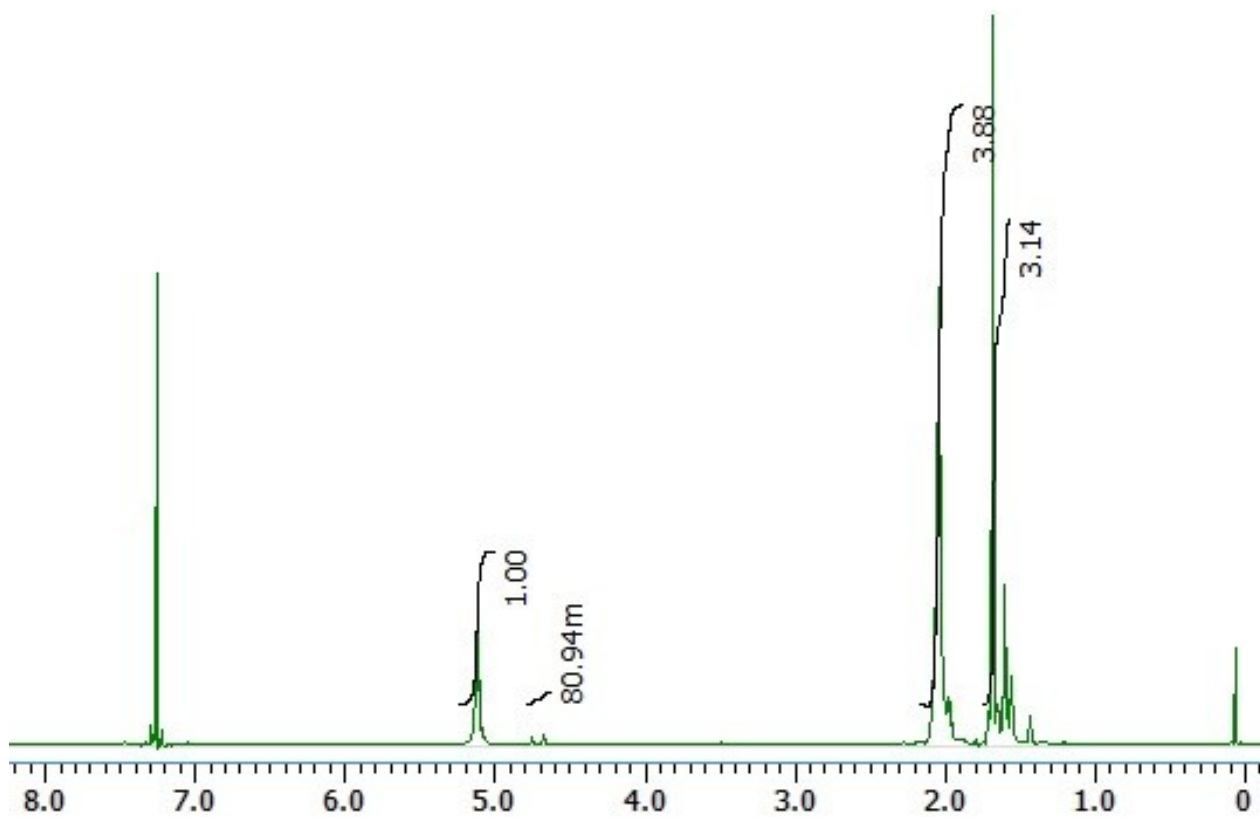
**Figure S1.** <sup>1</sup>H NMR spectrum of polyisoprene obtained in Table 1, Run 1.



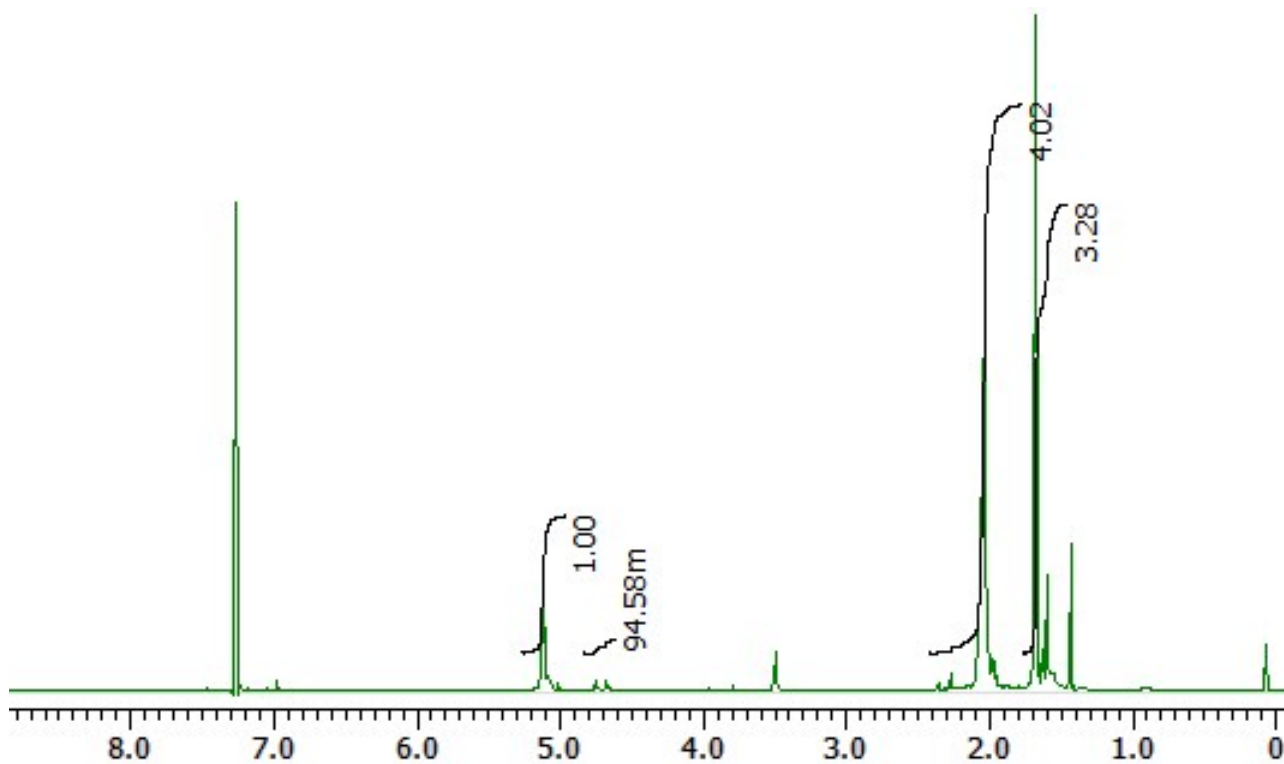
**Figure S2.** <sup>1</sup>H NMR spectrum of polyisoprene obtained in Table 1, Run 3.



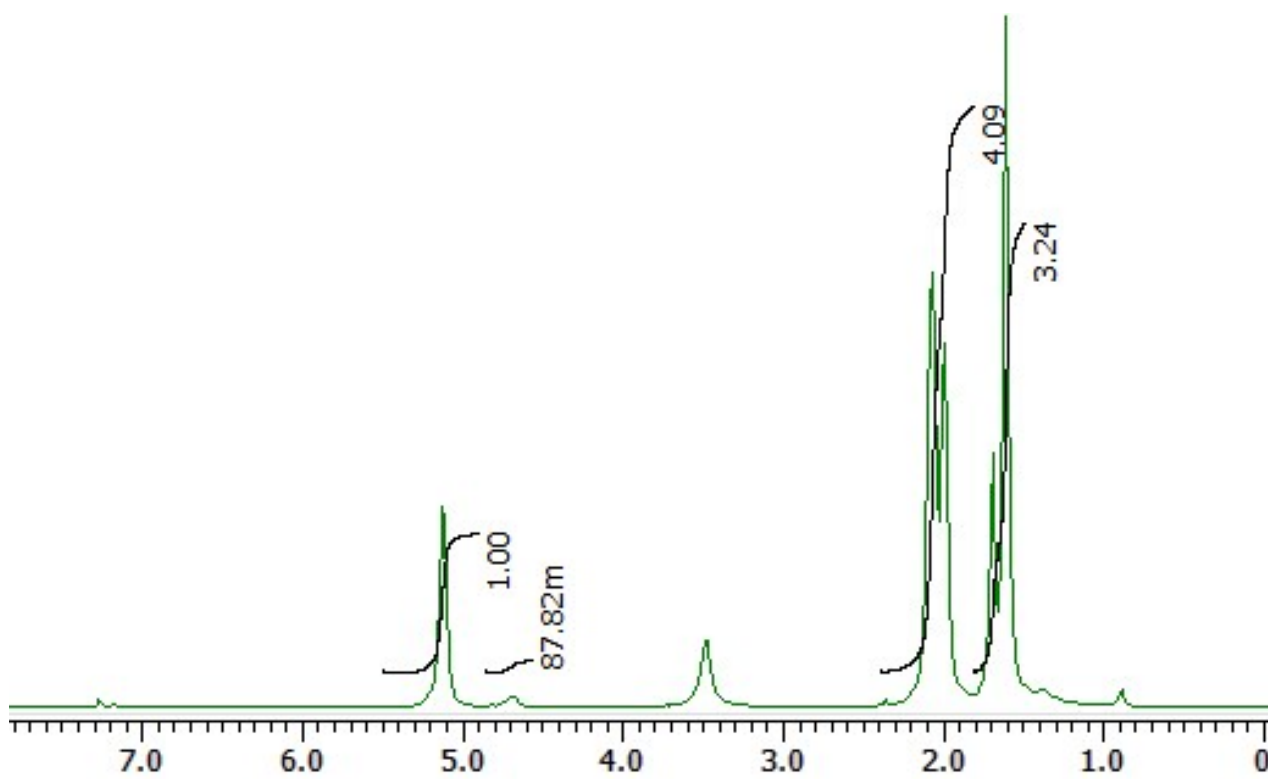
**Figure S3.** <sup>1</sup>H NMR spectrum of polyisoprene obtained in Table 1, Run 5.



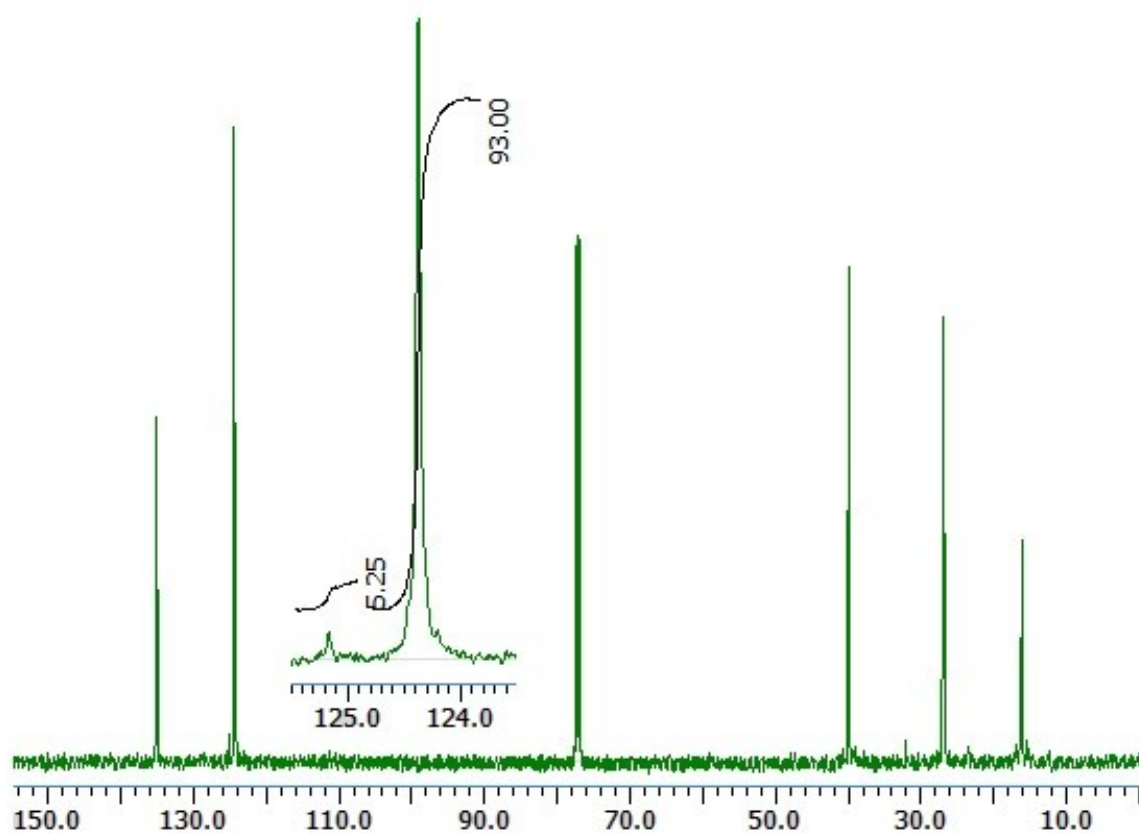
**Figure S4.** <sup>1</sup>H NMR spectrum of polyisoprene obtained in Table 1, Run 6.



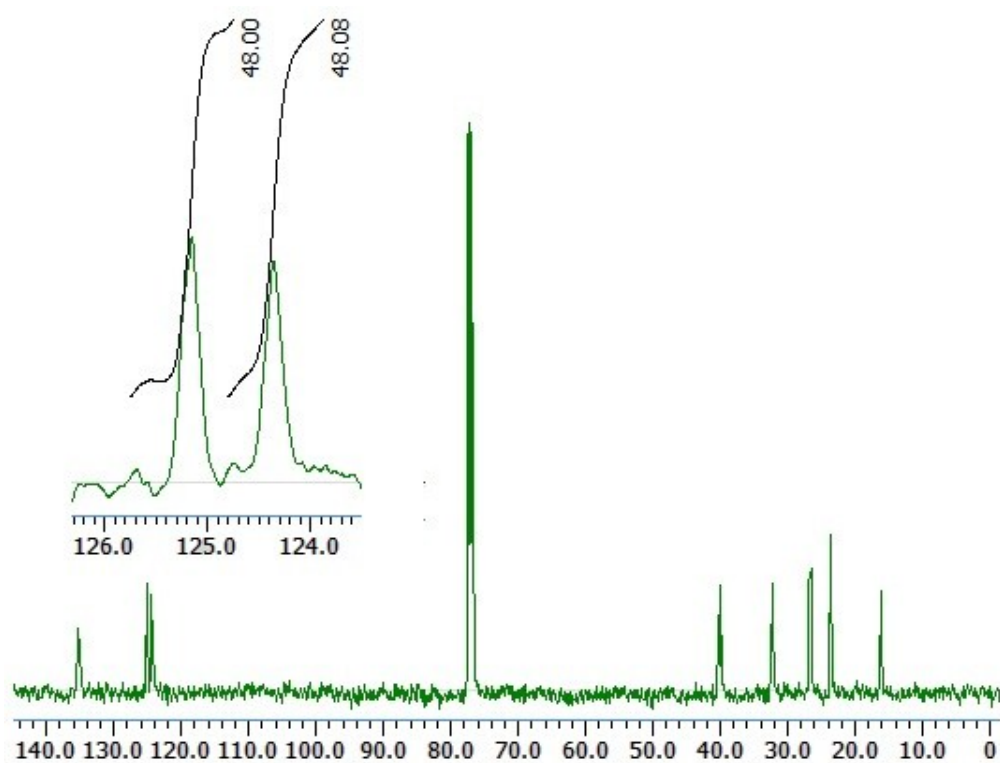
**Figure S5.** <sup>1</sup>H NMR spectrum of polyisoprene obtained in Table 1, Run 7.



**Figure S6.** <sup>1</sup>H NMR spectrum of polyisoprene obtained in Table 1, Run 8.



**Figure S7.**  $^{13}\text{C}$  NMR spectrum of polyisoprene obtained in Table 1, Run 1.



**Figure S8.**  $^{13}\text{C}$  NMR spectrum of polyisoprene obtained in Table 1, Run 3.

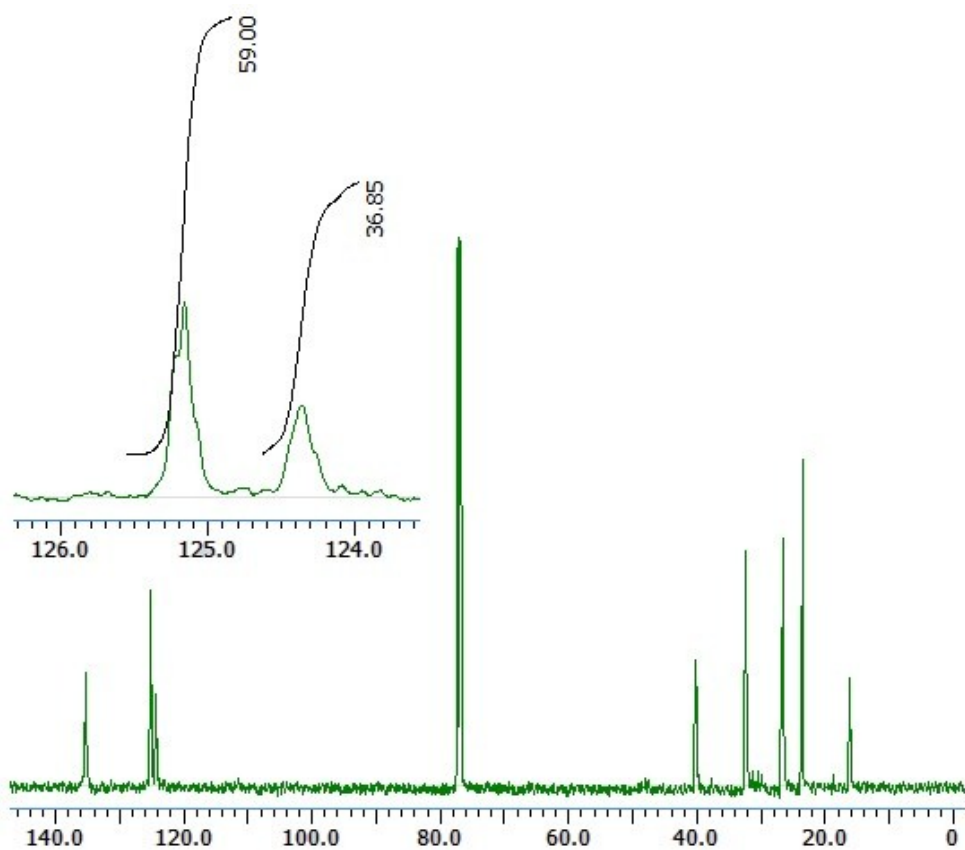
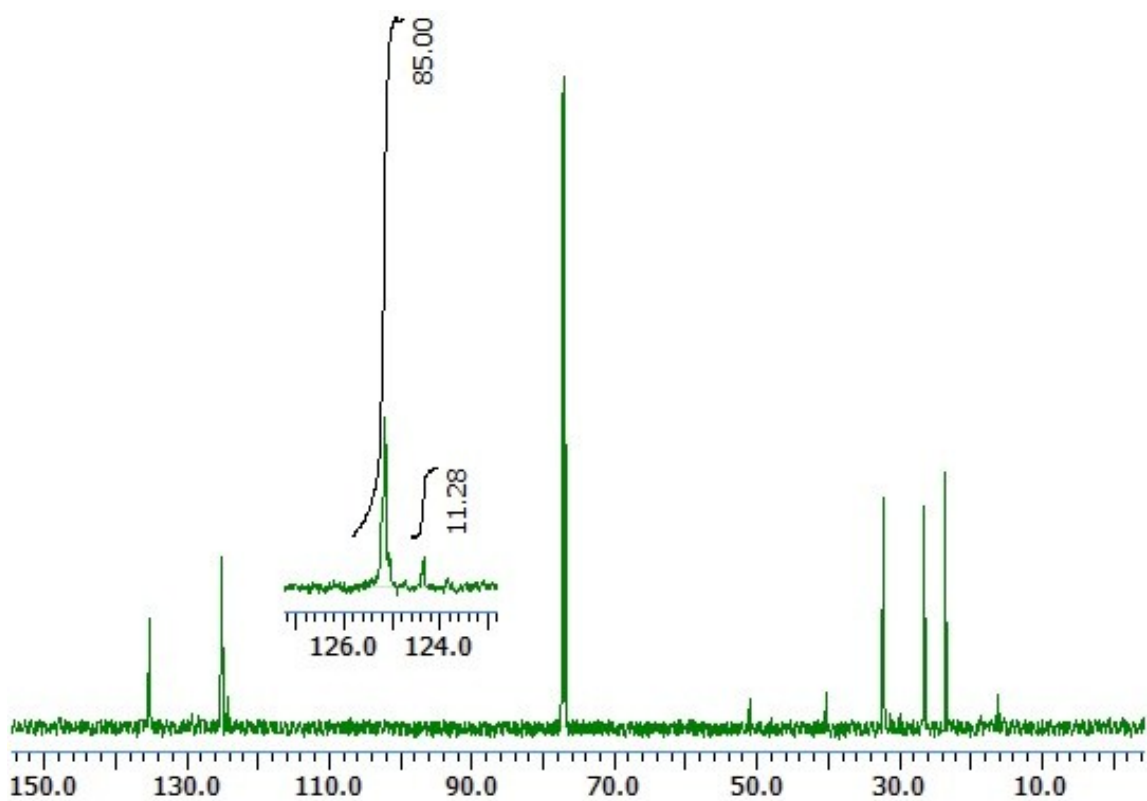
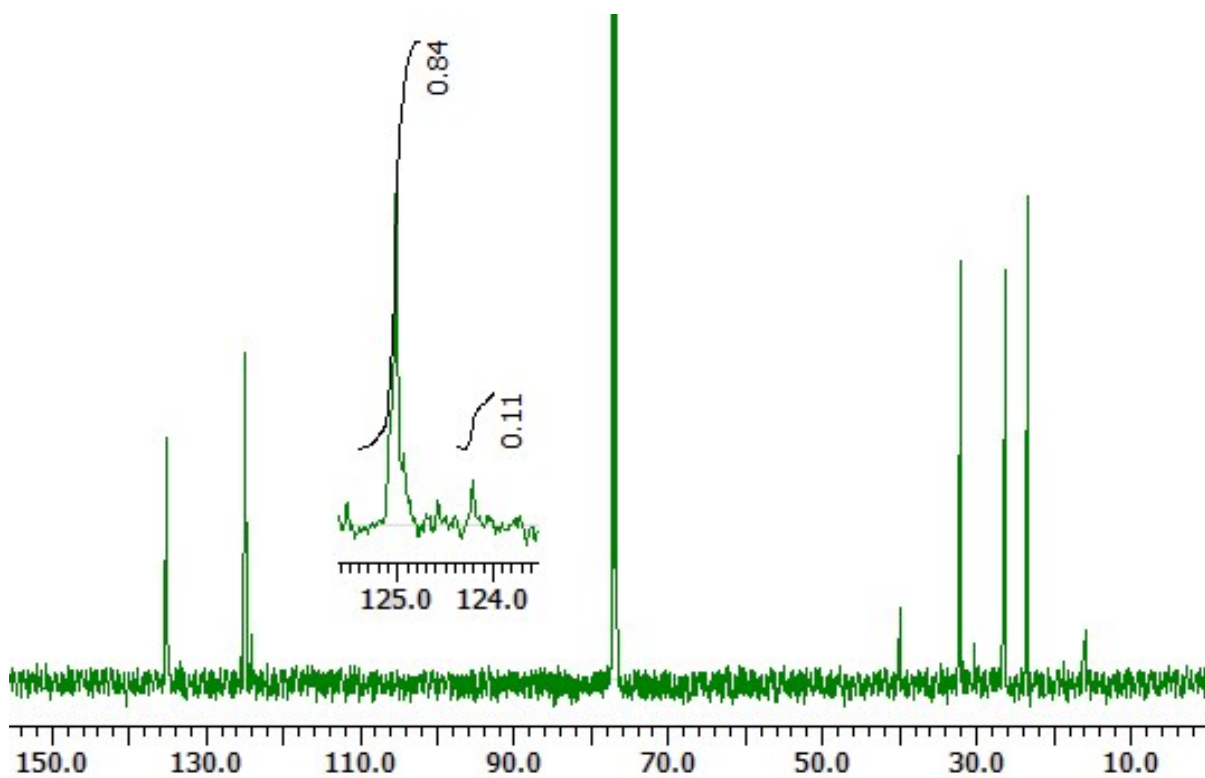


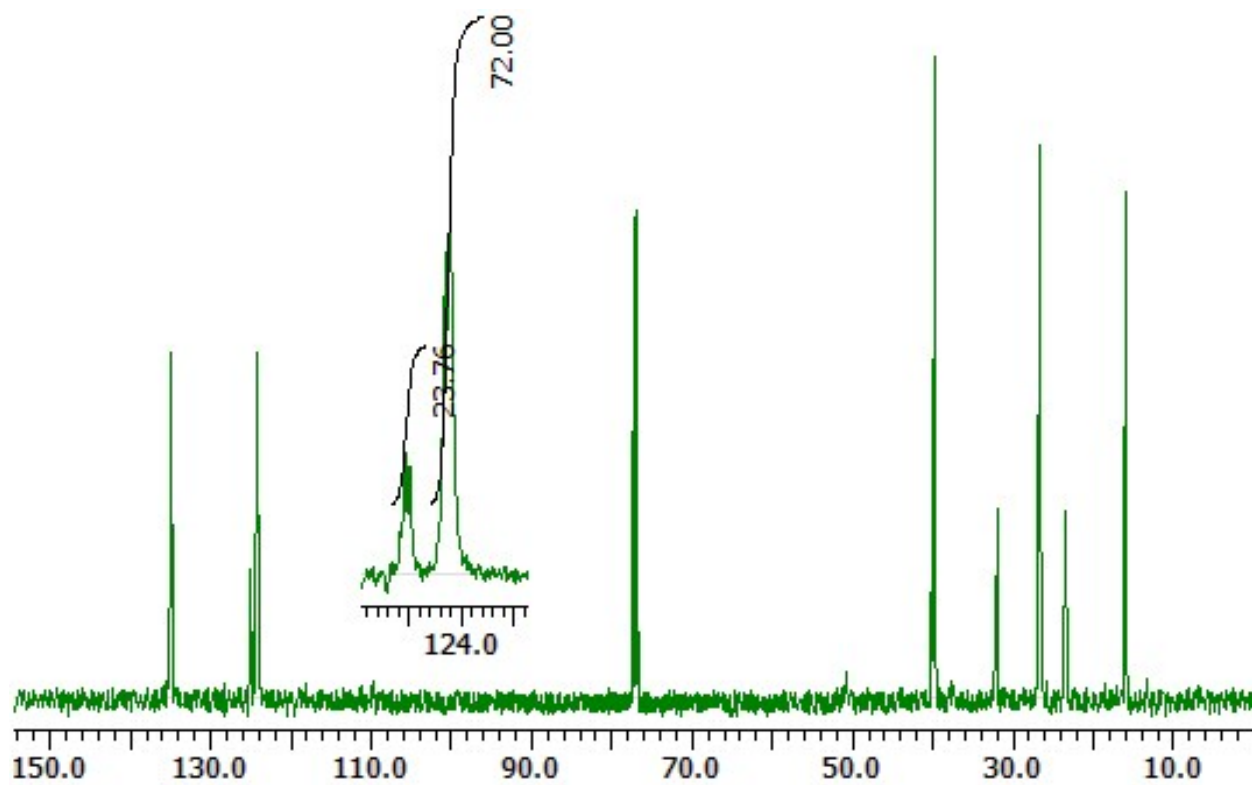
Figure S9.  $^{13}\text{C}$  NMR spectrum of polyisoprene obtained in Table 1, Run 5.



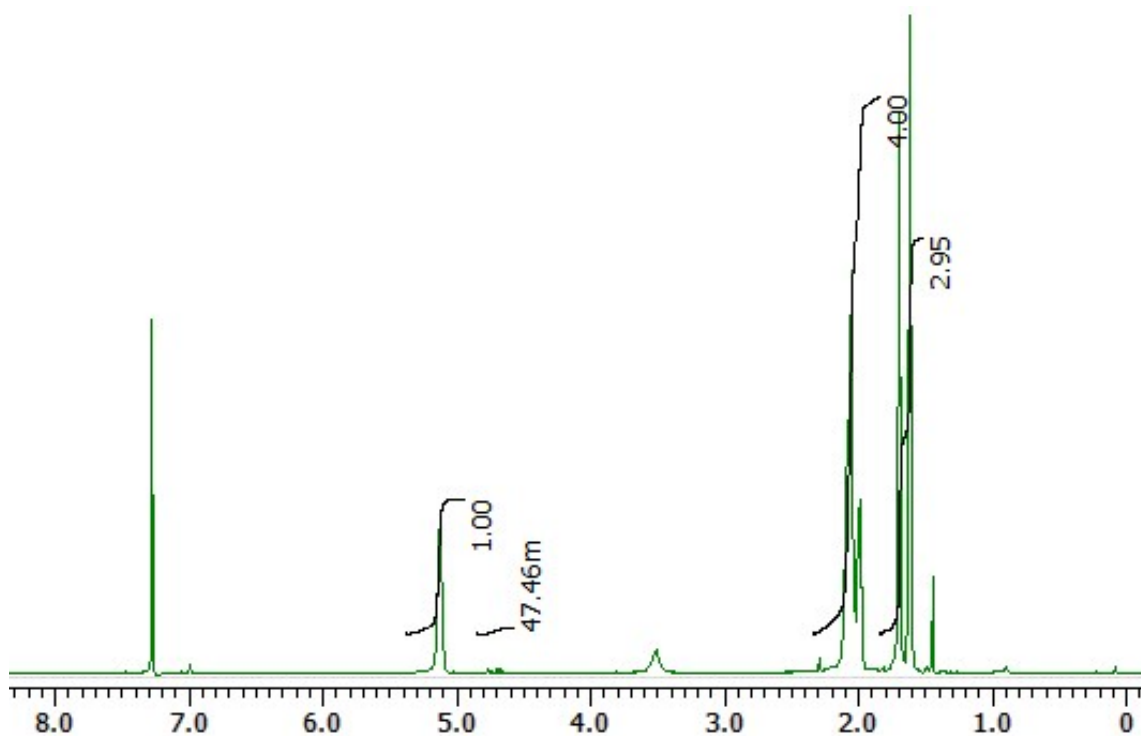
**Figure S10.**  $^{13}\text{C}$  NMR spectrum of polyisoprene obtained in Table 1, Run 6.



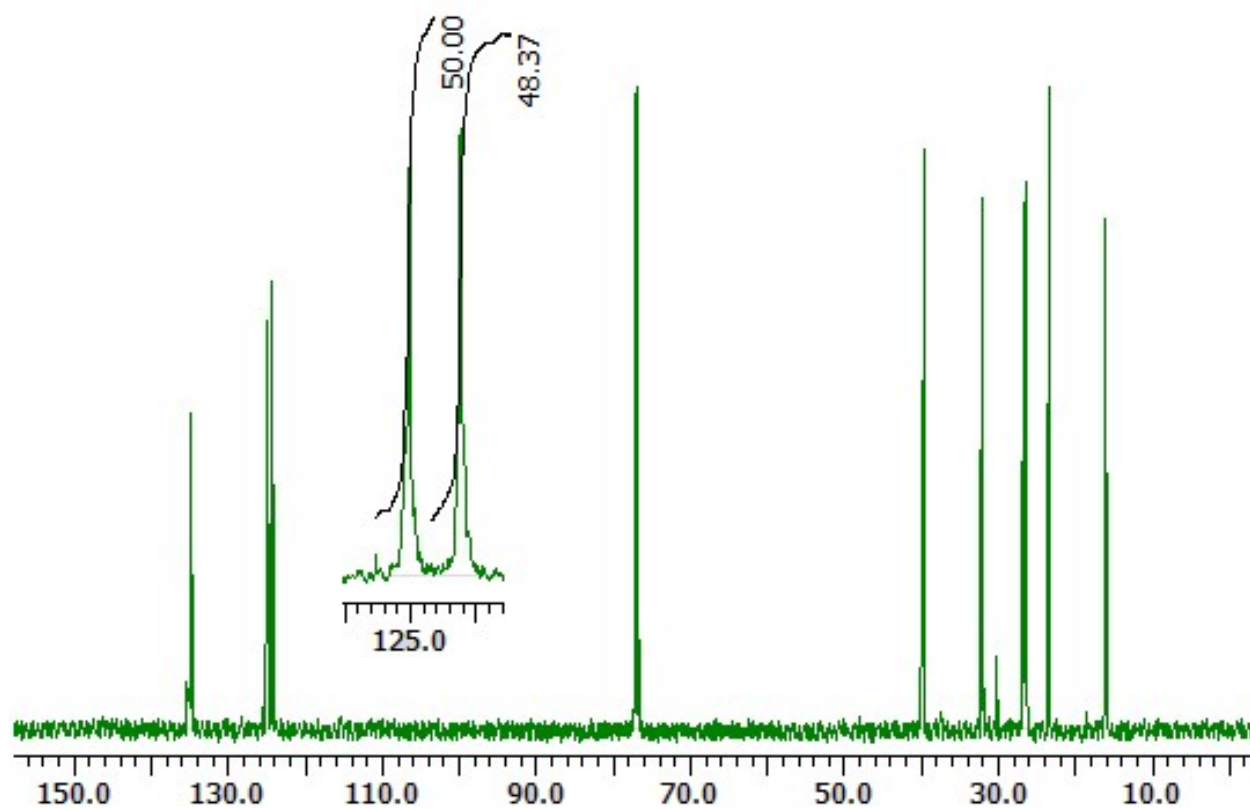
**Figure S11.**  $^{13}\text{C}$  NMR spectrum of polyisoprene obtained in Table 1, Run 7.



**Figure S12.**  $^{13}\text{C}$  NMR spectrum of polyisoprene obtained in Table 1, Run 8.

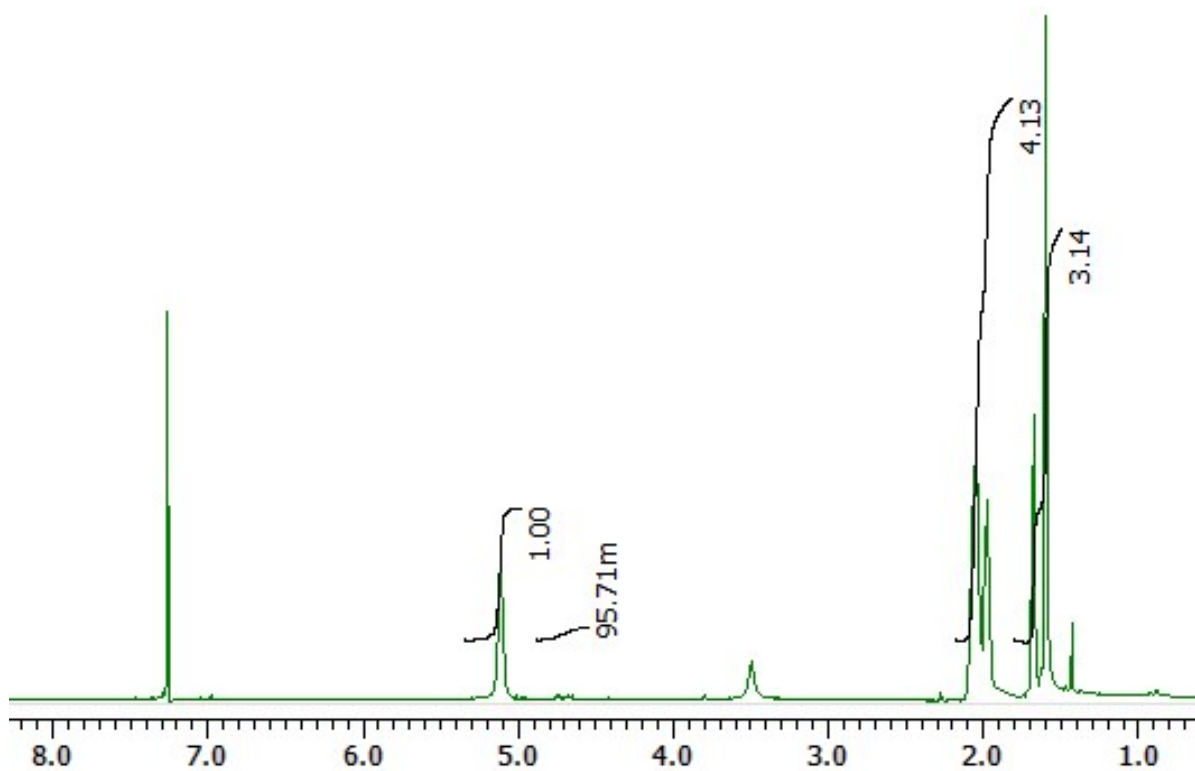


**Figure S13.**  $^1\text{H}$  NMR spectrum of stereodiblock polyisoprene obtained in Table 2, Run 2.

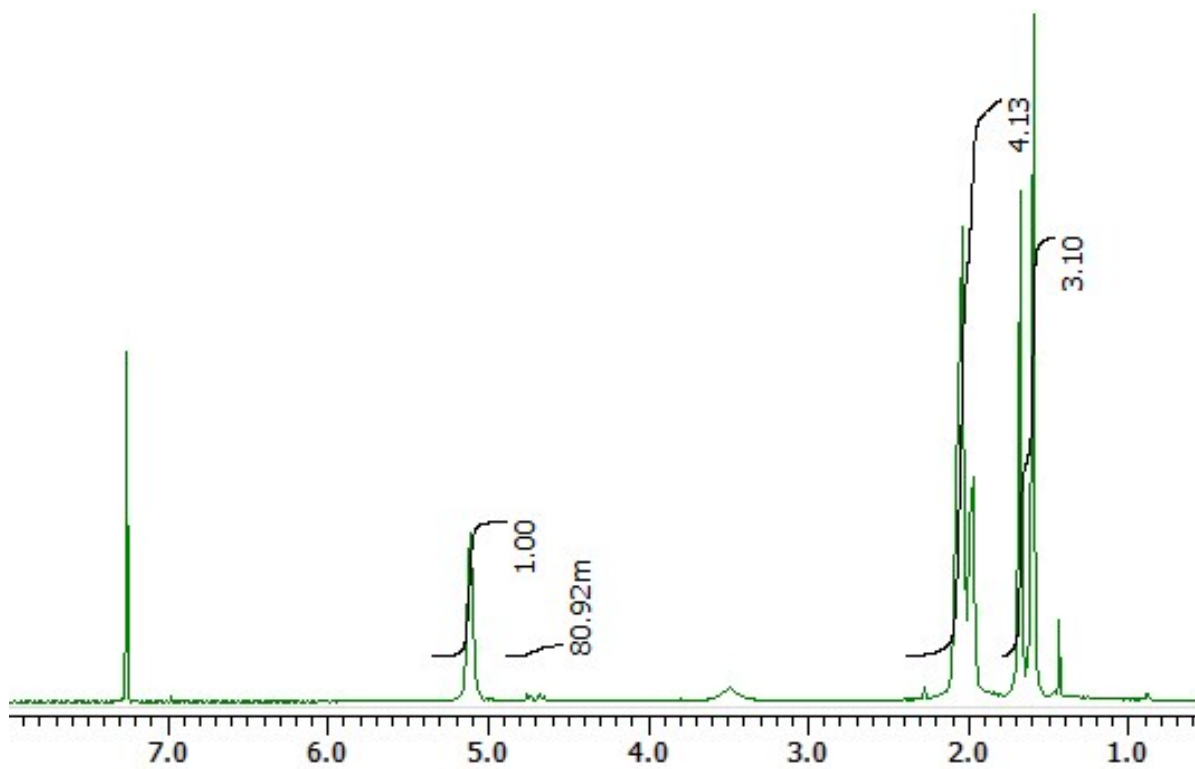




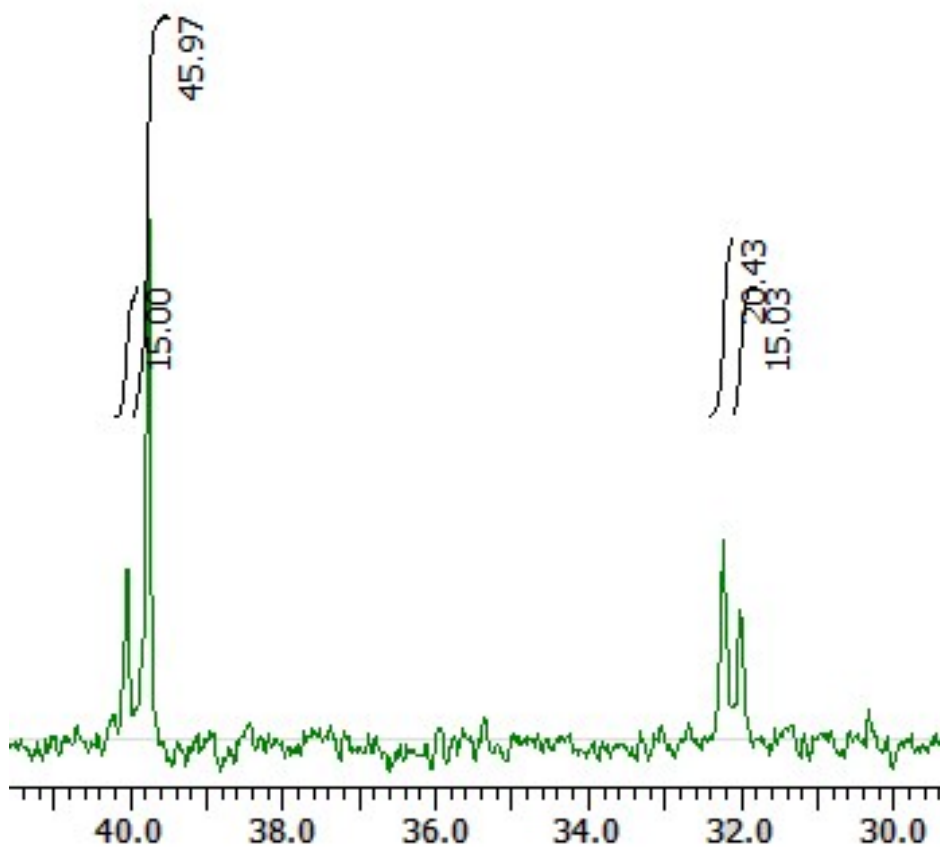
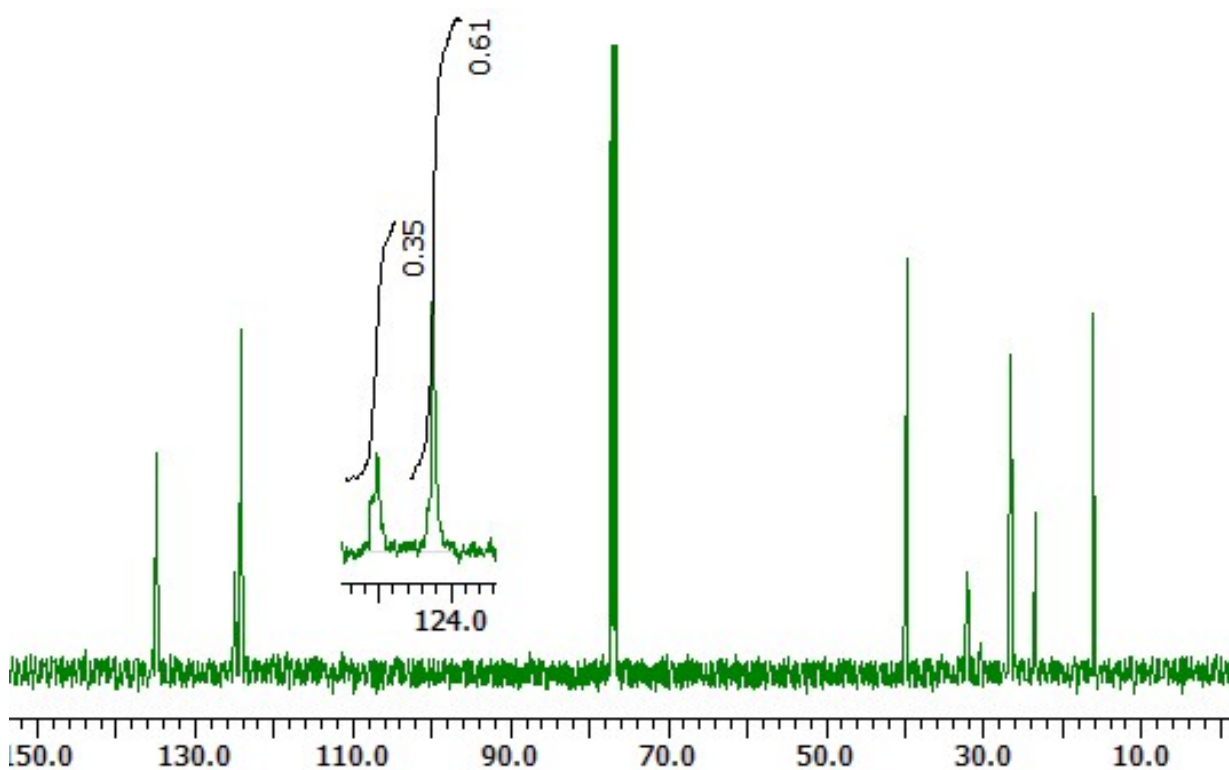
**Figure S14.**  $^{13}\text{C}$  NMR spectrum of stereodiblock polyisoprene obtained in Table 2, Run 2.



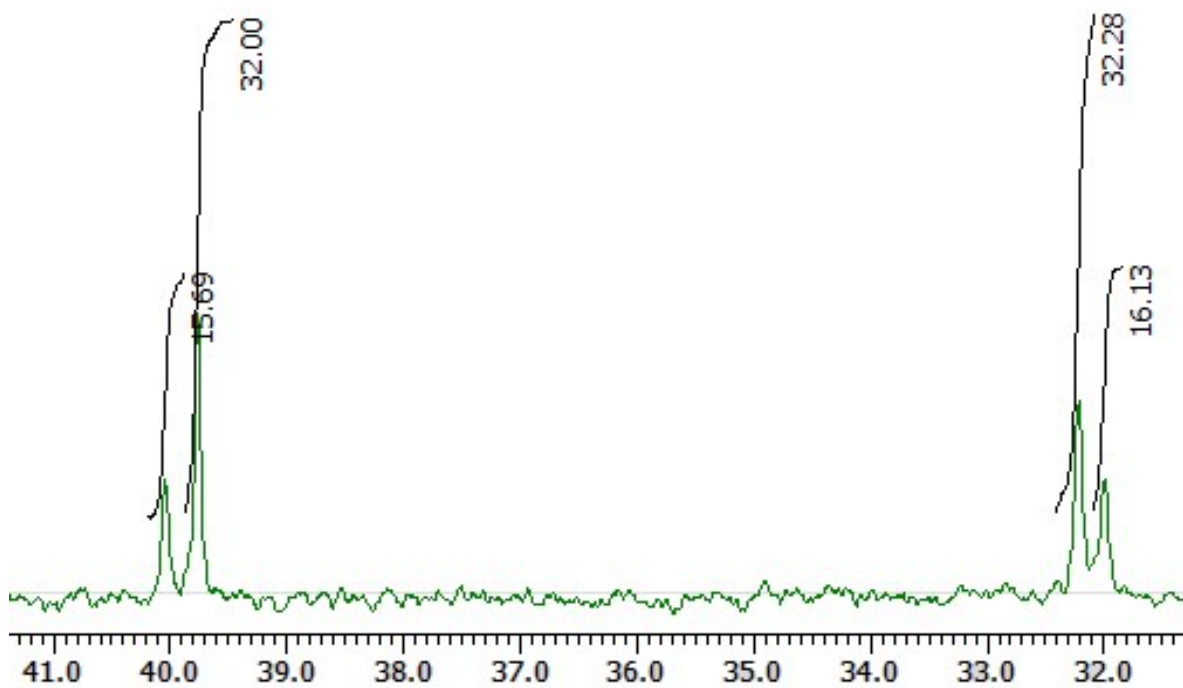
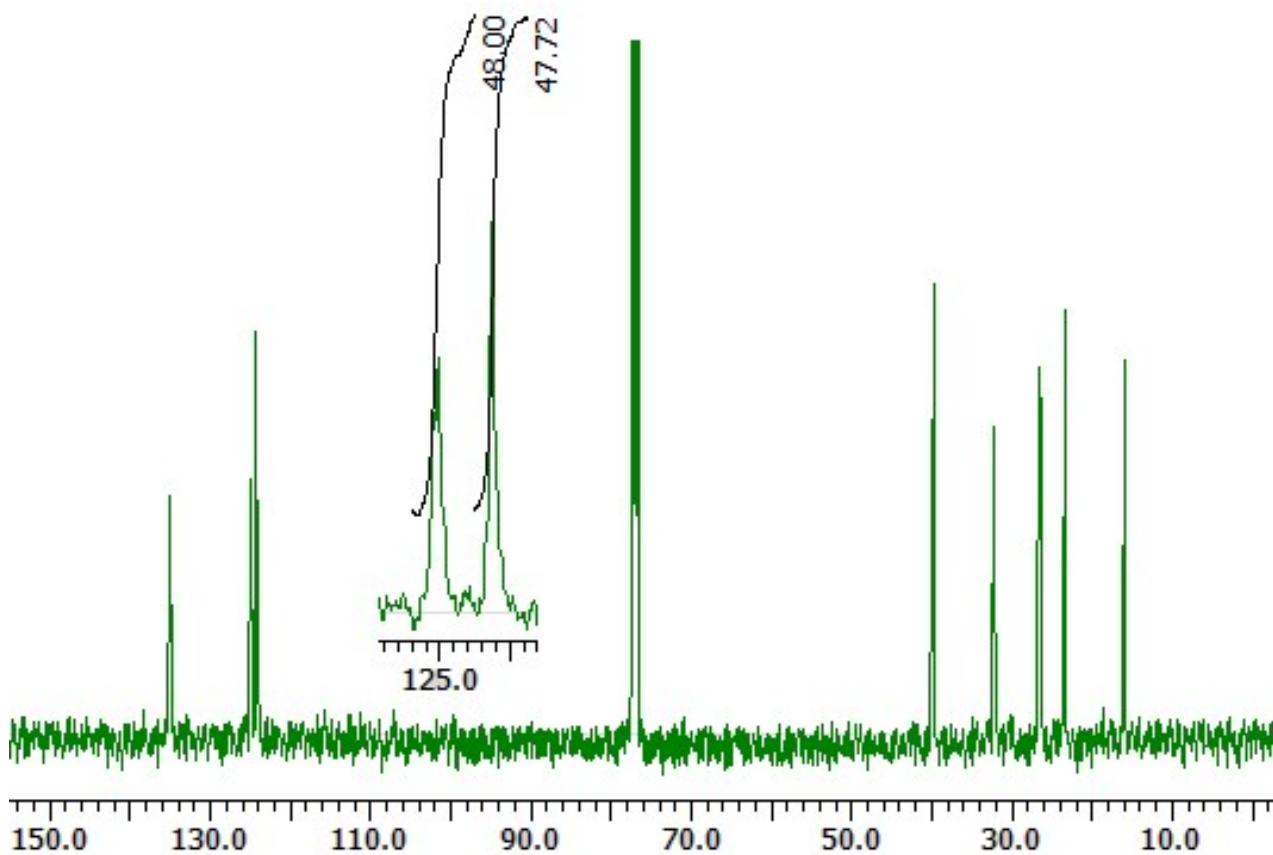
**Figure S15.**  $^1\text{H}$  NMR spectrum of stereodiblock polyisoprene obtained in Table 2, Run 3.



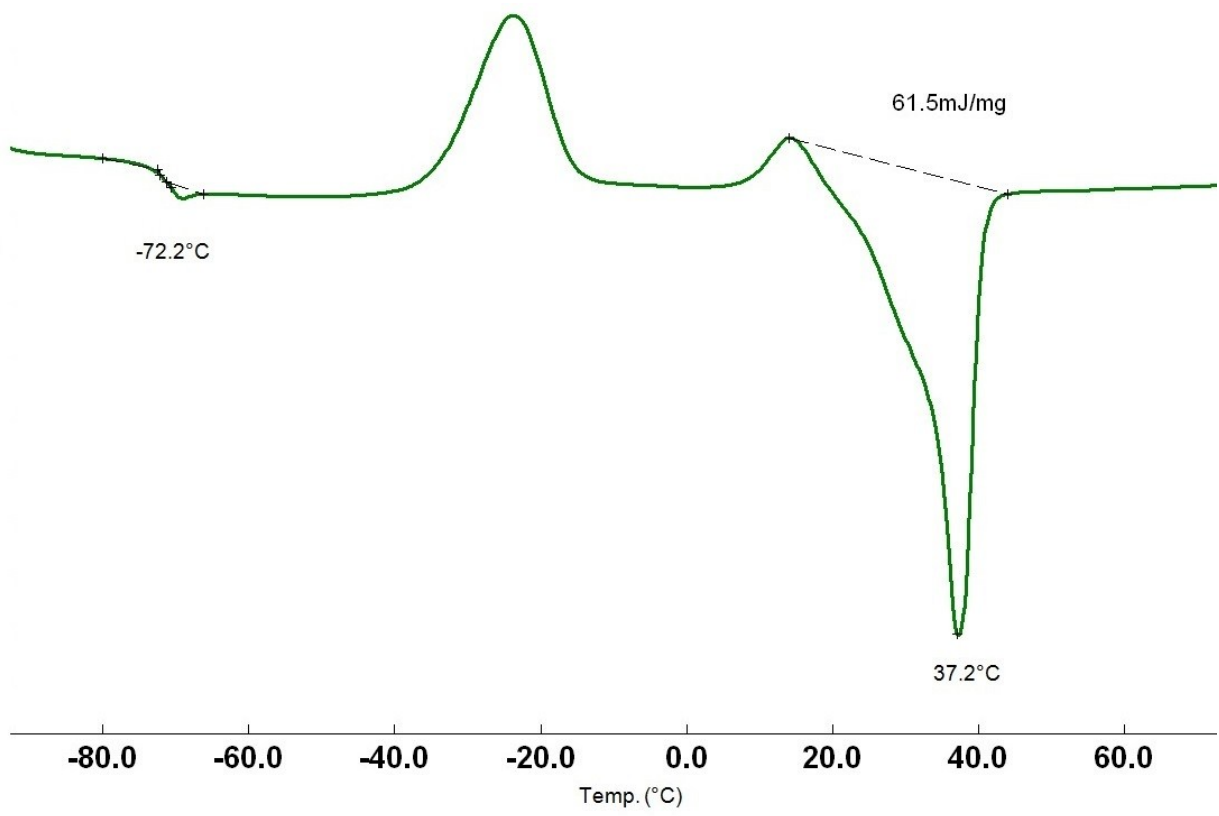
**Figure S16.**  $^1\text{H}$  NMR spectrum of stereodiblock polyisoprene obtained in Table 2, Run 4.



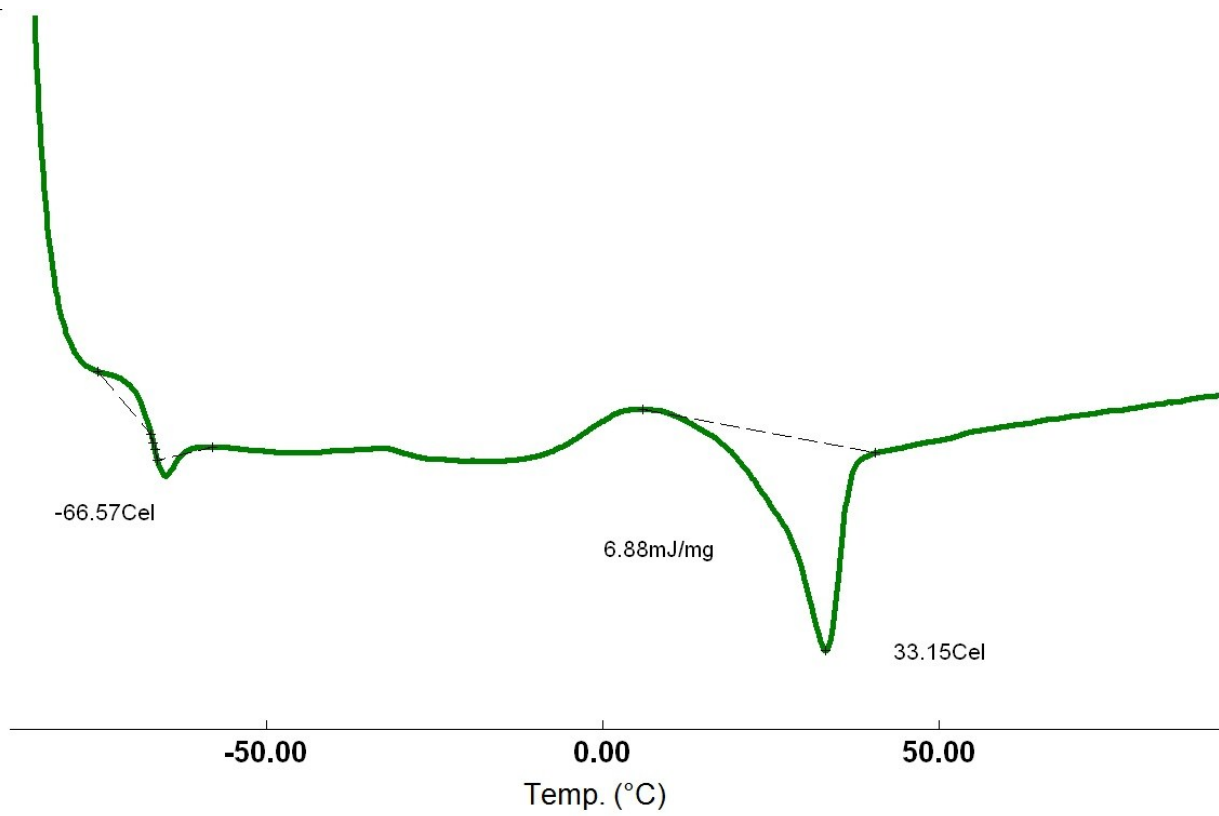
**Figure S17.**  $^{13}\text{C}$  NMR spectrum of stereodiblock polyisoprene obtained in Table 2, Run 3.



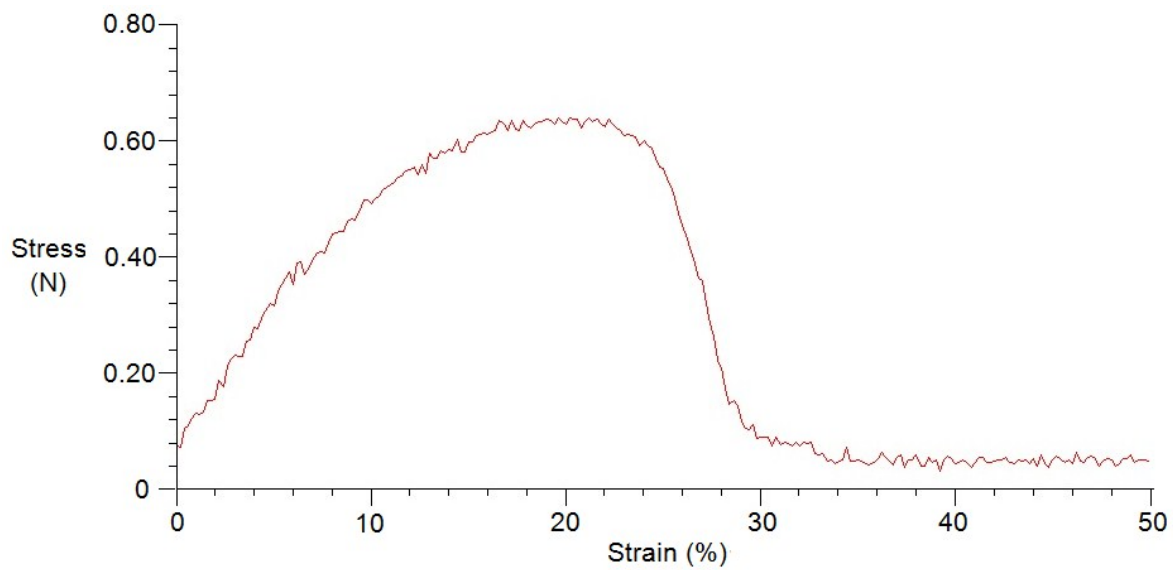
**Figure S18.**  $^{13}\text{C}$  NMR spectrum of stereodiblock polyisoprene obtained in Table 2, Run 4.



**Figure S19.** DSC chart of *trans*-1,4-polyisoprene obtained in Table 1, Run 1.



**Figure S20.** DSC chart of stereociblock polyisoprene obtained in Table 2, Run 2.



**Figure S21.** Stress-strain curve of the stereodiblock polyisoprene obtained in Table 2, Run 2.