

Supplementary Information

# Some Novel Cobalt Diphenylphosphine Complexes: Synthesis, Characterization, and Behavior in the Polymerization of 1,3-Butadiene

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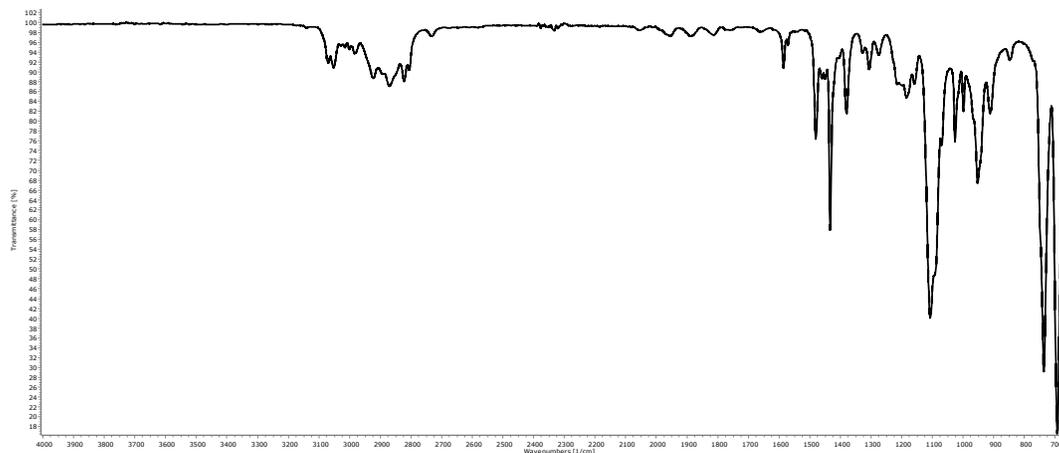
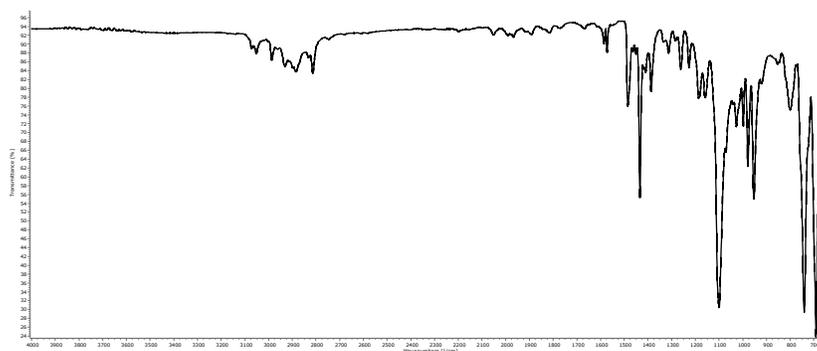
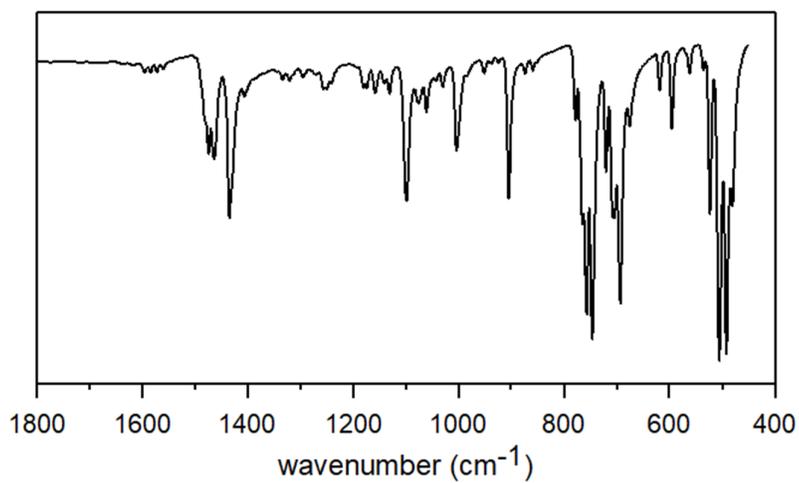


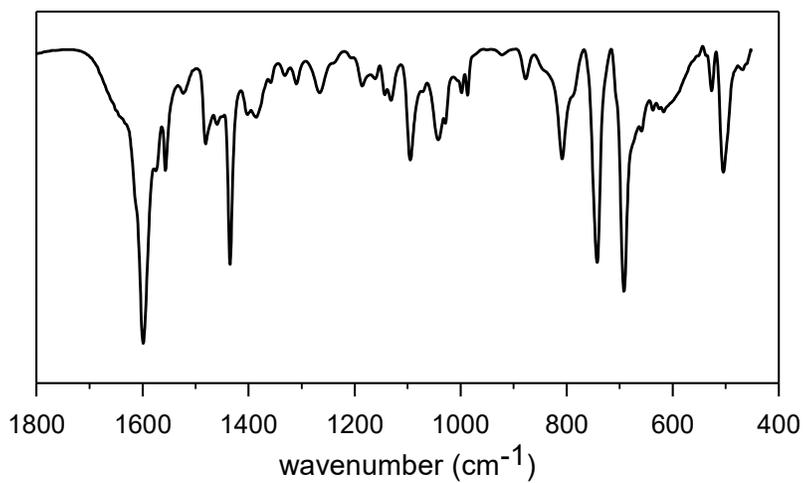
Figure S1. FT-IR spectrum of (2-methoxyethyl)diphenylphosphine.



**Figure S1A.** FT-IR spectrum of [(2-methoxyethyl)diphenylphosphine]<sub>2</sub> cobalt dichloride (1).



**Figure S2.** FT-IR spectrum of [(2-methoxyphenyl)diphenylphosphine]<sub>2</sub> cobalt dichloride (2).



**Figure S3.** FT-IR spectrum of [2-(1,1-dimethylpropyl)-6-(diphenylphosphino)pyridine]<sub>2</sub> cobalt dichloride (3).

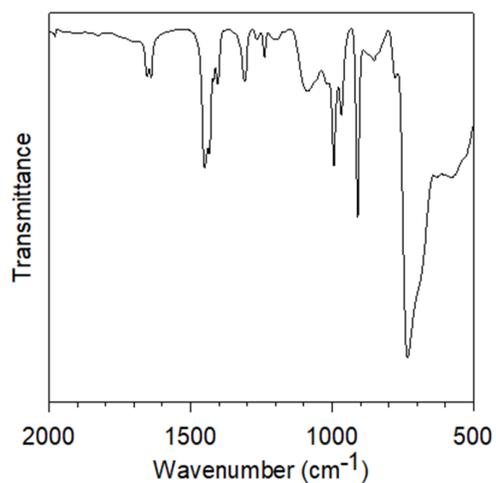


Figure S4. FT-IR spectrum of the polybutadiene of Table 3, run 1.

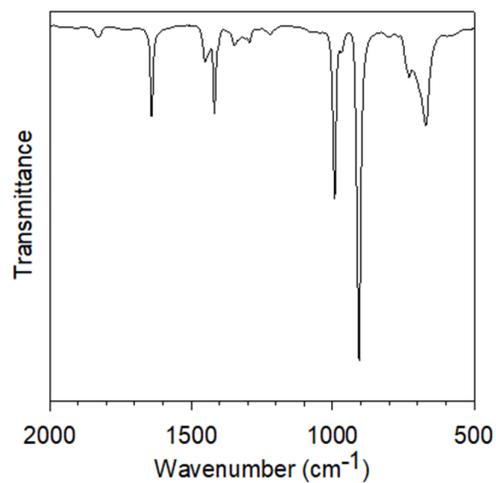


Figure S5. FT-IR spectrum of the polybutadiene of Table 3, run 2.

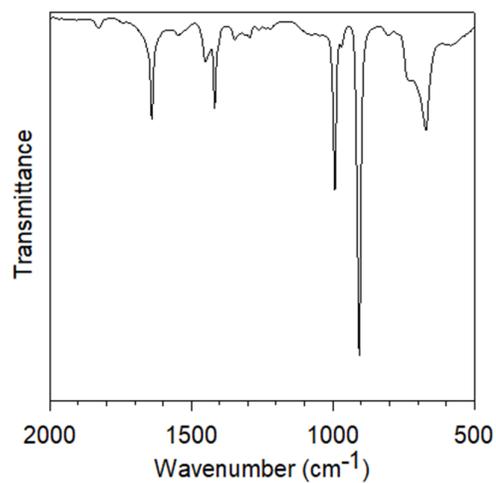


Figure S6. FT-IR spectrum of the polybutadiene of Table 3, run 3.

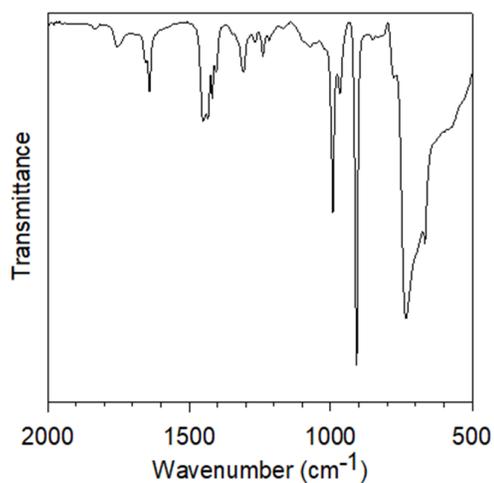


Figure S7. FT-IR spectrum of the polybutadiene of Table 3, run 4.

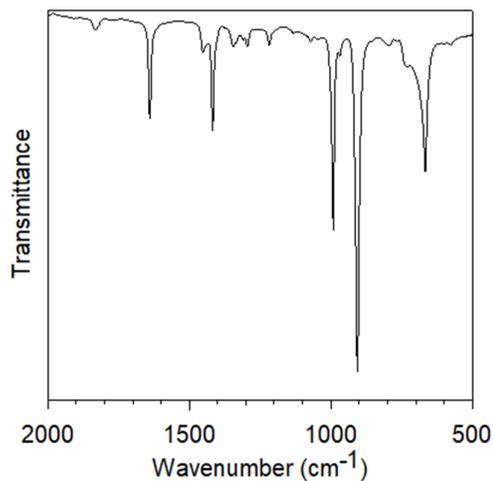


Figure S8. FT-IR spectrum of the polybutadiene of Table 3, run 5.

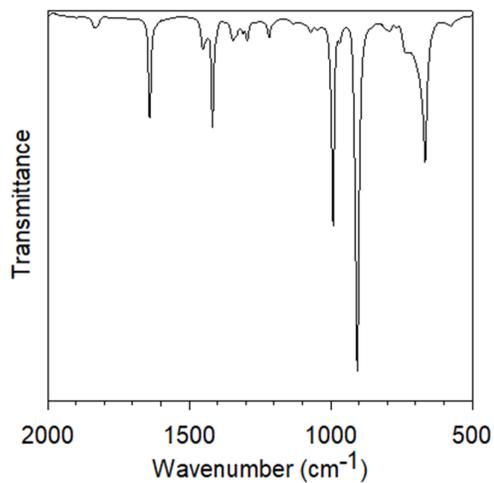


Figure S9. FT-IR spectrum of the polybutadiene of Table 3, run 6.

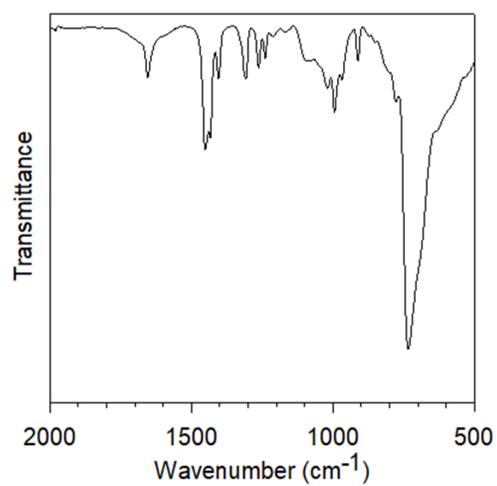


Figure S10. FT-IR spectrum of the polybutadiene of Table 3, run 7.

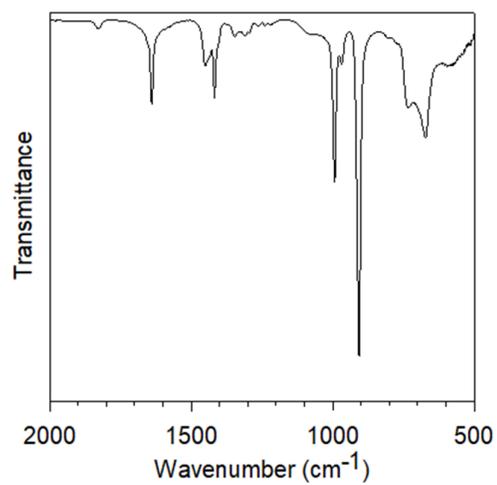
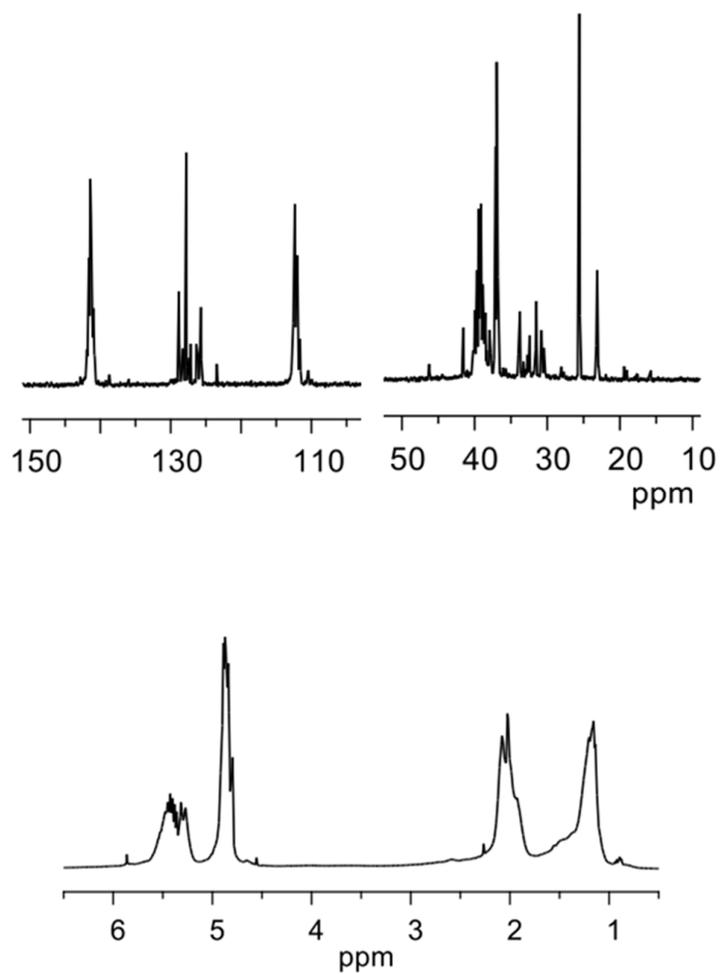
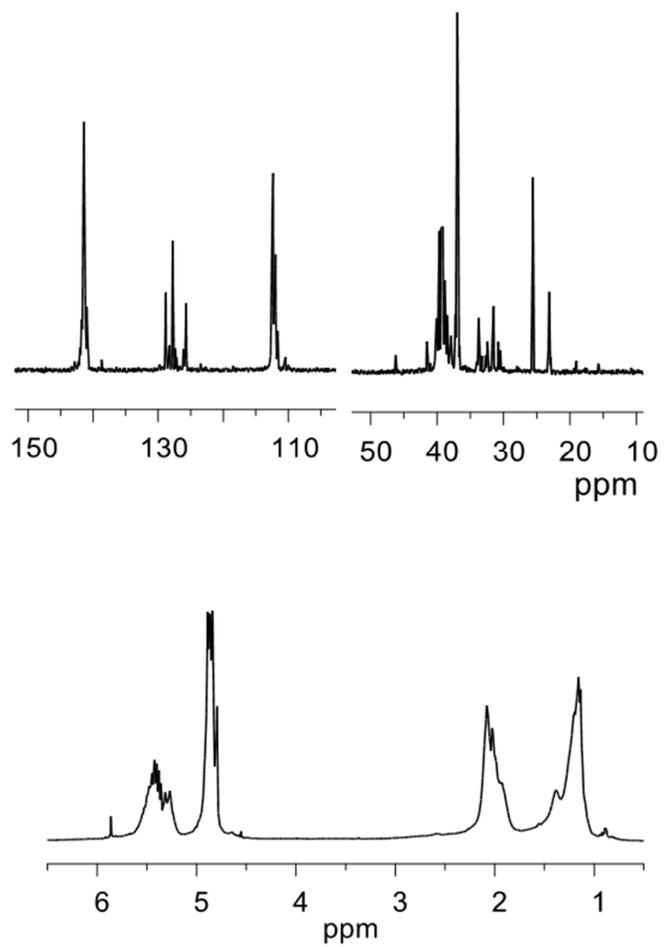


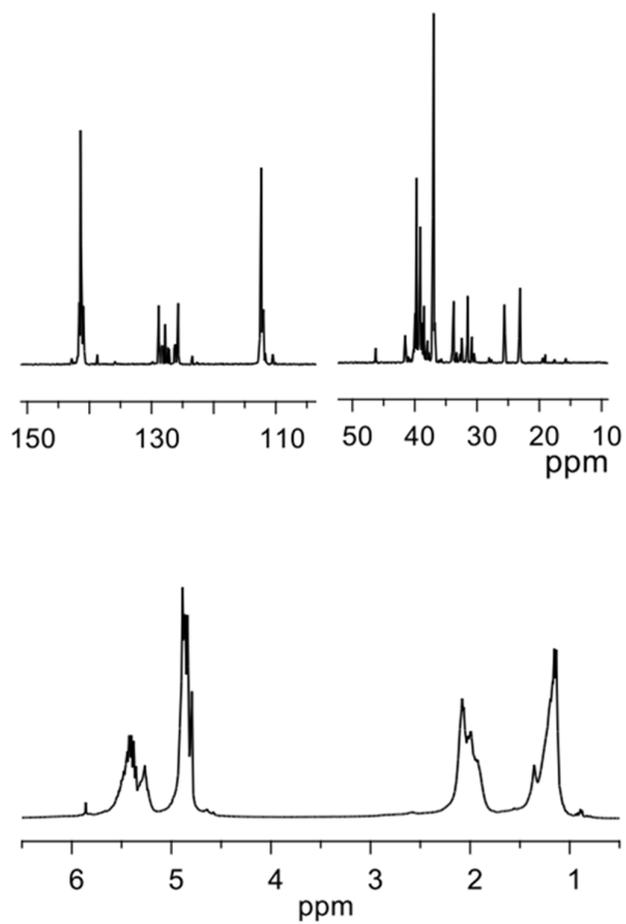
Figure S11. FT-IR spectrum of the polybutadiene of Table 3, run 8.



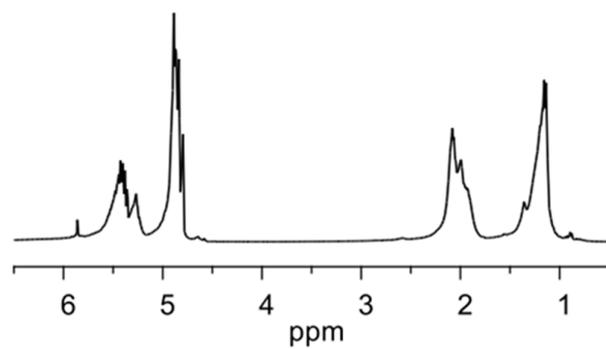
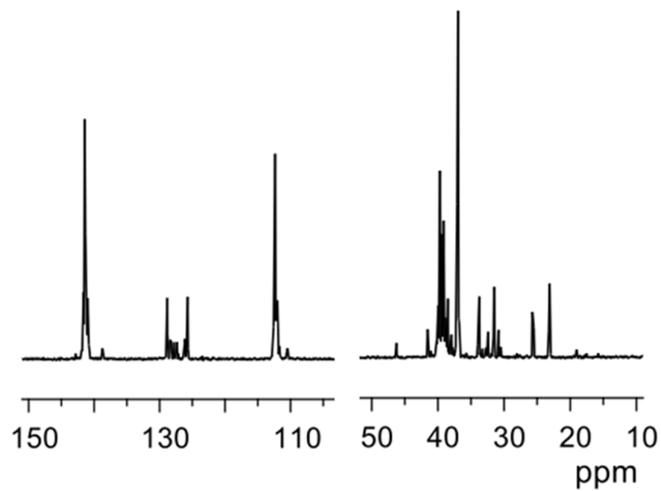
**Figure S12.** NMR spectra ( $^1\text{H}$  down,  $^{13}\text{C}$  up) of the polybutadiene of Table 3, run 2.



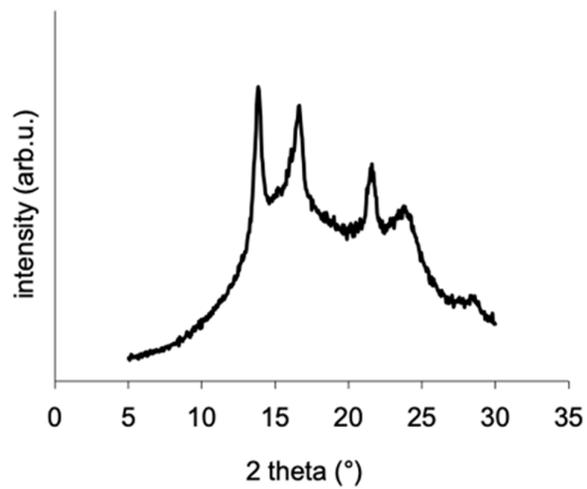
**Figure S13.** NMR spectra ( $^1\text{H}$  down,  $^{13}\text{C}$  up) of the polybutadiene of Table 3, run 3.



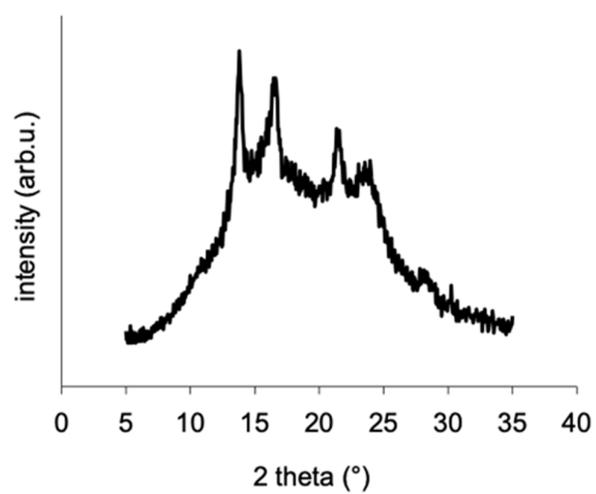
**Figure S14.** NMR spectra ( $^1\text{H}$  down,  $^{13}\text{C}$  up) of the polybutadiene of Table 3, run 5.



**Figure S15.** NMR spectra ( $^1\text{H}$  down,  $^{13}\text{C}$  up) of the polybutadiene of Table 3, run 6.



**Figure S16.** XRD spectrum of the polybutadiene of Table 3, run 5.



**Figure S17.** XRD spectrum of the polybutadiene of Table 3, run 6.