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## SUPPORTING INFORMATION

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**<u>Title:</u>** PEPPSI-Type Palladium–NHC Complexes: Synthesis, Characterization, and Catalytic Activity in the Direct C5-Arylation of 2-Substituted Thiophene Derivatives with Aryl Halides

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Figure S1. <sup>1</sup>H NMR spectrum of 2a (CDCl<sub>3</sub>)



Figure S2. <sup>13</sup>C NMR spectrum of 2a (CDCl<sub>3</sub>)



Figure S3. IR spectrum of 2a



Figure S4.  $^{1}$ H NMR spectrum of 2b (CDCl<sub>3</sub>)



Figure S5. <sup>13</sup>C NMR spectrum of 2b (CDCl<sub>3</sub>)



Figure S6. IR spectrum of 2b



Figure S7. <sup>1</sup>H NMR spectrum of 2c (CDCl<sub>3</sub>)



Figure S8. <sup>13</sup>C NMR spectrum of 2c (CDCl<sub>3</sub>)



Figure S9. IR spectrum of 2c



Figure S10. <sup>1</sup>H NMR spectrum of 2d (CDCl<sub>3</sub>)



Figure S11. <sup>13</sup>C NMR spectrum of 2d (CDCl<sub>3</sub>)



Figure S12. IR spectrum of 2d



Figure S13. <sup>1</sup>H NMR spectrum of 2e (CDCl<sub>3</sub>)



Figure S14. <sup>13</sup>C NMR spectrum of 2e (CDCl<sub>3</sub>)



Figure S15. IR spectrum of 2e



Figure S16. <sup>1</sup>H NMR spectrum of 2f (CDCl<sub>3</sub>)



Figure S17. <sup>13</sup>C NMR spectrum of 2f (CDCl<sub>3</sub>)



Figure S18. IR spectrum of 2f



Figure S19. <sup>1</sup>H NMR spectrum of 3a (CDCl<sub>3</sub>)



Figure S20. <sup>13</sup>C NMR spectrum of 3a (CDCl<sub>3</sub>)



Figure S21. IR spectrum of 3a



Figure S22. <sup>1</sup>H NMR spectrum of 3b (CDCl<sub>3</sub>)



Figure S23. <sup>13</sup>C NMR spectrum of 3b (CDCl<sub>3</sub>)



Figure S24. IR spectrum of 3b



Figure S25. <sup>1</sup>H NMR spectrum of 3c (CDCl<sub>3</sub>)



Figure S26. <sup>13</sup>C NMR spectrum of 3c (CDCl<sub>3</sub>)



Figure S27. IR spectrum of 3c



Figure S28. <sup>1</sup>H NMR spectrum of 3d (CDCl<sub>3</sub>)



Figure S29. <sup>13</sup>C NMR spectrum of 3d (CDCl<sub>3</sub>)



Figure S30. IR spectrum of 3d



Figure S31. <sup>1</sup>H NMR spectrum of 3e (CDCl<sub>3</sub>)



Figure S32. <sup>13</sup>C NMR spectrum of **3e** (CDCl<sub>3</sub>)



Figure S33. IR spectrum of 3e



Figure S34. <sup>1</sup>H NMR spectrum of 3f (CDCl<sub>3</sub>)



Figure S35. <sup>13</sup>C NMR spectrum of 3f (CDCl<sub>3</sub>)



Figure S36. IR spectrum of 3f