

# Stabilized Palladium Nanoparticles from Bis-(*N*-benzoylthiourea) Derived-Pd<sup>II</sup> Complexes as Efficient Catalysts for Sustainable Cross-Coupling Reactions in Water

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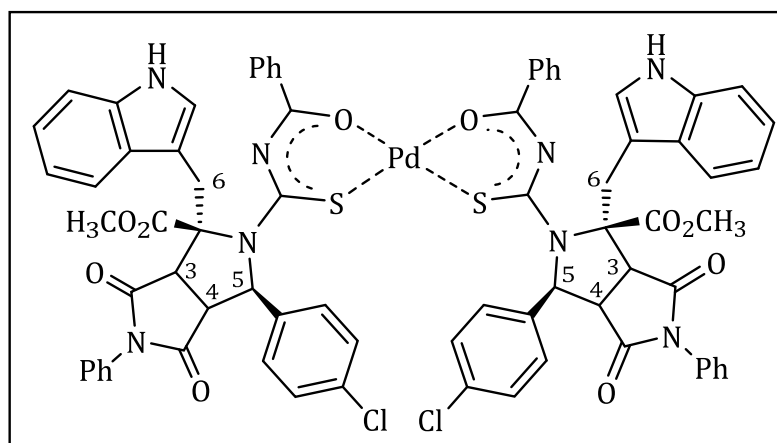
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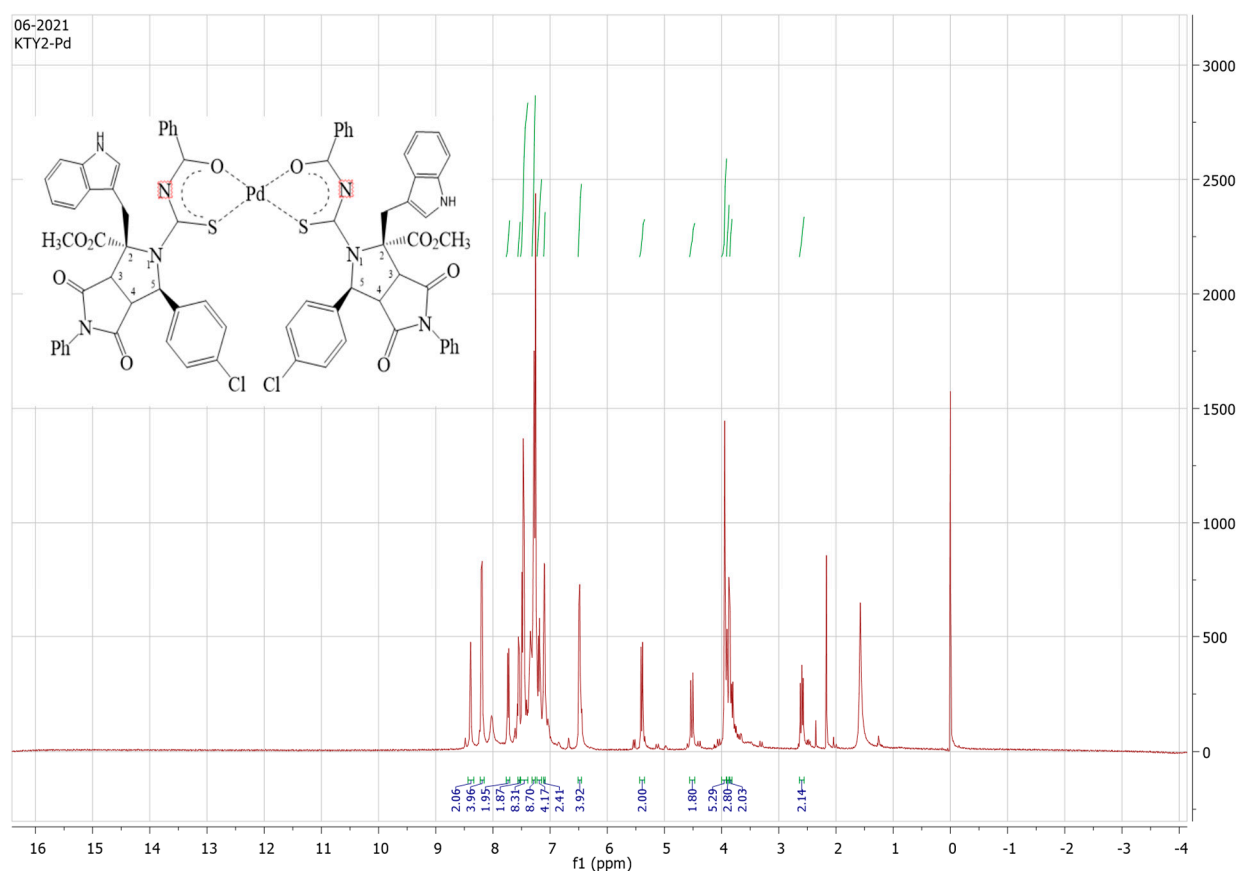
## Complex 2



Brownish-yellow solid, 123 mg, 90% yield; mp 253–255 °C (MeOH, decomp.); IR (cm<sup>-1</sup>)  $\nu_{\text{max}}$ : 3417, 3060, 2952, 1790, 1716, 1495, 1391, 1258, 1201, 1168, 1093, 743.  $\delta_{\text{H}}$  (400 MHz, CDCl<sub>3</sub>): 8.39 (s, 2H, N-H), 8.20 (d, 4H, *J* = 7.3 Hz, Ar-H), 7.73 (d, 2H, *J* = 7.8 Hz, Ar-H), 7.55 (d, 2H, *J* = 7.3 Hz, Ar-H), 7.51–7.36 (m, 9H, Ar-H), 7.32–7.26 (m, 9H, Ar-H), 7.19 (d, 4H, *J* = 7.7 Hz, Ar-H), 7.10 (d, 2H, *J* = 1.9 Hz, Ar-H), 6.52–6.45 (m, 4H, Ar-H), 5.40 (d, 2H, *J* = 11.0 Hz, 5-H), 4.52 (d, 2H, *J* = 15.10 Hz, 6-H),

3.95 (s, 6H, OCH<sub>3</sub>), 3.89 (d, 2H, *J* = 15.00 Hz, 6'-*H*), 3.84 (d, 2H, *J* = 9.5 Hz, 3-*H*), 2.60 (dd, 2H, *J* = 10.8 Hz, 9.1 Hz, 4-*H*).  $\delta_c$  (100 MHz, CDCl<sub>3</sub>): 172.66 (2xC=S), 172.63 (2xC=O), 172.25 (2xC=O), 172.00 (2xC=O), 169.67 (2xC=O), 136.02 (2C), 135.91 (2C), 135.83 (2C), 133.88 (2C), 132.59 (2C), 130.74 (2C), 130.12 (6C), 129.03 (6C), 128.74 (2C), 128.34 (6C), 127.75 (2C), 125.72 (6C), 124.33 (2C), 122.89 (2C), 120.78 (2C), 117.85 (2C), 111.96 (2C), 108.72 (2C), 68.90 (2C), 54.13 (2C), 53.15 (2C), 48.59 (2C), 31.77 (2C), 30.89 (2C). HRMS: calculated for C<sub>74</sub>H<sub>60</sub>Cl<sub>2</sub>N<sub>8</sub>O<sub>10</sub>PdS<sub>2</sub>: 1462.7717, found: 1462.7711. EA calculated for C<sub>74</sub>H<sub>60</sub>Cl<sub>2</sub>N<sub>8</sub>O<sub>10</sub>PdS<sub>2</sub>: C 60.8, H 4.1, N 7.7, S 4.4 %; found: C 60.5, H 4.4, N 7.7, S 4.5 %

### <sup>1</sup>H NMR spectra of complex 2



### <sup>13</sup>C-NMR spectra of complex 2

