# A facile synthesis of solvent-dispersible magnetically recoverable $Pd^0$ catalyst for C-C coupling reaction

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Biphenyl. $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 1，12，18**
δ 7.343 (t, 2H, $J_{HH}$=7.2 Hz), 7.439 (t, 4H, $J_{HH}$=7.6 Hz), 7.594 (d, 4H, $J_{HH}$=4.0 Hz)

4-methyl-biphenyl. $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 2 ，5**
δ 2.376 (s, 3H, C$H_3$), 7.230 (d, 2H, $J_{HH}$=4.0 Hz), 7.302 (t, 1H, $J_{HH}$=7.2 Hz), 7.405 (t, 2H, $J_{HH}$=7.6 Hz), 7.468 (t, 2H, $J_{HH}$=9.6 Hz), 7.564 (d, 2H, $J_{HH}$=4.0 Hz)

4,4'-dimethyl-biphenyl. $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 3，14**
δ 2.381 (s, 6H), 7.229 (d, $J_{HH}$ =7.6 Hz, 4H), 7.473(d, $J_{HH}$ =8.0 Hz, 4H)

4-acetyl-biphenyl $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 4，13**
2.19 (s, 3H) 7.405 (t, 1H, $J_{HH}$=7.2 Hz), 7.478 (t, 2H, $J_{HH}$=7.6 Hz), 7.633 (d, 2H, $J_{HH}$=3.6 Hz), 7.689 (d, 2H, $J_{HH}$=4.0 Hz), 8.037 (d, 2H, $J_{HH}$=4.0 Hz)

4-Hydroxy –biphenyl $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 6**
4.75 (s, 1H) ， 6.91 (d, J = 8.4Hz, 2H), 7.33-7.30 (m, 1H), 7.42 (t, J = 7.6Hz, 2H), 7.49 (d, J = 7.6Hz, 2H),δ =7.57-7.54(m, 2H)

4-Nitro-biphenyl. $^1$H NMR (($CD_3$)$_2$SO, 400 MHz, 25℃) **Table 2, entry 7，11**
δ 6.849 (d, 1H, $J_{HH}$=8.8 Hz), 7.268 (t, 2H, $J_{HH}$=7.6Hz), 7.402 (t, 2H, $J_{HH}$=7.8 Hz), 7.478 (d, 2H, $J_{HH}$=8.4 Hz), 7.566 (d, 2H, $J_{HH}$=7.6 Hz)

4-methyl-4'-niro-biphenyl. $^1$H NMR (($CD_3$)$_2$SO, 400 MHz, 25℃) **Table 2, entry 8，16**
δ 2.365 (s, 3H, C$H_3$), 7.336 (d, 2H, $J_{HH}$=4.0 Hz), 7.685 (d, 2H, $J_{HH}$=3.6 Hz), 7.928 (d, 2H, $J_{HH}$=4.0 Hz), 8.275 (d, 2H, $J_{HH}$=4.0 Hz)

4-Cyanobiphenyl $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 9**
δ = 7.49-7.40 (m, 4H)， 7.59-7.55 (m, 1H),7.69 (q, J = 8.8Hz, 4H)

N-Acetyl-4-aminobiphenyl .$^1$H NMR (400 MHz, $CDCl_3$, 25℃) **Table 2, entry 10**
δ = 2.19 (s, 3H), 7.34-7.30 (m, 1H), 7.41 (t, J = 7.6Hz, 2H), 7.59-7.52 (m, 6H), 7.66 (s, 1H)

4-Chloro-4'-methoxybiphenyl .$^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 15**
δ =3.86 (s, 3H), 6.93 (d, J = 8.8 Hz, 2H), 7.41-7.36 (m, 2H),7.52-7.50 (m, 4H)

4-Chloridebiphenyl .$^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 17，18**
δ 7.49-7.37 (m, 5H) ， 7.57-7.51 (m, 4H),

4-Methoxybiphenyl. $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 2, entry 19**
δ = 3.85 (s, 3H), 6.98 (d, J = 7.2 Hz, 2H), 7.30 (t, J = 7.6 Hz, 1H), 7.41 (t, J = 7.6Hz, 2H),7.56-7.51 (m, 4H)

(E)-Stilbene $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 3, entry 1,5**
δ 7.60 (d, J=1.0 Hz, 4H), δ 7.43 (t, J=7.5 Hz, 4H), δ 7.32 (t, J=7.2 Hz, 2H), δ 7.19 (s, 2H).

4-Methylstilbene $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 3, entry 2,6**
δ 7.48 (d, J=7.6 Hz, 2H), δ 7.40 (d, J=8.0 Hz, 2H), δ 7.33 (t, J=8.0 Hz, 2H), δ 7.23 (t, J=7.2 Hz,1H), δ 7.15 (d, J=8.0 Hz, 2H), δ 7.06 (d, J=2.4 Hz, 1H), δ 2.34 (s, 3H).

4-Methoxystilbene $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 3, entry 3,7**
δ 7.36 (d, J=7.4 Hz, 2H), δ 7.33 (d, J=8.7 Hz, 2H), δ 7. 24 (m, 1H), δ 6.94 (d, J=16.3 Hz, 1H), δ 6.84 (d, J=16.3 Hz, 1H), δ 6.76 (d, J=8.7 Hz, 2H), δ 3.71 (s, 3H).

4-Acetylstilbene $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 3, entry 4,8**
δ 7.90 (d, J=8.4 Hz, 2H), δ 7.53 (d, J=8.4 Hz, 2H), δ 7.48 (m, 2H), δ 7.35 (m, 2H), δ 7.28 (m, 1H), δ 7.17 (d, J=16.3 Hz, 1H), δ 7.07 (d, J=16.3 Hz, 1H), δ 2.55 (s, 3H)

n-Butylbenzene $^1$H NMR ($CDCl_3$, 400 MHz, 25℃) **Table 4, entry 1,4**
δ = 7.27 (t, J = 6.7 Hz, 2H), 7.21–7.18 (m, 3H), 2.59 (t, J = 7.6 Hz, 2H), 1.66–1.50 (m, 2H), 1.38–1.21 (m, 2H), 0.86 (t, J = 6.5 Hz, 3H).

n-Butyl-4-methylbenzene 1H NMR (CDCl3, 400 MHz, 25℃) **Table 4, entry 2,6**
δ = 7.10 (s, 4H), 2.60 (t, J = 7.7 Hz, 2H), 2.33 (s, 3H), 1.65–1.53 (m, 2H), 1.44–1.25 (m, 2H), 0.94 (t, J = 6.6 Hz, 3H)

4-(n-Butyl)acetophenone 1H NMR (CDCl3, 400 MHz, 25℃) **Table 4, entry 3**
7.87 (d, 2 H, J = 8.0 Hz), 7.26 (d, 2 H, J = 8.0 Hz), 2.67 (t, 2 H, J = 7.5 Hz), 2.58 (s, 3 H), 1.58-1.64 (m, 2 H), 1.33-1.38 (m, 2 H), 0.93 (t, 3 H, J = 7.0 Hz)

4-(n-Butyl)benzonitrile 1H NMR (CDCl3, 400 MHz, 25℃) **Table 4, entry 5**
7.27 (d, 2 H, J = 8.0 Hz), 7.56 (d, 2 H, J = 8.0 Hz), 2.66 (t, 2 H, J = 7.5 Hz), 1.60 (m, 2 H), 1.35 (m, 2 H), 0.95 (t, 3 H, J = 7.5 Hz)