Supporting Information
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Electronic Supplementary Information

Iron Catalyzed Inexpensive and practical Synthesis of N-Substituted Pyrroles in Water

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**General Experimental Methods:** $^{1}$H NMR spectra were recorded on 500 MHz NMR spectrometer and $^{13}$C NMR spectra were recorded on 125 MHz NMR spectrometer respectively using CDCl$_3$/DMSO or DMSO, as a solvent, Chemical shifts have been expressed in (ppm) downfield from TMS. Melting points are measured on a Buchi Melting Point B-545 apparatus and are uncorrected. All amines, 2,5 dimethoxytetrahydrofuran and solvent are commercially available and were purchased and used without further purification; water and other solvent were distilled before used.

**General procedure General Procedure for the Synthesis of Pyrroles.** To a mixture of the amine (5 mmol) and 2,5 dimethoxytetrahydrofuran (6 mmol) in Water (4 mL) at 60 °C FeCl$_3$.7H$_2$O (2 mol%) was added. The mixture was stirred at this temperature for 1-4 h and was diluted with Ethyl acetate, filtered on buckner. The organic solution was evaporated under vacuum affording the Pyrrole derivative with good analytical purity. In the few cases, the crude product was purified by flash chromatography (silica gel, eluent: ethyl acetate).
Table 1, 2a: 1-Phenyl-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 6.20 (d, $J$=1.8 Hz, 2H), 7.19-7.43 (m, 7H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 111.2, 119.5, 120.2, 126.0, 130.3, 140.8.

Table 1, 2e: 1-(3,4-dichlorophenyl)-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 6.37 (t, $J$=1.9 Hz, 2H), 7.23 (t, $J$= 7.6 Hz, 2H), 2.67 (t, $J$= 2 Hz, 2H), 7.10 (t, $J$= 2 Hz, 2H), 7.25 (d, $J$=8.2 Hz, 2H), 3.32 (d, $J$=8.2 Hz, 2H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 14.4, 22.8, 34.1, 35.5, 110.5, 119.8, 120.9, 129.8, 139.0, 146.8.

Table 1, 2j: 1-(4-isopropylphenyl)-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 1.29 (d, $J$=6.9 Hz, 6H), 2.96 (hep, $J$=6.9 Hz, 1H), 6.35 (t, $J$=2 Hz, 2H), 7.08 (t, $J$= 2 Hz, 2H), 7.28-7.34 (m, 4H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 24.4, 34.0, 110.4, 119.8, 121.0, 127.8, 139.1, 146.8.

Table 1, 2k: 1-(4-$n$-butylphenyl)-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 0.99 (t, $J$=7.3 Hz, 3H), 1.39-1.44 (m, 2H), 1.64-1.67 (m, 2H), 2.67 (t, $J$= 2 Hz, 2H), 7.10 (t, $J$= 2 Hz, 2H), 7.25 (d, $J$=8.2 Hz, 2H), 7.32 (d, $J$=8.2 Hz, 2H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 14.4, 22.8, 34.1, 35.5, 110.5, 119.8, 120.9, 129.8, 139.0, 140.8.

Table 1, 2n: 1-(2,6-dimethylphenyl)-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 2.07 (s, 6H), 6.36 (t, $J$=1.8 Hz, 2H), 6.64 (t, $J$= 1.8 Hz, 2H), 7.15 (d, $J$= 7.5 Hz, 2H), 7.25-7.27 (m, 1H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 17.9, 108.9, 121.8, 128.4, 128.4 136.7, 140.1.

Table 1, 2o: 1-(2,4,6-trimethylphenyl)-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 2.03 (s, 6H), 2.37 (s, 3H), 6.35 (t, $J$=1.9 Hz, 2H), 6.62 (t, $J$=1.9 Hz, 2H), 6.97 (s, 1H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 17.7, 21.4, 108.8, 122.0, 129.0, 136.6, 137.9, 138.1.

Table 1, 2u: 1-(1-ethylphenylamine)-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 1.83 (d, $J$=7.0 Hz, 3H), 5.30 (q, $J$=7.0 Hz, 1H), 6.19 (t, $J$=2.1 Hz, 2H), 6.76 (t, $J$=2.1 Hz, 2H), 7.09-7.31 (m, 5H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 22.5, 58.4, 108.4, 119.9, 126.2, 127.8, 129.0, 143.9.

Scheme 2, 3b: 1-$(p$-toluenesulfonyl)-Pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 2.37 (s, 3H), 6.28 (t, $J$= 1.9 Hz, 2H), 7.16 (t, $J$=1.9 Hz, 2H), 7.26 (d, $J$= 7.9 Hz, 2H), 7.73 (d, $J$= 7.9 Hz, 2H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 22.0, 114.0, 121.1, 127.2, 130.3, 136.5, 145.4.

Scheme 3, 4a: 1-Benzoyl-pyrrole

$^1$H NMR (500 MHz, CDCl$_3$) δ 6.35 (t, $J$=2Hz, 2H), 7.29 (t, $J$=2 Hz, 2H), 7.49-7.75 (m, 5H); $^{13}$C NMR (125 MHz, CDCl$_3$) δ 112.7, 122.1, 128.1, 129.6, 132.3, 132.4, 167.9.
Table 1, 2a
Table 1.2b
Table 1.

![Chemical Structure](Image)

**Note:** The image contains a chemical structure and some text related to it. The specific details of the chemical structure and the text are not fully legible due to the image resolution.
Table 1, 2e

![Chemical Structure Image]

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**Table 1, 2k**
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Table 1, 2a
Scheme 2