Supporting Information

for

An atom-economical addition of methyl azaarenes with aromatic aldehydes via benzylic C(sp\(^3\))–H bond functionalization under solvent- and catalyst-free conditions

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Experimental procedures, compound characterization data, and NMR spectra
1. Experimental section

i) Chemicals

Ammonium β zeolite (NH₄β) (Si/Al = 19) was purchased from Alfa Aesar, England and calcined at 500 °C for 10 h to afford Hβ. MCM-41 (Si/Al = 30) was synthesized [1], and H-mordenite (Si/Al = 12.5) was purchased from Zeolyst C. V. Azaarenes and benzaldehyde derivatives were purchased from Sigma-Aldrich. All remaining chemicals used in this study were used as received.

ii) General information

¹H NMR spectra were recorded at 300, 400, or 500 MHz and ¹³C NMR spectra at 75, 100, or 125 MHz in CDCl₃. The chemical shifts (δ) are described in ppm relative to TMS as an internal standard for ¹H NMR and CDCl₃ for ¹³C NMR spectra. Coupling constants (J) are reported in Hz, and multiplicities are indicated as follows: s (singlet), br s (broad singlet), d (doublet), dd (doublet of doublet), t (triplet), m (multiplet). The mass spectrometric analysis was performed using a high-resolution Q-TOF mass spectrometer. The GC analysis was carried out using a GC Shimadzu (GC-2014) gas chromatograph equipped with an FID detector and a capillary column (EB-5, length 30 m, inner diameter 0.25 mm, film 0.25 mm). TLC inspections were
carried out on silica gel 60 F_{254} plates. Column chromatography was performed on silica gel (100–200 mesh) using n-hexane/EtOAc as an eluent.

**iii) General procedure**

Reactions were performed in a magnetically stirred 15 mL sealed vial and placed in a temperature-controlled oil bath. The appropriate benzaldehyde (1 mmol) was added to a pyridine or quinoline compounds (2 mmol), and the reaction mixture was allowed to stir at 135 °C for 24 hours. After the disappearance of the starting materials (as monitored by TLC analysis) or after the appropriate time, the reaction mixture was cooled to room temperature. The crude residue was further purified by column chromatography using silica gel (100–200 mesh) to afford pure products. All the products were identified on the basis of NMR and mass spectral data.
2. Spectroscopic data of all products

2-(6-Methylpyridin-2-yl)-1-(4-nitrophenyl)ethan-1-ol (3a)\textsuperscript{[2]}

![Image of 2-(6-Methylpyridin-2-yl)-1-(4-nitrophenyl)ethan-1-ol (3a)]

\textsuperscript{1}H NMR (300 MHz, CDCl\textsubscript{3}) \( \delta \) (ppm) = 8.20 (d, \( J = 8.5 \) Hz, 2H), 7.60 (d, \( J = 8.5 \) Hz, 2H), 7.52 (t, \( J = 7.7 \) Hz, 1H), 7.07 (d, \( J = 7.7 \) Hz, 1H), 6.90 (d, \( J = 7.4 \) Hz, 1H), 5.25 (dd, \( J = 3.0, 8.5 \) Hz, 1H), 3.15-2.99 (m, 2H), 2.57 (s, 3H); \textsuperscript{13}C NMR (100 MHz, CDCl\textsubscript{3}) \( \delta \) (ppm) = 158.12, 157.42, 151.62, 147.03, 137.41, 126.54, 123.50, 121.61, 120.59, 72.50, 44.46, 24.25.

2-(6-Methylpyridin-2-yl)-1-(3-nitrophenyl)ethan-1-ol (3b)\textsuperscript{[2]}

![Image of 2-(6-Methylpyridin-2-yl)-1-(3-nitrophenyl)ethan-1-ol (3b)]

\textsuperscript{1}H NMR (400 MHz, CDCl\textsubscript{3}) \( \delta \) (ppm) = 8.30 (s, 1H), 8.13-8.10 (m, 1H), 7.79 (d, \( J = 8.3 \) Hz, 1H), 7.53 (qt, \( J = 7.6 \) Hz, 2H), 7.07 (d, \( J = 7.7 \) Hz, 1H), 6.91 (d, \( J = 7.6 \) Hz, 1H), 5.24 (dd, \( J = 3.2, 8.6 \) Hz, 1H), 3.15-3.02 (m, 2H), 2.57 (s, 3H); \textsuperscript{13}C NMR (125 MHz, CDCl\textsubscript{3}) \( \delta \) (ppm) = 158.22, 157.47, 148.24, 146.42, 137.40, 131.96, 129.18, 122.14, 121.60, 120.95, 120.59, 72.39, 44.56, 24.31.

2-(6-Methylpyridin-2-yl)-1-(2-nitrophenyl)ethan-1-ol (3c)\textsuperscript{[2]}

![Image of 2-(6-Methylpyridin-2-yl)-1-(2-nitrophenyl)ethan-1-ol (3c)]

\textsuperscript{1}H NMR (500 MHz, CDCl\textsubscript{3}) \( \delta \) (ppm) = 7.97 (dd, \( J = 7.9, 16.9 \) Hz, 2H), 7.64 (t, \( J = 7.6 \) Hz, 1H), 7.54 (t, \( J = 7.6 \) Hz, 1H), 7.41 (t, \( J = 7.6 \) Hz, 1H), 7.07 (d, \( J = 7.7 \) Hz, 1H), 6.98 (d, \( J = 7.6 \) Hz, 1H), 6.89 (brs, 1H), 5.63 (dd, \( J = 2.1, 9.0 \) Hz, 1H), 3.30 (dd, \( J = 2.1, 14.8 \) Hz, 1H), 3.02-2.97 (m, 1H), 2.57 (s, 3H); \textsuperscript{13}C NMR (75 MHz, CDCl\textsubscript{3}) \( \delta \) (ppm) = 158.70, 157.31, 147.53, 139.67, 137.45, 133.43, 128.55, 127.83, 124.17, 121.52, 120.60, 69.16, 44.19, 24.32.

(E)-2-Methyl-6-(2-nitrostyryl)pyridine (4c)

![Image of (E)-2-Methyl-6-(2-nitrostyryl)pyridine (4c)]
$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ (ppm) = 7.99-7.95 (m, 2H), 7.81-7.79 (m, 1H), 7.62-7.56 (m, 2H), 7.45-7.40 (m, 1H), 7.32 (d, $J = 7.7$ Hz, 1H), 7.16 (d, $J = 16.0$ Hz, 1H), 7.06 (d, $J = 7.5$ Hz, 1H), 2.58 (s, 3H);$^{13}$C NMR (100 MHz, CDCl$_3$) $\delta$ (ppm) = 158.49, 154.28, 148.24, 136.74, 133.65, 133.09, 132.54, 128.42, 127.27, 124.72, 122.50, 118.93, 24.57; HRMS (ESI): m/z calculated for C$_{14}$H$_{13}$O$_2$N$_2$[M+H]$^+$, 241.09715, found: 241.09674.

1-(5-Fluoro-2-nitrophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3d)

$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ (ppm) = 8.08 (dd, $J = 5.0$, 9.0 Hz, 1H), 7.72 (dd, $J = 2.8$, 9.7 Hz, 1H), 7.55 (t, $J = 7.7$ Hz, 1H), 7.11-7.06 (m, 2H), 6.98 (d, $J = 7.7$ Hz, 1H), 5.68 (d, $J = 9.7$ Hz, 1H), 3.30 (dd, $J = 2.2$, 14.9 Hz, 1H), 2.94 (dd, $J = 8.9$, 14.9 Hz, 1H), 2.57 (s, 3H); $^{13}$C NMR (100 MHz, CDCl$_3$) $\delta$ (ppm) = 166.74, 164.18, 158.37, 157.34, 144.15 (d, $J = 8.7$ Hz), 143.20, 137.56, 127.40 (d, $J = 9.8$ Hz), 121.67, 120.57, 115.7 (d, $J = 25.0$ Hz), 114.90 (d, $J = 23.9$ Hz), 69.13, 43.76, 24.29; HRMS (ESI): m/z calculated for C$_{14}$H$_{14}$O$_3$N$_2$F[M+H]$^+$, 277.0983, found: 277.0978.

1-(3-Fluorophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3e)$^{[2]}$

$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ (ppm) = 7.51 (t, $J = 7.7$ Hz, 1H), 7.58-7.53 (m, 2H), 7.35-7.28 (m, 3H), 7.22 (d, $J = 7.5$ Hz, 1H), 7.15 (d, $J = 16.1$ Hz, 1H), 7.04 (d, $J = 7.7$ Hz, 1H), 7.00-6.95 (m, 1H), 2.59 (s, 3H);$^{13}$C NMR (75 MHz, CDCl$_3$) $\delta$ (ppm) = 162.95 (d, $J = 245.7$ Hz), 158.72, 157.37, 146.94 (d, $J = 7.2$ Hz), 137.23, 129.67 (d, $J = 8.03$ Hz), 121.37, 120.56, 114.04, 113.76, 112.93, 112.64, 72.71, 44.95, 24.32.

(E)-2-(3-Fluorostyryl)-6-methylpyridine (4e)$^{[2]}$

$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ (ppm) = 7.58-7.53 (m, 2H), 7.35-7.28 (m, 3H), 7.22 (d, $J = 7.5$ Hz, 1H), 7.15 (d, $J = 16.1$ Hz, 1H), 7.04 (d, $J = 7.7$ Hz, 1H), 7.00-6.95 (m, 1H), 2.59 (s, 3H);$^{13}$C NMR (75 MHz, CDCl$_3$) $\delta$ (ppm) = 163.09 (d, $J = 244.9$ Hz), 158.36, 154.51, 139.14 (d, $J
= 8.0 Hz), 136.69, 131.07, 130.05 (d, \(J = 8.8\) Hz), 129.59, 122.96, 122.01, 119.12, 114.90 (d, \(J = 21.6\) Hz), 113.25 (d, \(J = 21.6\) Hz), 24.61.

1-(4-Fluorophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3f)\(^2\)

\(\text{\(1^H\) NMR (500 MHz, CDCl}_3\) \(\delta\) (ppm) = 7.50 (t, \(J = 7.6\) Hz, 1H), 7.40-7.37 (m, 2H), 7.05-7.00 (m, 3H), 6.89 (d, \(J = 7.6\) Hz, 1H), 5.11 (dd, \(J = 3.9, 8.0\) Hz, 1H), 3.08-3.00 (m, 2H), 2.55 (s, 3H); \(\text{\(13^C\) NMR (75 MHz, CDCl}_3\) \(\delta\) (ppm) = 161.95 (d, \(J = 244.2\) Hz), 158.84, 157.36, 139.91 (d, \(J = 2.7\) Hz), 137.21, 127.37 (d, \(J = 8.2\) Hz), 121.33, 120.58, 115.13, 114.86, 72.73, 45.26, 24.29.}

1-(4-Chlorophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3g)\(^2\)

\(\text{\(1^H\) NMR (400 MHz, CDCl}_3\) \(\delta\) (ppm) = 7.51 (t, \(J = 7.7\) Hz, 1H), 7.37-7.29 (m, 4H), 7.04 (d, \(J = 7.7\) Hz, 1H), 6.89 (d, \(J = 7.5\) Hz, 1H), 5.11 (t, \(J = 6.1\) Hz, 1H), 3.03 (d, \(J = 5.8\) Hz, 2H), 2.55 (s, 3H); \(\text{\(13^C\) NMR (125 MHz, CDCl}_3\) \(\delta\) (ppm) = 158.76, 157.38, 142.70, 137.24, 132.73, 128.36, 127.19, 121.37, 120.57, 72.69, 45.04, 24.33.}

1-(4-Bromophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3h)

\(\text{\(1^H\) NMR (400 MHz, CDCl}_3\) \(\delta\) (ppm) = 7.51 (t, \(J = 7.6\) Hz, 1H), 7.47-7.44 (m, 2H), 7.32-7.29 (m, 2H), 7.05 (d, \(J = 7.6\) Hz, 1H), 6.89 (d, \(J = 7.6\) Hz, 1H), 5.09 (t, \(J = 5.9\) Hz, 1H), 3.06-2.98 (m, 2H), 2.55 (s, 3H); \(\text{\(13^C\) NMR (125 MHz, CDCl}_3\) \(\delta\) (ppm) = 158.73, 157.38, 143.23, 137.24, 131.30, 127.56, 121.37, 120.57, 72.72, 44.98, 24.33; HRMS (ESI): m/z calculated for C\(_{14}\)H\(_{15}\) ONBr[M+H]+, 292.03315, found: 292.03254.}

\((E)-4-(2-(6-Methylpyridin-2-yl)vinyl)benzonitrile (4i)\(^2\)

\(\text{(E)-4-(2-(6-Methylpyridin-2-yl)vinyl)benzonitrile (4i)\(^2\)}}
1H NMR (500 MHz, CDCl₃) δ (ppm) = 7.64 (s, 4H), 7.62-7.57 (m, 2H), 7.26-7.22 (m, 2H), 7.07 (d, J = 7.6 Hz, 1H), 2.59 (s, 3H); 13C NMR (75 MHz, CDCl₃) δ (ppm) = 158.55, 153.84, 141.25, 136.79, 132.39, 131.72, 130.19, 127.31, 122.56, 119.66, 118.86, 111.02, 24.58.

(E)-2-Methyl-6-(2-(trifluoromethyl)styryl)pyridine (4j)[2]

1H NMR (400 MHz, CDCl₃) δ (ppm) = 7.89-7.82 (m, 2H), 7.68 (d, J = 7.9 Hz, 1H), 7.59-7.52 (m, 2H), 7.37 (t, J = 7.6 Hz, 1H), 7.33 (d, J = 7.6 Hz, 1H), 7.16 (d, J = 15.8 Hz, 1H), 7.05 (d, J = 7.6 Hz, 1H), 2.59 (s, 3H); 13C NMR (100 MHz, CDCl₃) δ (ppm) = 158.40, 154.73, 136.67, 135.89, 132.78, 131.89, 128.04, 127.72, 127.65, 127.30, 125.99-125.72 (m), 122.99, 122.18, 118.52, 24.57.

(E)-4-(2-(6-Methylpyridin-2-yl)vinyl)benzaldehyde (4k)

1H NMR (500 MHz, CDCl₃) δ (ppm) = 10.00 (s, 1H), 7.89-7.87 (m, 2H), 7.72-7.70 (m, 2H), 7.67-7.63 (m, 1H), 7.58 (t, J = 7.7 Hz, 1H), 7.31-7.24 (m, 2H), 7.07 (d, J = 7.5 Hz, 1H), 2.60 (s, 3H); 13C NMR (100 MHz, CDCl₃) δ (ppm) = 191.54, 158.53, 154.15, 142.83, 136.76, 135.64, 131.58, 130.85, 130.13, 127.41, 122.42, 119.55, 24.60; HRMS (ESI): m/z calculated for C₁₅H₁₄ON[M+H]⁺, 224.10699, found: 224.10648.

N-(4-(1-Hydroxy-2-(6-methylpyridin-2-yl)ethyl)phenyl)acetamide (3l)

1H NMR (500 MHz, CDCl₃+DMSO-d₆) δ (ppm) = 7.51 (t, J = 7.7 Hz, 1H), 7.46-7.35 (m, 4H), 7.04 (d, J = 7.7 Hz, 1H), 6.90 (d, J = 7.7 Hz, 1H), 6.09 (dd, J = 4.0, 8.1 Hz, 1H), 3.11-3.01 (m, 2H), 2.55 (s, 3H), 2.16 (s, 3H); 13C NMR (75 MHz, CDCl₃+DMSO-d₆) δ (ppm) = 168.03, 157.97, 156.28, 138.90, 137.14, 136.12, 125.34, 120.25, 120.04, 118.66, 72.02, 45.26, 39.47, 23.50, 23.39; HRMS (ESI): m/z calculated for C₁₆H₁₉O₂N₂ [M+H]⁺, 271.1441 found: 271.1434.
*(E)-4-(2-(6-Methylpyridin-2-yl)vinyl)phenol (4m)*

![Chemical structure](image)

$^1$H NMR (400 MHz, CDCl$_3$+DMSO-d$_6$) $\delta$ (ppm) = 7.62 (t, $J$ = 7.7 Hz, 1H), 7.54-7.46 (m, 3H), 7.27 (d, $J$ = 7.7 Hz, 1H), 7.06-7.01 (m, 2H), 6.78 (d, $J$ = 8.5 Hz, 2H), 2.47 (s, 3H); $^{13}$C NMR (75 MHz, CDCl$_3$+DMSO-d$_6$) $\delta$ (ppm) = 157.19, 154.76, 136.03, 131.61, 127.71, 127.30, 124.54, 120.50, 117.62, 115.17, 23.85; HRMS (ESI): m/z calculated for C$_{14}$H$_{14}$ON[M+H]$^+$, 212.1070, found: 212.1066.

*(E)-2-(2-(6-Methylpyridin-2-yl)vinyl)phenol (4n)*

![Chemical structure](image)

$^1$H NMR (400 MHz, CDCl$_3$+DMSO-d$_6$) $\delta$ (ppm) = 7.88 (d, $J$ = 16.2 Hz, 1H), 7.65-7.53 (m, 2H), 7.28-7.24 (m, 1H), 7.14-6.76 (m, 5H), 2.49 (s, 3H); $^{13}$C NMR (75 MHz, CDCl$_3$+DMSO-d$_6$) $\delta$ (ppm) = 157.48, 155.39, 154.78, 136.85, 129.11, 127.32, 126.85, 123.13, 121.29, 119.21, 115.80, 24.19; HRMS (ESI): m/z calculated for C$_{14}$H$_{16}$O$_2$N[M+H+H$_2$O]$^+$, 230.1176, found: 230.1170.

*(E)-2-Methyl-6-(4-methylstyrlyl)pyridine (4o)*

![Chemical structure](image)

$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ (ppm) = 7.56-7.51 (m, 2H), 7.48-7.46 (m, 2H), 7.22 (d, $J$ = 7.7 Hz, 1H), 7.18-7.10 (m, 3H), 7.00 (d, $J$ = 7.5 Hz, 1H), 2.58 (s, 3H), 2.36 (s, 3H); $^{13}$C NMR (100 MHz, CDCl$_3$) $\delta$ (ppm) = 158.19, 155.31, 138.14, 136.58, 134.00, 132.30, 129.37, 127.46, 126.97, 121.46, 118.58, 24.64, 21.28.

2-(6-Methylpyridin-2-yl)-1-phenylethan-1-ol (3p)

![Chemical structure](image)

$^1$H NMR (400 MHz, CDCl$_3$) $\delta$ (ppm) = 7.52 (t, $J$ = 7.5 Hz, 1H), 7.44-7.41 (m, 2H), 7.35-7.31 (m, 2H), 7.27-7.23 (m, 1H), 7.05 (d, $J$ = 7.7 Hz, 1H), 6.91 (d, $J$ = 7.5 Hz, 1H), 5.16-5.12 (m,
1H, 3.13-3.11 (m, 2H), 2.57 (s, 3H); 13C NMR (75 MHz, CDCl3) δ (ppm) = 158.72, 157.17, 144.02, 137.42, 132.90, 129.95, 128.23, 127.17, 125.77, 121.46, 120.86, 73.44, 45.28, 23.94.

(E)-2-Methyl-6-(2-(pyridin-2-yl)vinyl)pyridine (4q)

1H NMR (400 MHz, CDCl3) δ (ppm) = 8.62 (d, J = 4.7 Hz, 1H), 7.71-7.62 (m, 3H), 7.56 (t, J = 7.7 Hz, 1H), 7.46 (d, J = 7.8 Hz, 1H), 7.26 (d, J = 6.8 Hz, 1H), 7.17 (dd, J = 1.1, 4.8 Hz, 1H), 7.05 (d, J = 7.7 Hz, 1H), 2.59 (s, 3H); 13C NMR (100 MHz, CDCl3) δ (ppm) = 158.37, 155.19, 154.33, 149.64, 136.73, 136.53, 132.09, 131.45, 122.88, 122.44, 122.32, 120.16, 24.63; HRMS (ESI): m/z calculated for C13H13N2[M+H]+, 197.1073, found: 197.1071.

2-(6-Methylpyridin-2-yl)-1-((thiophen-2-yl)ethan-1-ol (3r)

1H NMR (400 MHz, CDCl3) δ (ppm) = 7.51 (t, J = 7.7 Hz, 1H), 7.21 (dd, J = 1.3, 4.8 Hz, 1H), 7.04 (d, J = 7.7 Hz, 1H), 6.98-6.93 (m, 3H), 5.40 (dt, J = 0.7, 5.9 Hz, 1H), 3.20 (d, J = 5.7 Hz, 2H), 2.54 (s, 3H); 13C NMR (100 MHz, CDCl3) δ (ppm) = 158.59, 157.34, 148.36, 137.18, 126.43, 124.06, 122.88, 121.35, 120.68, 69.64, 44.98, 24.27; HRMS (ESI): m/z calculated for C12H14ONS[M+H]+, 220.07906, found: 220.07861.

2-(4,6-Dimethylpyridin-2-yl)-1-(4-nitrophenyl)ethan-1-ol (5b)[3]

1H NMR (400 MHz, CDCl3) δ (ppm) = 8.19 (d, J = 8.6 Hz, 2H), 7.59 (d, J = 8.4 Hz, 2H), 6.89 (s, 1H), 6.72 (s, 1H), 5.22 (dd, J = 3.0, 8.8 Hz, 1H), 3.08-2.94 (m, 2H), 2.51 (s, 3H), 2.27 (s, 3H); 13C NMR (100 MHz, CDCl3) δ (ppm) = 157.91, 157.09, 151.80, 148.67, 147.03, 126.56, 123.53, 122.57, 121.56, 72.59, 44.31, 24.06, 20.90.
1-(4-Nitrophenyl)-2-(pyridin-2-yl)propan-1-ol (5c)

\[ \text{H NMR (400 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 8.52-8.50 (m, 1H), 8.09-8.06 (m, 2H), 7.53 (dt, J = 1.9, 7.7 Hz, 1H), 7.40-7.36 (m, 2H), 7.17-7.13 (m, 1H), 6.90 (d, J = 8.5 Hz, 1H), 5.04 (d, J = 4.5 Hz, 1H), 3.22-3.15 (m, 1H), 1.47 (d, J = 7.2 Hz, 3H); \text{C NMR (100 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 162.79, 151.94, 148.29, 146.84, 137.20, 126.74, 123.21, 122.00, 77.51, 46.64, 19.31; \text{HRMS (ESI): m/z calculated for C}_{14}H_{15}O_3N_2[M+H]^+, 259.10772, found: 259.10724. \]

1-(4-Nitrophenyl)-2-(pyridin-2-yl)ethan-1-ol (5d)[3]

\[ \text{H NMR (400 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 8.55-8.53 (m, 1H), 8.21-8.17 (m, 2H), 7.65 (dt, J = 1.8, 7.7 Hz, 1H), 7.59 (d, J = 8.3 Hz, 2H), 7.25-7.22 (m, 1H), 7.10 (d, J = 7.8 Hz, 1H), 5.29 (dd, J = 3.3, 8.6 Hz, 1H), 3.22-3.08 (m, 2H); \text{C NMR (100 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 158.66, 151.39, 148.33, 137.32, 126.57, 123.91, 123.57, 122.14, 72.50, 44.77. \]

(E)-2-(4-Nitrostyril)pyridine (6d)

\[ \text{H NMR (500 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 8.64 (d, J = 5.6 Hz, 1H), 8.24 (d, J = 8.8 Hz, 2H); 7.73-7.69 (m, 4H), 7.42 (d, J = 7.7 Hz, 1H), 7.30 (d, J = 16.0 Hz, 1H), 7.24-7.21 (m, 1H); \text{C NMR (100 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 154.34, 149.92, 143.10, 136.78, 132.10, 130.22, 127.50, 124.13, 123.05; \text{HRMS (ESI): m/z calculated for C}_{13}H_{11}O_2N_2 [M+H]^+, 227.08150, found: 227.08111. \]

(E)-2-(4-Nitrostyril)quinoline (6f)[3]

\[ \text{H NMR (400 MHz, CDCl}_3 \text{)} \delta (\text{ppm}) = 8.26 (d, J = 8.8 Hz, 2H), 8.18 (d, J = 8.4 Hz, 1H), 8.10 (d, J = 8.4 Hz, 1H), 7.83-7.72 (m, 5H), 7.67 (d, J = 8.5 Hz, 1H), 7.56-7.50 (m, 2H); \text{C NMR
(100 MHz, CDCl$_3$) δ (ppm) = 154.61, 148.24, 147.36, 142.92, 136.67, 133.11, 131.65, 130.04, 129.35, 127.62, 127.55, 126.76, 124.15, 119.70.

(6g) \[ \text{(E)-6-Fluoro-2-(4-nitrostyryl)quinoline} \]

\[ \text{\includegraphics{image}} \]

$^1$H NMR (400 MHz, CDCl$_3$) δ (ppm) = 8.27 (d, \( J = 8.8 \) Hz, 2H), 8.14-8.08 (m, 2H), 7.78-7.74 (m, 3H), 7.68 (d, \( J = 8.5 \) Hz, 1H), 7.54-7.42 (m, 3H); $^{13}$C NMR (100 MHz, CDCl$_3$) δ (ppm) = 154.04, 147.42, 145.37, 142.85, 136.03 (d, \( J = 5.5 \) Hz), 132.77, 131.87 (d, \( J = 8.8 \) Hz), 131.66, 128.21 (d, \( J = 9.9 \) Hz), 127.65, 124.19, 120.51, 120.12, 110.68 (d, \( J = 21.4 \) Hz); HRMS (ESI): m/z calculated for C$_{17}$H$_{12}$O$_2$N$_2$F[M+H]$^+$, 295.0877, found: 295.0873.
3. Copies of $^1$H and $^{13}$C NMR spectra of all products

2-(6-Methylpyridin-2-yl)-1-(4-nitrophenyl)ethan-1-ol (3a)
2-(6-Methylpyridin-2-yl)-1-(3-nitrophenyl)ethan-1-ol (3b)
2-(6-Methylpyridin-2-yl)-1-(2-nitrophenyl)ethan-1-ol (3c)
(E)-2-Methyl-6-(2-nitrostyryl)pyridine (4c)
1-(5-Fluoro-2-nitrophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3d)
1-(3-Fluorophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3e)
(E)-2-(3-Fluorostyryl)-6-methylpyridine (4e)
1-(4-Fluorophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3f)
1-(4-Chlorophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3g)
1-(4-Bromophenyl)-2-(6-methylpyridin-2-yl)ethan-1-ol (3h)
(E)-4-(2-((6-Methylpyridin-2-yl)vinyl)benzonitrile (4i)
(E)-2-Methyl-6-(2-(trifluoromethyl)styryl)pyridine (4j)
(E)-4-(2-(6-Methylpyridin-2-yl)vinyl)benzaldehyde (4k)
$N$-(4-(1-Hydroxy-2-(6-methylpyridin-2-yl)ethyl)phenyl)acetamide (3l)
(E)-4-(2-(6-Methylpyridin-2-yl)vinyl)phenol (4m)
(E)-2-(2-(6-Methylpyridin-2-yl)vinyl)phenol (4n)
(E)-2-Methyl-6-(4-methylstyryl)pyridine (4o)
2-(6-Methylpyridin-2-yl)-1-phenylethan-1-ol (3p)
(E)-2-Methyl-6-(2-(pyridin-2-y)vinyl)pyridine (4q)
2-(6-Methylpyridin-2-yl)-1-(thiophen-2-yl)ethan-1-ol (3r)
2-(4,6-Dimethylpyridin-2-yl)-1-(4-nitrophenyl)ethan-1-ol (5b)
1-(4-Nitrophenyl)-2-(pyridin-2-yl)propan-1-ol (5c)
1-(4-Nitrophenyl)-2-(pyridin-2-yl)ethan-1-ol (5d)
(E)-2-(4-Nitrostyryl)pyridine (6d)
(E)-2-(4-Nitostyryl)quinoline (6f)
(E)-6-Fluoro-2-(4- nitrostyryl)quinoline (6g)
4. References

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