Supporting Information

Access to 5-Fluoroalkylated Trisubstituted Oxazoles via
Copper-Catalyzed Cyclization of α-Fluoroalkyl-α-diazoketones with Amides

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Table of Contents

I. Table of Contents S1
II. General Experimental Section S2
III. Important Safety Note S2
IV. Single crystal X-ray structure of complex 3d and 3x’ S3
V. Table S1. Crystal Data and Summary of X-ray Data Collection S5
VI. Optimization of the Reaction Conditions S6
VII. Synthesis of 5-Fluoroalkylated Trisubstituted Oxazoles and Thiazoles S9
VIII. Characterization of Products and fluoroalkylated diazo compounds S10
IX. Experimental Mechanistic Studies S38
X. NMR Spectra of Products and fluoroalkylated diazo compounds S46
XI. References S223
General Experimental Section

Analytic methods. Unless otherwise noted, all reactions were carried out in flame-dried
glassware with dry solvents under argon atmosphere using standard Schlenk technique. $^1$H NMR
(400 MHz), $^{19}$F (376 MHz) and $^{13}$C($^1$H) NMR (100 MHz) were recorded on a Bruker AV400 NMR
spectrometer. Chemical shifts of $^1$H, $^{19}$F, and $^{13}$C($^1$H) NMR spectra are reported in parts per
million (ppm), and the residual solvent peak was used as an internal reference: proton (CDCl$_3$: $\delta$ =
7.26 ppm, DMSO-$d_6$: $\delta$ = 2.50 ppm), carbon (CDCl$_3$: $\delta$ = 77.00 ppm, DMSO-$d_6$: $\delta$ = 39.52 ppm).
All coupling constants ($J$ values) were reported in Hertz (Hz). Multiplicities are reported as follows:
singlet (s), doublet (d), doublet of doublets (dd), doublet of doublet of doublets (ddd), doublet of
triplets (dt), triplet (t), triplet of doublets (td), quartet (q), broad (s), and multiplet (m). Analytical
thin-layer chromatography (TLC) was performed on pre-coated, glass-backed silica gel plates and
visualized by UV radiation (254 nm). Column chromatography was performed on silica gel
200-300 mesh. Preparative thin-layer chromatography (TLC) was performed on pre-coated,
glass-backed (200 mm*200 mm) silica gel plates with 1mm silica gel 200-300 mesh. HRMS were
done on Agilent 6520 Q-TOF LC/MS, Varian 7.0T FTMS or Bruker Solarix scimax MRMS.

General preparation for chemicals. All commercial catalysts, reagents, and solvents were
used without additional purification unless otherwise noted.

Important Safety Note

The treatment fluoroalkylated diazo compounds should be carried out in a well-ventilated fume
hood. During this study, no accidents occurred when handling these reagents, but readers should
be aware of the potentially explosive nature of the fluoroalkylated diazo compounds described in
this article. When using fluoroalkylated diazo compounds, general safety precautions should be
followed. None of the reactions described in this manuscript should be carried out without a
rigorous risk assessment.
**X-ray Crystallographic Analysis.** All intensity data were collected with a Bruker SMART CCD diffractometer equipped with graphite mono-chromated Mo-Kα radiation (λ = 0.71073 Å). The structures were solved by direct methods and refined by full-matrix least squares on $F^2$. All non-hydrogen atoms were refined anisotropically. Hydrogen atoms were considered in calculated positions. Single crystals of complexes 3d and 3x′ suitable for X-ray diffraction were obtained from hexane/CH₂Cl₂ solution. The crystal data and summary of X-ray data collection are presented in Tables S1.

**Single crystal X-ray structure of complex 3d and 3x′**

*Figure S1.* ORTEP diagram of complex 3d. Thermal ellipsoids are shown at the 30% level. All hydrogen atoms have been omitted for clarity.
Figure S2. ORTEP diagram of complex 3x'. Thermal ellipsoids are shown at the 30% level. All hydrogen atoms have been omitted for clarity.
Table S1. Crystal Data and Summary of X-ray Data Collection for 3d and 3x’

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<tr>
<th>Identification code</th>
<th>3d</th>
<th>3x’</th>
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<tbody>
<tr>
<td>Empirical formula</td>
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<td>C_{20}H_{22}F_{3}NO_2</td>
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<tr>
<td>Formula weight</td>
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<td>Temperature/K</td>
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<tr>
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<td>a/Å</td>
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<td>b/Å</td>
<td>9.7630(4)</td>
<td>12.2278(6)</td>
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<td>c/Å</td>
<td>19.6787(7)</td>
<td>17.2662(10)</td>
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<td>α/°</td>
<td>92.407(3)</td>
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<td>β/°</td>
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<td>γ/°</td>
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<td>μ/mm⁻¹</td>
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<td>F(000)</td>
<td>752.0</td>
<td>1536.0</td>
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<td>max. 2θ(°)</td>
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<td>no. of ind refins/R_{int}</td>
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<td>no. of params</td>
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<td>R₁, wR₂ [I &gt; 2σ(I)]</td>
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<td>0.0628, 0.1850</td>
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<tr>
<td>R₁, wR₂ (all data)</td>
<td>0.1059, 0.1810</td>
<td>0.0829, 0.2033</td>
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Optimization of the Reaction Conditions

Table S2. Screen of the Transition Metal Catalysts for oxazole synthesis

<table>
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<tr>
<th>Entry</th>
<th>[M] (x mol %)</th>
<th>Yield (%)</th>
<th>Entry</th>
<th>[M] (x mol %)</th>
<th>Yield (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>Rh2(OAc)4 (5)</td>
<td>17c</td>
<td>12</td>
<td>FeCl2 (20)</td>
<td>Trace</td>
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<tr>
<td>2</td>
<td>AgSbF6 (20)</td>
<td>92</td>
<td>13</td>
<td>CuCl (20)</td>
<td>33</td>
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<tr>
<td>3</td>
<td>AgOTf (20)</td>
<td>21</td>
<td>14</td>
<td>CuBr (20)</td>
<td>68</td>
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<tr>
<td>4</td>
<td>AgPF6 (20)</td>
<td>77</td>
<td>15</td>
<td>CuI (20)</td>
<td>92</td>
</tr>
<tr>
<td>5</td>
<td>AgNTf2 (20)</td>
<td>81</td>
<td>16</td>
<td>CuTc (20)</td>
<td>61</td>
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<td>6</td>
<td>AgOMs (20)</td>
<td>11</td>
<td>17</td>
<td>CuOTf-1/2Toluene (20)</td>
<td>56</td>
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<td>7</td>
<td>AgBF4 (20)</td>
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<td>CuOTf-1/2Benzene (20)</td>
<td>43</td>
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<td>8</td>
<td>AgOAc (20)</td>
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<td>19</td>
<td>CuBr-SMe2 (20)</td>
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<td>9</td>
<td>Ag2CO3 (20)</td>
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<td>20</td>
<td>Cu(MeCN)4PF6 (20)</td>
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<td>Ni(OTf)2 (20)</td>
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<td>21</td>
<td>CuBr2 (20)</td>
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<tr>
<td>11</td>
<td>FeCl3 (20)</td>
<td>Trace</td>
<td>22</td>
<td>Cu(MeCN)4PF6 (5)</td>
<td>98</td>
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</table>

cReaction conditions: 1a (0.2 mmol), 2a (0.1 mmol, 1.0 equiv), catalyst (x mol %), DCE (1.0 mL), 100 °C, Ar atmosphere, 16 h. The yield was determined by 19F NMR spectroscopy by using PhCF3 as internal standard. The N-H insertion product 4 was formed in 62% NMR yield.

4

N-(1,1,1-trifluoro-3-oxo-3-phenylpropan-2-yl)benzamide (4)

The title compound was obtained as a white solid in 57% yield (17.5 mg); M.p.: 91-94 °C; 1H NMR (DMSO-d6, 400 MHz): δ 9.75 (d, J = 8.9 Hz, 1H), 7.98-7.93 (m, 2H), 7.90-7.84 (m, 2H), 7.67 (t, J = 7.4 Hz, 1H), 7.61-7.47 (m, 5H), 6.67-6.55 (m, 1H); 13C{1H} NMR (DMSO-d6, 100 MHz): δ 191.65, 167.46, 135.27, 134.89, 133.49, 133.16, 129.64, 129.43, 129.21, 128.61, 124.9 (q, J = 282.5 Hz), 55.5 (q, J = 28.5 Hz); 19F NMR (DMSO-d6, 376 MHz): δ -65.1 (d, J = 8.2 Hz); HRMS (ESI) m/z: [M+Na]+ Calcd for C16H12F3NNaO2 330.0712, Found: 330.0714.
Table S3. Screen of the Reaction Conditions for oxazole synthesis

\[
\begin{align*}
\text{Ph} & \text{CF}_3 \text{N}_2 \text{Ph} + \text{Ph} & \text{O} & \text{NH}_2 \\
1a & \rightarrow & \text{Ph} & \text{N} & \text{Ph} & \text{CF}_3 \\
2a & & \text{Cu(MeCN)}_4PF_6 (5 \text{ mol } \%) & \text{Solvent, Temp., 16 h, Ar} & 3a
\end{align*}
\]

<table>
<thead>
<tr>
<th>Entry</th>
<th>Solvent</th>
<th>Temp. (°C)</th>
<th>Yield (%)(^b)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>DCE</td>
<td>100</td>
<td>98 (98)(^c)</td>
</tr>
<tr>
<td>2</td>
<td>THF</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>TFE</td>
<td>100</td>
<td>11</td>
</tr>
<tr>
<td>4</td>
<td>EtOAc</td>
<td>100</td>
<td>59</td>
</tr>
<tr>
<td>5</td>
<td>Toluene</td>
<td>100</td>
<td>86</td>
</tr>
<tr>
<td>6</td>
<td>H$_2$O</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>DCE</td>
<td>80</td>
<td>87</td>
</tr>
<tr>
<td>8(^d)</td>
<td>DCE</td>
<td>100</td>
<td>(97)(^c)</td>
</tr>
</tbody>
</table>

\(^a\)Reaction conditions: 1a (0.2 mmol, 2.0 equiv), 2a (0.1 mmol, 1.0 equiv), Cu(MeCN)$_4$PF$_6$ (5 mol %), solvent (1.0 mL), Temp., Ar atmosphere, 16 h. \(^b\)The yield was determined by $^{19}$F NMR spectroscopy by using PhCF$_3$ as internal standard. \(^c\)Value in parentheses indicates isolated yield. \(^d\)2.0 mmol scale.
Results and Discussion of the Optimization of Reaction Conditions

We commenced the optimization experiments by treatment of fluoroalkylated diazo 1a with benzamide 2a in 1,2-dichloroethane (DCE) at 100 °C under various metal complexes catalysis. As anticipated, the utilization of Rh(OAc)$_2$ as catalyst produced the N-H insertion complex 4a as the predominant product along with small amount of the desired 2,4-diphenyl-5-(trifluoromethyl)oxazole 3a (Table S2, entry 1). In contrast, AgSbF$_6$ successfully promoted the reaction to deliver 3a as the sole product in 92% NMR yield (Table S2, entry 2). Further exploration of other metal catalysts revealed that copper salts also effectively enhance this transformation (Table S2, entries 3-21). An evaluation of the copper sources identified Cu(MeCN)$_4$PF$_6$ as the optimal catalyst, thus allowing a lower catalyst loading (5 mol %) while maintaining high catalytic activity (Table S2, entry 22). The choice of DCE as solvent was superior to THF, TFE, EtOAc, toluene, and H$_2$O (Table S3, entries 2-6). The reaction efficiency was also sensitive to the reaction temperatures (Table S3, entry 7). Importantly, the optimal conditions were applicable to a scale up to 2 mmol of 2a, furnishing 3a in 97% isolated yield (Table S3, entry 8).
General Procedure:

**Synthesis of 5-Fluoroalkylated Trisubstituted Oxazoles and Thiazoles**

A mixture of diazo compounds 1 (0.2 mmol), amides 2 or thioamide 6 (0.1 mmol), Cu(MeCN)₄PF₆ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was then cooled to room temperature. The suspension was filtered through a short column filled with celite and the solvent was removed in vacuo, and the residue was purified by preparative thin-layer chromatography (TLC) with petroleum ether: ethyl acetate = 50:1 (v/v) to give the final products.
Characterization of Products 3, 5, and 7

2,4-diphenyl-5-(trifluoromethyl)oxazole (3a)

The title compound was obtained as a white solid in 98% yield (28.3 mg) by following the general procedure; M.p.: 48-50 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.16 (dd, $J = 7.6$, 1.7 Hz, 2H), 7.80-7.79 (m, 2H), 7.57-7.44 (m, 6H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.7, 142.5 (q, $J = 2.6$ Hz), 133.5 (q, $J = 42.6$ Hz), 131.6, 129.6, 129.3, 128.9, 128.6, 128.5 (br s), 127.1, 126.0, 119.8 (q, $J = 267.9$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.1 (s). This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

2-phenyl-4-(p-tolyl)-5-(trifluoromethyl)oxazole (3b)

The title compound was obtained as a white solid in 89% yield (26.8 mg) by following the general procedure; M.p.: 61-63 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.18-8.15 (m, 2H), 7.69 (d, $J = 8.1$ Hz, 2H), 7.54-7.49 (m, 3H), 7.30 (d, $J = 7.9$ Hz, 2H), 2.43 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.5, 142.5 (q, $J = 2.6$ Hz), 139.7, 133.1 (q, $J = 42.7$ Hz), 131.5, 129.3, 128.9, 128.3 (q, $J = 1.7$ Hz), 127.1, 126.4, 126.1, 119.9 (q, $J = 267.8$ Hz), 21.4; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.1; HRMS (ESI) m/z: [M+H]$^+$ C$_{17}$H$_{13}$F$_3$NO 304.0944, Found: 304.0952.

4-(4-methoxyphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3c)

The title compound was obtained as a white solid in 98% yield (31.2 mg) by following the general procedure; M.p.: 70-72 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.15 (dd, $J = 7.8$, 1.8 Hz, 2H), 7.74 (d, $J = 8.8$ Hz, 2H), 7.56-7.48 (m, 3H), 7.02-6.99 (m, 2H), 3.87 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.5, 160.6, 142.3 (q, $J = 2.6$ Hz), 132.7 (q, $J = 42.6$ Hz), 131.5, 129.9 (q, $J = 1.8$ Hz), 128.9, 127.1, 126.1, 121.8, 120.0 (q, $J = 267.8$ Hz), 114.1, 55.3; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.1. This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]
4-[(1,1'-biphenyl)-4-yl]-2-phenyl-5-(trifluoromethyl)oxazole (3d)

The title compound was obtained as a white solid in 91% yield (33.3 mg) by following the general procedure; M.p.: 124-127 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.21-8.18 (m, 2H), 7.89 (d, \(J = 8.3\) Hz, 2H), 7.75-7.72 (m, 2H), 7.68-7.66 (m, 2H), 7.56-7.47 (m, 5H), 7.43-7.38 (m, 1H); \(^13\)C\(^{\{1\}H\}) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.7, 142.3, 142.1 (q, \(J = 2.3\) Hz), 140.3, 133.5 (q, \(J = 43.4\) Hz), 131.6, 128.93, 128.86, 128.2, 127.7, 127.3, 127.1, 126.0, 119.9 (q, \(J = 267.7\) Hz) (two signals missing due to overlap); \(^19\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.0 (s); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{22}\)H\(_{15}\)F\(_3\)NO 366.1100, Found: 366.1101.

4-(4-fluorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3e)

The title compound was obtained as a white solid in 82% yield (25.2 mg) by following the general procedure; M.p.: 67-69 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.14 (dd, \(J = 7.6, 1.8\) Hz, 2H), 7.78 (dd, \(J = 8.6, 5.4\) Hz, 2H), 7.57-7.49 (m, 3H), 7.18 (t, \(J = 8.7\) Hz, 2H); \(^13\)C\(^{\{1\}H\}) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 163.5 (d, \(J = 250.0\) Hz), 161.7, 141.5 (q, \(J = 2.7\) Hz), 133.3 (q, \(J = 43.6\) Hz), 131.7, 130.4 (d, \(J = 8.4\) Hz), 129.0, 127.1, 125.9, 125.5 (d, \(J = 2.8\) Hz), 119.8 (q, \(J = 267.7\) Hz), 115.7 (d, \(J = 21.9\) Hz); \(^19\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.2 (s, CF\(_3\)), -111.1 (s, F); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{16}\)H\(_{10}\)F\(_4\)NO 308.0693, Found: 308.0692.

4-(4-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3f)

The title compound was obtained as a white solid in 84% yield (27.0 mg) by following the general procedure; M.p.: 73-75 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.16-8.13 (m, 2H), 7.73 (d, \(J = 8.5\) Hz, 2H), 7.57-7.49 (m, 3H), 7.48-7.44 (m, 2H); \(^13\)C\(^{\{1\}H\}) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.8, 141.3 (q, \(J = 2.5\) Hz), 135.7, 133.6 (q, \(J = 42.4\) Hz), 131.8, 129.7 (q, \(J = 1.8\) Hz), 129.0, 128.9, 127.8, 127.1, 125.8, 119.7 (q, \(J = 267.9\) Hz); \(^19\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.2; HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{16}\)H\(_{10}\)ClF\(_3\)NO 324.0398, Found: 324.0399.
The title compound was obtained as a white solid in 91% yield (33.6 mg) by following the general procedure; M.p.: 70-72 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.16-8.11 (m, 2H), 7.67-7.60 (m, 4H), 7.57-7.50 (m, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 161.8, 141.4 (q, $J = 2.4$ Hz), 133.7 (q, $J = 42.7$ Hz), 131.84, 131.76, 130.0 (q, $J = 1.6$ Hz), 129.0, 128.2, 127.1, 125.8, 124.0, 119.7 (q, $J = 268.1$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.2; This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

The title compound was obtained as a white solid in 94% yield (38.9 mg) by following the general procedure; M.p.: 80-82 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.15-8.12 (m, 2H), 7.84-7.81 (m, 2H), 7.57-7.49 (m, 5H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 161.8, 141.5 (q, $J = 2.4$ Hz), 137.8, 133.7 (q, $J = 43.4$ Hz), 131.8, 130.0 (q, $J = 1.9$ Hz), 129.0, 128.8, 127.1, 125.8, 119.7 (q, $J = 268.6$ Hz), 95.9; $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.2 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{16}$H$_{10}$F$_3$INO 415.9754, Found: 415.9758.

The title compound was obtained as a white solid in 97% yield (33.5 mg) by following the general procedure; M.p.: 110-102 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.16-8.12 (m, 4H), 7.86 (d, $J = 8.3$ Hz, 2H), 7.58-7.50 (m, 3H), 3.96 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 166.5, 161.9, 141.4 (q, $J = 2.2$ Hz), 134.3 (q, $J = 42.9$ Hz), 133.5, 131.8, 131.0, 129.8, 129.0, 128.4 (q, $J = 1.8$ Hz), 127.1, 125.8, 119.6 (q, $J = 268.3$ Hz), 52.3; $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.2 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{18}$H$_{13}$F$_3$NO$_3$ 348.0842, Found: 348.0845.
**1-(4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)phenyl)ethan-1-one (3j)**

The title compound was obtained as a white solid in 81% yield (26.8 mg) by following the general procedure; M.p.: 73-75 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.17-8.14 (m, 2H), 8.08-8.05 (m, 2H), 7.89 (d, $J = 8.4$ Hz, 2H), 7.56-7.50 (m, 3H), 2.65 (s, 3H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 197.5, 161.9, 141.3 (q, $J = 2.5$ Hz), 137.6, 134.3 (q, $J = 42.6$ Hz), 133.7, 131.9, 129.0, 128.7 (q, $J = 1.9$ Hz), 128.5, 127.2, 125.7, 119.6 (q, $J = 268.4$ Hz), 26.7; $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.1 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{18}$H$_{13}$F$_3$NO$_2$ 332.0893, Found: 332.0895.

**4-(4-nitrophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3k)**

The title compound was obtained as a white solid in 95% yield (31.7 mg) by following the general procedure; M.p.: 125-127 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.35-8.31 (m, 2H), 8.16-8.13 (m, 2H), 7.97 (d, $J = 8.8$ Hz, 2H), 7.58-7.51 (m, 3H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 162.2, 148.3, 140.2 (q, $J = 2.7$ Hz), 135.4, 134.9 (q, $J = 43.4$ Hz), 132.1, 129.3 (q, $J = 1.4$ Hz), 129.1, 127.2, 125.5, 123.8, 119.4 (q, $J = 268.4$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.2 (s); HRMS (MALDI) m/z: [M+H]$^+$ Calcd for C$_{16}$H$_{10}$F$_3$N$_2$O$_3$ 335.0638, Found: 335.0636.

**4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzonitrile (3l)**

The title compound was obtained as a white solid in 72% yield (22.6 mg) by following the general procedure; M.p.: 119-125 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.16-8.13 (m, 2H), 7.91 (d, $J = 8.4$ Hz, 2H), 7.80-7.76 (m, 2H), 7.59-7.51 (m, 3H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 162.1, 140.5 (q, $J = 2.4$ Hz), 134.6 (q, $J = 37.8$ Hz), 133.6, 132.4, 132.0, 129.1, 127.2, 125.5, 119.4 (q, $J = 268.5$ Hz), 118.3, 113.2 (one signal missing due to overlap); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.2 (s); HRMS (MALDI) m/z: [M+H]$^+$ Calcd for C$_{17}$H$_{10}$F$_3$N$_2$O 315.0740, Found: 315.0742.
2-phenyl-5-(trifluoromethyl)-4-(4-(trifluoromethyl)phenyl)oxazole (3m)

The title compound was obtained as a white solid in 71% yield (25.4 mg) by following the general procedure; M.p.: 47-49 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.17-8.14 (m, 2H), 7.91 (d, \(J = 8.2\) Hz, 2H), 7.75 (d, \(J = 8.2\) Hz, 2H), 7.57-7.50 (m, 3H); \(^{13}\)C\(^{1H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.0, 141.0 (d, \(J = 2.0\) Hz), 134.3 (d, \(J = 43.2\) Hz), 132.8, 131.9, 131.5 (d, \(J = 33.1\) Hz), 129.0, 128.8, 127.2, 125.7, 125.6 (d, \(J = 3.7\) Hz), 123.9 (q, \(J = 272.0\) Hz), 119.6 (q, \(J = 268.7\) Hz); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.2 (s), -62.8 (s); HRMS (MALDI) m/z: [M+H]+ Calcd for C\(_{17}\)H\(_{10}\)F\(_6\)NO 358.0661, Found: 358.0662.

4-(2-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3n)

The title compound was obtained as a colorless oil in 98% yield (31.6 mg) by following the general procedure; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.15 (d, \(J = 7.7\) Hz, 2H), 7.58-7.49 (m, 4H), 7.48-7.35 (m, 3H); \(^{13}\)C\(^{1H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.2, 139.8 (q, \(J = 2.4\) Hz), 135.5 (q, \(J = 42.4\) Hz), 133.9, 131.8, 131.5, 130.9, 129.9, 129.0, 128.8, 127.2, 126.7, 125.9, 119.1 (q, \(J = 268.4\) Hz); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -62.1 (s); HRMS (MALDI) m/z: [M+H]+ Calcd for C\(_{16}\)H\(_{10}\)ClF\(_3\)NO 324.0398, Found: 324.0397.

4-(3-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3o)

The title compound was obtained as a white solid in 84% yield (30.8 mg) by following the general procedure; M.p.: 62-64 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.14 (dd, \(J = 7.4\), 1.6 Hz, 2H), 7.98 (s, 1H), 7.69 (d, \(J = 7.8\) Hz, 1H), 7.60-7.49 (m, 4H), 7.35 (t, \(J = 7.9\) Hz, 1H); \(^{13}\)C\(^{1H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.8, 140.9 (q, \(J = 2.8\) Hz), 133.9 (q, \(J = 42.9\) Hz), 132.6, 131.8, 131.4, 131.3, 130.1, 129.0, 127.1, 127.0 (q, \(J = 1.8\) Hz), 125.8, 122.7, 119.6 (q, \(J = 268.1\) Hz); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.2 (s); HRMS (ESI) m/z: [M+H]+ Calcd for C\(_{16}\)H\(_{10}\)BrF\(_3\)NO 367.9892, Found: 367.9894.
4-(3,5-dimethylphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3p)

The title compound was obtained as a white solid in 88% yield (27.9 mg) by following the general procedure; M.p.: 71-73 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.22-8.11 (m, 2H), 7.58-7.47 (m, 3H), 7.40 (s, 2H), 7.10 (s, 1H), 2.41 (s, 3H), 2.40 (s, 3H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.5, 142.7 (q, \(J = 2.5\) Hz), 138.2, 133.3 (q, \(J = 42.5\) Hz), 131.5, 131.3, 129.1, 128.9, 127.1, 126.2 (q, \(J = 1.5\) Hz), 126.1, 119.8 (q, \(J = 268.0\) Hz), 21.3; \(^1\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.0 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{18}\)H\(_{15}\)F\(_3\)NO 318.1100, Found: 318.1098.

4-(benzo[d][1,3]dioxol-5-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3q)

The title compound was obtained as a white solid in 90% yield (29.9 mg) by following the general procedure; M.p.: 80-82 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.13 (dd, \(J = 7.8, 1.7\) Hz, 2H), 7.55-7.47 (m, 3H), 7.30 (dd, \(J = 8.1, 1.6\) Hz, 1H), 7.27-7.25 (m, 1H), 6.90 (d, \(J = 8.1\) Hz, 1H), 6.02 (s, 2H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.4, 148.8, 147.9, 142.1 (q, \(J = 2.3\) Hz), 132.8 (q, \(J = 42.7\) Hz), 131.6, 128.9, 127.1, 126.0, 123.1, 122.8 (q, \(J = 1.6\) Hz), 119.9 (q, \(J = 267.8\) Hz), 108.8, 108.5, 101.4; \(^1\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.0 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{17}\)H\(_{11}\)F\(_3\)NO \(_3\) 334.0686, Found: 334.0685.

4-(naphthalen-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3r)

The title compound was obtained as a white solid in 97% yield (32.9 mg) by following the general procedure; M.p.: 67-69 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.21 (dd, \(J = 7.7, 1.8\) Hz, 2H), 7.99 (d, \(J = 7.4\) Hz, 2H), 7.95-7.92 (m, 1H), 7.60 (d, \(J = 6.5\) Hz, 1H), 7.57-7.51 (m, 6H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.1, 141.8 (q, \(J = 2.3\) Hz), 135.7 (q, \(J = 42.2\) Hz), 133.7, 131.8, 131.6, 130.2, 129.0, 128.5, 128.4, 127.2, 126.8, 126.6, 126.3, 126.0, 125.3, 124.9, 119.5 (q, \(J = 268.3\) Hz); \(^1\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.9 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{20}\)H\(_{13}\)F\(_3\)NO \(_3\) 340.0944, Found: 340.0943.
4-(naphthalen-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3s)

The title compound was obtained as a white solid in 82% yield (27.7 mg) by following the general procedure; M.p.: 107-109 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.32 (s, 1H), 8.20 (dd, $J = 7.3$, 2.0 Hz, 2H), 7.96 (d, $J = 8.7$ Hz, 2H), 7.91-7.87 (m, 2H), 7.58-7.51 (m, 5H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.7, 142.5 (q, $J = 2.8$ Hz), 133.72 (q, $J = 42.6$ Hz), 133.65, 133.0, 131.7, 129.0, 128.6, 128.4, 128.3, 127.7, 127.2, 127.0, 126.7, 126.6, 126.0, 125.5, 119.9 (q, $J = 267.9$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -59.9 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{20}$H$_{13}$F$_3$NO 340.0944, Found: 340.0947.

4-(furan-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3t)

The title compound was obtained as a white solid in 98% yield (27.4 mg) by following the general procedure; M.p.: 83-85 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.14 (dd, $J = 7.7$, 1.7 Hz, 2H), 7.60 (d, $J = 1.0$ Hz, 1H), 7.56-7.48 (m, 3H), 6.98 (d, $J = 3.4$ Hz, 1H), 6.55 (dd, $J = 3.4$, 1.8 Hz, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.9, 144.2, 144.0, 133.5 (q, $J = 4.8$ Hz), 132.3 (q, $J = 43.8$ Hz), 131.8, 128.9, 127.2, 125.7, 119.5 (q, $J = 267.9$ Hz), 111.9 (q, $J = 2.2$ Hz), 111.7; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.7 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{14}$H$_9$F$_3$NO$_2$ 280.0580, Found: 280.0582.

2-phenyl-4-(thiophen-3-yl)-5-(trifluoromethyl)oxazole (3u)

The title compound was obtained as a white solid in 80% yield (23.6 mg) by following the general procedure; M.p.: 101-103 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.16-8.13 (m, 2H), 7.87 (dd, $J = 3.0$, 1.2 Hz, 1H), 7.56-7.49 (m, 4H), 7.42 (dd, $J = 5.1$, 3.0 Hz, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.5, 137.9 (q, $J = 2.8$ Hz), 132.5 (q, $J = 43.0$ Hz), 131.6, 130.1, 128.9, 127.14 (q, $J = 2.4$ Hz), 127.10, 126.3, 126.1 (q, $J = 2.4$ Hz), 125.9, 119.8 (q, $J = 267.8$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.2 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{14}$H$_9$F$_3$NO$_2$ 296.0351, Found: 296.0354.
4-heptadecyl-2-phenyl-5-(trifluoromethyl)oxazole (3v)

The title compound was obtained as a white solid in 62% yield (27.9 mg) by following the general procedure; M.p.: 116-118 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.07 (dd, \(J = 7.8, 1.7\) Hz, 2H), 7.53-7.45 (m, 3H), 2.71-2.67 (m, 2H), 1.78-1.64 (m, 3H), 1.33-1.25 (br s, 27H), 0.88 (t, \(J = 6.8\) Hz, 3H); \(^{13}C\{^1H\}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.9, 144.0 (q, \(J = 2.1\) Hz), 134.0 (q, \(J = 41.8\) Hz), 131.4, 128.9, 127.0, 126.3, 120.0 (q, \(J = 267.1\) Hz), 31.9, 29.69, 29.65, 29.61, 29.5, 29.36, 29.28, 29.1, 28.7, 26.1, 22.7, 14.1 (five signals missing due to overlap); \(^{19}F\) NMR (CDCl\(_3\), 376 MHz): \(\delta\) -61.3 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{27}\)H\(_{41}\)F\(_3\)NO 452.3135, Found: 452.3136.

4-cyclobutyl-2-phenyl-5-(trifluoromethyl)oxazole (3w)

The title compound was obtained as a colorless oil in 64% yield (17.1 mg) by following the general procedure; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.12-8.08 (m, 2H), 7.53-7.46 (m, 3H), 3.75-3.67 (m, 1H), 2.54-2.44 (m, 2H), 2.33-2.25 (m, 2H), 2.13-1.95 (m, 2H); \(^{13}C\{^1H\}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.8, 146.3 (q, \(J = 2.2\) Hz), 132.5 (q, \(J = 42.3\) Hz), 131.3, 128.8, 127.0, 126.4, 119.9 (q, \(J = 266.6\) Hz), 30.9, 27.8, 18.7; \(^{19}F\) NMR (CDCl\(_3\), 376 MHz): \(\delta\) -61.1 (s); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{14}\)H\(_{13}\)F\(_3\)NO 268.0944, Found: 268.0947.

4-(adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3x)

The title compound was obtained as a white solid in 37% yield (13.0 mg) by following the general procedure; M.p.: 71-75 °C; \(^1H\) NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.9-8.03 (m, 2H), 7.51-7.44 (m, 3H), 2.09 (br s, 3H), 2.07 (br s, 6H), 1.79 (br s, 6H); \(^{13}C\{^1H\}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 159.9, 151.7 (q, \(J = 2.4\) Hz), 133.5 (q, \(J = 42.7\) Hz), 131.1, 128.8, 126.9, 126.5, 120.1 (q, \(J = 267.7\) Hz), 40.9, 36.6, 34.5, 28.4; \(^{19}F\) NMR (CDCl\(_3\), 376 MHz): \(\delta\) -56.0 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{20}\)H\(_{21}\)F\(_3\)NO 348.1570, Found: 348.1569.

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s17
4-(adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)-4,5-dihydrooxazol-4-ol (3x’)

The title compound was obtained as a white solid in 29% yield (10.6 mg) by following the general procedure; M.p.: 140-142 °C; \(^1\)H NMR (CDCl\(_3\), 500 MHz): \(\delta\) 8.01 (d, \(J = 7.3\) Hz, 2H), 7.55 (t, \(J = 7.5\) Hz, 1H), 7.45 (t, \(J = 7.6\) Hz, 2H), 4.81 (q, \(J = 7.0\) Hz, 1H), 3.33 (br s, 1H), 2.02 (br s, 3H), 1.72 (t, \(J = 11.4\) Hz, 6H), 1.63-1.60 (m, 6H); \(^13\)C\(^{1\,\text{H}}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 163.0, 132.5, 128.9, 128.5, 125.8, 123.1 (q, \(J = 281.2\) Hz), 104.0, 76.7 (q, \(J = 30.2\) Hz), 40.3, 36.8, 35.2, 27.9; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -72.2 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{20}\)H\(_{23}\)F\(_3\)NO\(_2\) 366.1675, Found: 366.1674.

5-(perfluoroethyl)-2,4-diphenyloxazole (3y)

The title compound was obtained as a colorless oil in 84% yield (28.5 mg) by following the general procedure; \(^1\)H NMR (CDCl\(_3\), 500 MHz): \(\delta\) 8.15 (dd, \(J = 9.2, 1.7\) Hz, 2H), 7.77-7.75 (m, 2H), 7.57-7.47 (m, 6H); \(^13\)C\(^{1\,\text{H}}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.6, 145.1, 132.2 (t, \(J = 34.5\) Hz), 131.7, 129.6, 129.5, 129.0, 128.8 (t, \(J = 2.6\) Hz), 128.5, 127.1, 126.0, 118.7 (qt, \(J = 286.8, 37.9\) Hz), 109.8 (tq, \(J = 252.9, 40.5\) Hz); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -83.6 (d, \(J = 7.2\) Hz, CF\(_3\)), -111.5 (br s, CF\(_2\)).

This product has been previously reported and spectral data are in agreement with those reported in the literature.[3]

5-(perfluoropropyl)-2,4-diphenyloxazole (3z)

The title compound was obtained as a white solid in 79% yield (30.7 mg) by following the general procedure; M.p.: 45-49 °C; \(^1\)H NMR (CDCl\(_3\), 500 MHz): \(\delta\) 8.16 (dd, \(J = 7.8, 1.6\) Hz, 2H), 7.77-7.75 (m, 2H), 7.59-7.44 (m, 6H); \(^13\)C\(^{1\,\text{H}}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.8, 145.4, 132.2 (t, \(J = 34.4\) Hz), 131.7, 129.6, 129.0, 128.9 (br s), 128.4, 127.1, 125.9, 119.6-105.6 (m, 3C) (one signal missing due to ovlap); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -80.3 (t, \(J = 9.4\) Hz, CF\(_3\)), -109.2 (q, \(J = 9.3\) Hz, CF\(_2\)), -126.1 (br s, CF\(_2\)).

This product has been previously reported and spectral data are in agreement with those reported in the literature.[3]
4-phenyl-2-(p-tolyl)-5-(trifluoromethyl)oxazole (5a)

The title compound was obtained as a white solid in 98% yield (29.7 mg) by following the general procedure; M.p.: 72-74 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.04 (d, $J = 8.2$ Hz, 2H), 7.79-7.75 (m, 2H), 7.51-7.43 (m, 3H), 7.32 (d, $J = 8.0$ Hz, 2H), 2.44 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.9, 142.3 (q, $J = 2.5$ Hz), 142.2, 133.1 (q, $J = 42.5$ Hz), 129.6, 129.5, 129.4, 128.6, 128.5 (q, $J = 1.7$ Hz), 127.1, 123.3, 119.8 (q, $J = 267.9$ Hz), 21.6 (s); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.1 (s); HRMS (ESI) m/z: [M+H]$^+$ C$_{17}$H$_{13}$F$_3$NO 304.0944, Found: 304.0953.

2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5b)

The title compound was obtained as a white solid in 89% yield (28.5 mg) by following the general procedure; M.p.: 75-77 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.11-8.07 (m, 2H), 7.79-7.76 (m, 2H), 7.50-7.43 (m, 3H), 7.03-6.99 (m, 2H), 3.88 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 162.3, 161.8, 142.3 (q, $J = 2.1$ Hz), 132.9 (q, $J = 42.5$ Hz), 129.5, 128.9, 128.5, 128.5 (br s), 119.9 (q, $J = 268.0$ Hz), 118.7, 114.3, 55.4 (one signal missing due to overlap); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.0 (s). This product has been previously reported and spectral data are in agreement with those reported in the literature.[2]

4-phenyl-2-(4-(trifluoromethoxy)phenyl)-5-(trifluoromethyl)oxazole (5c)

The title compound was obtained as a colorless oil in 81% yield (30.2 mg) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.21-8.18 (m, 2H), 7.77 (dd, $J = 7.6$, 1.8 Hz, 2H), 7.52-7.44 (m, 3H), 7.37-7.34 (m, 2H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 160.4, 151.5 (q, $J = 1.8$ Hz), 142.6 (q, $J = 2.6$ Hz), 133.8 (q, $J = 42.9$ Hz), 129.7, 129.0, 128.9, 128.6, 128.4 (q, $J = 1.8$ Hz), 124.5, 121.1 (q, $J = 0.8$ Hz), 120.3 (q, $J = 258.7$ Hz), 119.7 (q, $J = 268.1$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -57.7 (s), -60.2 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{17}$H$_{10}$F$_6$NO$_2$ 374.0610, Found: 374.0608.
2-[[1,1'-biphenyl]-4-yl]-4-phenyl-5-(trifluoromethyl)oxazole (5d)

The title compound was obtained as a white solid in 83% yield (30.1 mg) by following the general procedure; M.p.: 87-90 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.23 (d, $J = 8.4$ Hz, 2H), 7.81 (d, $J = 7.0$ Hz, 2H), 7.75 (d, $J = 8.4$ Hz, 2H), 7.67 (d, $J = 7.3$ Hz, 2H), 7.53-7.48 (m, 5H), 7.45-7.40 (m, 1H); $^{13}$C$\{^1$H\} NMR (CDCl$_3$, 100 MHz): δ 161.6, 144.3, 142.6 (q, $J = 2.0$ Hz), 139.8, 133.5 (q, $J = 43.0$ Hz), 129.6, 129.3, 129.0, 128.6, 128.5 (br s), 128.1, 127.6, 127.1, 124.8, 119.8 (q, $J = 267.9$ Hz) (one signal missing due to overlap); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.0 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{22}$H$_{15}$F$_3$NO 366.1100, Found: 366.1102.

2-(4-fluorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5e)

The title compound was obtained as a white solid in 91% yield (28.0 mg) by following the general procedure; M.p.: 58-60 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.17-8.14 (m, 2H), 7.78 (d, $J = 6.6$ Hz, 2H), 7.52-7.44 (m, 3H), 7.20 (t, $J = 8.6$ Hz, 2H); $^{13}$C$\{^1$H\} NMR (CDCl$_3$, 100 MHz): δ 164.8 (d, $J = 253.0$ Hz), 160.8, 142.5 (q, $J = 2.6$ Hz), 133.5 (q, $J = 42.8$ Hz), 129.6, 129.3 (d, $J = 8.9$ Hz), 129.1, 128.6, 128.4 (q, $J = 1.8$ Hz), 122.3 (d, $J = 3.2$ Hz), 119.7 (q, $J = 267.9$ Hz), 116.2 (d, $J = 22.3$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.1 (s, CF$_3$), -107.1 (s, F); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{10}$H$_{10}$F$_4$NO 308.0693, Found: 308.0695.

2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5f)

The title compound was obtained as a colorless oil in 85% yield (27.6 mg) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): δ 8.08 (d, $J = 7.8$ Hz, 2H), 7.77 (d, $J = 7.7$ Hz, 2H), 7.51-7.46 (m, 5H); $^{13}$C$\{^1$H\} NMR (CDCl$_3$, 100 MHz): δ 160.7, 142.5 (q, $J = 2.7$ Hz), 137.9, 133.6 (q, $J = 42.9$ Hz), 129.7, 129.3, 129.1, 128.6, 128.4 (q, $J = 1.8$ Hz), 128.3, 124.4, 119.7 (q, $J = 268.1$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -60.1 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{16}$H$_{10}$ClF$_3$NO 324.0398, Found: 324.0397.
2-(4-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5g)

The title compound was obtained as a white solid in 83% yield (30.5 mg) by following the general procedure; M.p.: 63-65 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.03-8.00 (m, 2H), 7.77 (dd, \(J = 7.6, 1.8\) Hz, 2H), 7.67-7.64 (m, 2H), 7.51-7.46 (m, 3H); \(^{13}\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 160.8, 142.6 (q, \(J = 2.8\) Hz), 133.7 (q, \(J = 42.8\) Hz), 132.3, 129.7, 129.0, 128.6, 128.5, 128.4 (q, \(J = 1.8\) Hz), 126.4, 124.9, 119.7 (q, \(J = 268.1\) Hz); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.1 (s). This product has been previously reported and spectral data are in agreement with those reported in the literature.\(^[2]\)

2-(4-iodophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5h)

The title compound was obtained as a white solid in 81% yield (33.7 mg) by following the general procedure; M.p.: 56-58 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 7.87 (br s, 4H), 7.78-7.75 (m, 2H), 7.51-7.45 (m, 3H); \(^{13}\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 160.9, 142.6 (q, \(J = 2.3\) Hz), 138.2, 133.7 (q, \(J = 42.8\) Hz), 129.7, 129.1, 128.6, 128.4, 125.4, 119.7 (q, \(J = 268.2\) Hz), 98.6 (one signal missing due to overlap); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.1 (s); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{16}\)H\(_{10}\)F\(_3\)INO 415.9754, Found: 415.9758.

4-phenyl-5-(trifluoromethyl)-2-(4-(trifluoromethyl)phenyl)oxazole (5i)

The title compound was obtained as a white solid in 92% yield (32.7 mg) by following the general procedure; M.p.: 45-47 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.27 (d, \(J = 8.2\) Hz, 2H), 7.81-7.77 (m, 4H), 7.52-7.46 (m, 3H); \(^{13}\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 160.1, 142.7 (q, \(J = 2.6\) Hz), 134.2 (q, \(J = 43.0\) Hz), 133.1 (q, \(J = 32.8\) Hz), 129.8, 129.1, 128.9, 128.7, 128.4 (q, \(J = 1.7\) Hz), 127.4, 126.0 (q, \(J = 3.8\) Hz), 123.6 (q, \(J = 272.5\) Hz), 119.6 (q, \(J = 268.2\) Hz); \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.2 (s), -63.1 (s); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{27}\)H\(_{10}\)F\(_6\)NO 358.0661, Found: 358.0667.
4-phenyl-5-(trifluoromethyl)-2-(4-vinylphenyl)oxazole (5j)

The title compound was obtained as a colorless oil in 88% yield (27.7 mg) by following the general procedure; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.11 (d, \(J = 8.4\) Hz, 2H), 7.80-7.77 (m, 2H), 7.55-7.43 (m, 5H), 6.77 (dd, \(J = 17.6, 10.9\) Hz, 1H), 5.89 (d, \(J = 17.6\) Hz, 1H), 5.40 (d, \(J = 10.9\) Hz, 1H); \(^{13}\)C\(^{(1)}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.5, 142.5 (q, \(J = 2.2\) Hz), 140.7, 135.9, 133.4 (q, \(J = 43.0\) Hz), 129.6, 129.3, 128.6, 128.5 (q, \(J = 1.9\) Hz), 127.3, 126.7, 125.1, 119.8 (q, \(J = 268.3\) Hz), 116.2; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.1; HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{18}\)H\(_{13}\)F\(_3\)NO 316.0944, Found: 316.0947.

4-phenyl-2-(o-tolyl)-5-(trifluoromethyl)oxazole (5k)

The title compound was obtained as a colorless oil in 88% yield (26.7 mg) by following the general procedure; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.05 (dd, \(J = 7.7, 1.7\) Hz, 1H), 7.81-7.79 (m, 2H), 7.52-7.40 (m, 4H), 7.36-7.32 (m, 2H), 2.77 (s, 3H); \(^{13}\)C\(^{(1)}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.0, 141.9 (q, \(J = 2.5\) Hz), 138.4, 133.0 (q, \(J = 42.7\) Hz), 131.8, 131.1, 129.5, 129.4, 129.3, 128.6, 128.4 (q, \(J = 1.8\) Hz), 126.1, 124.9, 119.9 (q, \(J = 268.0\) Hz), 22.1; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.1; HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{17}\)H\(_{13}\)F\(_3\)NO 304.0944, Found: 304.0948.

2-(2-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5l)

The title compound was obtained as a white solid in 93% yield (29.7 mg) by following the general procedure; M.p.: 56-58 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.05 (dd, \(J = 7.7, 1.7\) Hz, 1H), 7.81-7.79 (m, 2H), 7.52-7.44 (m, 4H), 7.10-7.05 (m, 2H), 3.97 (s, 3H); \(^{13}\)C\(^{(1)}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 160.6, 158.1, 141.9 (q, \(J = 2.2\) Hz), 133.3 (q, \(J = 42.3\) Hz), 132.9, 131.0, 129.5, 129.4, 128.52 (q, \(J = 1.9\) Hz), 128.48, 120.7, 119.9 (q, \(J = 267.6\) Hz), 115.2, 112.1, 56.0; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.1; HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{17}\)H\(_{13}\)F\(_3\)NO\(_2\) 320.0893, Found: 320.0891.
2-(2-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5m)

The title compound was obtained as a colorless oil in 78% yield (25.2 mg) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta 8.10$ (dd, $J = 7.7$, 1.7 Hz, 1H), 7.81-7.79 (m, 2H), 7.56 (d, $J = 8.0$ Hz, 1H), 7.51-7.39 (m, 5H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 159.7, 142.1 (q, $J = 2.3$ Hz), 134.0 (q, $J = 43.1$ Hz), 133.3, 132.2, 131.42, 131.40, 129.6, 129.1, 128.6, 128.5 (q, $J = 1.3$ Hz), 127.0, 125.0, 119.7 (q, $J = 268.2$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.2; HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{16}$H$_{10}$ClF$_3$NO 324.0398, Found: 324.0398.

2-(2-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5n)

The title compound was obtained as a colorless oil in 85% yield (31.4 mg) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.04 (dd, $J = 7.8$, 1.7 Hz, 1H), 7.82-7.80 (m, 2H), 7.77 (dd, $J = 8.0$, 0.9 Hz, 1H), 7.52-7.44 (m, 4H), 7.37 (td, $J = 7.8$, 1.6 Hz, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 160.2, 142.1 (q, $J = 2.8$ Hz), 134.7, 133.9 (q, $J = 42.9$ Hz), 132.2, 131.7, 129.7, 129.1, 128.6, 128.5 (br s), 127.5, 127.1, 121.6, 119.7 (q, $J = 268.3$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.2; HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{16}$H$_{10}$BrF$_3$NO 367.9893, Found: 367.9893.

2-(3-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5o)

The title compound was obtained as a colorless oil in 93% yield (29.6 mg) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.79 (d, $J = 6.5$ Hz, 2H), 7.75 (d, $J = 7.7$ Hz, 1H), 7.67 (s, 1H), 7.51-7.46 (m, 3H), 7.42 (t, $J = 8.0$ Hz, 1H), 7.09 (dd, $J = 8.3$, 2.1 Hz, 1H), 3.90 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 161.6, 160.0, 142.5 (q, $J = 2.3$ Hz), 133.5 (q, $J = 42.4$ Hz), 130.1, 129.6, 129.3, 128.6, 128.5 (br s), 127.2, 119.8 (q, $J = 268.0$ Hz), 119.6, 118.2, 111.7, 55.5; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -60.1; HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{17}$H$_{13}$F$_3$NO$_2$ 320.0893, Found: 320.0898.
2-(3-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5p)

The title compound was obtained as a white solid in 73% yield (26.8 mg) by following the general procedure; M.p.: 82-84 °C; \(^1\text{H NMR (CDCl}_3, 400 \text{ MHz)}: δ 8.31 \text{ (t, J = 1.7 Hz, 1H), 8.08 (d, J = 7.9 Hz, 1H), 7.79-7.77 (m, 2H), 7.66 \text{ (dd, J = 8.0, 0.7 Hz, 1H), 7.52-7.46 (m, 3H), 7.38 (t, J = 7.9 Hz, 1H);} \(^{13}\text{C\{H\} NMR (CDCl}_3, 100 \text{ MHz)}: δ 160.1, 142.6 \text{ (q, J = 2.3 Hz), 134.6, 133.9 (q, J = 42.7 Hz), 130.5, 130.0, 129.7, 129.0, 128.6, 128.4 (br s), 127.8, 125.6, 123.1, 119.6 (q, J = 268.1 Hz);} \(^{19}\text{F NMR (CDCl}_3, 376 \text{ MHz)}: δ -60.2; HRMS (ESI) m/z: [M+H]^+ \text{ Calcd for C}_{16}\text{H}_{10}\text{BrF}_3\text{NO 367.9892, Found: 367.9892.}}}

2-(3-nitrophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5q)

The title compound was obtained as a white solid in 88% yield (29.4 mg) by following the general procedure; M.p.: 75-77 °C; \(^1\text{H NMR (CDCl}_3, 400 \text{ MHz)}: δ 8.98 \text{ (t, J = 1.8 Hz, 1H), 8.47 (d, J = 7.8 Hz, 1H), 8.40-8.38 (m, 1H), 7.80-7.77 (m, 2H), 7.73 \text{ (t, J = 8.0 Hz, 1H), 7.53-7.47 (m, 3H);} \(^{13}\text{C\{H\} NMR (CDCl}_3, 100 \text{ MHz)}: δ 159.2, 148.7, 142.8 \text{ (q, J = 2.2 Hz), 134.4 (q, J = 42.9 Hz), 132.5, 130.2, 129.9, 128.7, 128.4, 127.6, 126.0, 122.0, 119.5 (q, J = 268.2 Hz);} \(^{19}\text{F NMR (CDCl}_3, 376 \text{ MHz)}: δ -60.2 (s); HRMS (ESI) m/z: [M+H]^+ \text{ Calcd for C}_{16}\text{H}_{10}\text{F}_3\text{N}_2\text{O}_3 335.0638, Found: 335.0644.}}}

2-(3,5-dimethylphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5r)

The title compound was obtained as a white solid in 99% yield (31.6 mg) by following the general procedure; M.p.: 79-81 °C; \(^1\text{H NMR (CDCl}_3, 400 \text{ MHz)}: δ 7.80-7.77 \text{ (m, 4H), 7.51-7.45 (m, 3H), 7.17 \text{ (br s, 1H), 2.41 (br s, 6H);} \(^{13}\text{C\{H\} NMR (CDCl}_3, 100 \text{ MHz)}: δ 162.1, 142.3 \text{ (q, J = 2.7 Hz), 138.7, 133.4, 133.3 (q, J = 42.7 Hz), 129.5, 129.4, 128.6, 128.5 (q, J = 1.8 Hz), 125.7, 124.8, 119.8 \text{ (q, J = 267.8 Hz), 21.2 (one signal missing due to overlap);} \(^{19}\text{F NMR (CDCl}_3, 376 \text{ MHz)}: δ -60.1 (s); HRMS (ESI) m/z: [M+H]^+ \text{ Calcd for C}_{18}\text{H}_{15}\text{F}_3\text{N}_2\text{O} 318.1000, Found: 318.1107.}}}


2-(naphthalen-1-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5s)

The title compound was obtained as a white solid in 98% yield (33.1 mg) by following the general procedure; M.p.: 88-90 °C;\(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 9.36 (d, \(J = 8.7\) Hz, 1H), 8.34 (dd, \(J = 7.3, 1.1\) Hz, 1H), 8.05 (d, \(J = 8.2\) Hz, 1H), 7.94 (d, \(J = 8.1\) Hz, 1H), 7.90-7.86 (m, 2H), 7.72-7.68 (m, 1H), 7.62-7.58 (m, 2H), 7.56-7.47 (m, 3H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.5, 142.2 (q, \(J = 2.4\) Hz), 133.9, 133.2 (q, \(J = 42.9\) Hz), 132.6, 130.2, 129.6, 129.4, 128.8, 128.7, 128.62, 128.58 (br s), 128.1, 126.6, 125.9, 124.9, 122.3, 120.0 (q, \(J = 267.4\) Hz);\(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.0 (s); HRMS (ESI) m/z: [M+H]\(^{+}\) Calcd for C\(_{20}\)H\(_{13}\)F\(_3\)NO 340.0944, Found: 340.0948.

2-(naphthalen-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5t)

The title compound was obtained as a white solid in 82% yield (27.8 mg) by following the general procedure; M.p.: 83-85 °C;\(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.65 (s, 1H), 8.20 (d, \(J = 8.6\) Hz, 1H), 7.98-7.94 (m, 2H), 7.90-7.88 (m, 1H), 7.84 (d, \(J = 7.4\) Hz, 2H), 7.60-7.47 (m, 5H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 161.8, 142.6 (q, \(J = 2.7\) Hz), 134.7, 133.6 (q, \(J = 42.6\) Hz), 132.8, 129.6, 129.3, 128.9, 128.8, 128.6, 128.5 (br s), 127.9, 127.6, 127.0, 123.3, 123.2, 119.8 (q, \(J = 267.8\) Hz) (one signal missing due to overlap);\(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.0 (s); HRMS (ESI) m/z: [M+H]\(^{+}\) Calcd for C\(_{20}\)H\(_{13}\)F\(_3\)NO 340.0944, Found: 340.0948.

2-(benzofuran-6-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5u)

The title compound was obtained as a white solid in 94% yield (30.9 mg) by following the general procedure; M.p.: 86-88 °C;\(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.30 (s, 1H), 8.07 (d, \(J = 8.1\) Hz, 1H), 7.81 (d, \(J = 6.8\) Hz, 2H), 7.76 (d, \(J = 2.1\) Hz, 1H), 7.71 (d, \(J = 8.2\) Hz, 1H), 7.52-7.46 (m, 3H), 6.84 (d, \(J = 1.2\) Hz, 1H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 162.0, 154.7, 147.5, 142.5 (q, \(J = 2.2\) Hz), 133.4 (q, \(J = 42.6\) Hz), 130.6, 129.6, 129.4, 128.6, 128.5 (br s), 122.2, 121.9, 121.7, 119.8 (q, \(J = 267.9\) Hz), 110.5, 106.9;\(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.0 (s); HRMS (MALDI) m/z: [M+H]\(^{+}\) Calcd for C\(_{25}\)H\(_{12}\)F\(_3\)NO\(_2\) 330.0736, Found: 330.0736.
4-phenyl-2-(thiophen-2-yl)-5-(trifluoromethyl)oxazole (5v)

The title compound was obtained as a colorless oil in 87% yield (25.7 mg) by following the general procedure; 

$$\text{H NMR (CDCl}_3\text{, 400 MHz): } \delta 7.84\text{ (dd, } J = 3.7, 1.2 \text{ Hz, 1H), 7.75\text{ (dd, } J = 7.6, 1.8 \text{ Hz, 2H), 7.55\text{ (dd, } J = 5.0, 1.2 \text{ Hz, 1H), 7.50–7.44 (m, 3H), 7.17\text{ (dd, } J = 5.0, 3.7 \text{ Hz, 1H); } \text{C}^{1}\text{NMR (CDCl}_3\text{, 100 MHz): } \delta 157.9, 142.5\text{ (q, } J = 2.7 \text{ Hz), 132.8 (q, } J = 42.9 \text{ Hz), 130.2, 129.8, 129.6, 129.0, 128.6, 128.5 (q, } J = 1.8 \text{ Hz), 128.2, 128.19, 119.7 (q, } J = 268.1 \text{ Hz); F NMR (CDCl}_3\text{, 376 MHz): } \delta -60.1\text{ (s); HRMS (ESI) m/z: } [M+H]^+ \text{ Calcd for } C_{14}H_{10}F_{3}NO, 296.0351, \text{ Found: 296.0354.}$$

2-(benzofuran-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5w)

The title compound was obtained as a white solid in 83% yield (27.3 mg) by following the general procedure; m.p.: 84-86 °C; 

$$\text{H NMR (CDCl}_3\text{, 400 MHz): } \delta 7.81–7.79\text{ (m, 2H), 7.71\text{ (d, } J = 7.4 \text{ Hz, 1H), 7.65\text{ (dd, } J = 8.4, 0.8 \text{ Hz, 1H), 7.58\text{ (d, } J = 0.8 \text{ Hz, 1H), 7.52–7.43 (m, 4H), 7.36–7.32 (m, 1H); C}^{1}\text{NMR (CDCl}_3\text{, 100 MHz): } \delta 155.7, 154.3, 142.8\text{ (q, } J = 2.6 \text{ Hz), 142.4, 133.7 (q, } J = 43.2 \text{ Hz), 129.9, 128.63, 128.61, 128.56 (q, } J = 1.8 \text{ Hz), 127.3, 127.1, 124.0, 122.3, 119.5 (q, } J = 268.2 \text{ Hz), 112.1, 110.2; F NMR (CDCl}_3\text{, 376 MHz): } \delta -60.1\text{ (s); HRMS (MALDI) m/z: } [M+H]^+ \text{ Calcd for } C_{18}H_{11}F_{3}NO_2, 330.0734, \text{ Found: 330.0734.}$$

(E)-4-phenyl-2-styryl-5-(trifluoromethyl)oxazole (5x)

The title compound was obtained a colorless oil in 98% yield (30.9 mg) by following the general procedure; 

$$\text{H NMR (CDCl}_3\text{, 400 MHz): } \delta 7.76–7.69\text{ (m, 3H), 7.60–7.57 (m, 2H), 7.51–7.39 (m, 6H), 6.99 (d, } J = 16.4 \text{ Hz, 1H); C}^{1}\text{NMR (CDCl}_3\text{, 100 MHz): } \delta 161.4, 142.5\text{ (q, } J = 2.4 \text{ Hz), 139.4, 134.8, 133.0 (q, } J = 42.7 \text{ Hz), 129.9, 129.6, 129.2, 129.0, 128.6, 128.4 (br s), 127.5, 119.7 (q, } J = 267.6 \text{ Hz), 112.4; F NMR (CDCl}_3\text{, 376 MHz): } \delta -60.1\text{ (s); HRMS (MALDI) m/z: } [M+H]^+ \text{ Calcd for } C_{18}H_{13}F_{3}NO, 316.0944, \text{ Found: 316.0942.}$$

s26
4-phenyl-2-propyl-5-(trifluoromethyl)oxazole (5y)

The title compound was obtained as a colorless oil in 63% yield (16.1 mg) by following the general procedure; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 7.69-7.64 (m, 2H), 7.47-7.39 (m, 3H), 2.83 (t, \(J = 7.5\) Hz, 2H), 1.92-1.83 (m, \(J = 7.4\) Hz, 2H), 1.05 (t, \(J = 7.4\) Hz, 3H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 165.5, 141.1 (q, \(J = 3.0\) Hz), 133.3 (q, \(J = 42.4\) Hz), 129.4, 128.5, 128.4 (br s), 119.7 (q, \(J = 267.6\) Hz), 29.9, 20.3, 13.6; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.3 (s); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{13}\)H\(_{13}\)F\(_3\)NO 256.0944, Found: 259.0946.

2-benzyl-4-phenyl-5-(trifluoromethyl)oxazole (5z)

The title compound was obtained as a white solid in 56% yield (16.5 mg) by following the general procedure; M.p.: 86-88 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 7.69-7.67 (m, 2H), 7.47-7.41 (m, 3H), 7.39-7.34 (m, 4H), 7.32-7.29 (m, 1H), 4.20 (s, 2H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 163.5, 141.5, 134.2, 133.9 (q, \(J = 42.5\) Hz), 129.5, 129.2, 128.9, 128.5, 128.4 (q, \(J = 1.6\) Hz) 127.4, 119.6 (q, \(J = 268.0\) Hz), 34.5; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.3 (s); HRMS (ESI) m/z: [M+H]\(^+\) Calcd for C\(_{17}\)H\(_{13}\)F\(_3\)NO 304.0944, Found: 304.0947.

\((8S,9R,13R,14R)-13\)-methyl-3-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-6,7,8,9,11,12,13,14,15,16-decahydro-17H-cyclopenta[a]phenanthren-17-one (5aa)

The title compound was obtained as a white solid in 94% yield (43.7 mg) by following the general procedure; M.p.: 123-128 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 7.91-7.88 (m, 2H), 7.79-7.76 (m, 2H), 7.50-7.41 (m, 4H), 3.04-2.96 (m, 2H), 2.56-2.44 (m, 2H), 2.39-2.33 (m, 1H), 2.21-1.98 (m, 4H), 1.69-1.46 (m, 6H), 0.94 (s, 3H); \(^{13}\)C\(^{1}\)H NMR (CDCl\(_3\), 100 MHz): \(\delta\) 220.6, 161.9, 143.9, 142.4 (q, \(J = 2.3\) Hz), 137.4, 133.2 (q, \(J = 42.6\) Hz), 129.5, 129.4, 128.6, 128.5 (br s), 127.6, 126.0, 124.4, 123.4, 119.8 (q, \(J = 267.9\) Hz), 50.5, 47.9, 44.6, 37.8, 35.8, 31.5, 29.2, 26.2, 25.6, 21.6, 13.8; \(^{19}\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -60.1 (s); HRMS (MALDI) m/z: [M+H]\(^+\) Calcd for C\(_{28}\)H\(_{27}\)F\(_3\)NO\(_2\) 466.1988, Found: 466.1982.
**4-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-N,N-dipropylbenzenesulfonamide (5ab)**

![Chemical Structure](attachment:image1.png)

The title compound was obtained as a white solid in 94% yield (42.5 mg) by following the general procedure; M.p.: 86-88 °C; 

\[ ^1H \text{NMR (CDCl}_3, \text{400 MHz)}: \delta \, 8.28 \, (d, \, J = \, 8.4 \, Hz, \, 2H), \, 7.95 \, (d, \, J = \, 8.4 \, Hz, \, 2H), \, 7.78-7.76 \, (m, \, 2H), \, 7.52-7.48 \, (m, \, 3H), \, 3.14 \, (t, \, J = \, 7.6 \, Hz, \, 4H), \, 1.61-1.52 \, (m, \, 4H), \, 0.88 \, (t, \, J = \, 7.4 \, Hz, \, 6H); \]

\[ ^{13}C\{^1H\} \text{NMR (CDCl}_3, \text{100 MHz)}: \delta \, 160.0, \, 143.0, \, 142.8 \, (q, \, J = \, 2.6 \, Hz), \, 134.3 \, (q, \, J = \, 43.2 \, Hz), \, 129.8, \, 129.2, \, 128.8, \, 128.7, \, 128.4 \, (br \, s), \, 127.6, \, 119.5 \, (q, \, J = \, 268.5 \, Hz), \, 49.8, \, 21.8, \, 11.1 \, \text{(one signal missing due to overlap)}; \]

\[ ^{19}F \text{NMR (CDCl}_3, \text{376 MHz)}: \delta \, -60.2 \, (s); \]

HRMS (ESI) m/z: [M+H]^+ Calcd for C\text{22H}_{24}F_3N_2O_3S 453.1454, Found: 453.1452.

**2,4-diphenyl-5-(trifluoromethyl)thiazole (7a)**

![Chemical Structure](attachment:image2.png)

The title compound was obtained as a white solid in 97% yield (29.6 mg) by following the general procedure; M.p.: 61-63 °C; 

\[ ^1H \text{NMR (CDCl}_3, \text{400 MHz)}: \delta \, 8.03-8.00 \, (m, \, 2H), \, 7.80-7.76 \, (m, \, 2H), \, 7.52-7.46 \, (m, \, 6H); \]

\[ ^{13}C\{^1H\} \text{NMR (CDCl}_3, \text{100 MHz)}: \delta \, 168.2, \, 156.8 \, (q, \, J = \, 2.5 \, Hz), \, 133.2, \, 132.4, \, 131.2, \, 129.4, \, 129.1, \, 129.0 \, (q, \, J = \, 1.7 \, Hz), \, 128.4, \, 126.8, \, 122.4 \, (q, \, J = \, 270.2 \, Hz), \, 120.0 \, (q, \, J = \, 37.3 \, Hz); \]

\[ ^{19}F \text{NMR (CDCl}_3, \text{376 MHz)}: \delta \, -50.1 \, (s); \]

HRMS (MALDI) m/z: [M+H]^+ C\text{16H}_{11}F_3NS 306.0559, Found: 306.0559.

**2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7b)**

![Chemical Structure](attachment:image3.png)

The title compound was obtained as a white solid in 98% yield (32.7 mg) by following the general procedure; M.p.: 71-74 °C; 

\[ ^1H \text{NMR (CDCl}_3, \text{400 MHz)}: \delta \, 7.96-7.93 \, (m, \, 2H), \, 7.78-7.76 \, (m, \, 2H), \, 7.51-7.45 \, (m, \, 3H), \, 6.99-6.96 \, (m, \, 2H), \, 3.87 \, (s, \, 3H); \]

\[ ^{13}C\{^1H\} \text{NMR (CDCl}_3, \text{100 MHz)}: \delta \, 168.1, \, 162.0, \, 156.6 \, (q, \, J = \, 1.9 \, Hz), \, 133.4, \, 129.3, \, 129.0, \, 128.4, \, 128.3, \, 125.3, \]

\[ 122.4 \, (q, \, J = \, 269.7 \, Hz), \, 119.0 \, (q, \, J = \, 36.9 \, Hz), \, 114.4, \, 55.4; \]

\[ ^{19}F \text{NMR (CDCl}_3, \text{376 MHz)}: \delta \, -50.0 \, (s); \]

HRMS (MALDI) m/z: [M+H]^+ C\text{17H}_{13}F_3NOS 336.0665, Found: 336.0659.
2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7c)

The title compound was obtained as a colorless oil in 98% yield (33.2 mg) by following the general procedure; 

**^1H NMR (CDCl₃, 400 MHz):** δ 7.97-7.92 (m, 2H), 7.78-7.75 (m, 2H), 7.51-7.44 (m, 5H); **^13C{^1H} NMR (CDCl₃, 100 MHz):** δ 166.8, 157.0 (q, J = 2.5 Hz), 137.3, 133.0, 130.9, 129.5, 129.4, 129.0 (br s), 128.4, 128.0, 122.2 (q, J = 270.0 Hz), 120.3 (q, J = 37.6 Hz); 

**^19F NMR (CDCl₃, 376 MHz):** δ -50.2 (s); **HRMS (MALDI) m/z:** [M+H]+ Calcd for C₁₆H₁₀ClF₃NS 340.0169, Found: 340.0167.

2-benzyl-4-phenyl-5-(trifluoromethyl)thiazole (7d)

The title compound was obtained as a colorless oil in 78% yield (25.0 mg) by following the general procedure; 

**^1H NMR (CDCl₃, 400 MHz):** δ 7.72-7.70 (m, 2H), 7.49-7.44 (m, 3H), 7.43-7.33 (m, 5H), 4.37 (s, 2H). **^13C{^1H} NMR (CDCl₃, 100 MHz):** δ 171.9, 155.9 (q, J = 2.6 Hz), 136.7, 133.2, 129.3, 129.14, 129.05, 129.0 (br s), 128.3, 127.7, 122.3 (q, J = 269.7 Hz), 120.6 (q, J = 37.2 Hz), 39.8; 

**^19F NMR (CDCl₃, 376 MHz):** δ -50.2 (s); **HRMS (ESI) m/z:** [M+H]+ Calcd for C₁₇H₁₃F₃NS 320.0715, Found: 320.0713.

5-(perfluoroethyl)-2,4-diphenylthiazole (7e)

The title compound was obtained as a colorless oil in 87% yield (30.9 mg) by following the general procedure; 

**^1H NMR (CDCl₃, 400 MHz):** δ 8.04-8.01 (m, 2H), 7.65-7.62 (m, 2H), 7.53–7.46 (m, 6H); **^13C{^1H} NMR (CDCl₃, 100 MHz):** δ 169.6, 158.8, 133.9, 132.3, 131.3, 129.4, 129.2, 129.1, 128.0, 126.9, 119.2 (qt, J = 287.6, 39.9 Hz), 118.2 (t, J = 27.8 Hz) 112.4 (tq, J = 255.7, 40.2 Hz); 

**^19F NMR (CDCl₃, 376 MHz):** δ -83.8 (s, CF₃), -99.5 (s, CF₂); **HRMS (ESI) m/z:** [M+H]+ Calcd for C₁₇H₁₁F₅NS 356.0527, Found: 356.0532.
5-(perfluoroethyl)-2,4-diphenylthiazole (7f)

The title compound was obtained as a colorless oil in 88% yield (35.5 mg) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 8.03-8.00 (m, 2H), 7.61-7.59 (m, 2H), 7.51-7.45 (m, 6H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 169.8, 159.0 (t, $J =$ 2.0 Hz) 134.0, 132.3, 131.3, 129.4, 129.1, 128.0, 126.9, 118.3 (t, $J =$ 28.4 Hz) 114.4 (t, $J =$ 32.2 Hz), 119.2-108.4 (m, 3C); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -79.9 (t, $J =$ 8.9 Hz, CF$_3$), -96.2 (q, $J =$ 10.0 Hz, CF$_2$), -124.4 (s, CF$_2$); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{18}$H$_{11}$F$_7$NS 406.0495, Found: 406.0493.
Characterization of dizao compounds 1

2-diazo-3,3,3-trifluoro-1-phenylpropan-1-one (1a)

The title compound was obtained as a yellow solid in 89% yield (1.91 g) by following the general procedure; M.p.: 56-57 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.63 (d, $J = 8.2$ Hz, 2H), 7.59-7.55 (m, 1H), 7.51-7.43 (t, $J = 7.6$ Hz, 2H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 184.3, 136.0, 132.8, 128.8, 127.2, 122.9 (q, $J = 271.3$ Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta -56.4$ (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_9$H$_6$F$_3$N$_2$O 215.0427, Found: 215.0423.

2-diazo-3,3,3-trifluoro-1-(p-tolyl)propan-1-one (1b)

The title compound was obtained as a yellow solid in 77% yield (1.76 g) by following the general procedure; M.p.: 73-75 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.55 (d, $J = 8.1$ Hz, 2H), 7.27 (d, $J = 7.8$ Hz, 2H), 2.41 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 184.0, 143.7, 133.3, 129.4, 127.3, 123.0 (q, $J = 271.1$ Hz), 21.6; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta -56.4$ (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_{10}$H$_7$F$_3$N$_2$NaO 251.0403, Found: 251.0403.

2-diazo-3,3,3-trifluoro-1-(4-methoxyphenyl)propan-1-one (1c)

The title compound was obtained as a yellow solid in 59% yield (1.44 g) by following the general procedure; M.p.: 44-46 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.66-7.63 (m, 2H), 6.97-6.93 (m, 2H), 3.86 (s, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 182.9, 163.3, 129.6, 128.6, 123.2 (q, $J = 271.2$ Hz), 114.0, 55.5; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta -56.3$ (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_{10}$H$_7$F$_3$N$_2$NaO$_2$ 267.0352, Found: 267.0352.

1-([1,1'-biphenyl]-4-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1d)

The title compound was obtained as a yellow solid in 63% yield (1.83 g) by following the general procedure; M.p.: 127-129 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.75-7.69 (m, 4H), 7.63-7.58 (m, 2H), 7.50-7.46 (m, 2H), 7.43-7.40
(m, 1H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 183.8, 145.7, 139.5, 134.7, 129.0, 128.4, 127.9, 127.4, 127.3, 123.0 (q, J = 271.6 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -56.1 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{15}$H$_{10}$F$_3$N$_2$O 291.0740, Found: 291.0740.

2-diazo-3,3,3-trifluoro-1-(4-fluorophenyl)propan-1-one (1e)

The title compound was obtained as a yellow solid in 65% yield (1.51 g) by following the general procedure; M.p.44-46: ºC; $^1$H NMR (CDCl$_3$, 400 MHz): δ 7.70-7.66 (m, 2H), 7.19-7.15 (m, 2H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 183.0, 165.3 (d, J = 254.9 Hz), 132.3 (d, J = 3.1 Hz), 129.9 (d, J = 9.2 Hz), 122.9 (q, J = 271.2 Hz), 116.1 (d, J = 22.1 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -55.8 (s, CF$_3$), -104.8 (s, F); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_9$H$_4$F$_3$N$_2$NaO 255.0152, Found: 255.0151.

1-(4-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1f)

The title compound was obtained as a yellow solid in 62% yield (1.52 g) by following the general procedure; M.p.: 41-43ºC; $^1$H NMR (CDCl$_3$, 400 MHz): δ 7.59 (d, J = 8.4 Hz, 2H), 7.46 (d, J = 8.4 Hz, 2H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 183.1, 139.2, 134.4, 129.2, 128.7, 122.8 (q, J = 271.3 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -55.7 (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_9$H$_4$ClF$_3$N$_2$NaO 270.9856, Found: 270.9858.

1-(4-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1g)

The title compound was obtained as a white solid in 67% yield (1.96 g) by following the general procedure; M.p. 67-69: ºC; $^1$H NMR (CDCl$_3$, 400 MHz): δ 7.63 (d, J = 8.5 Hz, 2H), 7.51 (d, J = 8.4 Hz, 2H); $^{13}$C$^1$H NMR (CDCl$_3$, 100 MHz): δ 183.3, 134.8, 132.1, 128.8, 127.8, 122.8 (q, J = 271.3 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -55.7 (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_9$H$_4$BrF$_3$N$_2$NaO 314.9351, Found: 314.9352.

2-diazo-3,3,3-trifluoro-1-(4-iodophenyl)propan-1-one (1h)

The title compound was obtained as a white solid in 52% yield (1.76 g) by following the general procedure; M.p.: 58-60 ºC; $^1$H NMR (CDCl$_3$, 400 MHz): δ 7.84 (d, J = 8.5 Hz, 2H), 7.36 (d, J = 8.4 Hz, 2H); $^{13}$C$^1$H NMR (CDCl$_3$, 100
MHZ): δ 183.4, 138.1, 135.4, 128.6, 122.8 (q, J = 271.2 Hz), 100.2; \(^{19}\text{F NMR (CDCl}_3, 376 MHZ): \ δ -55.8 (s); \text{HRMS (ESI) m/z: [M+Na]}^+ \text{ Calcd for C}_9\text{H}_4\text{F}_3\text{IN}_2\text{NaO} 362.9213, \text{ Found: 362.9209.}

4-(2-diazo-3,3,3-trifluoropropanoyl)phenyl acetate (1i)

The title compound was obtained as a yellow solid in 70% yield (1.91 g) by following the general procedure; M.p.: 79-81 °C; \(^1\text{H NMR (CDCl}_3, 400 MHZ): \ δ 8.14 (d, J = 8.2 Hz, 2H), 7.69 (d, J = 8.2 Hz, 2H), 3.95 (s, 3H); \(^{13}\text{C\text{\{}^1\text{H}} \text{ NMR (CDCl}_3, 100 MHZ): \ δ 183.7, 165.8, 139.6, 133.7, 130.0, 127.2, 122.7 (q, J = 271.4 Hz), 52.5; \(^{19}\text{F NMR (CDCl}_3, 376 MHZ): \ δ -55.8 (s); \text{HRMS (ESI) m/z: [M+Na]}^+ \text{ Calcd for C}_{11}\text{H}_7\text{F}_3\text{N}_2\text{NaO} 295.0301, \text{ Found: 295.0298.}

1-(4-acetylphenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1j)

The title compound was obtained as a yellow solid in 83% yield (2.12 g) by following the general procedure; M.p.: 35-37 °C; \(^1\text{H NMR (CDCl}_3, 400 MHZ): \ δ 8.06-8.03 (m, 2H), 7.73-7.70 (m, 2H), 2.65 (s, 3H); \(^{13}\text{C\text{\{}^1\text{H}} \text{ NMR (CDCl}_3, 100 MHZ): \ δ 197.1, 183.7, 139.9, 139.6, 128.6, 127.5, 122.7 (q, J = 271.4 Hz), 26.8; \(^{19}\text{F NMR (CDCl}_3, 376 MHZ): \ δ -55.7 (s); \text{HRMS (ESI) m/z: [M+Na]}^+ \text{ Calcd for C}_{11}\text{H}_7\text{F}_3\text{N}_2\text{NaO} 279.0352, \text{ Found: 279.0350.}

2-diazo-3,3,3-trifluoro-1-(4-nitrophenyl)propan-1-one (1k)

The title compound was obtained as a yellow solid in 47% yield (1.22 g) by following the general procedure; M.p.: 40-42 °C; \(^1\text{H NMR (CDCl}_3, 400 MHZ): \ δ 8.33 (d, J = 8.5 Hz, 2H), 7.80 (d, J = 8.5 Hz, 2H); \(^{13}\text{C\text{\{}^1\text{H}} \text{ NMR (CDCl}_3, 100 MHZ): \ δ 182.6, 150.0, 141.3, 128.3, 124.0, 122.5 (q, J = 271.3 Hz); \(^{19}\text{F NMR (CDCl}_3, 376 MHZ): \ δ -55.0 (s); \text{HRMS (ESI) m/z: [M+Na]}^+ \text{ Calcd for C}_9\text{H}_4\text{F}_3\text{N}_2\text{NaO} 282.0097, \text{ Found: 282.0099.}

s33
4-(2-diazo-3,3,3-trifluoropropanoyl)benzonitrile (1I)

The title compound was obtained as a yellow solid in 36% yield (0.86 g) by following the general procedure; M.p.: 84-86 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.78 (d, J = 8.3 Hz, 2H), 7.72 (d, J = 8.2 Hz, 2H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 182.7, 139.6, 132.6, 127.7, 122.5 (q, J = 271.3 Hz), 117.5, 116.2; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -55.3 (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_{10}$H$_4$F$_3$N$_3$NaO 262.0199, Found: 262.0201.

2-diazo-3,3,3-trifluoro-1-(4-{trifluoromethyl}phenyl)propan-1-one (1m)

The title compound was obtained as a yellow oil in 30% yield (0.85 g) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.75 (br s, 4H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 183.3, 139.2, 134.2 (q, J = 33.0 Hz), 130.4, 127.6, 125.9 (q, J = 3.6 Hz), 123.3 (q, J = 272.8 Hz), 122.7 (q, J = 271.1 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -55.4, -63.2; HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_{10}$H$_4$F$_3$N$_2$NaO 305.0120, Found: 305.0125.

1-(2-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1n)

The title compound was obtained as a yellow oil in 59% yield (1.46 g) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.46-7.42 (m, 2H), 7.40-7.33 (m, 2H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 183.1, 135.7, 132.2, 130.4, 130.1, 128.2, 127.2, 122.3 (q, J = 271.9 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -57.4 (br s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_9$H$_4$ClF$_3$N$_2$NaO 270.9856, Found: 270.9859.

1-(3-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1o)

The title compound was obtained as a yellow solid in 85% yield (2.47 g) by following the general procedure; M.p.: 68-70 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.78 (t, J = 1.7 Hz, 1H), 7.70 (ddd, J = 8.0, 1.9, 1.0 Hz, 1H), 7.55 (dt, J = 7.8, 1.2 Hz, 1H), 7.36 (t, J = 7.9 Hz, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 182.8, 137.8, 135.7, 130.35, 130.30, 125.6, 123.0, 122.7 (q, J = 271.4 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ 55.8 (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_9$H$_4$BrF$_3$N$_2$NaO 314.9351, Found: 314.9354.

2-diazo-1-(3,5-dimethylphenyl)-3,3,3-trifluoropropan-1-one (1p)
The title compound was obtained as a yellow oil in 89% yield (2.15 g) by following the general procedure; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 7.23 (s, 2H), 7.19 (s, 1H), 2.35 (s, 6H); \(^1^3\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 184.6, 138.6, 136.0, 134.3, 124.8, 123.0 (q, \(J = 271.3\) Hz), 21.0; \(^1^9\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -56.7 (s); HRMS (ESI) m/z: [M+Na]^+ Calcd for C\(_{11}\)H\(_9\)N\(_2\)O 265.0559, Found: 265.0564.

1-(benzo[d][1,3]dioxol-5-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1q)

The title compound was obtained as a yellow solid in 50% yield (1.29 g) by following the general procedure; M.p.: 64-66 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 7.21 (dd, \(J = 8.1, 1.5\) Hz, 1H), 7.11 (d, \(J = 1.4\) Hz, 1H), 6.84 (d, \(J = 8.1\) Hz, 1H), 6.04 (s, 2H); \(^1^3\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 182.5, 151.6, 148.2, 130.1, 123.1 (q, \(J = 271.3\) Hz), 122.9, 108.1, 107.7, 102.0; \(^1^9\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -56.4 (s); HRMS (ESI) m/z: [M+H]^+ Calcd for C\(_{10}\)H\(_6\)F\(_3\)NaO 259.0325, Found: 259.0323.

2-diazo-3,3,3-trifluoro-1-(naphthalen-1-yl)propan-1-one (1r)

The title compound was obtained as a yellow oil in 58% yield (1.53 g) by following the general procedure; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.10 (d, \(J = 8.2\) Hz, 1H), 7.99 (d, \(J = 8.2\) Hz, 1H), 7.92-7.89 (m, 1H), 7.62-7.54 (m, 3H), 7.51-7.47 (m, 1H); \(^1^3\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 185.6, 133.7, 133.5, 132.0, 129.4, 128.6, 127.9, 126.9, 125.2, 124.34, 124.31 122.7 (q, \(J = 271.4\) Hz); \(^1^9\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -56.5 (s); HRMS (ESI) m/z: [M+Na]^+ Calcd for C\(_{13}\)H\(_7\)F\(_3\)NaO 287.0403, Found: 287.0405.

2-diazo-3,3,3-trifluoro-1-(naphthalen-2-yl)propan-1-one (1s)

The title compound was obtained as a yellow solid in 83% yield (2.20 g) by following the general procedure; M.p.: 94-96 °C; \(^1\)H NMR (CDCl\(_3\), 400 MHz): \(\delta\) 8.17 (br s, 1H), 7.93 (d, \(J = 8.5\) Hz, 2H), 7.89 (d, \(J = 7.9\) Hz, 1H), 7.71 (dd, \(J = 8.5, 1.6\) Hz, 1H), 7.64-7.56 (m, 2H); \(^1^3\)C\(^{\{1\}H}\) NMR (CDCl\(_3\), 100 MHz): \(\delta\) 184.2, 135.2, 133.3, 132.2, 129.1, 128.9, 128.6, 128.3, 127.9, 127.2, 123.3, 123.0 (q, \(J = 271.4\) Hz); \(^1^9\)F NMR (CDCl\(_3\), 376 MHz): \(\delta\) -56.2 (s); HRMS (ESI) m/z: [M+Na]^+ Calcd for C\(_{13}\)H\(_7\)F\(_3\)NaO 287.0403, Found: 287.0402.
2-diazo-3,3,3-trifluoro-1-(furan-2-yl)propan-1-one (1t)

The title compound was obtained as a yellow solid in 71% yield (1.45 g) by following the general procedure; M.p.38-40 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ$^1$H NMR (400 MHz, ) δ 7.55 (s, 1H), 7.30 (d, J = 3.3 Hz, 1H), 6.63-6.59 (m, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 169.5, 151.0, 145.5, 123.0 (q, J = 271.5 Hz), 117.8, 112.7; $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -57.4 (s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_7$H$_4$F$_3$N$_2$O$_2$ 205.0219, Found: 205.0218.

2-diazo-3,3,3-trifluoro-1-(thiophen-3-yl)propan-1-one (1u)

The title compound was obtained as a yellow solid in 86% yield (1.89 g) by following the general procedure; M.p.45-47 °C; $^1$H NMR (CDCl$_3$, 400 MHz): δ 7.93-7.92 (m, 1H), 7.43 (d, J = 5.0, 1.0 Hz, 1H), 7.38 (dd, J = 5.1, 2.9 Hz, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 177.2, 138.5, 130.7, 126.8, 123.0 (q, J = 270.7 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -55.7 (s); HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_7$H$_3$F$_3$N$_2$OS 242.9810, Found: 242.9809.

2-diazo-1,1,1-trifluoroicosan-3-one (1v)

The title compound was obtained as a yellow solid in 64 % yield (2.41 g) by following the general procedure; M.p. 36-38 °C $^1$H NMR (CDCl$_3$, 400 MHz): δ 2.51 (t, J = 7.4 Hz, 2H), 1.69-1.62 (m, 2H), 1.25 (br s, 28H), 0.87 (t, J = 7.1 Hz, 3H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 189.7, 123.1 (q, J = 269.5 Hz), 39.0, 31.9, 29.69, 29.65, 29.63, 29.56, 29.41, 29.36, 29.3, 29.0, 24.0, 22.7, 14.0; $^{19}$F NMR (CDCl$_3$, 376 MHz): δ -55.0; HRMS (ESI) m/z: [M+Na]$^+$ Calcd for C$_{20}$H$_{35}$F$_3$N$_2$NaOS 399.2594, Found: 399.2599.

1-cyclobutyl-2-diazo-3,3,3-trifluoropropan-1-one (1w)

The title compound was obtained as a a yellow oil in 69% yield (1.34 g) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): δ 3.49-3.41 (m, 1H), 2.44-2.35 (m, 2H), 2.21-2.13 (m, 2H), 2.06-1.97 (m, 1H), 1.94-1.85 (m, 1H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): δ 190.8, 123.0 (q, J = 269.7 Hz), 42.4, 24.5, 17.7; $^{19}$F NMR (CDCl$_3$, 376 MHz): δ...
1-(adamantan-1-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1x)

The title compound was obtained as a yellow solid in 69% yield (1.88 g) by following the general procedure; M.p.: 91-93 °C; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 2.09 (br s, 3H), 1.91 (d, $J = 2.6$ Hz, 6H), 178-1.67 (m, 6H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 193.7, 123.5 (q, $J = 272.3$ Hz), 47.7, 37.5, 36.3, 28.0; $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -55.0 (br s); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_7$H$_8$F$_3$N$_2$O 193.0583, Found: 193.0579.

2-diazo-3,3,4,4,4-pentafluoro-1-phenylbutan-1-one (1y)

The title compound was obtained as a yellow oil in 78% yield (2.06 g) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.63-7.61 (m, 2H), 7.59-7.54 (m, 1H), 7.47 (t, $J = 7.5$ Hz, 2H). $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 184.2, 136.1, 132.8, 128.8, 127.2, 118.7 (qt, $J = 287.2$, 40.4 Hz), 111.6 (tq, $J = 260.9$, 41.7 Hz); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -84.0 (s, CF$_3$), -111.6 (s, CF$_2$); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{13}$H$_{16}$F$_3$N$_2$O 273.1209, Found: 273.1215.

2-diazo-3,3,4,4,5,5,5-heptafluoro-1-phenylpentan-1-one (1z)

The title compound was obtained as a yellow oil in 84% yield (2.64 g) by following the general procedure; $^1$H NMR (CDCl$_3$, 400 MHz): $\delta$ 7.62-7.59 (m, 2H), 7.58-7.54 (m, 1H), 7.48-7.44 (m, 2H); $^{13}$C($^1$H) NMR (CDCl$_3$, 100 MHz): $\delta$ 184.1, 136.2, 132.7, 128.8, 127.2, 119.1-108.6 (m, 3C); $^{19}$F NMR (CDCl$_3$, 376 MHz): $\delta$ -80.6 (t, $J = 9.2$ Hz, CF$_3$), -108.0 (q, $J = 8.8$ Hz, CF$_2$), -126.2 (br s, CF$_2$); HRMS (ESI) m/z: [M+H]$^+$ Calcd for C$_{11}$H$_{16}$F$_7$N$_2$O 315.0363, Found: 315.0365.
Experimental Mechanism Studies

(a) Reaction of styrene with 1a to trap the possible Cu carbene intermediate

\[
\begin{align*}
\text{Ph} = & + \text{Ph} \quad \text{N}_2 \quad \text{CF}_3 \\
\text{0.2 mmol} & + \text{1a (0.2 mmol)} \quad \text{Cu(\text{MeCN})}_4\text{PF}_6 (\text{5 mol }\%) \\
\text{DCE, 100 °C} & \quad 16 \text{ h, Ar} \\
\text{(standard conditions)} & \rightarrow \text{Ph} \quad \text{O} \quad \text{CF}_3 \\
\text{Ph} & \quad 8, 0%
\end{align*}
\]

A mixture of 1a (42.8 mg, 0.2 mmol, 1.0 equiv), Cu(MeCN)_4PF_6 (3.7 mg, 0.01 mmol, 5.0 mol %), styrene (20.8 mg, 0.2 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added and the resulting mixture was stirred at 100 °C for using heating modular of parallel reactor 16 h under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH_2Cl_2. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by column chromatography on silica gel with petroleum ether/EtOAc (50:1) shown that no cyclopropanation product was formed.
(b) Reaction of styrene with 1a in the presence of catalytic amount of 2a

A mixture of 1a (42.8 mg, 0.2 mmol, 1.0 equiv), 2a (0.5 mg, 0.04 mmol, 0.2 equiv), Cu(MeCN)₄PF₆ (3.7 mg, 0.01 mmol, 5.0 mol %), styrene (20.8 mg, 0.2 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. The reaction was cooled to room temperature and the suspension was filtered through a short column filled with celite and the solvent was removed in vacuo. The solvent was removed to leave a crude product, which was analysed by ¹⁹F NMR using PhCF₃ (0.04 mmol) as the internal standard. Based on ¹⁹F NMR spectra, the 5a was formed in 81% NMR yield. The residue was then purified by column chromatography on silica gel with petroleum ether/EtOAc (50:1) shown that no cyclopropanation product was formed.
(c) Stoichiometric reaction of amide 2a with Cu(MeCN)$_4$PF$_6$

**Detailed process:**

both 2a and Cu(MeCN)$_4$PF$_6$ are **insoluble** in DCE at r.t.

the mixture becomes **clear** (colorless) when heated to 100 °C

large amount of light-green **precipitation** emerges after heated at 100 °C for 16 h

The colorless solution turns into **light-green** after heated at 100 °C for 1 h

filtration

A mixture of 2a (24.2 mg, 0.2 mmol, 1.0 equiv), Cu(MeCN)$_4$PF$_6$ (74.4 mg, 0.2 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was then added. and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. Then the reaction mixture was filtered while still hot. The obtained light green precipitation 9 was analyzed by HRMS. The HRMS analysis of 9 showed a peak at m/z = 183.9810, which match the structure of proposed Cu-imidate complex (calcd mass: 183.9818).

Cu-complex 9: **HRMS (ESI)** m/z: [M+H]$^+$ Calcd for C$_7$H$_7$CuNO 183.9818, Found: 183.9810.
(d) The reaction of stoichiometric amounts of complex 9 with diazo 1a

A mixture of 1a (42.8 mg, 0.2 mmol, 2.0 equiv), Cu complex 6 (18.4 mg, 0.1 mmol, 1.0 equiv), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (2.0 mL) was added and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. The reaction was cooled to room temperature and the suspension was filtered through a short column filled with celite and the solvent was removed in vacuo. The solvent was removed to leave a crude product, which was purified by column chromatography on silica gel with petroleum ether/EtOAc (50:1). The desired product 3a was obtained in 89% yield (25.7 mg).
(e) Complex 9-catalyzed cyclization of diazo 1a with amide 2a

\[
\begin{align*}
\text{Ph} & \quad N_2 \\
\text{CF}_3 \\
1a \quad (0.2 \text{ mmol}) & \quad + \quad \text{Ph} \quad O \\
\text{NH}_2 \\
2a \quad (0.1 \text{ mmol}) & \quad \rightarrow \quad \text{Ph} \quad O \\
\text{CF}_3 \\
3a \quad 85 \% & \quad \text{(NMR yield)}
\end{align*}
\]

A mixture of 1a (42.8 mg, 0.2 mmol, 2.0 equiv), 2a (12.1 mg, 0.1 mmol, 1.0 equiv), Cu complex 9 (0.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C using heating modular of parallel reactor for 16 h under Ar atmosphere. The reaction was cooled to room temperature and the suspension was filtered through a short column filled with celite and the solvent was removed in vacuo. The solvent was removed to leave a crude product, which was analysed by $^{19}$F NMR using PhCF$_3$ (0.1 mmol) as the internal standard. Based on $^{19}$F NMR spectra, the 5a was formed in 86% NMR yield.
(f) Intermolecular competition reaction between electronically differentiated amides 2b and 2g

A mixture of 1a (42.8 mg, 0.2 mmol, 2.0 equiv), 2b (15.1 mg, 0.1 mmol, 1.0 equiv), 2g (19.9 mg, 0.1 mmol, 1.0 equiv), Cu(MeCN)$_4$PF$_6$ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH$_2$Cl$_2$. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by preparative thin-layer chromatography (TLC) with petroleum ether/EtOAc (50:1, v/v). The desired products 5b and 5g were obtained in 63% yield (20.1 mg) and 44% yield (16.2 mg), respectively.
(g) Intermolecular competition reaction between electronically differentiated diazo compounds 1c and 1g

A mixture of 1c (24.4 mg, 0.1 mmol, 1.0 equiv), 1g (29.3 mg, 0.1 mmol, 1.0 equiv), 2a (12.1 mg, 0.1 mmol, 1.0 equiv), Cu(MeCN)4PF6 (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH2Cl2. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by preparative thin-layer chromatography (TLC) with petroleum ether/EtOAc (50:1, v/v). The desired products 3c and 3g were obtained in 54% yield (17.3 mg) and 46% yield (16.8 mg), respectively.
(h) Conversion of oxazoline 3x’ to oxazole 3x

![Chemical structure](image)

**standard conditions: 3x (43%) + 3x’ (55% recovery)
without Cu(MeCN)$_4$PF$_6$: 3x (0%) + 3x’ (97% recovery)**

A mixture of 3x’ (36.5 mg, 0.1 mmol, 1.0 equiv), Cu(MeCN)$_4$PF$_6$ (1.9 mg, 0.005 mmol, 5.0 mol %), were weighted in a Schlenk tube equipped with a stir bar. Dry DCE (1.0 mL) was added and the resulting mixture was stirred at 100 °C for 16 h using heating modular of parallel reactor under Ar atmosphere. The reaction was cooled to room temperature and transferred to a 100 mL round-bottomed flask using CH$_2$Cl$_2$. Silica was added to the flask and volatiles were evaporated under reduced pressure. The residue was purified by column chromatography on silica gel with petroleum ether: ethyl acetate = 50:1 (v/v). The desired product 3x was obtained in 43% yield (15.0 mg) and unreacted 3x’ was recovered in 55% yield (20.2 mg).

When the above reaction was carried out in the absence of Cu(MeCN)$_4$PF$_6$, TLC indicadeted that no reaction occurred and most of 3x’ (35.2 mg, 97%) was recovered.
Spectral Copies of $^1$H, $^{19}$F and $^{13}$C$^{1}$H NMR of Compounds Obtained in this Study
2,4-diphenyl-5-(trifluoromethyl)oxazole (3a)

\[ \text{\^{1}H NMR, CDCl}_3, 400 \text{ MHz} \]

\[ \text{\^{13}C\{\text{\^{1}H}\} NMR, CDCl}_3, 100 \text{ MHz} \]
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-phenyl-4-(p-tolyl)-5-(trifluoromethyl)oxazole (3b)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(4-methoxyphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3c)

$\text{^1H NMR, CDCl}_3, 400 \text{ MHz}$

$\text{^13C\{^1H\} NMR, CDCl}_3, 100 \text{ MHz}$
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-[(1,1′-biphenyl)-4-yl]-2-phenyl-5-(trifluoromethyl)oxazole (3d)

^1H NMR, CDCl₃, 400 MHz

^13C[^1H] NMR, CDCl₃, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(4-fluorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3e)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
4-(4-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3f)

$^{1}H$ NMR, CDCl$_3$, 400 MHz

$^{13}C(^{1}H)$ NMR, CDCl$_3$, 100 MHz
$^{19}\text{F NMR, CDCl}_3$, 376 MHz
4-(4-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3g)

\[ \text{1H NMR, CDCl}_3, 400 \text{ MHz} \]

\[ \text{13C(1H) NMR, CDCl}_3, 100 \text{ MHz} \]
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(4-iodophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3h)

$\text{\textsuperscript{13}C}\{\text{\textsuperscript{1}H}\}\text{NMR, CDCl}_3$, 100 MHz

ppm (t1)

161.81 141.53 141.51 141.49 137.80 133.88 133.45 131.77 130.07 130.05 128.97 128.80 127.12 125.81 121.01 118.34 95.91 77.32 77.00 76.68

ppm (t1) 0 50 100 150 200

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0

0 2.00 2.03 5.04
methyl 4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzoate (3i)
19F NMR, CDCl3, 376 MHz
1-(4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)phenyl)ethan-1-one (3j)

$^{1}$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
4-(4-nitrophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3k)
4-(2-phenyl-5-(trifluoromethyl)oxazol-4-yl)benzonitrile (3I)

$^{1}$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-phenyl-5-(trifluoromethyl)-4-(4-(trifluoromethyl)phenyl)oxazole (3m)

$^{1}H$ NMR, CDCl$_3$, 400 MHz

$^{13}C\{^1H\}$ NMR, CDCl$_3$, 100 MHz
4-(2-chlorophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3n)
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(3-bromophenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3o)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H)-NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(3,5-dimethylphenyl)-2-phenyl-5-(trifluoromethyl)oxazole (3p)

$\text{^{1}H NMR, CDCl}_3, 400 \text{ MHz}$

$\text{^{13}C\{^{1}H\} NMR, CDCl}_3, 100 \text{ MHz}$
4-(benzo[d][1,3]dioxol-5-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3q)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(naphthalen-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3r)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(naphthalen-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3s)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(furan-2-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3t)

$^{1} \text{H NMR, CDCl}_3, 400 \text{ MHz}$

$^{13}\text{C}[^{1}\text{H}] \text{NMR, CDCl}_3, 100 \text{ MHz}$
2-phenyl-4-(thiophen-3-yl)-5-(trifluoromethyl)oxazole (3u)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-heptadecyl-2-phenyl-5-(trifluoromethyl)oxazole (3v)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C$^{(1)}$H NMR, CDCl$_3$, 100 MHz
$\text{ppm (t)}$

$-300$  $-200$  $-100$  $0$  $100$

$19F$ NMR, CDCl$_3$, 376 MHz

[Chemical structure with $C_{17}H_{35}$ and other labels]
4-cyclobutyl-2-phenyl-5-(trifluoromethyl)oxazole (3w)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz

ppm (s1)
4-((3r,5r,7r)-adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)oxazole (3x)

\[
\begin{align*}
40.93 & \quad 36.57 & \quad 34.51 & \quad 28.37 \\
159.90 & \quad 151.73 & \quad 151.71 & \quad 133.71 \\
153.28 & \quad 151.05 & \quad 150.79 & \quad 133.28 \\
121.42 & \quad 118.76 & \quad 121.42 & \quad 118.76 \\
159.90 & \quad 151.73 & \quad 151.71 & \quad 133.71 \\
153.28 & \quad 151.05 & \quad 150.79 & \quad 133.28 \\
121.42 & \quad 118.76 & \quad 121.42 & \quad 118.76 \\
\end{align*}
\]

\[\text{ppm (t1)}\]

\[
\begin{align*}
2.09 & \quad 1.79 & \quad 2.00 & \quad 3.04 \\
6.03 & \quad 6.13 & \quad 3.16 & \quad 6.03 \\
1.70 & \quad 1.80 & \quad 1.90 & \quad 2.00 \\
2.10 & \quad 2.20 & \quad 2.30 & \quad 2.40 \\
0.0 & \quad 5.0 & \quad 10.0 & \quad 15.0 \\
20.0 & \quad 25.0 & \quad 30.0 & \quad 35.0 \\
\end{align*}
\]

\[\text{ppm (t1)}\]

\[
\begin{align*}
159.90 & \quad 151.73 & \quad 151.71 & \quad 133.71 \\
153.28 & \quad 151.05 & \quad 150.79 & \quad 133.28 \\
121.42 & \quad 118.76 & \quad 121.42 & \quad 118.76 \\
159.90 & \quad 151.73 & \quad 151.71 & \quad 133.71 \\
153.28 & \quad 151.05 & \quad 150.79 & \quad 133.28 \\
121.42 & \quad 118.76 & \quad 121.42 & \quad 118.76 \\
\end{align*}
\]

\[\text{ppm (t1)}\]
$^{19}\text{F NMR, CDCl}_3, \text{376 MHz}$
4-((3r,5r,7r)-adamantan-1-yl)-2-phenyl-5-(trifluoromethyl)-4,5-dihydrooxazol-4-ol (3x')

\[
\text{\begin{center}
\begin{array}{c}
\text{1H NMR, CDCl}_3, 400 MHz}
\end{array}
\end{center} }
\]

\[
\text{\begin{center}
\begin{array}{c}
\text{13C(\text{1H})-NMR, CDCl}_3, 100 MHz}
\end{array}
\end{center} }
\]
$^{19}$F NMR, CDCl$_3$, 376 MHz
5-(perfluoroethyl)-2,4-diphenyloxazole (3y)
$^{19}$F NMR, CDCl$_3$, 376 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-phenyl-2-(p-tolyl)-5-(trifluoromethyl)oxazole (5a)

$\text{H}_3\text{C} \begin{array}{c} \text{O} \\ \text{CF}_3 \end{array} \begin{array}{c} \text{N} \\ \text{C} \end{array} \begin{array}{c} \text{O} \\ \text{CF}_3 \end{array} \begin{array}{c} \text{N} \\ \text{C} \end{array}$

$^1\text{H NMR, CDCl}_3, 400 \text{ MHz}$

$\text{H}_3\text{C} \begin{array}{c} \text{O} \\ \text{CF}_3 \end{array} \begin{array}{c} \text{N} \\ \text{C} \end{array} \begin{array}{c} \text{O} \\ \text{CF}_3 \end{array} \begin{array}{c} \text{N} \\ \text{C} \end{array}$

$^{13}\text{C}^{(1)}\text{H NMR, CDCl}_3, 100 \text{ MHz}$
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5b)

$\text{H}_3\text{CO}$

$\text{O}$

$\text{CF}_3$

$^1\text{H NMR, CDCl}_3$, 400 MHz

$^1\text{C}[^1\text{H}]$ NMR, CDCl$_3$, 100 MHz

S103
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-phenyl-2-(4-(trifluoromethoxy)phenyl)-5-(trifluoromethyl)oxazole (5c)
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-[(1,1'-biphenyl)-4-yl]-4-phenyl-5-(trifluoromethyl)oxazole (5d)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(4-fluorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5e)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5f)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(4-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5g)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(4-iodophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5h)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^1$H NMR, CDCl$_3$, 376 MHz
4-phenyl-5-(trifluoromethyl)-2-(4-(trifluoromethyl)phenyl)oxazole (5i)

\[ \text{\( \text{\^H NMR, CDCl}_3, 400 \text{ MHz} \)} \]

\[ \text{\( \text{\^{13}C\{\^H\} NMR, CDCl}_3, 100 \text{ MHz} \)} \]
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-phenyl-5-(trifluoromethyl)-2-(4-vinylphenyl)oxazole (5j)

$\text{H NMR, CDCl}_3$, 400 MHz

$^{13}\text{C}^{(1)}\text{H NMR, CDCl}_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-phenyl-2-(o-tolyl)-5-(trifluoromethyl)oxazole (5k)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H)-NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(2-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5l)

1H NMR, CDCl3, 400 MHz

13C{1H} NMR, CDCl3, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(2-chlorophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5m)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(2-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5n)

$\text{^1H NMR, CDCl}_3, 400 \text{ MHz}$

$\text{^13C}(^1\text{H}) \text{ NMR, CDCl}_3, 100 \text{ MHz}$
2-(3-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5o)

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(3-bromophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5p)

\[ \text{NMR, CDCl}_3, 400 MHz \]

\[ \text{NMR, CDCl}_3, 100 MHz \]
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(3-nitrophenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5q)

^1^H NMR, CDCl₃, 400 MHz

^13^C(^1^H) NMR, CDCl₃, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(3,5-dimethylphenyl)-4-phenyl-5-(trifluoromethyl)oxazole (5r)

{H NMR, CDCl₃, 400 MHz}

{C{H} NMR, CDCl₃, 100 MHz}
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(naphthalen-1-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5s)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(naphthalen-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5t)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-phenyl-2-(thiophen-2-yl)-5-(trifluoromethyl)oxazole (5u)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(benzofuran-6-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5v)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-(benzofuran-2-yl)-4-phenyl-5-(trifluoromethyl)oxazole (5w)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
(E)-4-phenyl-2-styryl-5-(trifluoromethyl)oxazole (5x)

$^{1}$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^{1}$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-phenyl-2-propyl-5-(trifluoromethyl)oxazole (5y)

**1H NMR, CDCl₃, 400 MHz**

**13C{¹H} NMR, CDCl₃, 100 MHz**
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-benzyl-4-phenyl-5-(trifluoromethyl)oxazole (5z)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
(8S,9R,13R,14R)-13-methyl-3-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-6,7,8,9,11,12,13,14,15,16-decahydro-17H-cyclopenta[a]phenanthren-17-one (5aa)
4-(4-phenyl-5-(trifluoromethyl)oxazol-2-yl)-N,N-dipropylbenzenesulfonamide (5ab)
2,4-diphenyl-5-(trifluoromethyl)thiazole (7a)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
2-(4-methoxyphenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7b)

$^{1}H$ NMR, CDCl$_3$, 400 MHz

$^{13}C(^1H)$ NMR, CDCl$_3$, 100 MHz
2-(4-chlorophenyl)-4-phenyl-5-(trifluoromethyl)thiazole (7c)

$^{1}$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
2-benzyl-4-phenyl-5-(trifluoromethyl)thiazole (7d)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
5-(perfluoroethyl)-2,4-diphenylthiazole (7e)

\[ \text{\(1^1\text{H NMR, CDCl}_3, 400 \text{ MHz}\)} \]

\[ \text{\(1^3\text{C}^{(1)}\text{H} \ NMR, CDCl}_3, 100 \text{ MHz}\)} \]
5-(perfluoroethyl)-2,4-diphenylthiazole (7f)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
$N$-(1,1,1-trifluoro-3-oxo-3-phenylpropan-2-yl)benzamide (4a)

$^1$H NMR, DMSO, 400 MHz

$^{13}$C($^1$H) NMR, DMSO, 100 MHz
2-diazo-3,3,3-trifluoro-1-phenylpropan-1-one (1a)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,3-trifluoro-1-(p-tolyl)propan-1-one (1b)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,3-trifluoro-1-(4-methoxyphenyl)propan-1-one (1c)

$\text{H}_3\text{CO}$

$\begin{array}{c}
\text{N}_2 \\
\text{CF}_3 \\
\text{O}
\end{array}$

$^1\text{H NMR, CDCl}_3$, 400 MHz

$\text{ppm (t)}$

0.00 5.00 10.00

7.66 7.65 7.64 7.63 7.26 6.97 6.94 6.93

3.86 3.07 2.00 2.03

$\begin{array}{c}
\text{H}_3\text{CO} \\
\text{N}_2 \\
\text{CF}_3 \\
\text{O}
\end{array}$

$^1\text{H NMR, CDCl}_3$, 100 MHz

$\text{ppm (t)}$

0 50 100 150 200

182.94 163.31 129.62 128.57 127.24 124.54 121.85 119.15 114.02 77.32 77.00 76.68 55.48

S175
$^{19}$F NMR, CDCl$_3$, 376 MHz
1-[(1,1'-biphenyl)-4-yl]-2-diazo-3,3,3-trifluoropropan-1-one (1d)

**^1H NMR, CDCl₃, 400 MHz**

**^13C(^1H) NMR, CDCl₃, 100 MHz**
$^{19}\text{F NMR, CDCl}_3, 376 \text{ MHz}$
2-diazo-3,3-trifluoro-1-(4-fluorophenyl)propan-1-one (1e)

\[ \text{F}N_2\text{CF}_3 \]

\( ^1\text{H NMR, CDCl}_3, 400 \text{ MHz} \)

\[ \text{F}N_2\text{CF}_3 \]

\( ^{13}\text{C}(^1\text{H}) \text{NMR, CDCl}_3, 100 \text{ MHz} \)
$^{19}\text{F NMR, CDCl}_3, 376\text{ MHz}$
1-(4-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1f)

\[
\begin{align*}
\text{\(1\)H NMR, CDCl}_3, 400 \text{ MHz} \\
\text{\(13\)C\((1)\)H NMR, CDCl}_3, 100 \text{ MHz}
\end{align*}
\]
$^{19}$F NMR, CDCl$_3$, 376 MHz
1-(4-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1g)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,3-trifluoro-1-(4-iodophenyl)propan-1-one (1h)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
4-(2-diazo-3,3,3-trifluoropropanoyl)phenyl acetate (1i)

$\text{MeO}_2C\text{-}N_2\text{-CF}_3\text{CO}$

$^1H$ NMR, CDCl$_3$, 400 MHz

$\text{ppm}(\delta)$

$^13C\text{-}[^1H]$ NMR, CDCl$_3$, 100 MHz

$\text{ppm}(\delta)$
1-(4-acetylphenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1j)

$\mathrm{^{1}H\ NMR,\ CDCl_3,\ 400\ MHz}$

$\mathrm{^{13}C\{^1H\}\ NMR,\ CDCl_3,\ 100\ MHz}$
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,3-trifluoro-1-(4-nitrophenyl)propan-1-one (1k)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}\text{F NMR, CDCl}_3$, 376 MHz
4-(2-diazo-3,3,3-trifluoropropanoyl)benzonitrile (1l)

**1H NMR, CDCl₃, 400 MHz**

<table>
<thead>
<tr>
<th>ppm (t1)</th>
<th>7.800</th>
<th>7.750</th>
<th>7.700</th>
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<tr>
<td>7.79</td>
<td>7.73</td>
<td>7.73</td>
<td></td>
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</table>

**13C(1H) NMR, CDCl₃, 100 MHz**

<table>
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<th>ppm (t1)</th>
<th>182.74</th>
<th>156.06</th>
<th>129.67</th>
<th>129.45</th>
<th>121.16</th>
<th>118.46</th>
<th>117.48</th>
<th>116.16</th>
<th>114.67</th>
<th>77.32</th>
<th>77.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>183.74</td>
<td>139.80</td>
<td>132.57</td>
<td>127.73</td>
<td>126.55</td>
<td>123.85</td>
<td>121.15</td>
<td>118.46</td>
<td>117.48</td>
<td>116.16</td>
<td>77.32</td>
<td>77.00</td>
</tr>
</tbody>
</table>
$^{19}\text{F NMR, CDCl}_3, 376 \text{ MHz}$
2-diazo-3,3,3-trifluoro-1-(4-(trifluoromethyl)phenyl)propan-1-one (1m)

$\text{F}_3\text{C}$

\[ \text{N}_2 \]

$\text{CF}_3$

$\text{1H NMR, CDCl}_3, 400 \text{ MHz}$

$\text{ppm (H)}$

$0.0 \quad 5.0 \quad 10.0$

$7.75 \quad 7.26$

$\text{ppm (H)}$

$0 \quad 50 \quad 100 \quad 150 \quad 200$

$183.26 \quad 139.16 \quad 134.73 \quad 134.40 \quad 134.08 \quad 133.75 \quad 130.42 \quad 127.62 \quad 127.42 \quad 126.71 \quad 125.95 \quad 125.92 \quad 125.88 \quad 124.71 \quad 124.01 \quad 121.99 \quad 121.31 \quad 119.28 \quad 118.59 \quad 77.32 \quad 77.00 \quad 76.68$

$\text{F}_3\text{C}$

\[ \text{N}_2 \]

$\text{CF}_3$

$\text{13C{(^1}H)} \text{ NMR, CDCl}_3, 100 \text{ MHz}$

$\text{ppm (C)}$

$0 \quad 50 \quad 100 \quad 150 \quad 200$

$183.26 \quad 139.16 \quad 134.73 \quad 134.40 \quad 134.08 \quad 133.75 \quad 130.42 \quad 127.62 \quad 127.42 \quad 126.71 \quad 125.95 \quad 125.92 \quad 125.88 \quad 124.71 \quad 124.01 \quad 121.99 \quad 121.31 \quad 119.28 \quad 118.59 \quad 77.32 \quad 77.00 \quad 76.68$
$^{19}$F NMR, CDCl$_3$, 376 MHz
1-(2-chlorophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1n)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
1-(3-bromophenyl)-2-diazo-3,3,3-trifluoropropan-1-one (1o)

$\text{H NMR, CDCl}_3$, 400 MHz

$\text{C}^{13}(\text{H}) \text{ NMR, CDCl}_3$, 100 MHz
2-diazo-1-(3,5-dimethylphenyl)-3,3,3-trifluoropropan-1-one (1p)

$\text{H NMR, CDCl}_3, 400 \text{ MHz}$

$\text{C}^1\text{H NMR, CDCl}_3, 100 \text{ MHz}$
1-(benzo[d][1,3]dioxol-5-yl)-2-diazo-3,3,3-trifluoropropan-1-one(1q)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}\text{F NMR, CDC}_6, 376\text{ MHz}$
2-diazo-3,3,3-trifluoro-1-(naphthalen-1-yl)propan-1-one (1r)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,3-trifluoro-1-(naphthalen-2-yl)propan-1-one (1s)

$\text{N}_2\text{CF}_3$

$^1\text{H NMR, CDCl}_3$, 400 MHz

$^1\text{H NMR, CDCl}_3$, 400 MHz

$^{13}\text{C}[^{1}\text{H}]$ NMR, CDCl$_3$, 100 MHz
2-diazo-3,3,3-trifluoro-1-(furan-2-yl)propan-1-one (1t)

$^{1}$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,3-trifluoro-1-(thiophen-3-yl)propan-1-one (1u)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
2-diazo-1,1,1-trifluoroicosan-3-one (1v)

$^{1}$H NMR, CDCl₃, 400 MHz

$^{13}$C($^{1}$H) NMR, CDCl₃, 100 MHz
$^{19}$F NMR, CDCl₃, 376 MHz
1-cyclobutyl-2-diazo-3,3,3-trifluoropropan-1-one (1w)

$^1$H NMR, CDCl$_3$, 400 MHz

$^{13}$C($^1$H) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz

Chemical structure:

$\text{N}_2$ \[ \text{CF}_3 \text{C}=\]
1-(adamantan-1-yl)-2-diazo-3,3,3-trifluoropropan-1-one (1x)

$\text{H NMR, CDCl}_3, 400\text{ MHz}$

$\text{C}\{^1\text{H}\} \text{ NMR, CDCl}_3, 100\text{ MHz}$
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,4,4,4-pentafluoro-1-phenylbutan-1-one(1y)

$\text{NMR, CDCl}_3, 400 \text{ MHz}$

$\text{NMR, CDCl}_3, 100 \text{ MHz}$
$^{19}$F NMR, CDCl$_3$, 376 MHz
2-diazo-3,3,4,4,5,5,5-heptafluoro-1-phenylpentan-1-one (1z)

$^{1}H$ NMR, CDCl$_3$, 400 MHz

$^{13}$C($^{1}H$) NMR, CDCl$_3$, 100 MHz
$^{19}$F NMR, CDCl$_3$, 376 MHz
References

