Supporting Information

Fluorination-Triggered Tandem Cyclization of Styrene-type Carboxylic Acid to Access 3-Aryl Isocoumarin Derivatives under Microwave Irradiation

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Contents

1. Screening the reaction conditions
2. Copies of spectra of products
1. Screening the reaction condition

![Chemical structure of reaction substrates](image)

Table S1 Screening the molar ratio of reaction substrates

<table>
<thead>
<tr>
<th>Entry</th>
<th>The molar ratio of 1a and 2</th>
<th>Yields (%)$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2:1</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>1:1</td>
<td>58</td>
</tr>
<tr>
<td>3</td>
<td>1:1.2</td>
<td>63</td>
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<tr>
<td>4</td>
<td>1:1.5</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>1:2.0</td>
<td>61</td>
</tr>
</tbody>
</table>

$^a$ Reaction conditions: (E)-2-styrylbenzoic acid 1a (0.2 mmol, 44.8 mg), Selectflour reagent 2, in 3.0 mL CH$_3$CN solvent, 100 °C for 0.5 h.

$^b$ Isolated yield.
2. Copies of spectra of products

**Fig. 1** $^1$H NMR spectrum of compound 3a

**Fig. 2** $^{13}$C NMR spectrum of compound 3a
Fig. 3 $^{19}$F NMR spectrum of compound 3a

Fig. 4 $^1$H NMR spectrum of compound 3b
Fig. 5 $^{13}$C NMR spectrum of compound 3b

Fig. 6 $^{19}$F NMR spectrum of compound 3b
Fig. 7 $^1$H NMR spectrum of compound 3c

Fig. 8 $^{13}$C NMR spectrum of compound 3c
Fig. 9 $^{19}$F NMR spectrum of compound 3c

Fig. 10 $^1$H NMR spectrum of compound 3d
**Fig. 11** $^{13}$C NMR spectrum of compound 3d

**Fig. 12** $^{19}$F NMR spectrum of compound 3d
Fig. 13 $^1$H NMR spectrum of compound 3e

Fig. 14 $^{13}$C NMR spectrum of compound 3e
Fig. 15 $^{19}$F NMR spectrum of compound 3e

Fig. 16 $^1$H NMR spectrum of compound 3f
Fig. 17 $^{13}$C NMR spectrum of compound 3f

Fig. 18 $^{19}$F NMR spectrum of compound 3f
Fig. 19 $^1$H NMR spectrum of compound 3g

Fig. 20 $^{13}$C NMR spectrum of compound 3g
Fig. 21 $^{19}$F NMR spectrum of compound 3g

Fig. 22 $^1$H NMR spectrum of compound 3h
Fig. 23 $^{13}$C NMR spectrum of compound 3h

Fig. 24 $^{19}$F NMR spectrum of compound 3h
Fig. 25 $^1$H NMR spectrum of compound 3i

Fig. 26 $^{13}$C NMR spectrum of compound 3i
Fig. 27 $^{19}$F NMR spectrum of compound 3i

Fig. 28 $^1$H NMR spectrum of compound 3j
Fig. 29 $^{13}$C NMR spectrum of compound 3j

Fig. 30 $^{19}$F NMR spectrum of compound 3j
Fig. 31 $^1$H NMR spectrum of compound 3k

Fig. 32 $^{13}$C NMR spectrum of compound 3k
Fig. 33 $^{19}$F NMR spectrum of compound 3k

Fig. 34 $^1$H NMR spectrum of compound 4a
Fig. 35 $^{13}$C NMR spectrum of compound 4a

Fig. 36 $^1$H NMR spectrum of compound 4b
Fig. 37 $^{13}$C NMR spectrum of compound 4b

Fig. 38 $^1$H NMR spectrum of compound 4c
Fig. 39 $^{13}$C NMR spectrum of compound 4c

Fig. 40 $^1$H NMR spectrum of compound 4d
Fig. 41 $^{13}$C NMR spectrum of compound 4d

Fig. 42 $^1$H NMR spectrum of compound 4e
Fig. 43 $^{13}$C NMR spectrum of compound 4e

Fig. 44 $^{19}$F NMR spectrum of compound 4e
Fig. 45 $^1$H NMR spectrum of compound 4f

Fig. 46 $^{13}$C NMR spectrum of compound 4f
Fig. 47 $^1$H NMR spectrum of compound 4g

Fig. 48 $^{13}$C NMR spectrum of compound 4g