Supporting Information

Visible-light photocatalytic trifluoromethylation of arenes using graphene oxide as metal-free photocatalyst

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Figure S1. (a) AFM and (b) FESEM images, (c) XRD and (d) UV-adsorption curves of the as-used GO sheets.

Figure S2. C1 XPS spectra of GO samples: (a) after 3h irradiation, (b) after 12h irradiation, (c) after 48h irradiation.
Figure S3. FT-IR spectra of GO samples: (a) original ones, (b) GO-6h, (c) GO-24h, (d) rGO.

Figure 4S. GC-MS spectra of benzene before (A) and after (B) light irradiation.
19 F NMR spectra of several representative products.

1. Benzene

\[ \delta \approx -43.45 \text{ (d, } J = 10.5 \text{ Hz)}, \quad -62.87 \text{ (d, } J = 10.5 \text{ Hz)}. \]

2. Toluene

\[ \delta \approx -43.47 \text{ (d, } J = 5.3 \text{ Hz)}, \quad -59.05 \text{ -- } -65.29 \text{ (m)}. \]

3. Benzaldehyde
$^{19}$F NMR (376 MHz, None) $\delta$ -43.36 (s), -54.76 (s), -56.37 (d, $J = 27.2$ Hz), -59.41 (s), -63.10 (dd, $J = 108.4$, 33.9 Hz).

4. Anisole

$^{19}$F NMR (376 MHz, None) $\delta$ -43.52 (d, $J = 7.7$ Hz), -60.58 – -64.27 (m).

5. Methyl benzoate

$^{19}$F NMR (376 MHz, None) $\delta$ -43.10 (s), -59.44 (s), -62.80 (d, $J = 107.0$ Hz).

6. o-Xylene
\(^{19}\text{F} \text{NMR (376 MHz, None)} \delta \ -43.53 \ (d, J = 4.7 \text{ Hz}), \ -60.51 \ (s), \ -62.40 \ (d, J = 4.8 \text{ Hz}).

7. Nitrobenzene

\(^{19}\text{F} \text{NMR (376 MHz, None)} \delta \ -43.12 \ (s), \ -57.93 \ (s), \ -59.96 \ (s), \ -63.09 \ (s).

8. p-Chlorotoluene

\(^{19}\text{F} \text{NMR (376 MHz, None)} \delta \ -42.98 \ (s), \ -57.90 \ (s), \ -62.05 \ (d, J = 112.1 \text{ Hz}).