

Supporting Information

Visible-light-induced deboronative acylarylation of acrylamides with organoboronic acids

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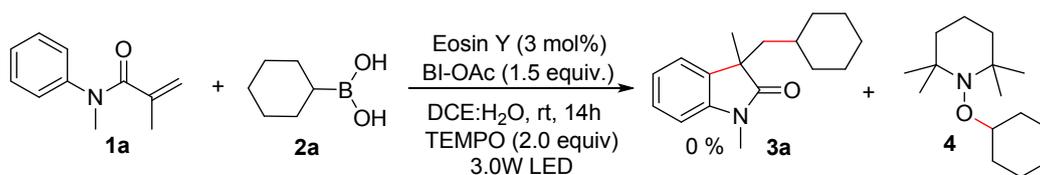
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Table of Contents for Supporting Information

1. Free radical-trapping experiment.....	2
2. Apparent quantum efficiency (AQE)	3
3. Type of reaction setup.....	3
4. ¹ H and ¹³ C NMR spectra of the products.....	4

1. Free radical-trapping experiment



An oven-dried reaction quartz tube (20 mL) equipped with a magnetic stirrer bar was charged with *N*-methyl-*N*-phenylmethacrylamide (**1a**, 0.20 mmol), cyclohexylboronic acid (**2a**, 0.40 mmol), TEMPO (0.40 mmol), Eosin Y (3.0 mol%), BI-OAc (0.30 mmol, 1.5 equiv.) and DCE/H₂O (v/v = 1:1, 3 mL). The reaction vessel was irradiated under blue LED irradiation (450–455 nm, 3.0 W) in air at room temperature for 14 h. After completion of the reaction, the mixture was concentrated to yield the crude product, which was further purified by flash chromatography (silica gel, petroleum ether/ethyl acetate) and not found 3-(cyclohexylmethyl)-1,3-dimethylindolin-2-one (**3a**). Meanwhile, the formation of the corresponding adduct **4** from TEMPO with a cyclohexyl radical, which was detected by HRMS analysis of reaction mixture (Figure S1), implying the formation of cyclohexyl radical during the reaction.

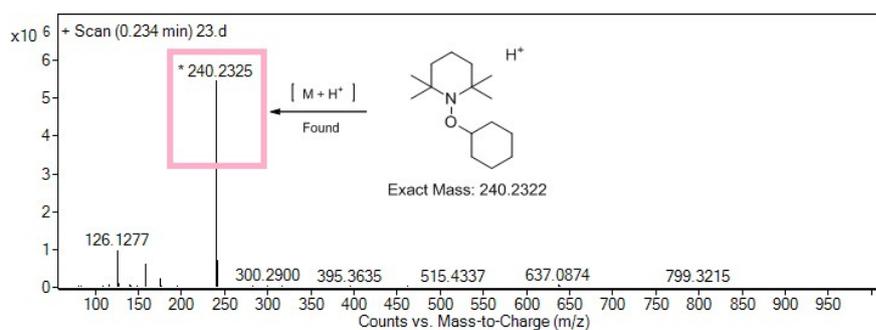


Figure S1. Analysis of reaction mixture by HRMS

2. Apparent quantum efficiency (AQE)

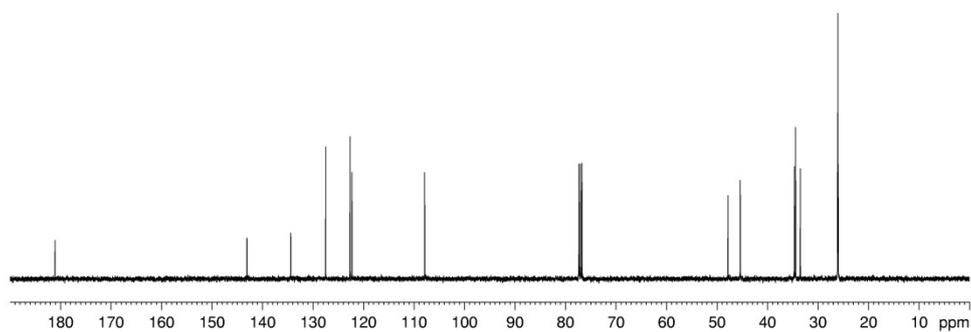
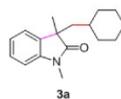
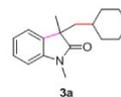
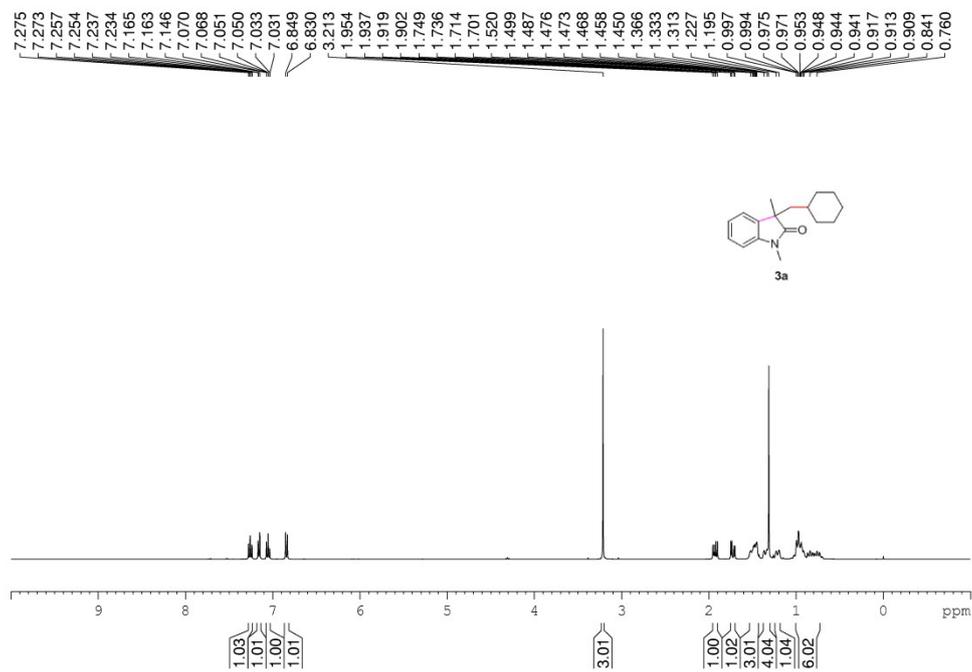
Apparent quantum efficiency (AQE) is an important factor to reflect the photon utilization in the photocatalytic process. The apparent quantum efficiency (AQE) was measured under the standard photocatalytic reaction conditions. The blue LED (3 W, 450-455 nm) located 0.5 cm away from the bottom of the reactor was used as light source to drive the photocatalytic of the reaction. The AQE of the representative reaction at 450-455 nm was measured and calculated as follows: $[AQE = 2 * n(3a) * N_0 / N(\text{photon}) * 100\%, N(\text{photon}) = F * S * t]$, where $n(3a)$, N_0 and $N(\text{photon})$ represent mole number of the product 3a, Avogadro constant and number of incident photons, respectively. Meanwhile, F , S and t refer to the power of the light, light radiation area and illumination time. In our experiment, $n(3a) = 1.28 * 10^{-4}$ mol, $N_0 = 6.022 * 10^{23}$, $F = 5.28 * 10^{20}$ Photon/ $\text{m}^2 \cdot \text{s}$, $S = 3.80 * 10^{-4}$ m^2 and $t = 5.04 * 10^4$ s. Therefore, the AQE value of the representative reaction at 450-455 nm was calculated to be 1.52%.

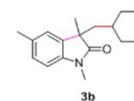
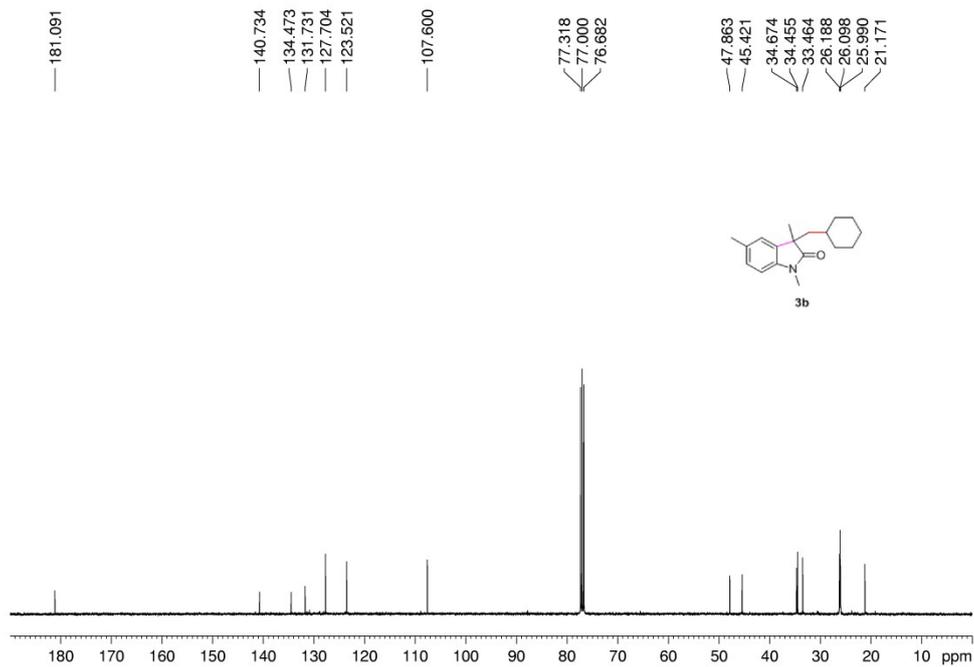
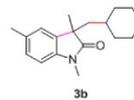
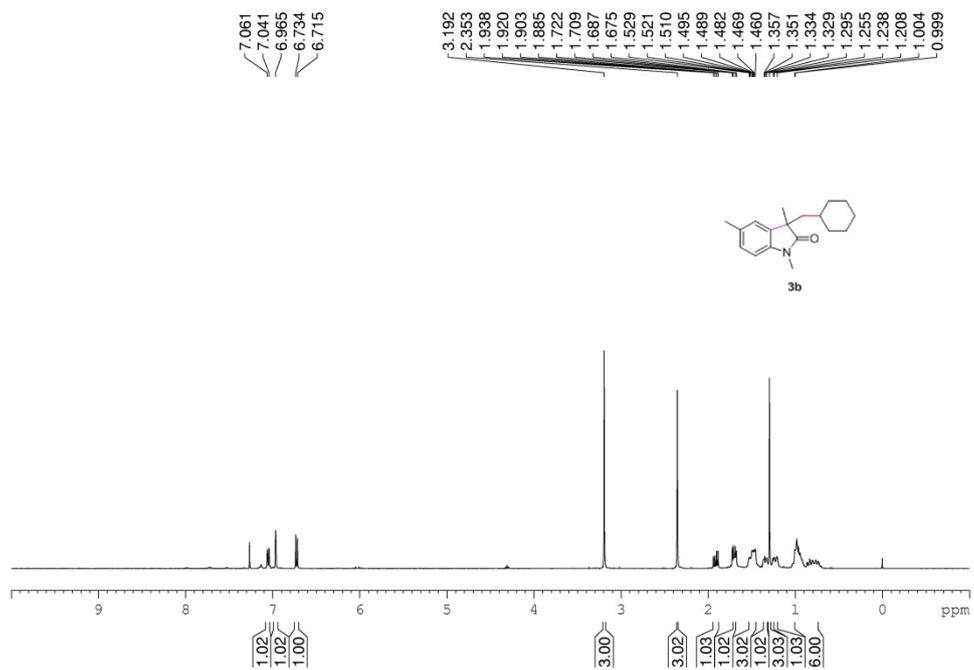
3. Type of reaction setup

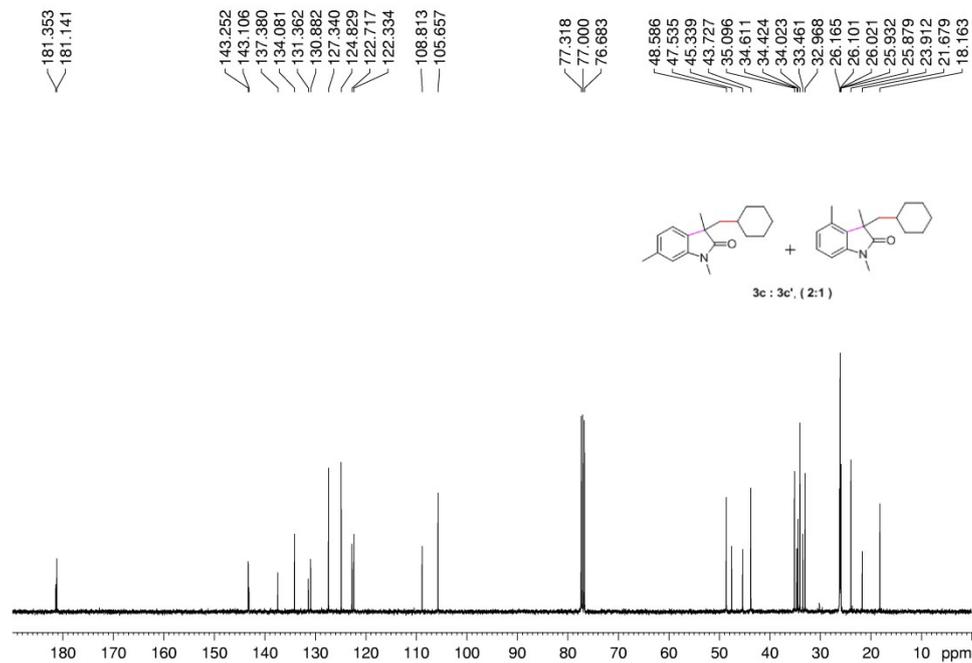
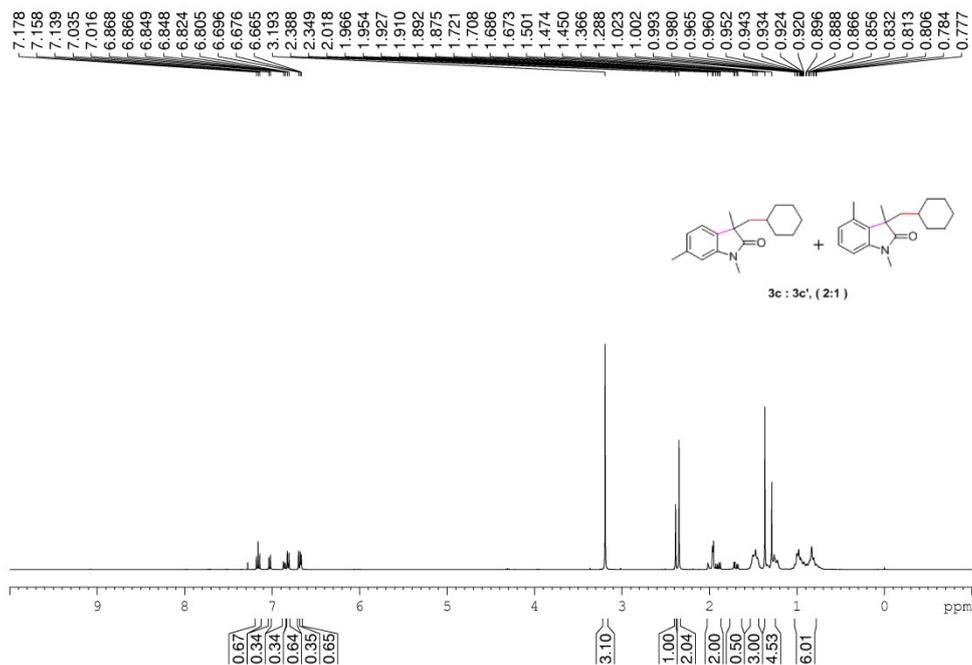
The photo-reactor was purchased from WATTCAS (WP-TEC-1020HSL). The blue LED (3 W, 450-455 nm) located 0.5 cm away from the bottom of quartz tube (20 mL). For temperature control, we have a circulating condensing unit.

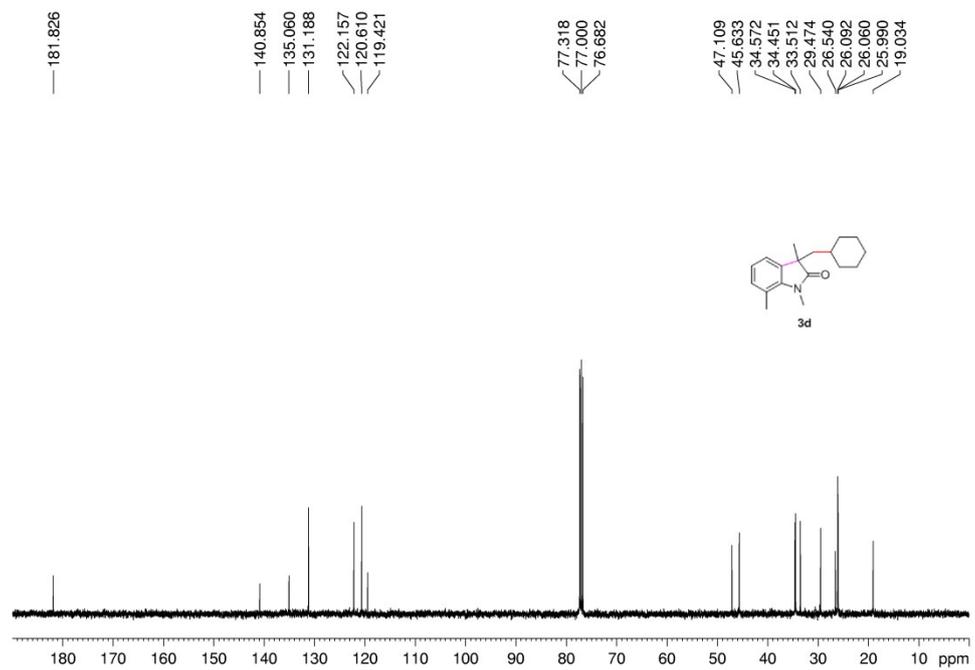
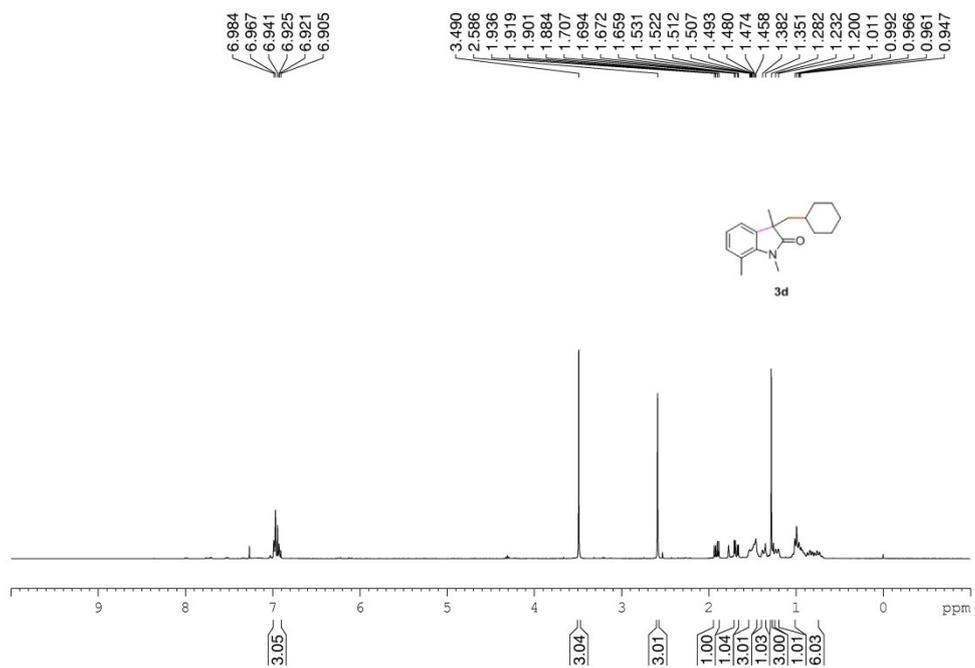


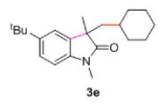
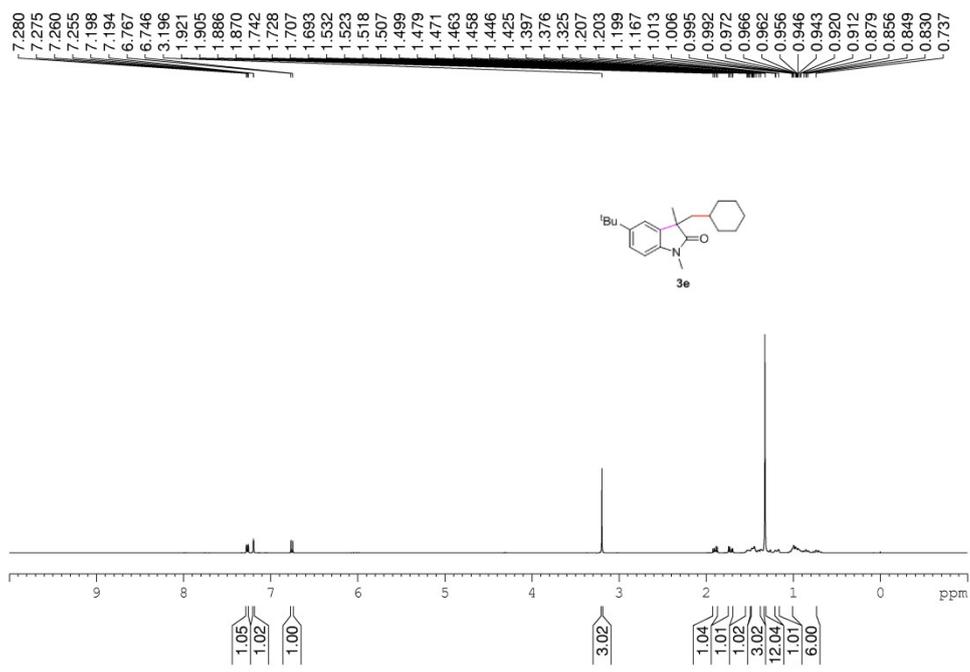
2. ^1H and ^{13}C NMR spectra of the products



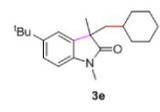
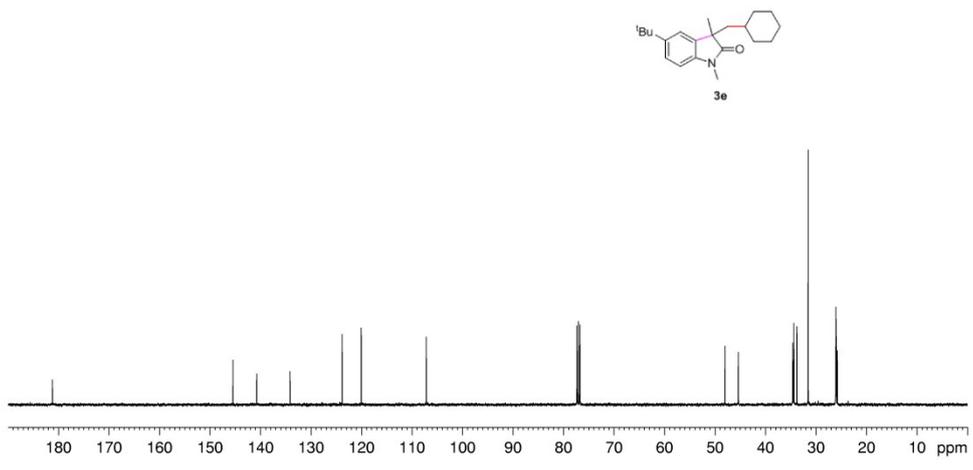


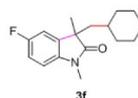
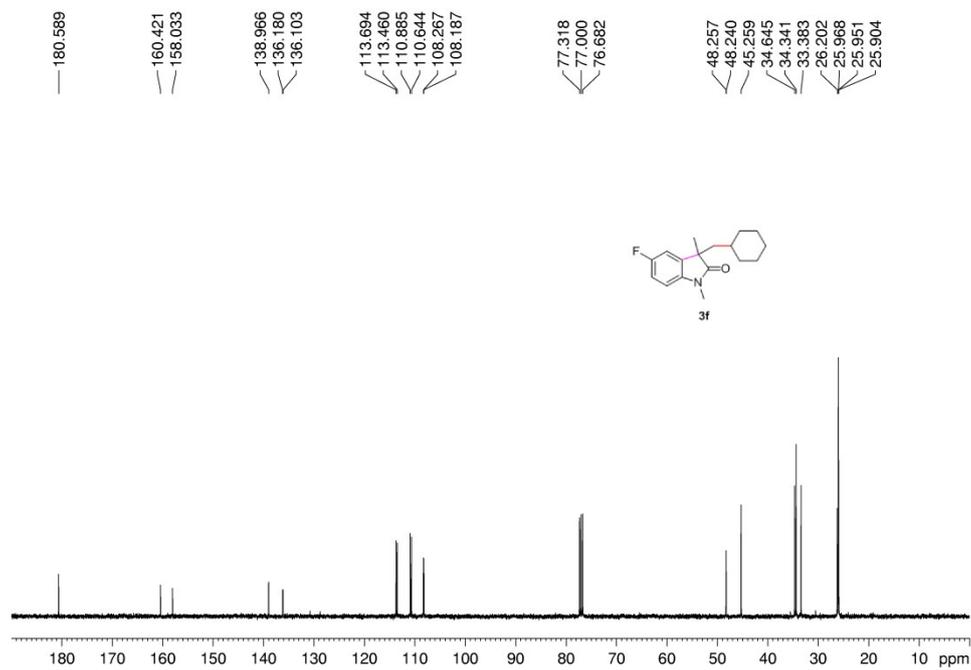
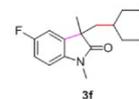
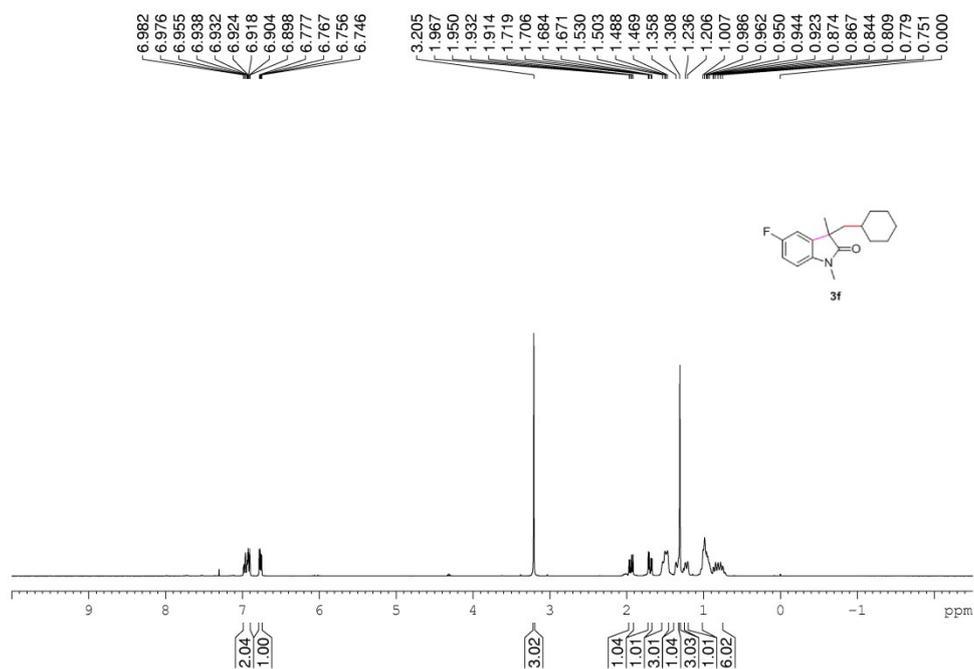


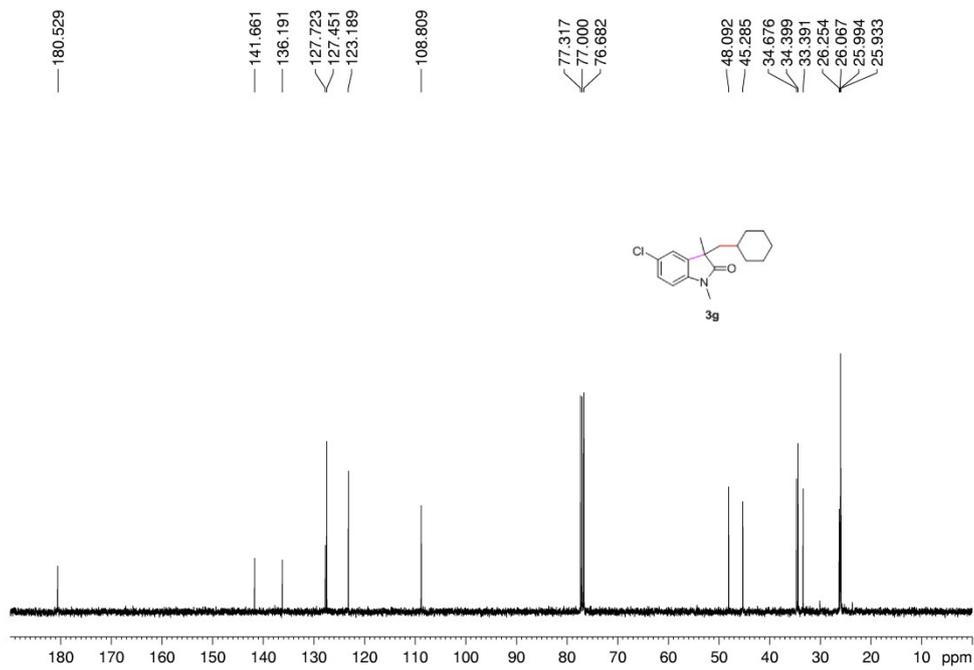
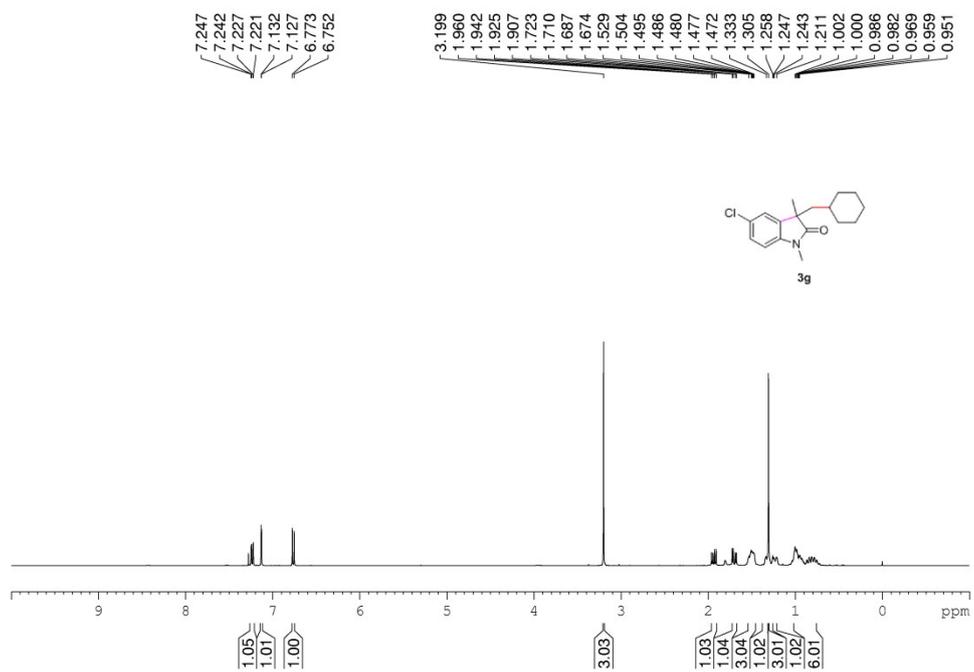


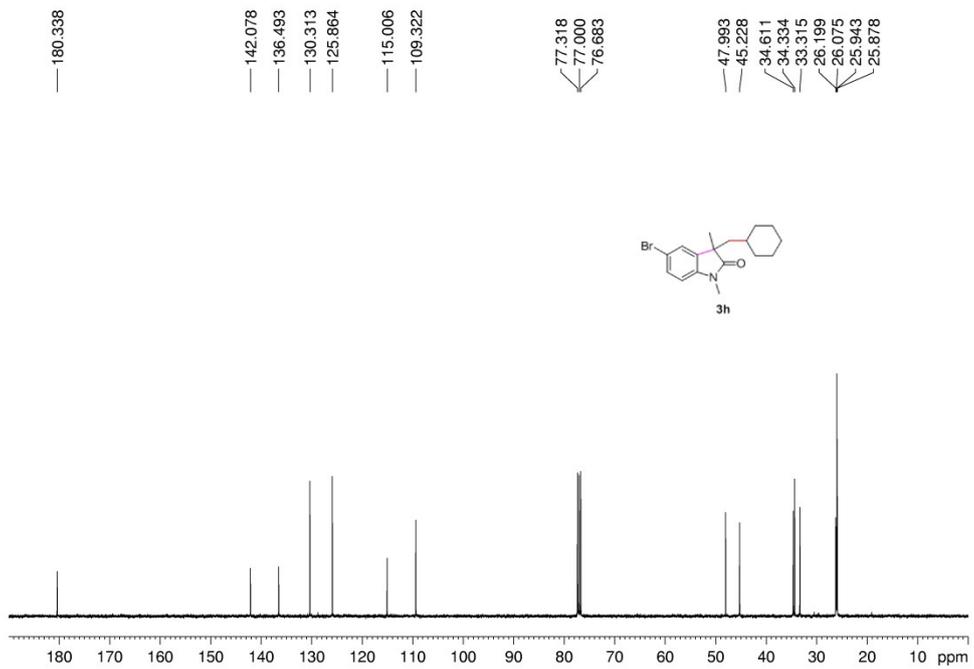
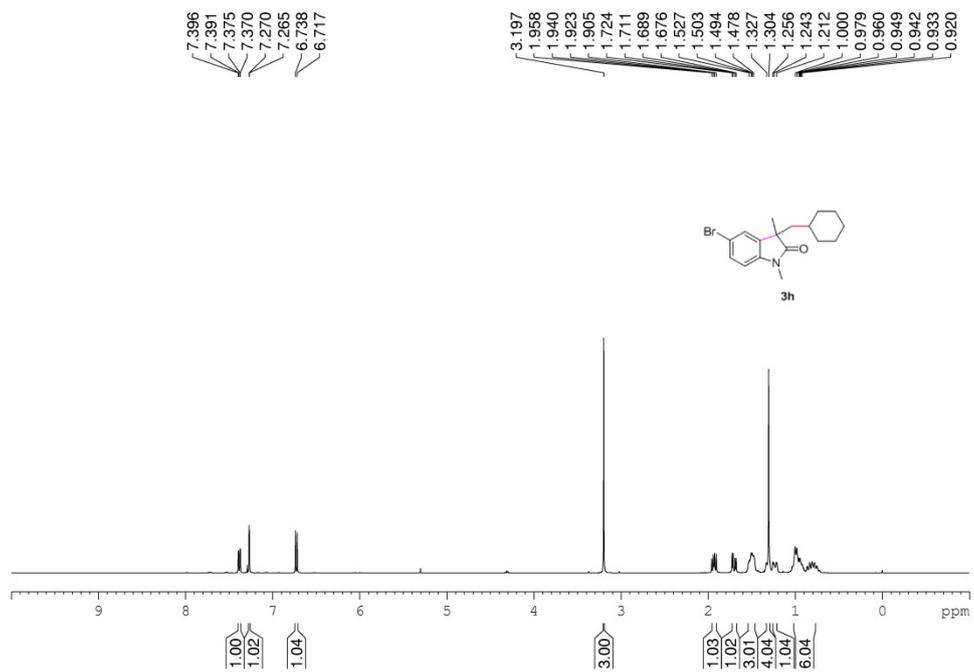


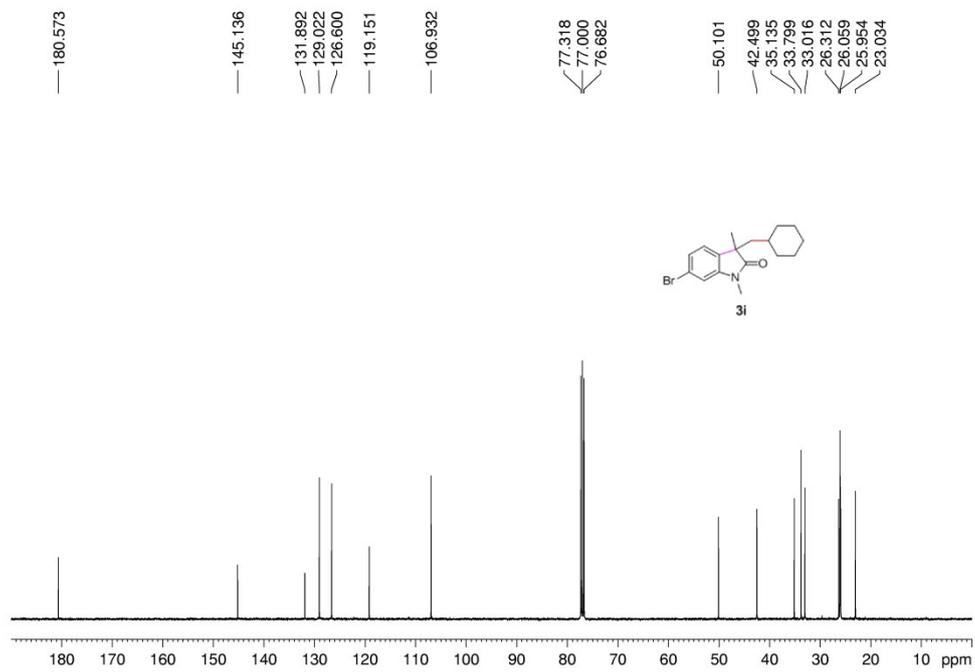
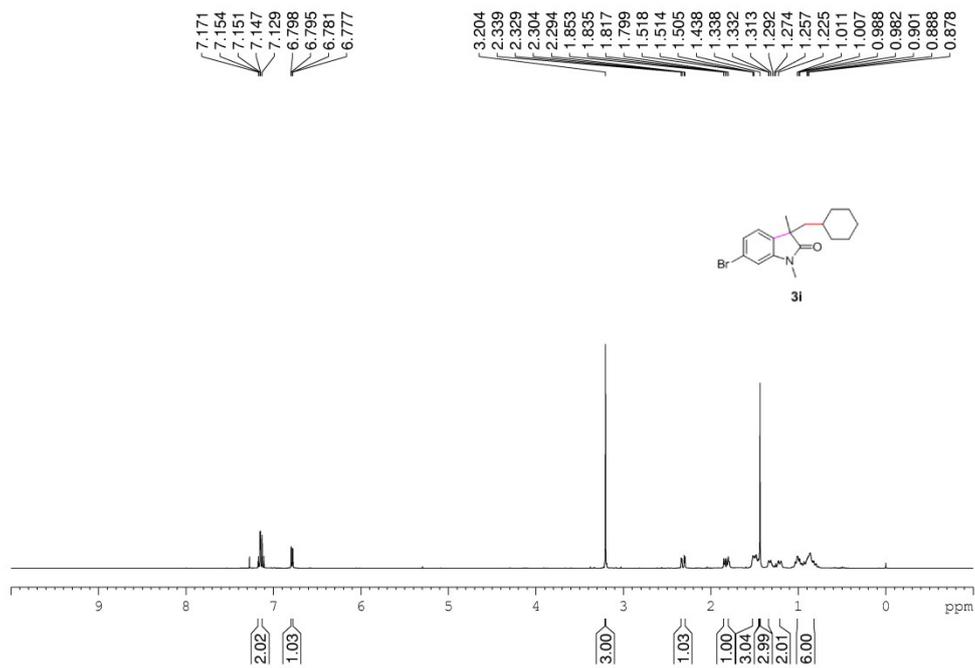
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- 45.387
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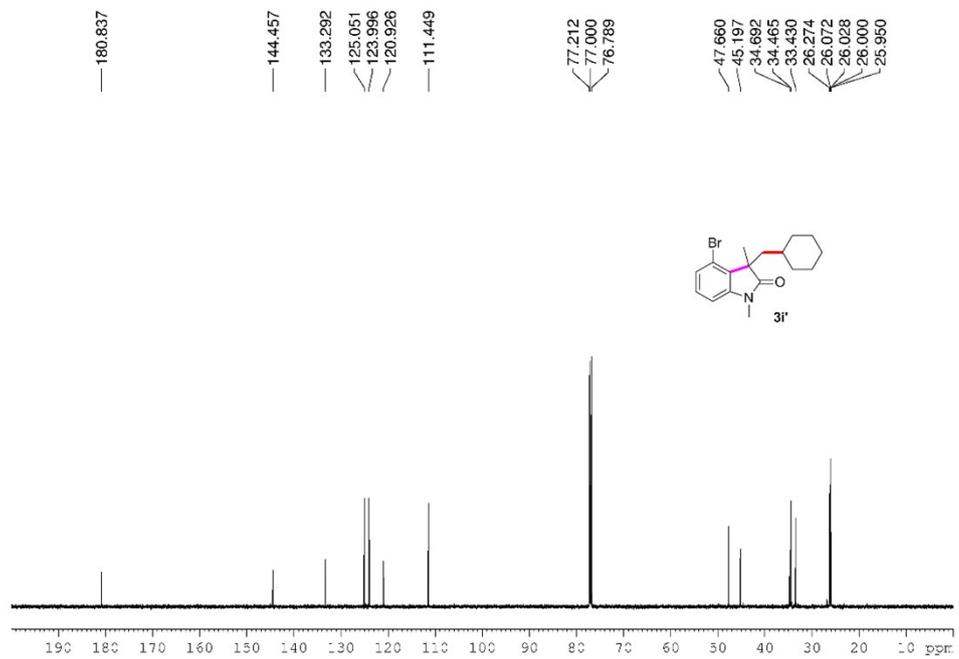
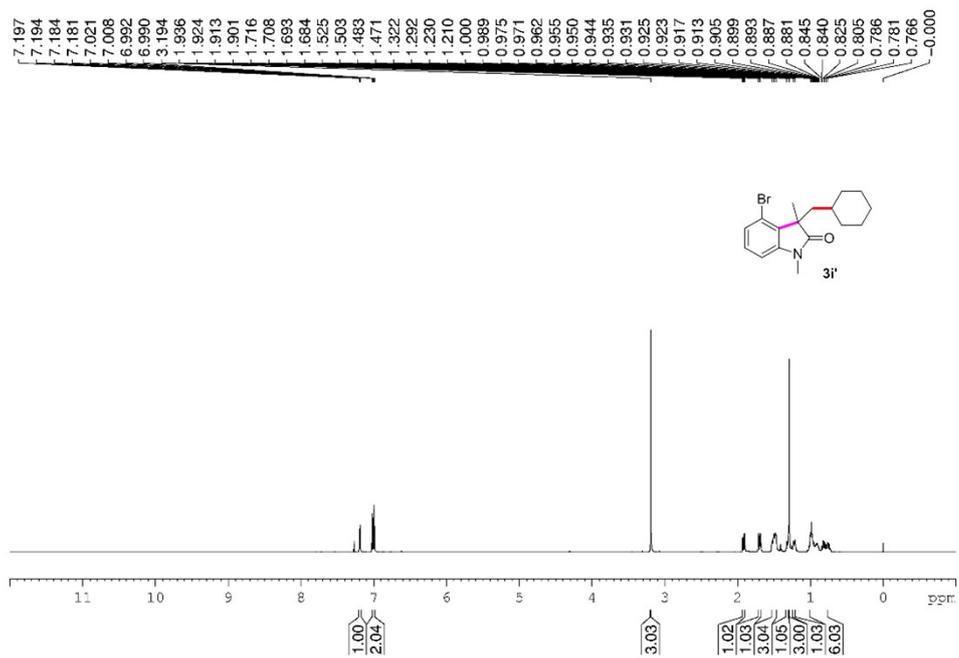


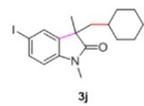
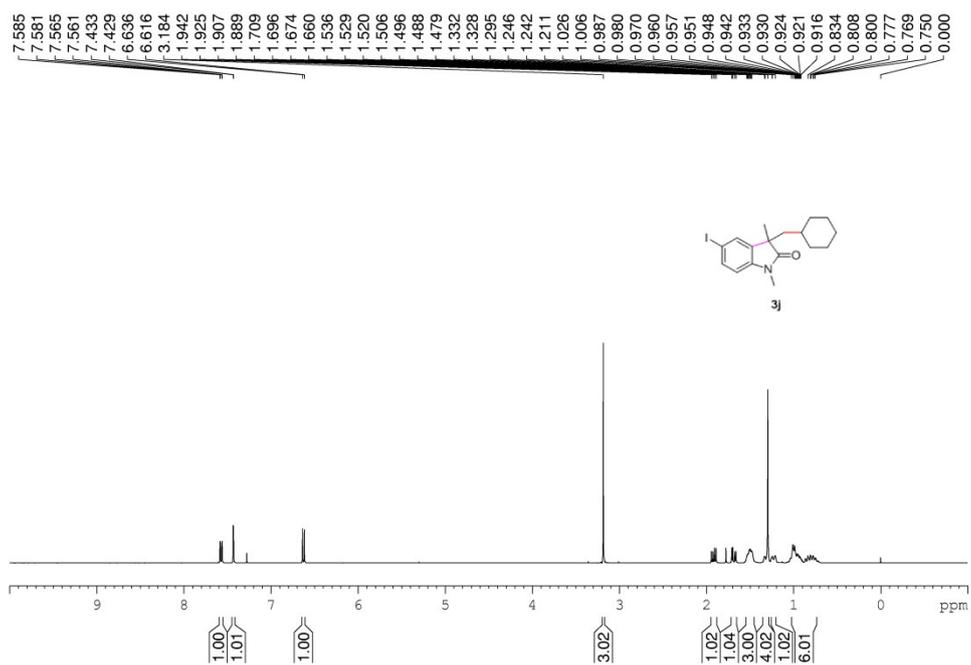












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