

Supporting Information

Visible-Light-Promoted Organic-Dye-Catalyzed Sulfonylation/Cyclization to Access Indolo[2,1- α]isoquinoline Derivatives

Yucai Tang^{a*}, Jinglin Duan^a, Biyu Yang^a, Yupeng He^a, Changyuan Du^a and Xiangyang
Zhang

*^aCollege of Chemistry and Materials Engineering, Hunan University of Arts and
Science, Engineering Technology Research Center of Key Preparation Technology
of Biomedical Polymer Materials, Changde 415000, P.R. China. *e-mail:
yctang1009@163.com*

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1. General Information

All reagents and solvents were purchased from commercial suppliers and used without purifications. TLC was performed on silica gel plates (200-300mesh) using UV light (254/365 nm) for detection and column chromatography was performed on silicagel (200-300 mesh).The ^1H NMR and ^{13}C NMR spectra were recorded at 25 °C in CDCl_3 at 400 and 100 MHz, respectively, with TMS as the internal standard. Chemical shifts (δ) are expressed in ppm and coupling constants J are given in Hz. All reactions were performed on the photoreaction instrument (WP-TEC-1020SL), which are purchased from WATTCAS, China (Figure S1).

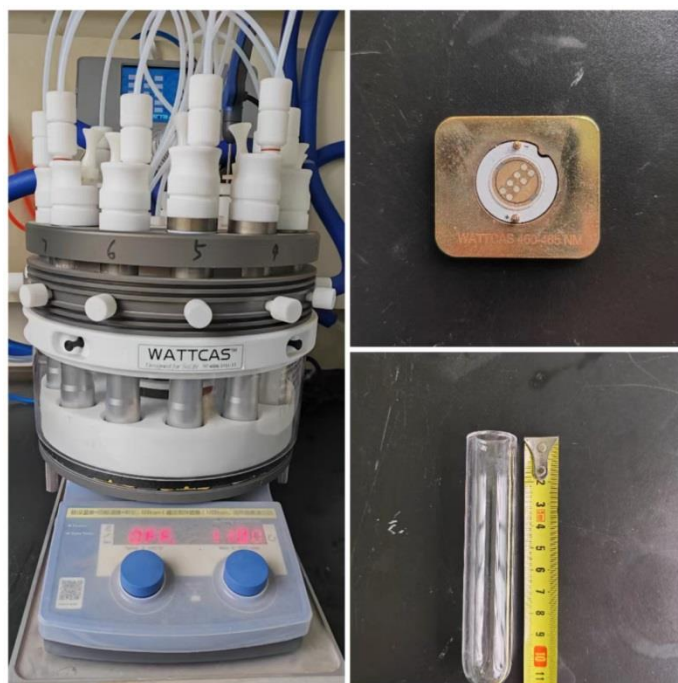


Figure S1. Photoreactor for photoreaction

2. Experimental Section

General procedures for the synthesis of ester substituted indolo[2,1- α]isoquinolines and benzimidazo[2,1- α]isoquinolin-6(5*H*)-ones.



To a suspension of 2-aryl-*N*-acryloyl indoles (0.2mmol) in DMSO (2mL) was added sulfonyl hydrazine(0.6 mmol,3.0 eq.), Eosin B (5mol%) and (NH₄)₂S₂O₈ (0.6 mmol, 3.0 eq.) at room temperature, and the mixture was stirred in air under a 10W blue LEDs and irradiated for 15 hours. The temperature was maintained at 20~25 °C when the LED light was on. After the reaction was complete, the reaction mixture was diluted with a brine solution (25 mL) and extracted with EtOAc (3 × 50 mL). The combined organic phase was dried over anhydrous Na₂SO₄, filtered and concentrated in vacuo. The residue was purified by flashcolumn chromatography to afford the desired products.

3.Fluorescence quenching experiments

The fluorescence emission intensities were carried out on an F-7000 FL spectrophotometer (Hitachi Ltd, Japan) with excitation slit set at 5 nm and emission at 5 nm. The excitation wavelength was fixed at 323 nm, and the emission wavelength was measured at 350~550 nm. The samples were prepared by mixing Eosin B (1.0×10⁻⁸mol/L) and different amount of (NH₄)₂S₂O₈ in DMSO in a light path quartz fluorescence cuvette. The concentration of (NH₄)₂S₂O₈ stock solution is 1.3×10⁻⁶mol/L in DMSO. For each quenching experiment, 0.1mL of (NH₄)₂S₂O₈ stock solution was titrated to a mixed solution of Eosin B (0.1mL, in a total volume = 1.0 mL). Then the emission intensity was collected and the results were presented in Figure S1.

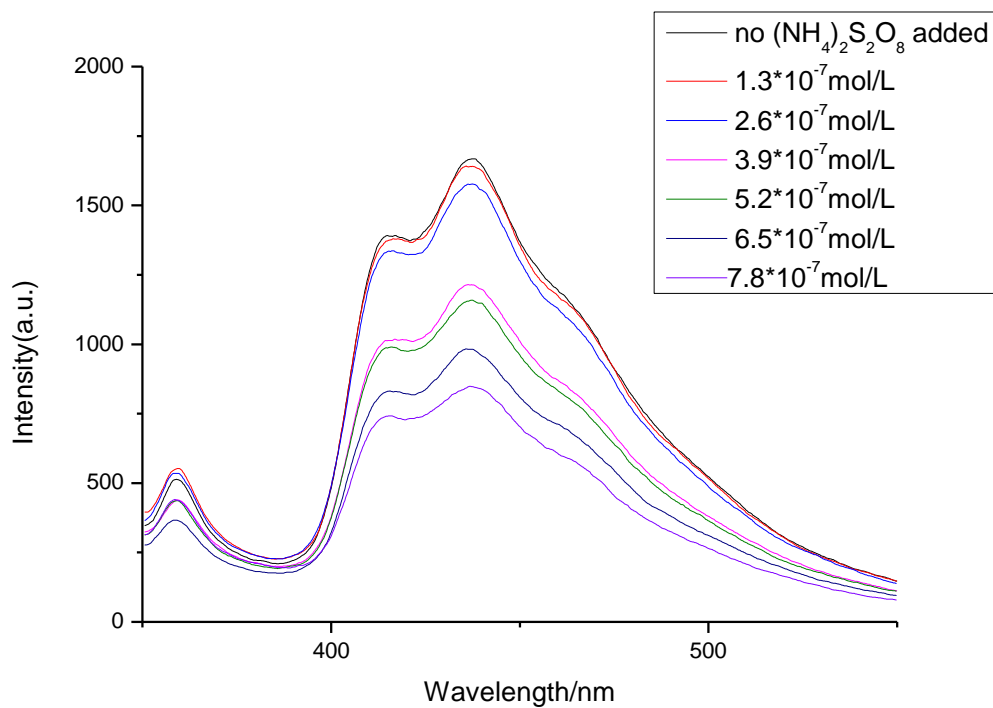
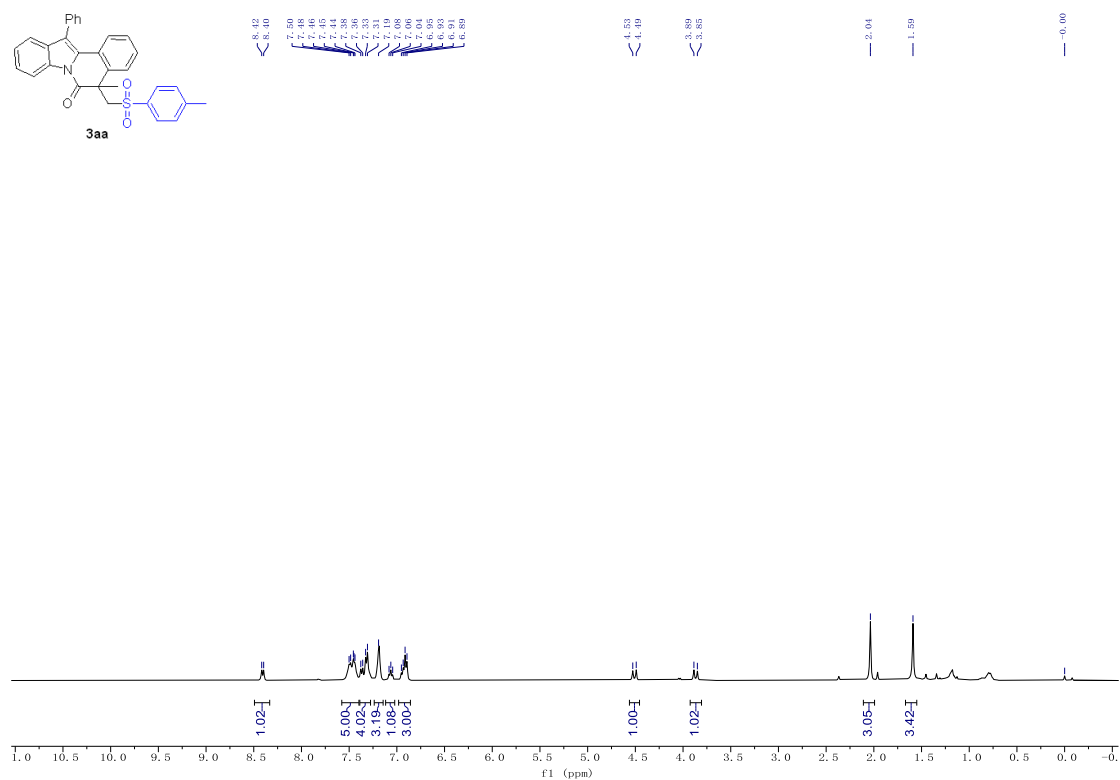
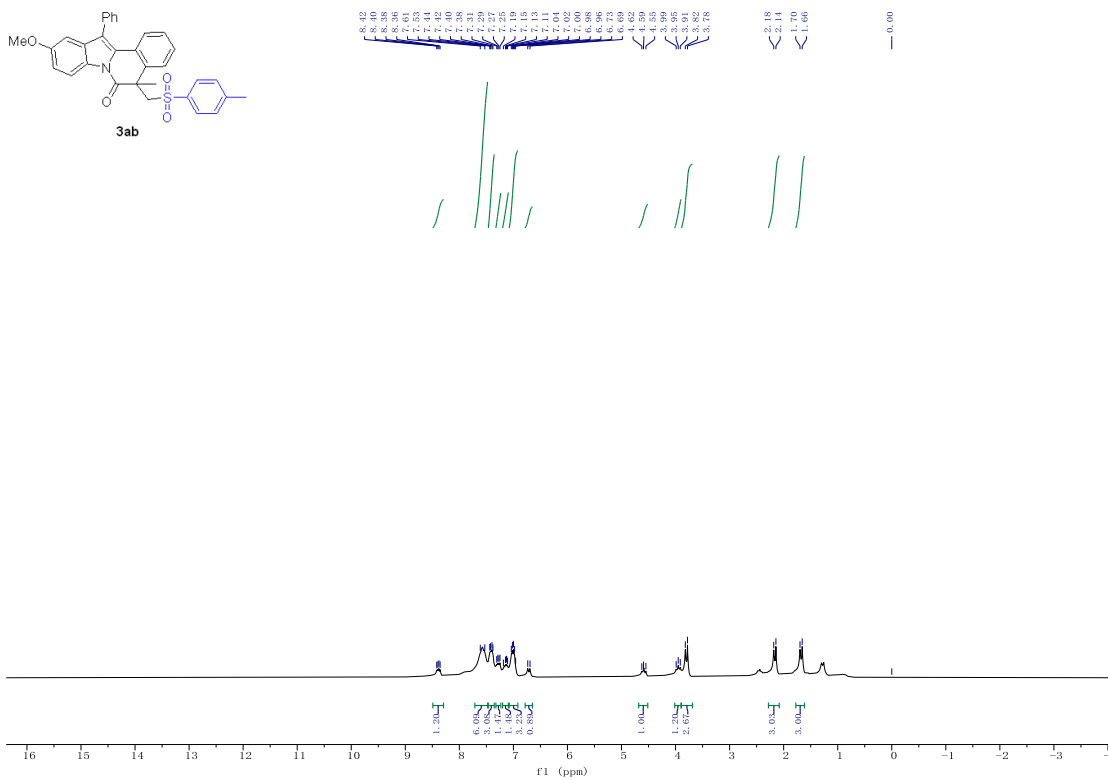
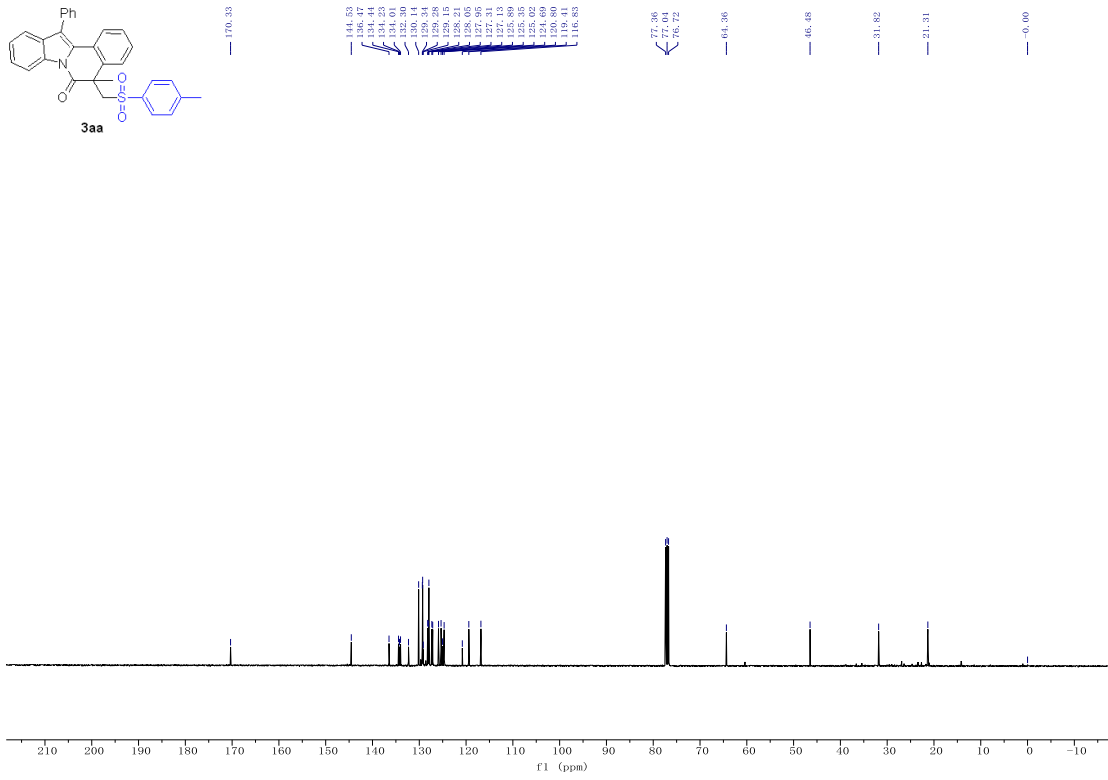
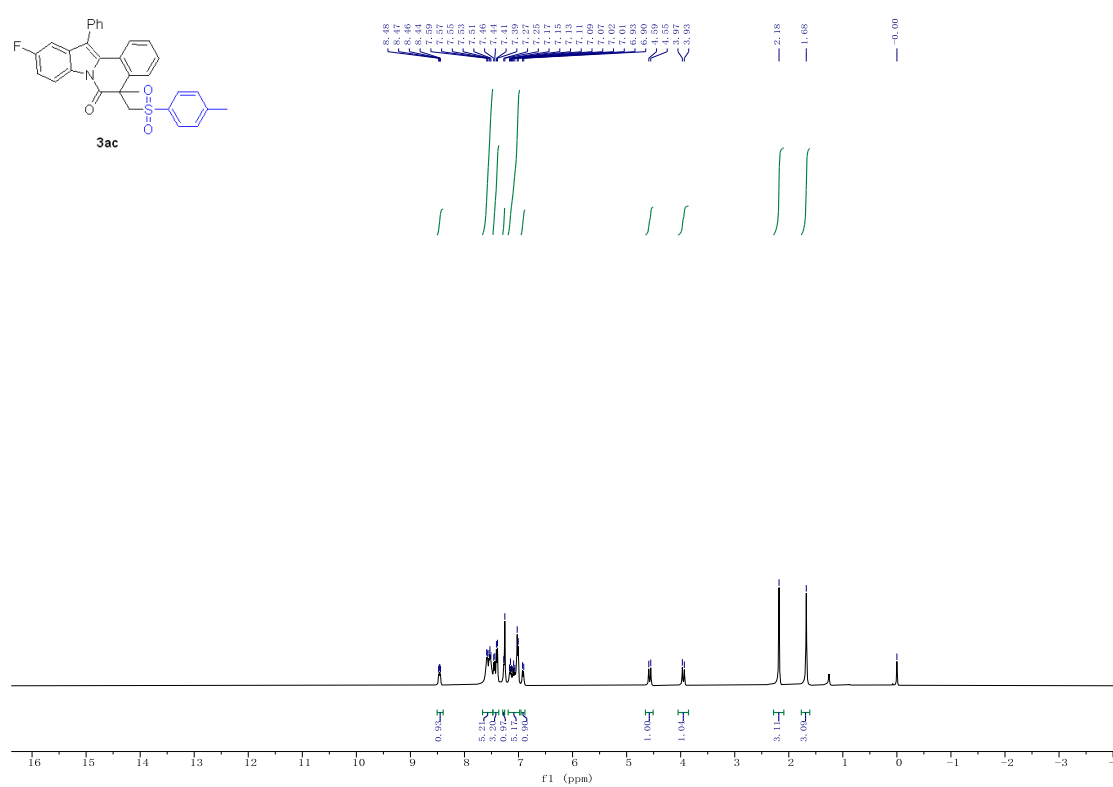
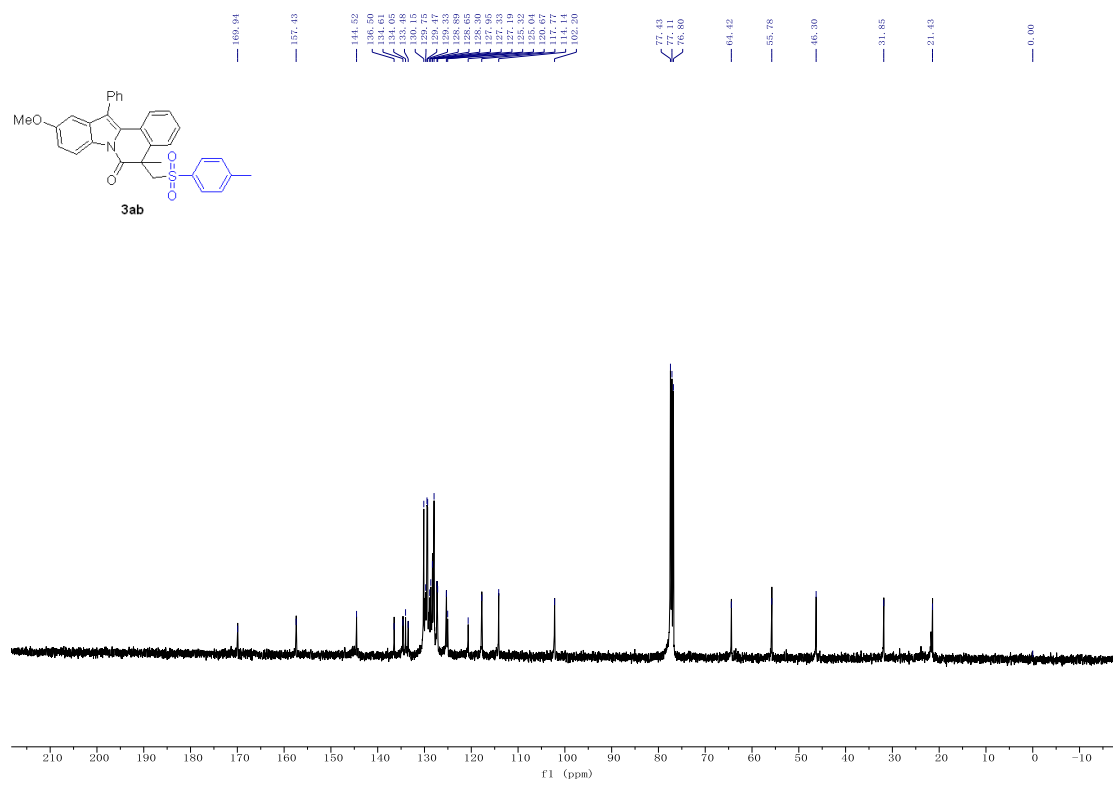


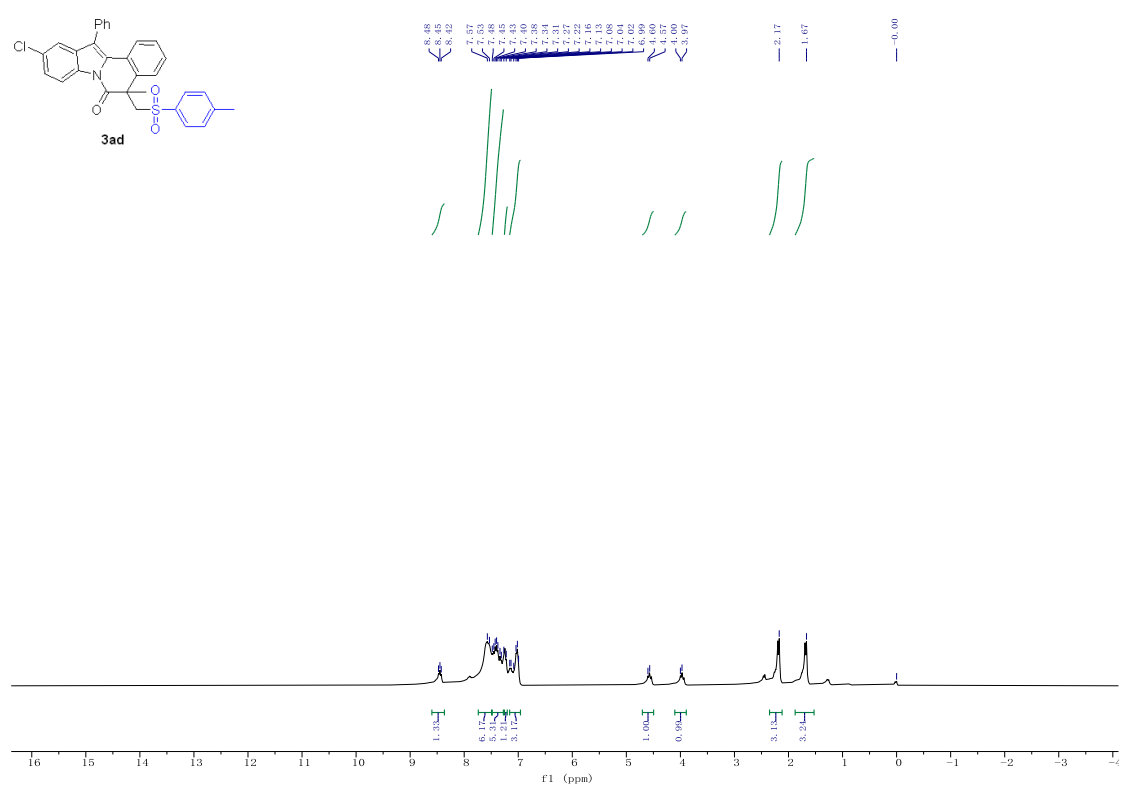
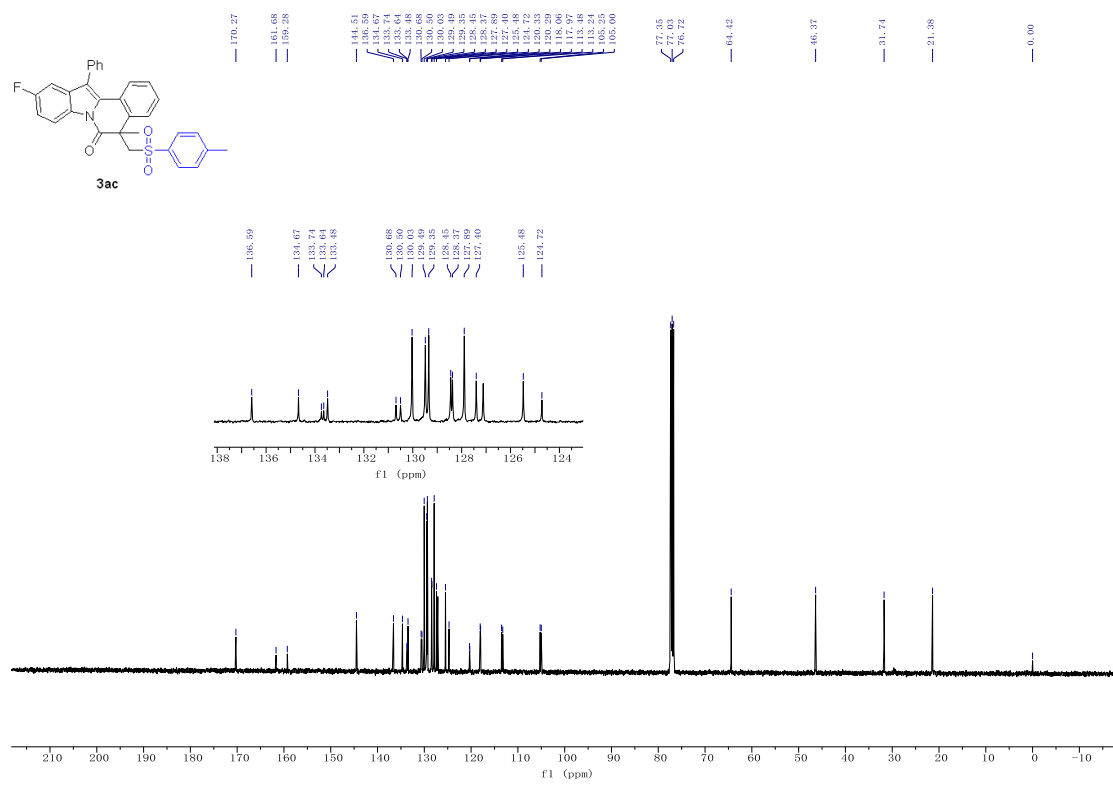
Figure S1 Quenching of Eosin B fluorescence emission in the presence of $(\text{NH}_4)_2\text{S}_2\text{O}_8$.

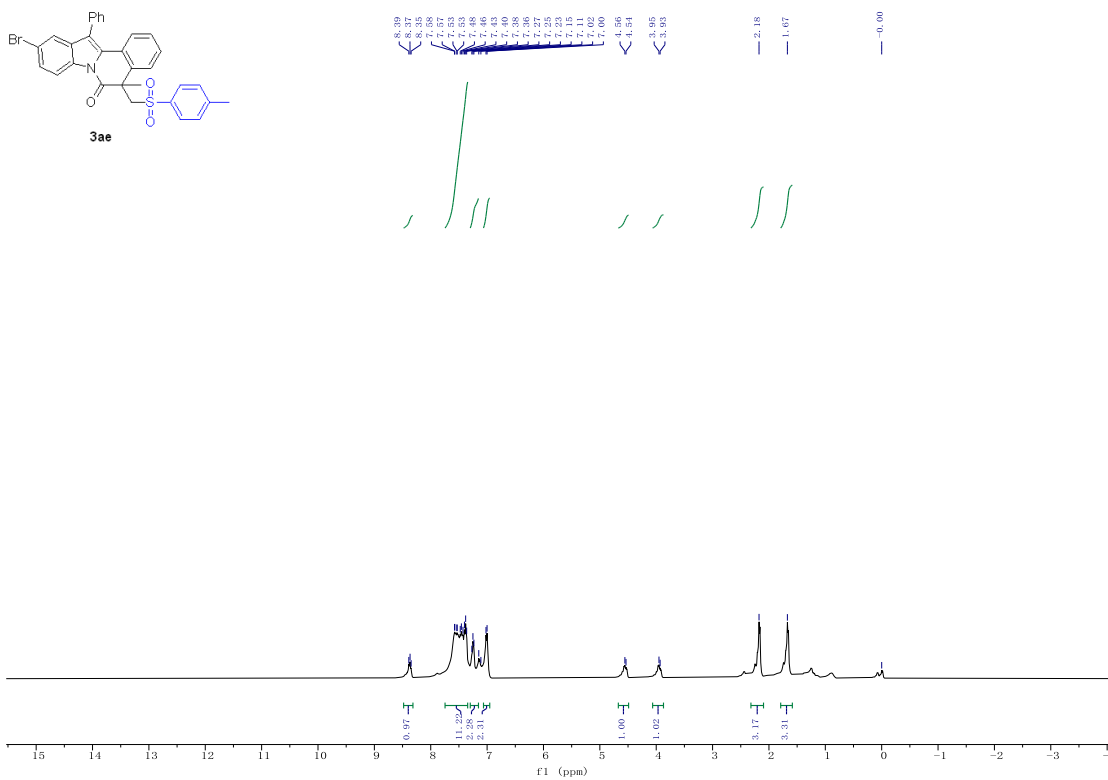
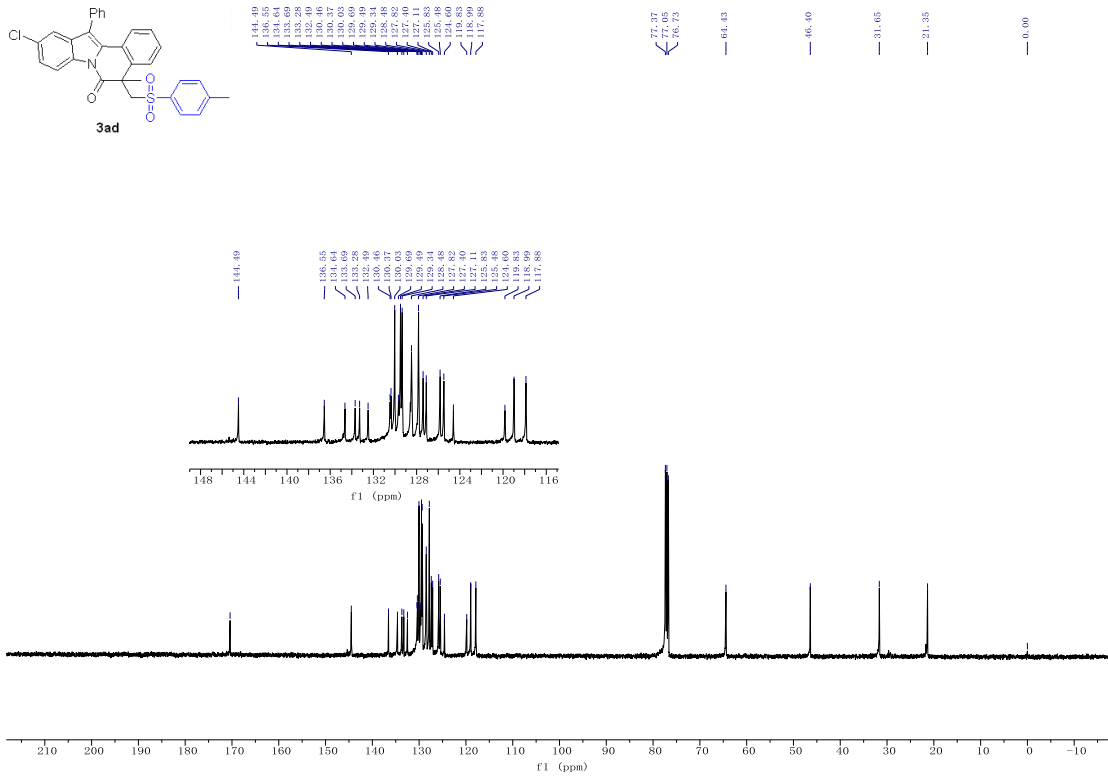
4.¹H and ¹³C NMR spectra of products

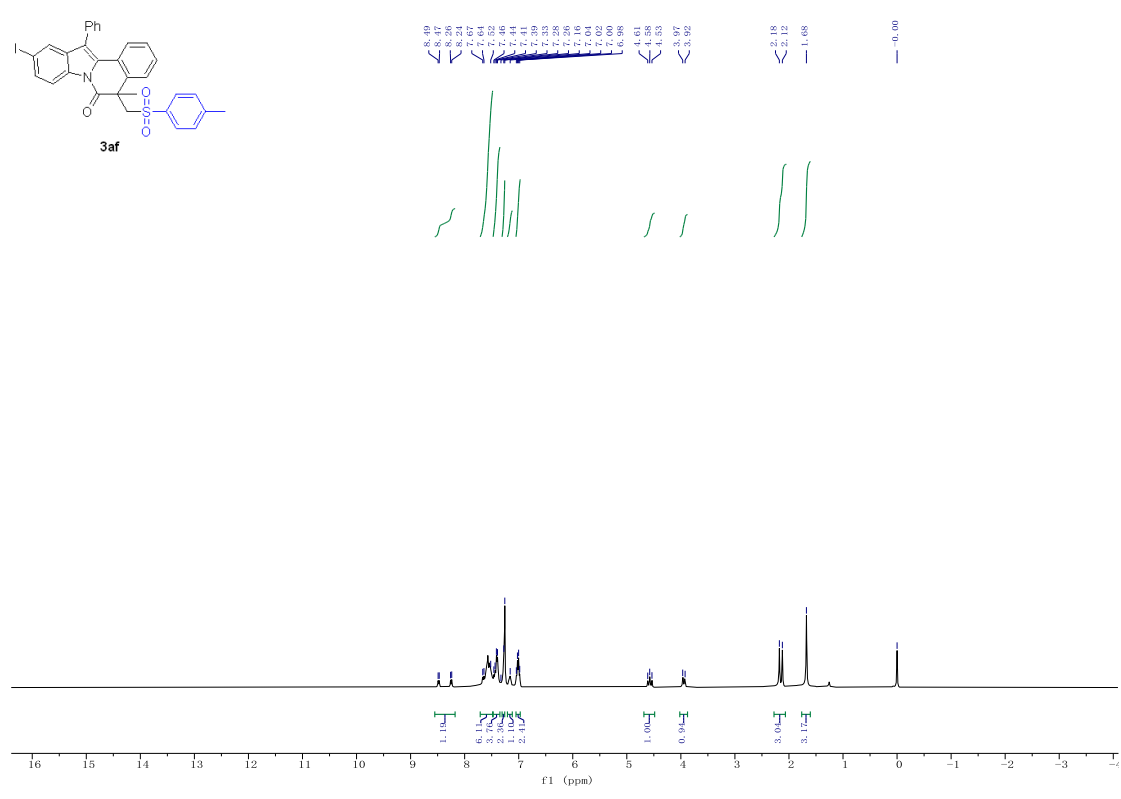
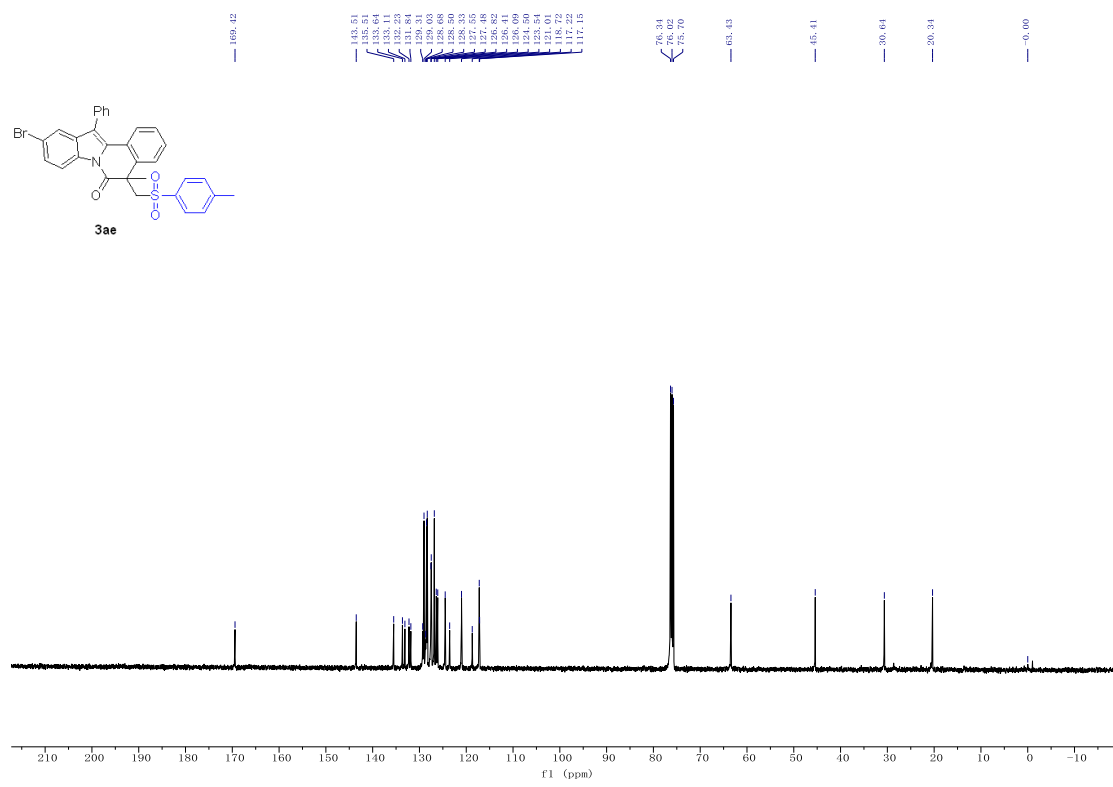


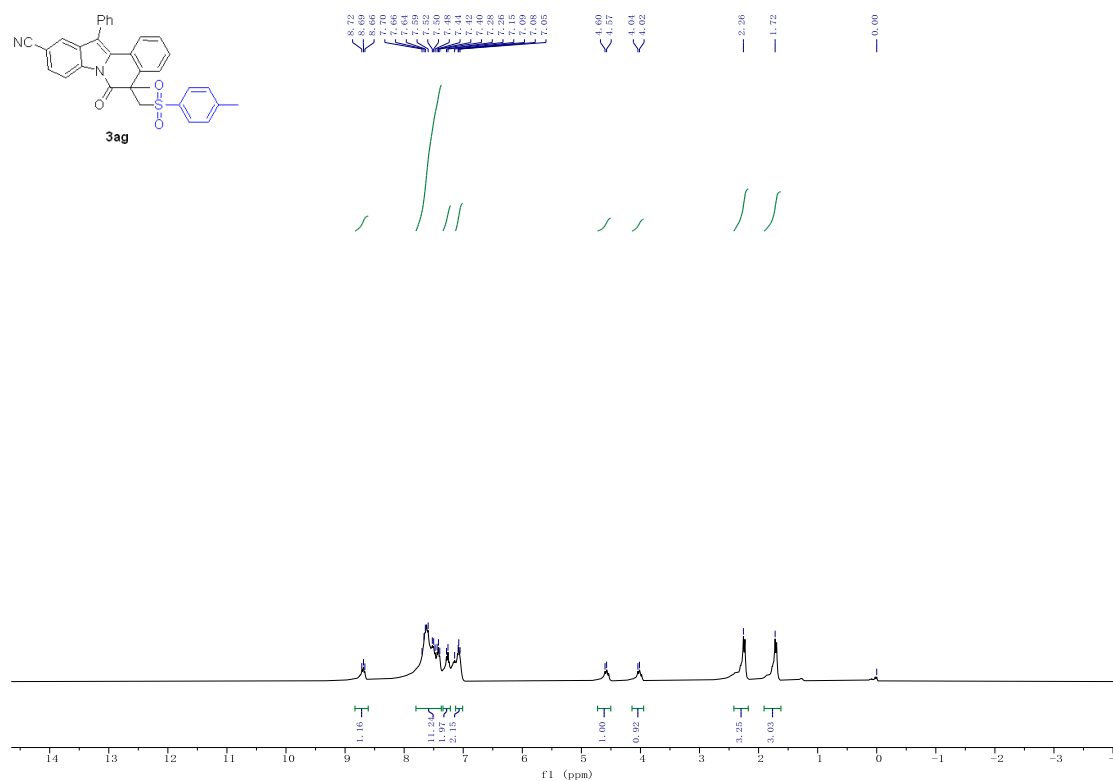
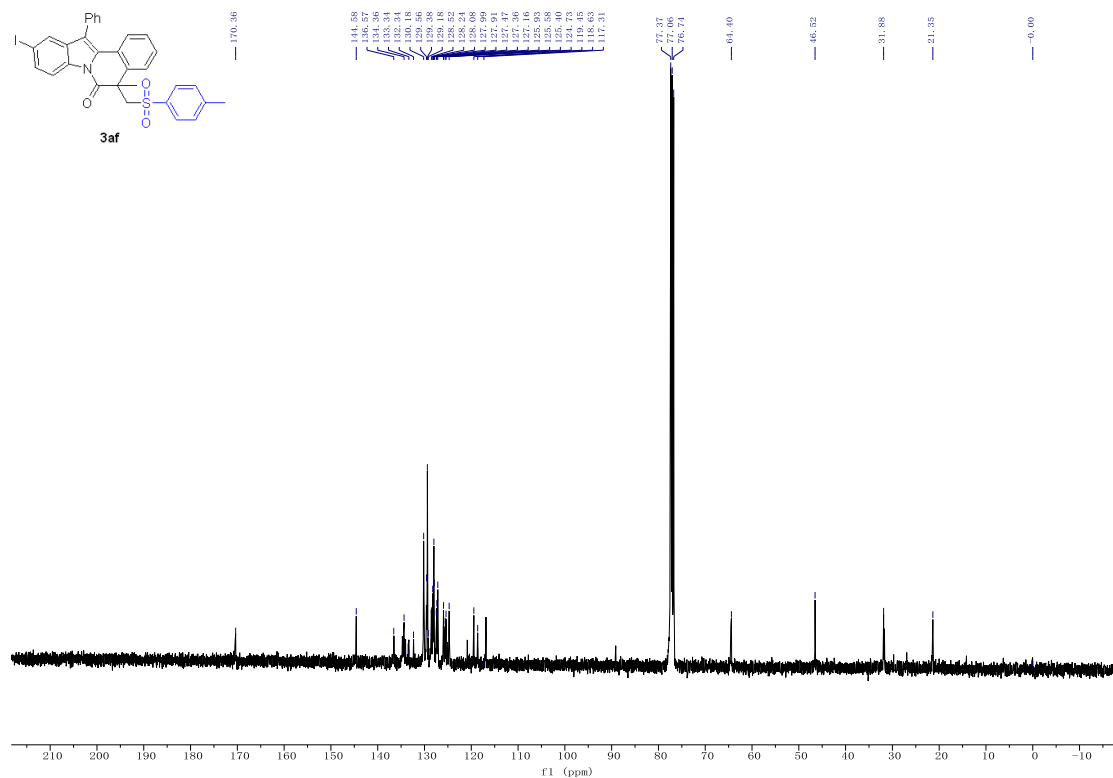


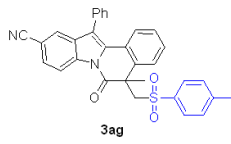












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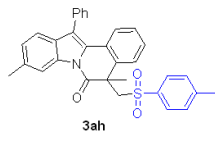
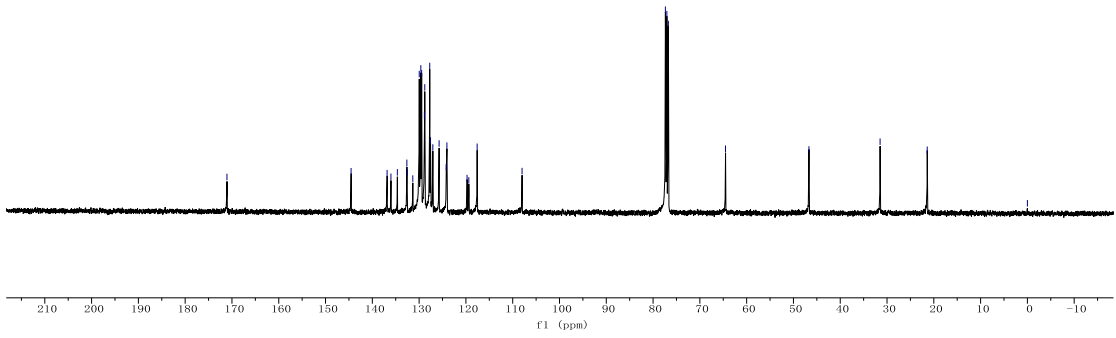
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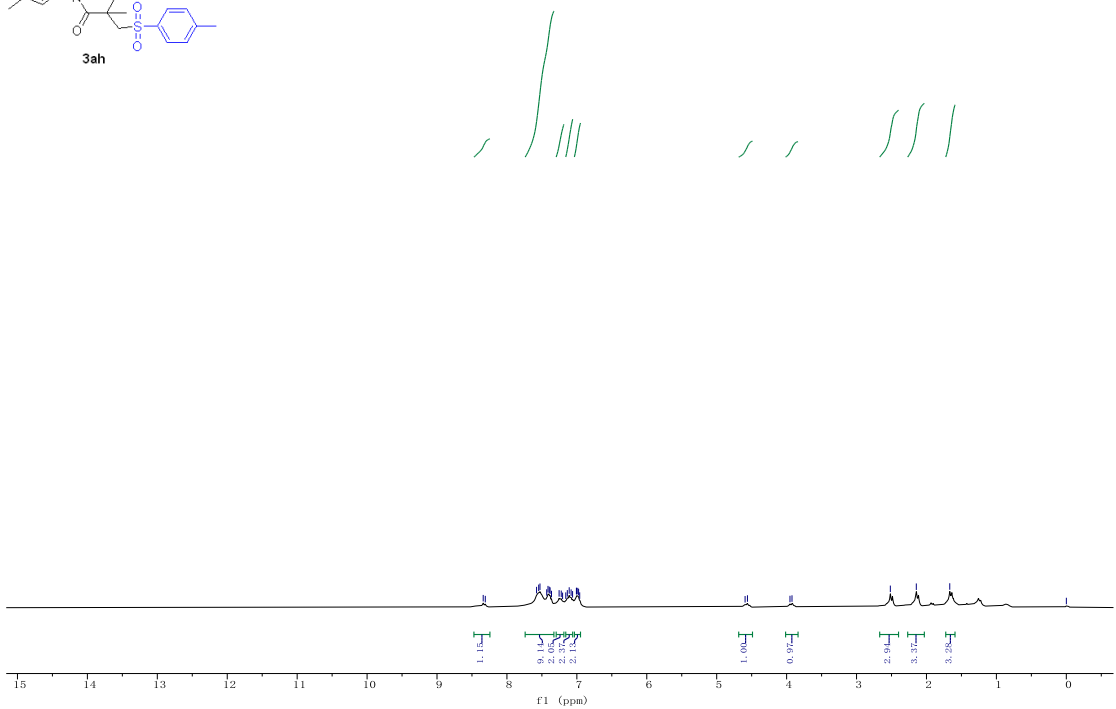
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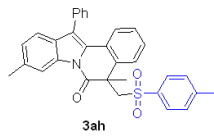
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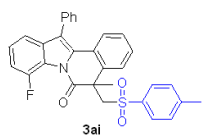
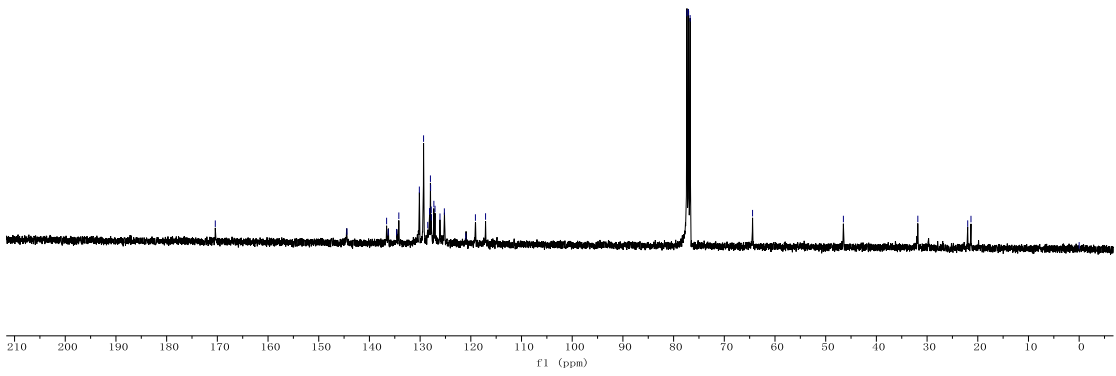
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