

Electronic Supporting Information

The synthesis of imidazo[1,5-*a*]quinolines via a decarboxylative cyclization under metal-free condition

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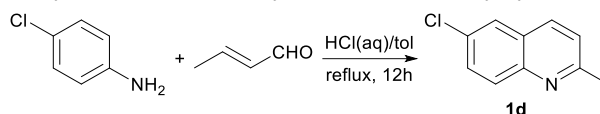
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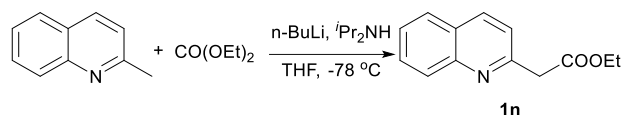
(A) Typical experimental procedure for the synthesis of substrates

(1) A typical experimental procedure for the synthesis of 2-methyl quinolines:



4-Chloro-aniline (2.54g, 20 mmol), 23.2 mL of 37% HCl (aq) and 10 mL of water were added to a 250 mL round-bottom flask. The mixture was stirred at 100 °C for at least 30 minutes. When the solid were all dissolved, crotonaldehyde (1.75g, 25mmol) in 13 mL of toluene was added and the mixture were kept reflux for 12 h. Then the mixture was cooled to room temperature and poured into 100 mL of Na₂CO₃ (aq). The product was extracted by CH₂Cl₂ and purified by silica gel column chromatography (PE/EtOAc = 15:1) to afford the desired product **1d** (2.52g, 71%).

(2) Experimental procedure for the synthesis of ethyl quinoline-2-acetate (**1n**):



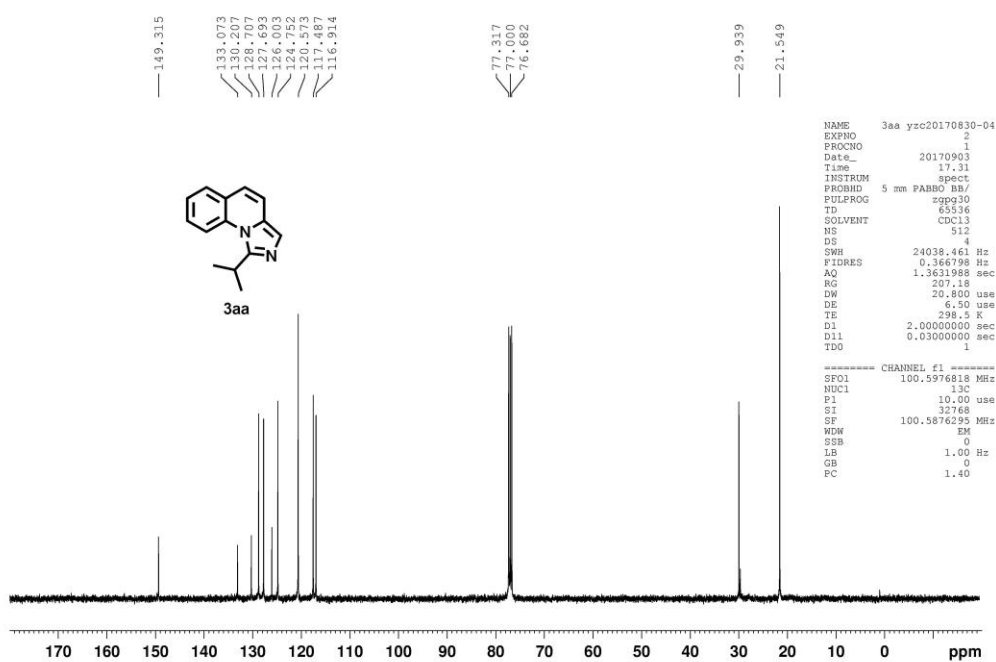
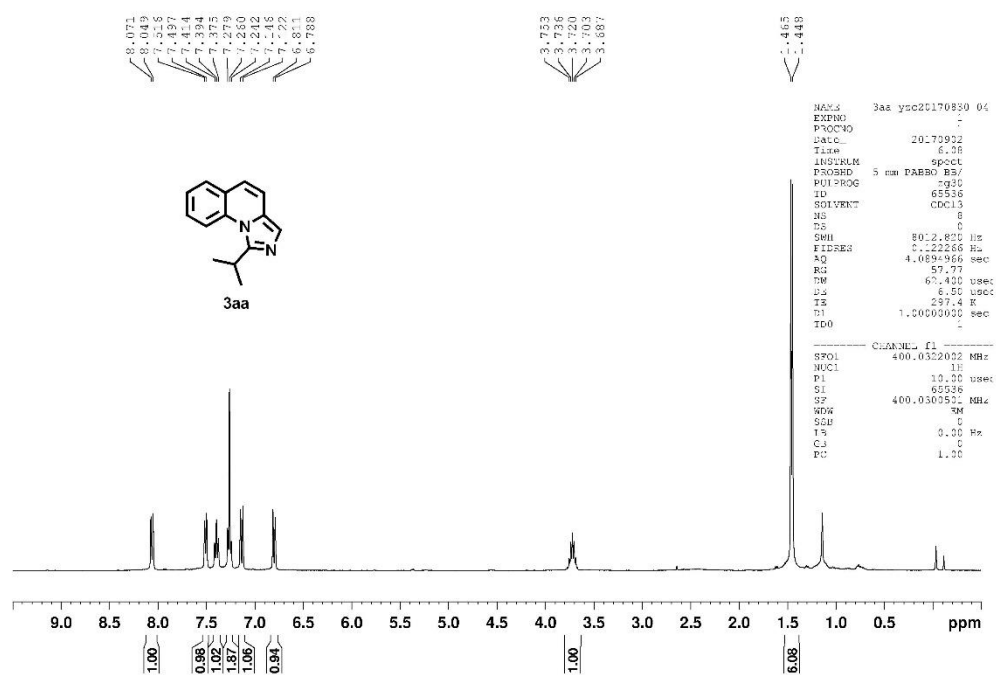
A mixture of 7.08g diisopropylamine (9.8 mL, 70 mmol) and 10 mL of dried THF was added to a three-necked flask by syringe under N₂. After cooling down to -78 °C, 28.4 mL of *n*-Butyl lithium (2.4M in hexane, 68 mmol) was slowly added. The mixture was stirred for 30 minutes. Then 3.5g of 2-methyl quinoline (3.3mL, 24 mmol) was slowly added. The colour turned to orange rapidly then dark-brown. After 30 minutes, 10.6g of diethyl carbonate (11mL, 90 mmol) was added and the mixture was stirred for 2 hours. The reaction was quenched by 10 mL of water. The desired product **1n** (3.3g, 64%) was extracted by EtOAc and purified by silica gel column chromatography (PE/EtOAc = 20:1).

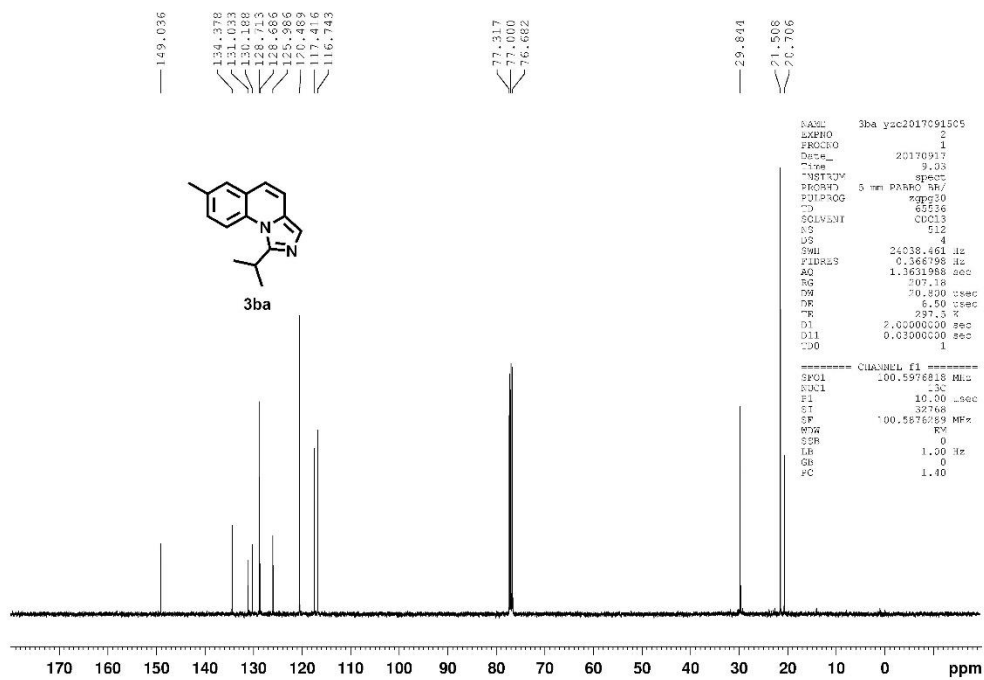
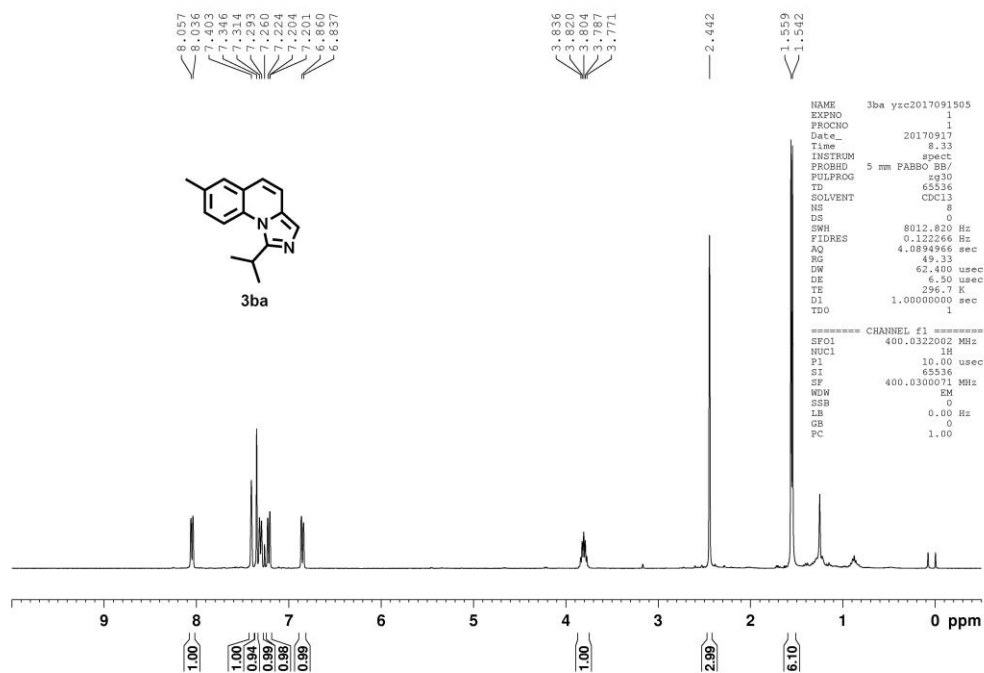
(3) 2-Ethyl quinoline was prepared following the reported methodology^{S1}.

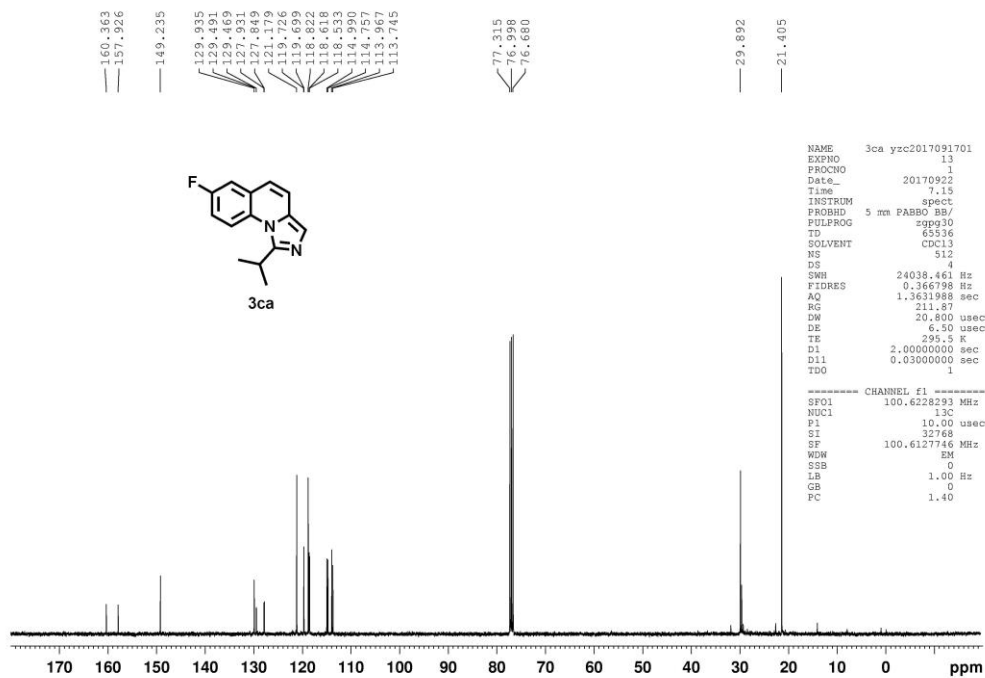
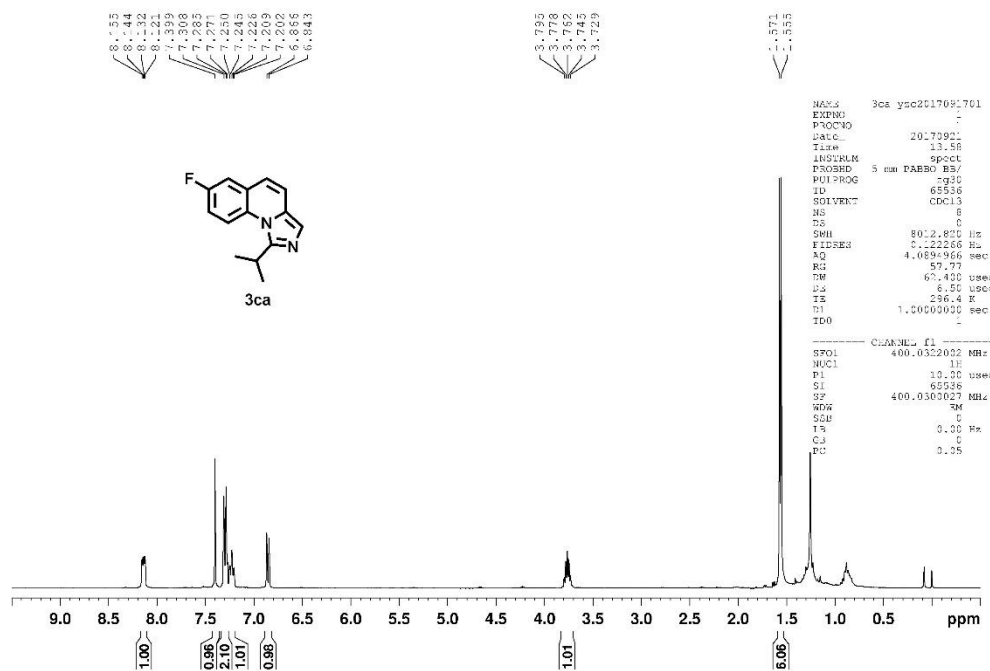
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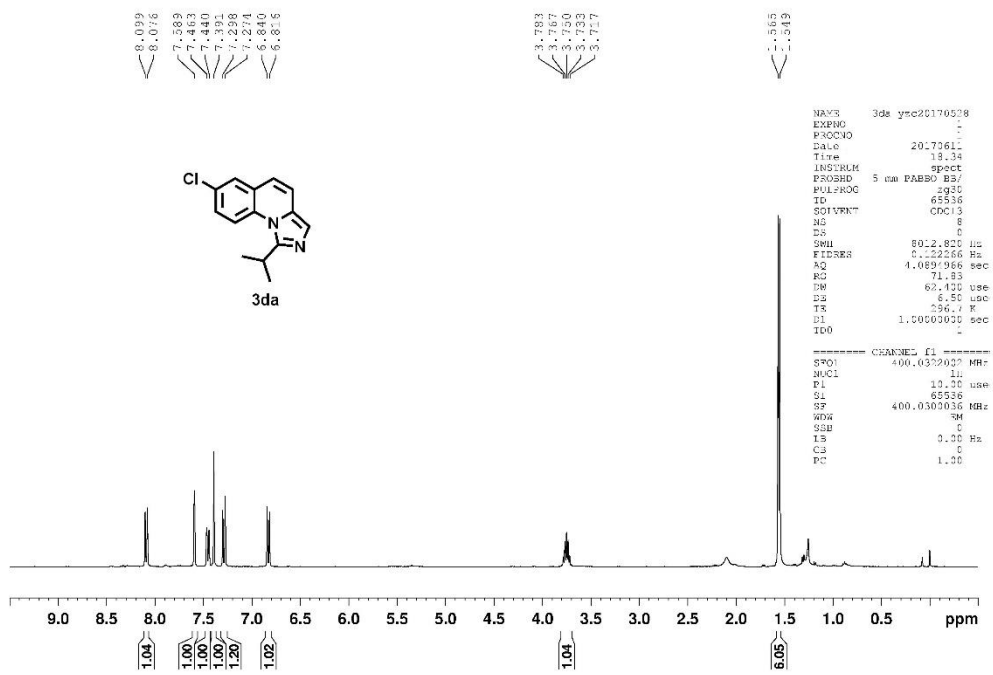
S1 B. Qian, S. Guo, J. Shao, Q. Zhu, L. Yang, C. Xia and H. Huang, *J. Am. Chem. Soc.*, 2010, **132**, 3650 - 3651.

(B) Copies of NMR spectra for product 3



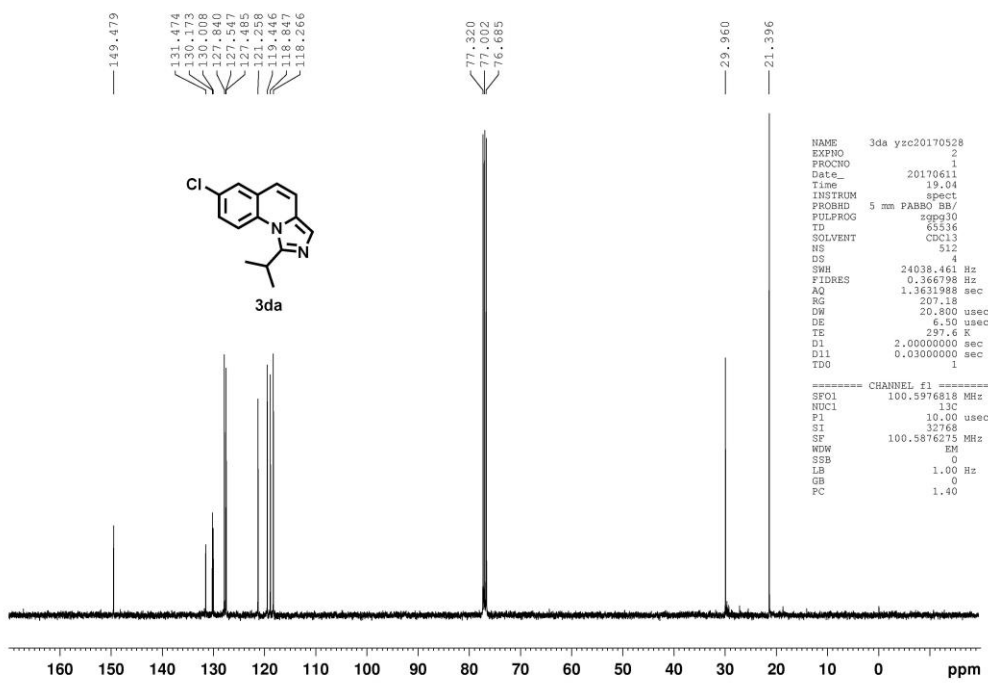






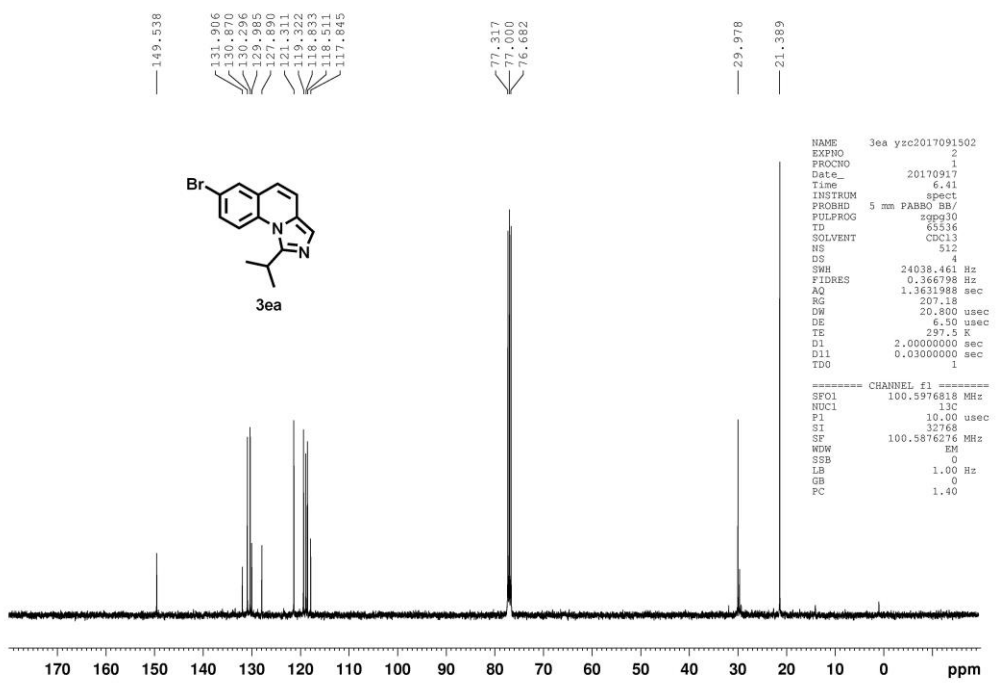
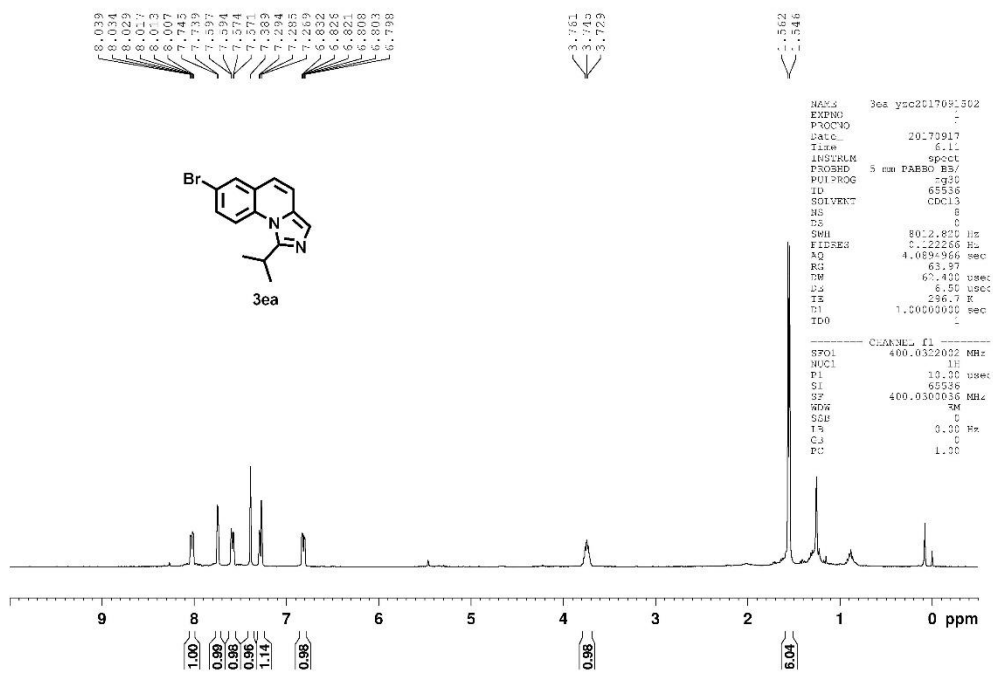
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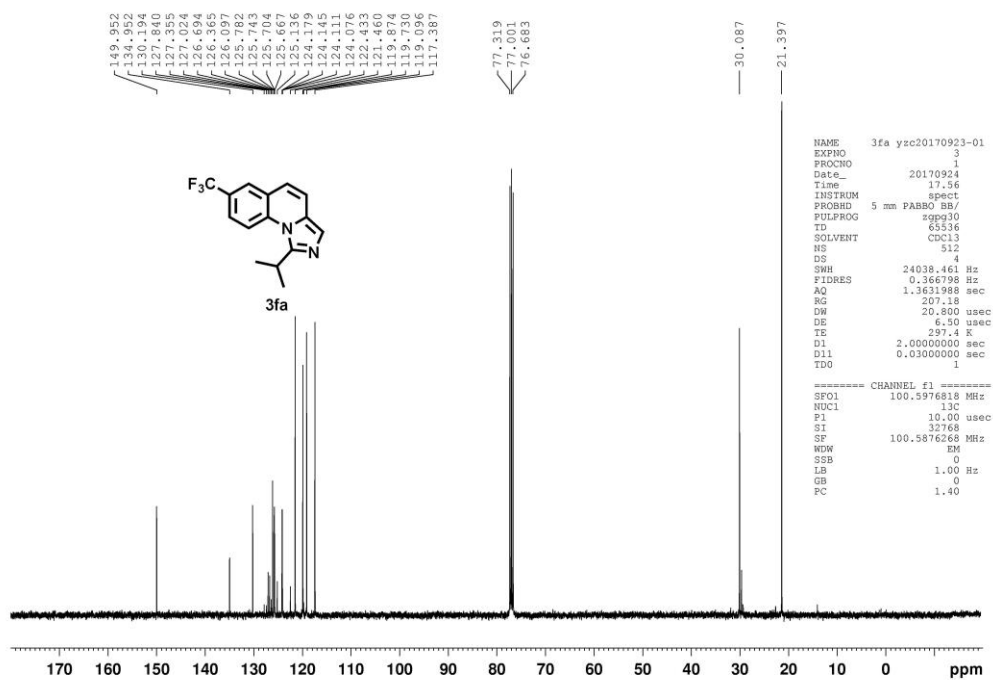
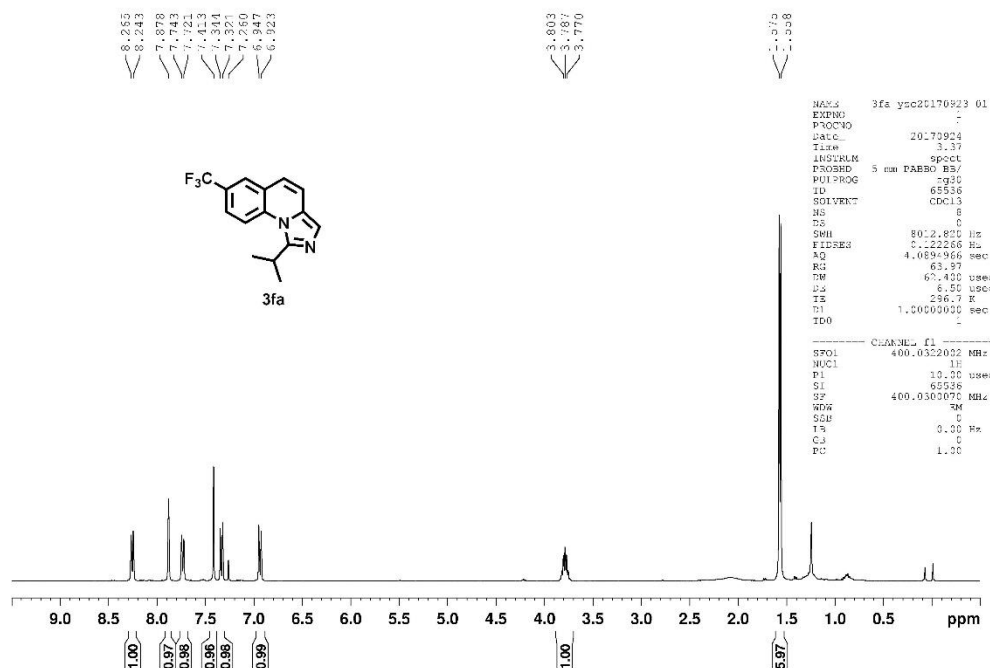
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FIDRES   0.366798 Hz
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RG        207.18
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DE        6.50 usec
TE        297.6 K
D1        2.0000000 sec
D11       0.0300000 sec
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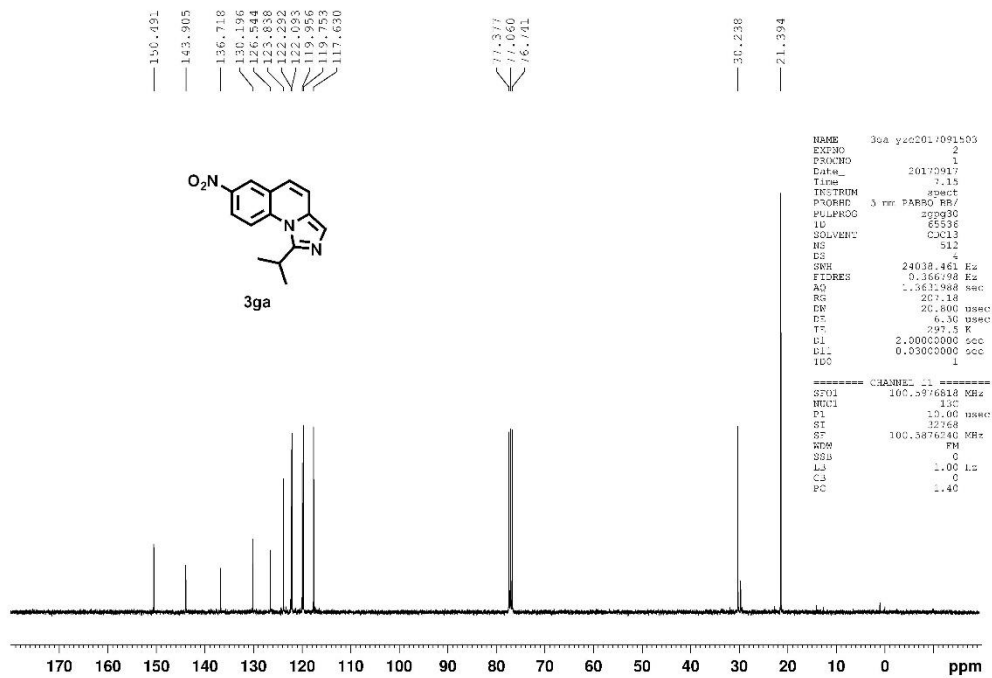
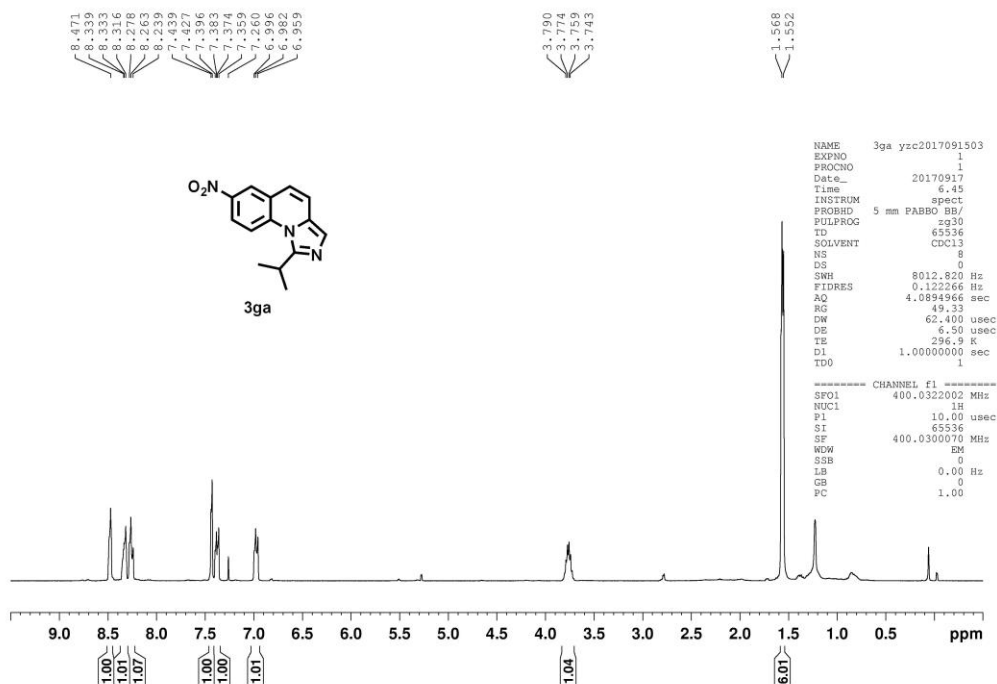


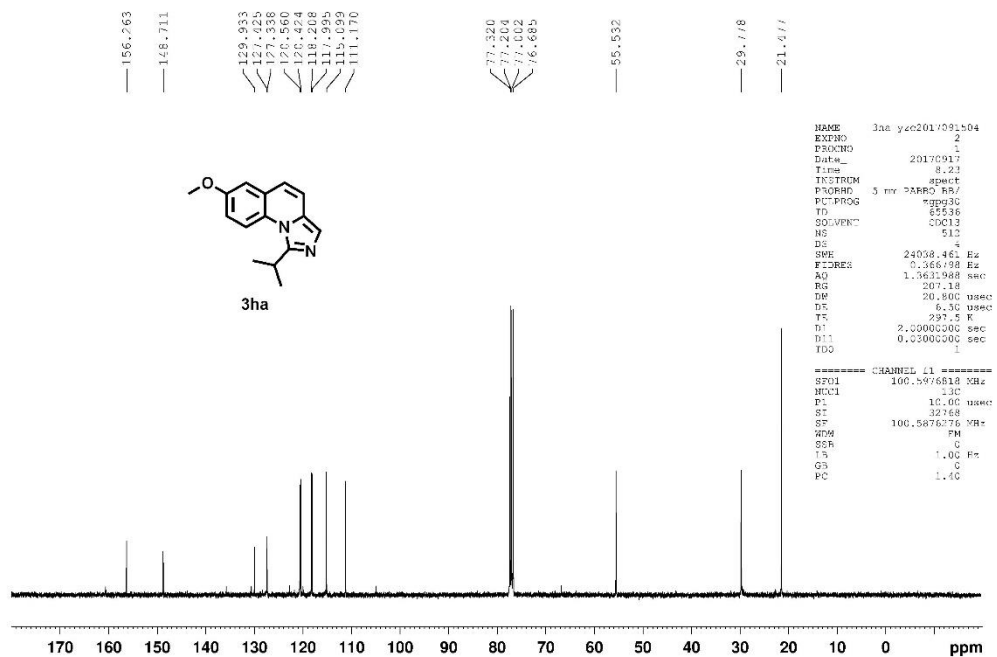
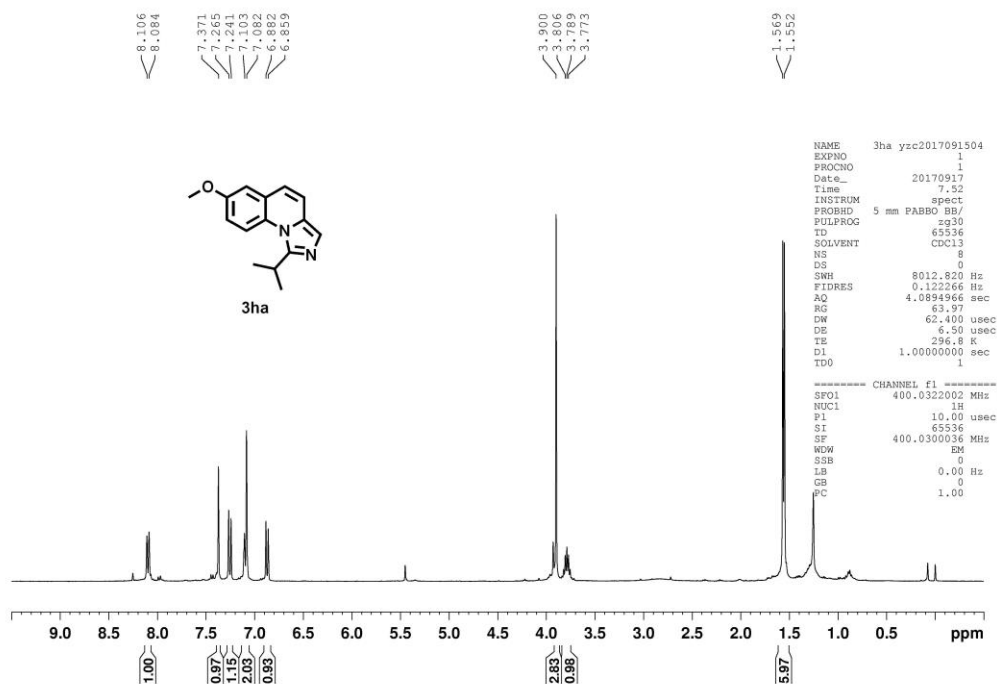
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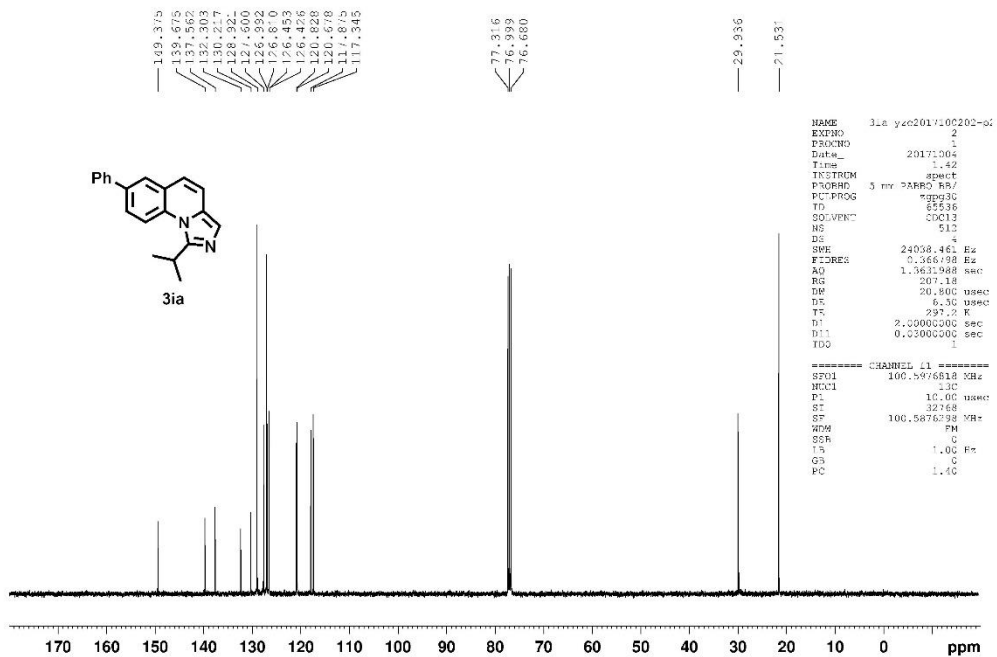
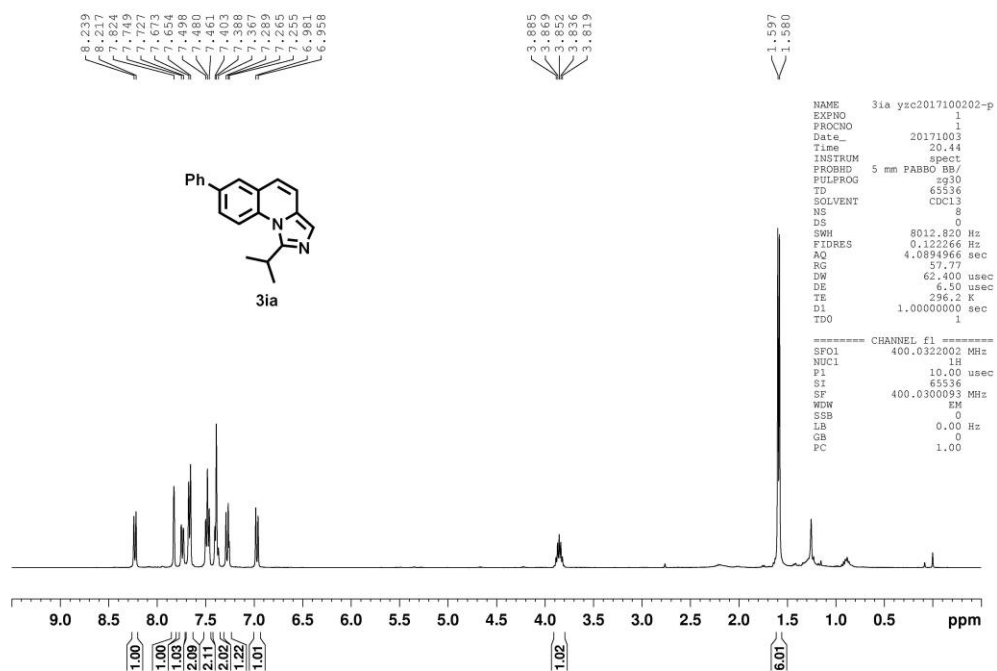
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D1        2.0000000 sec
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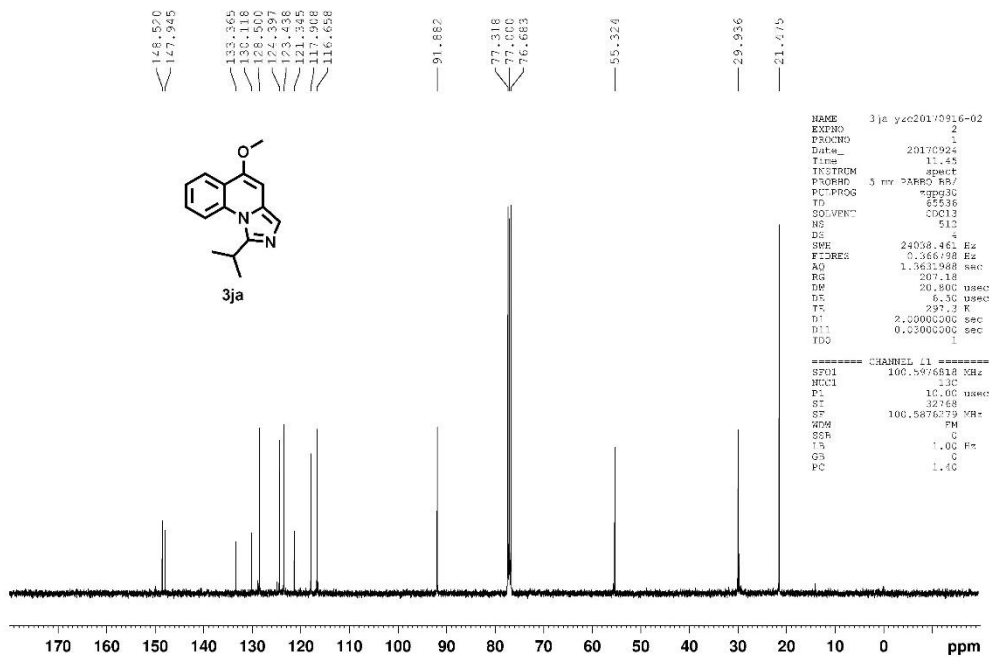
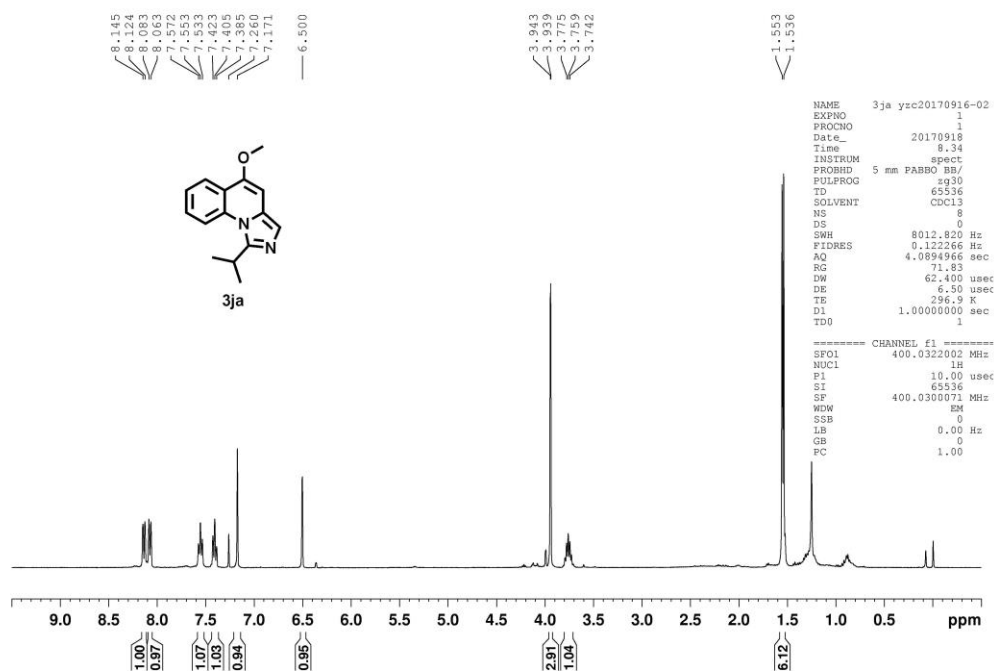


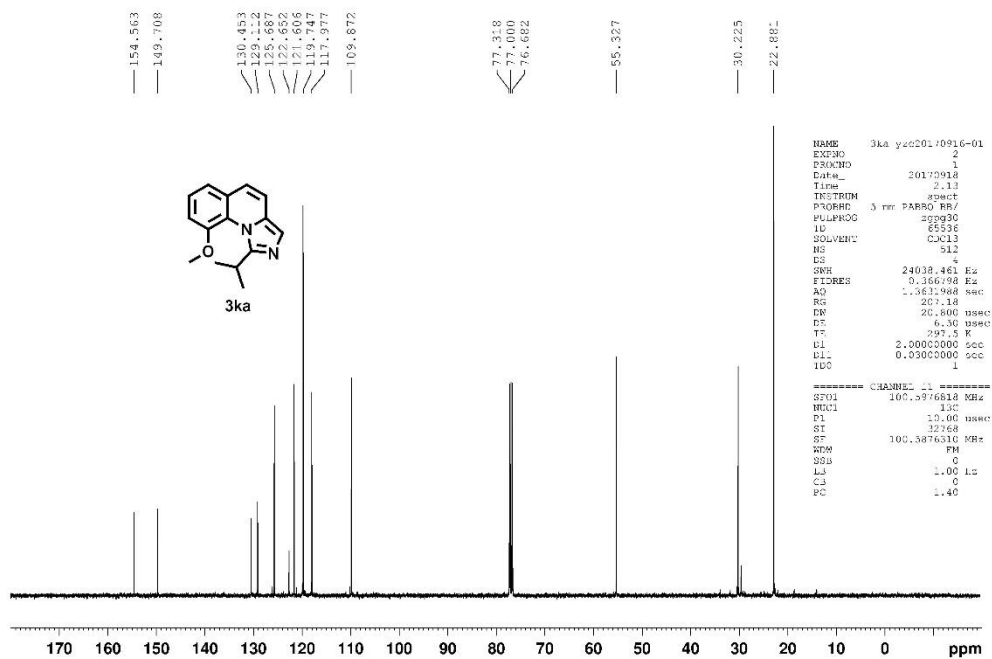
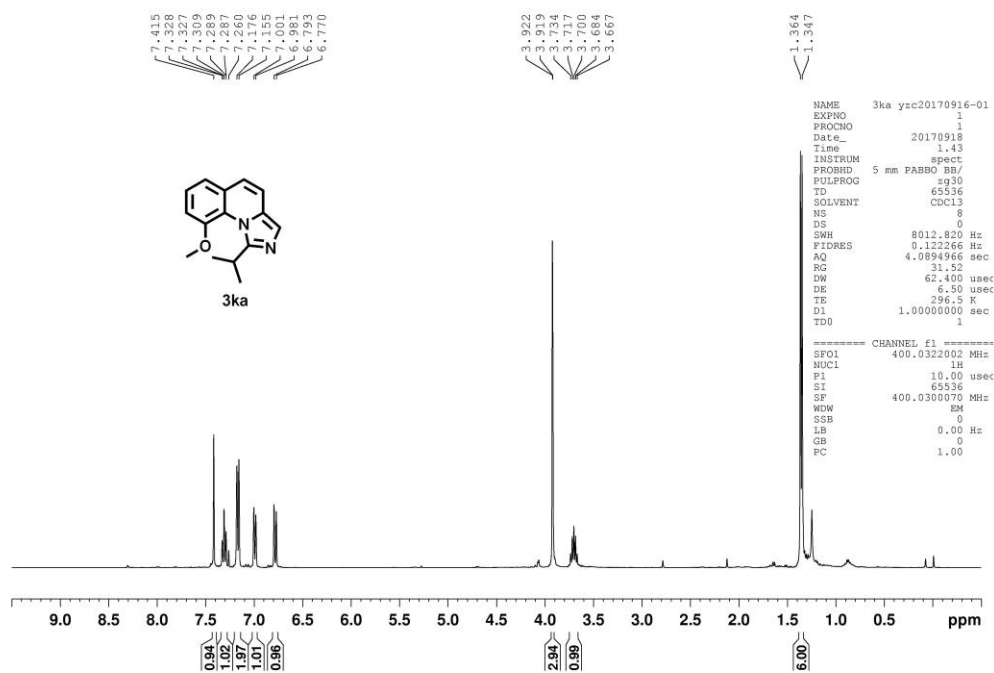


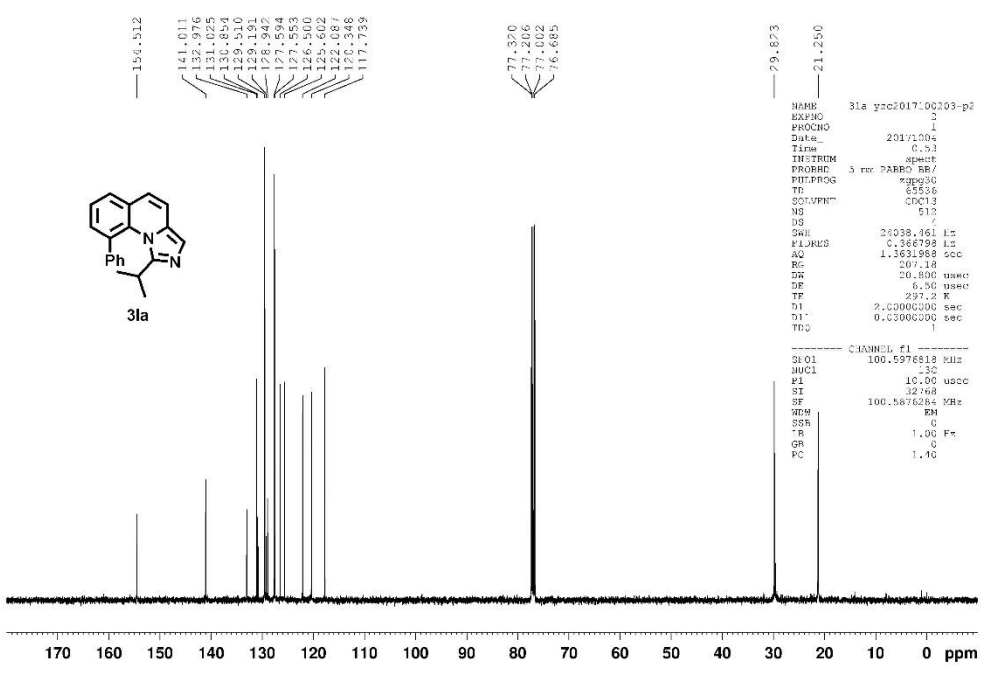
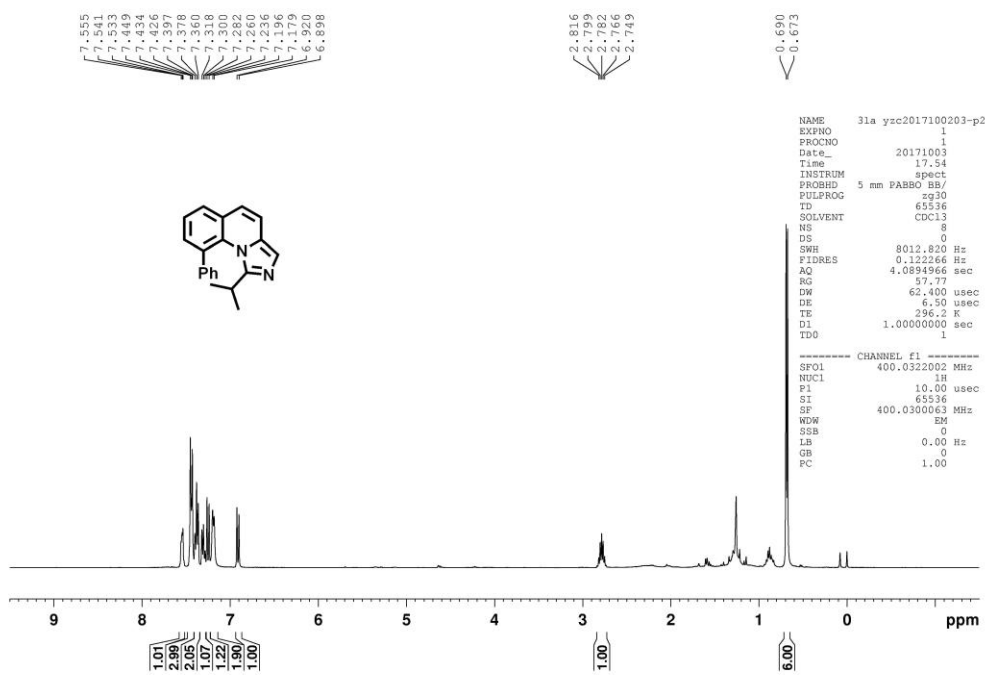


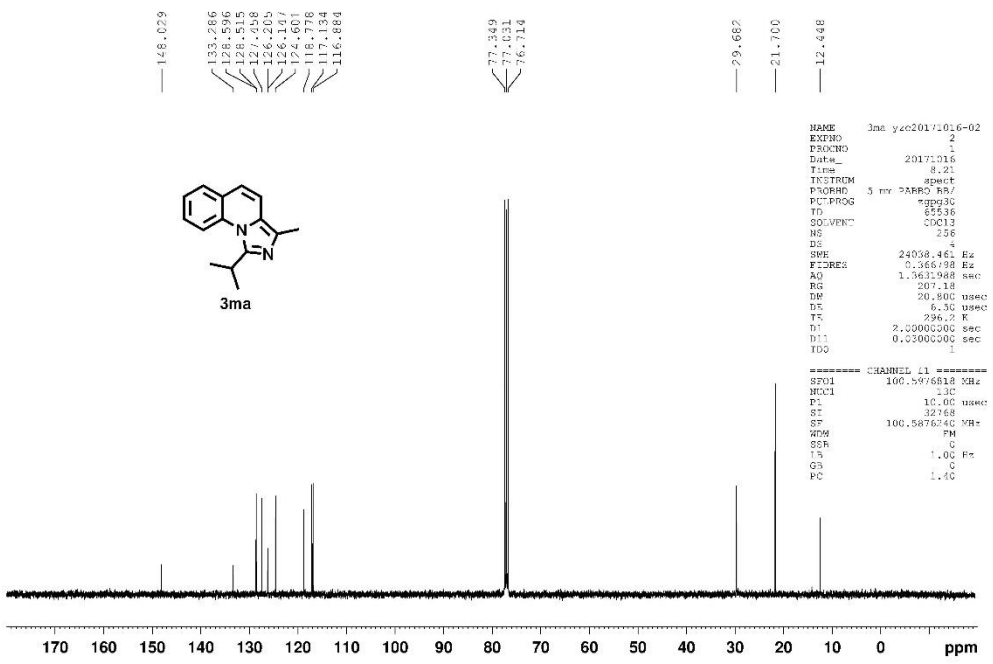
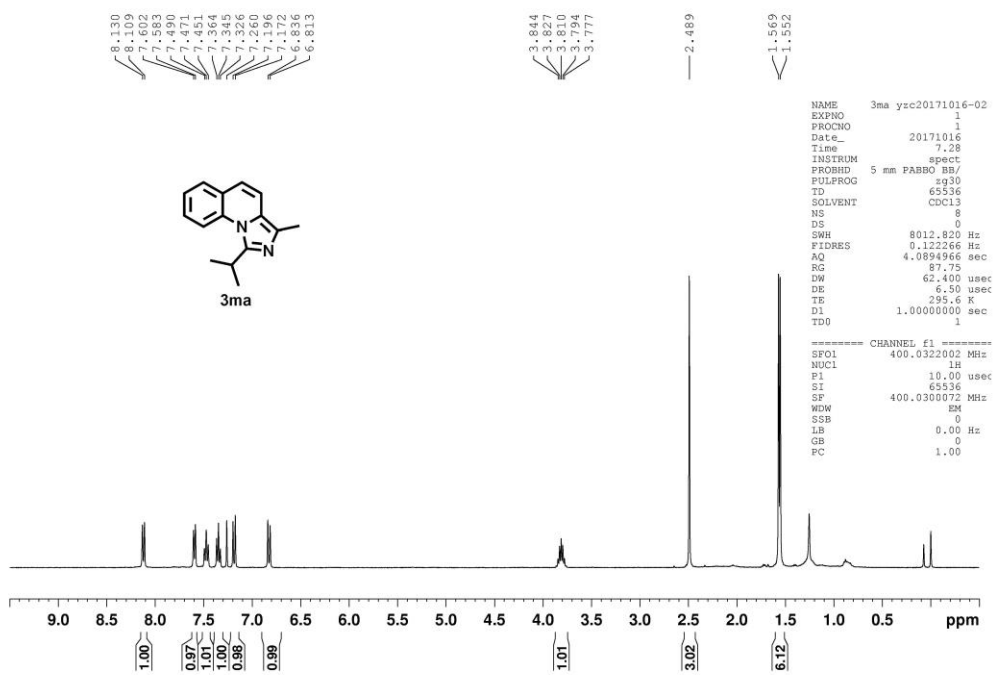


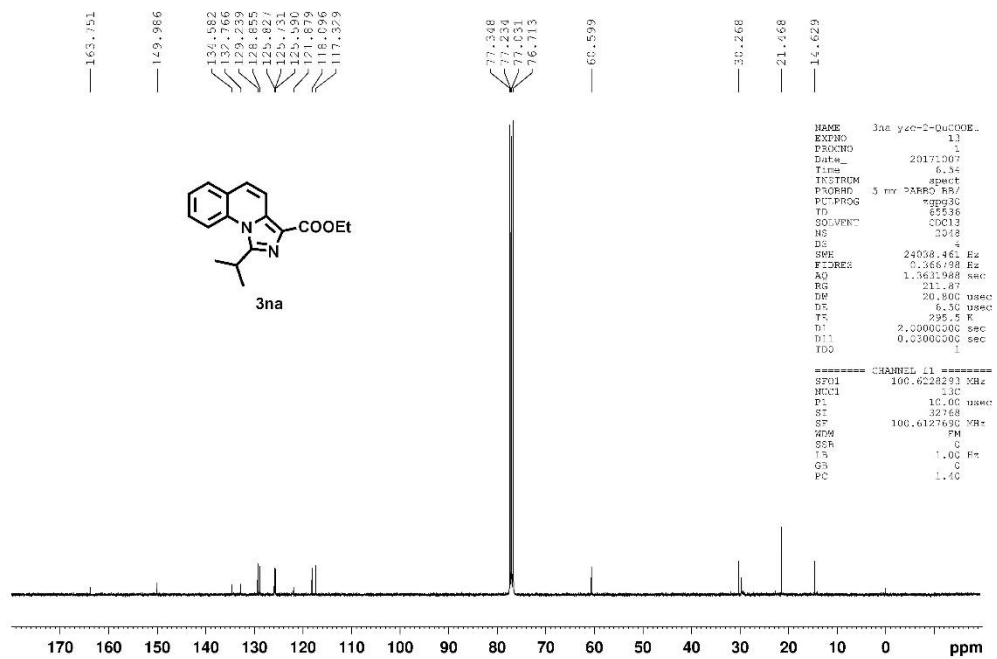
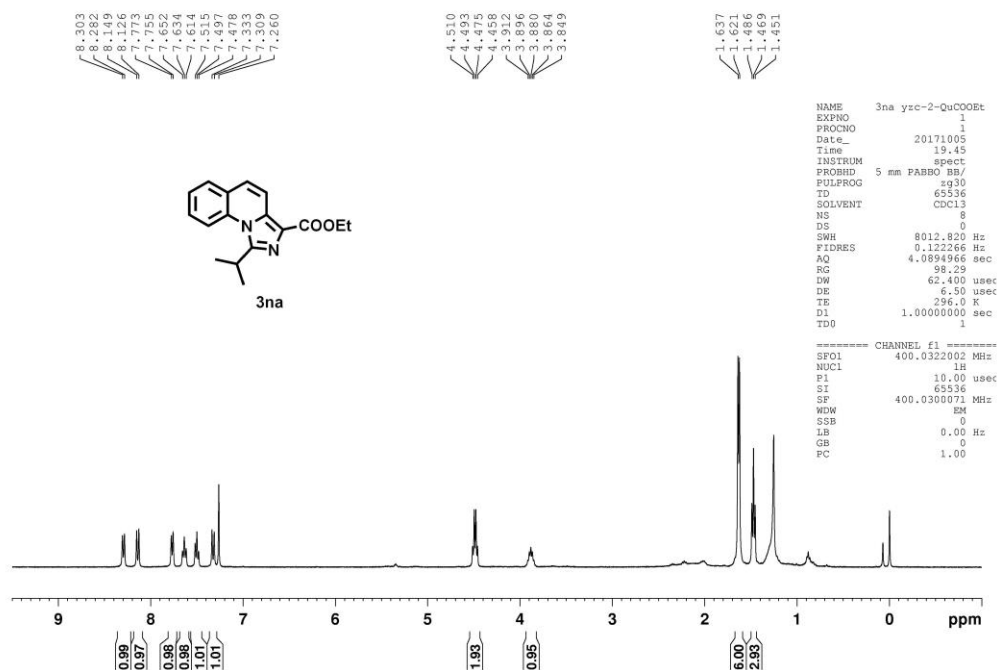


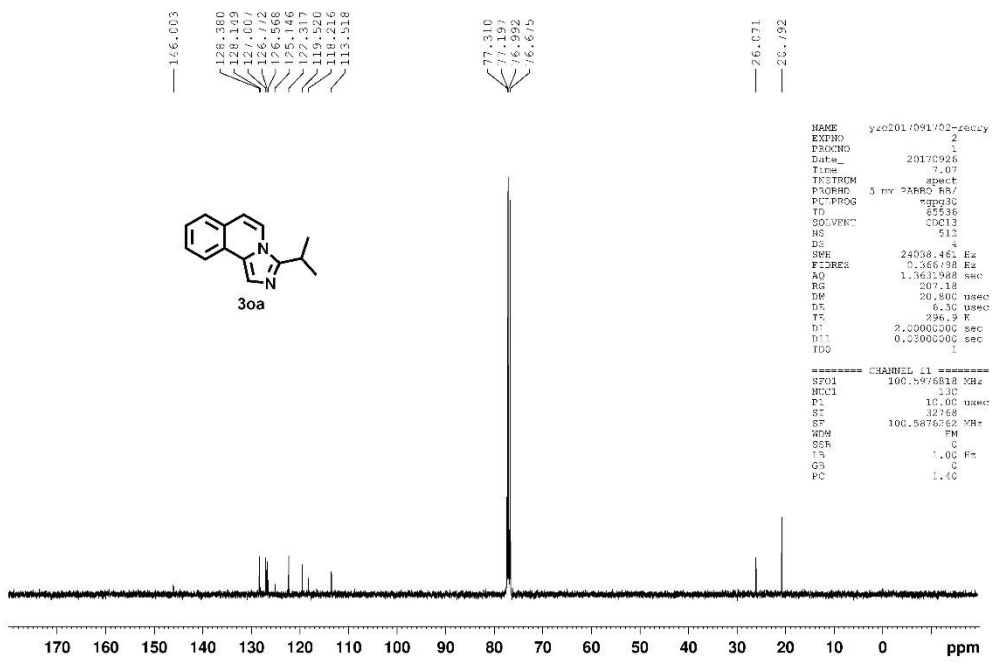
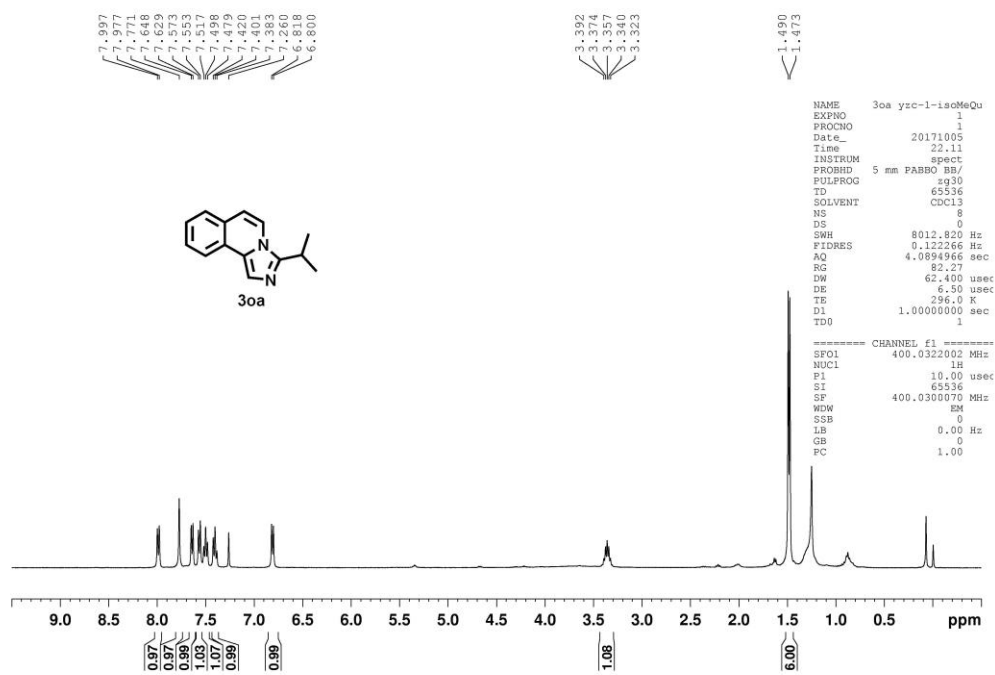


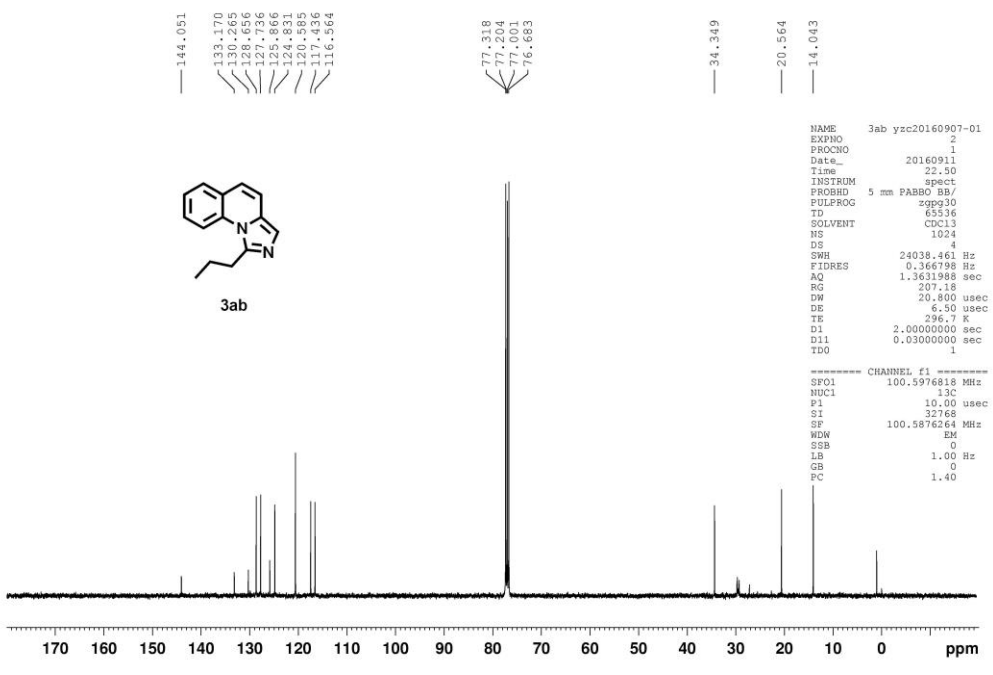
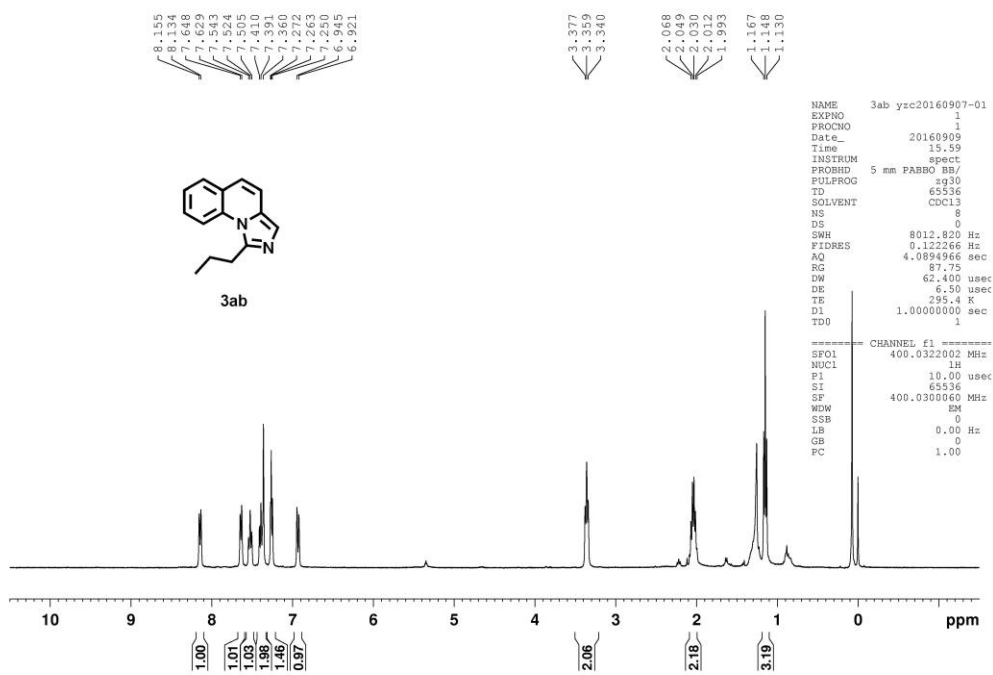


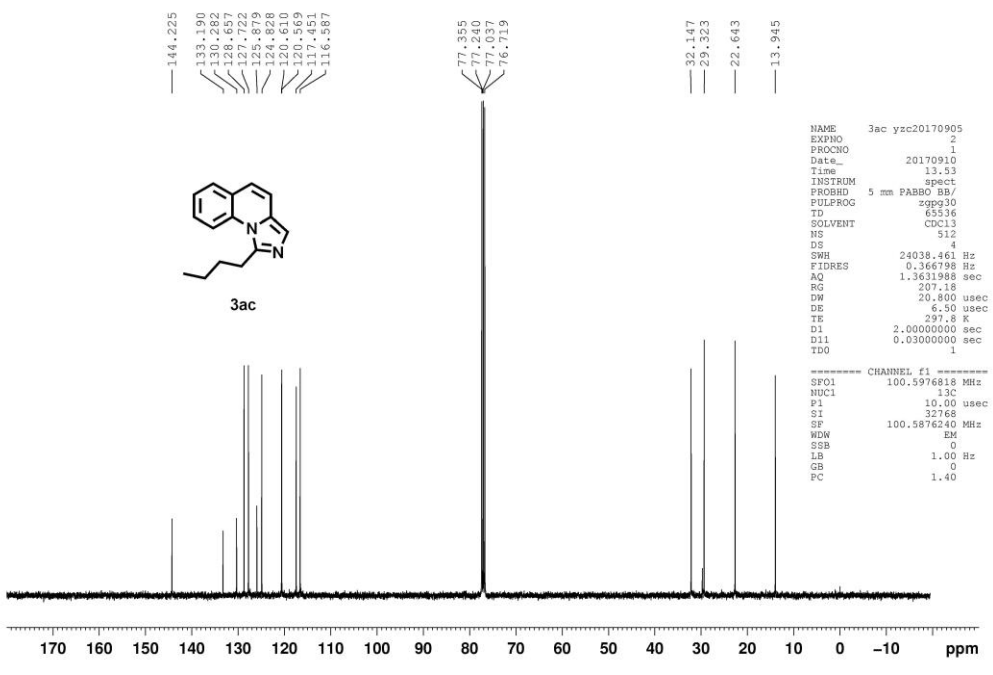
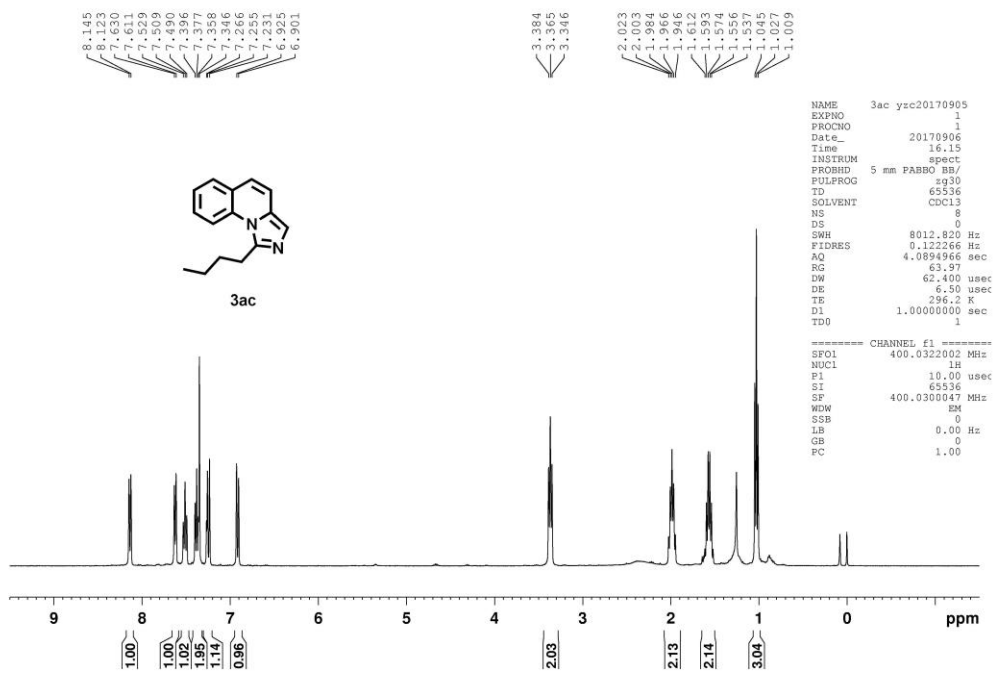


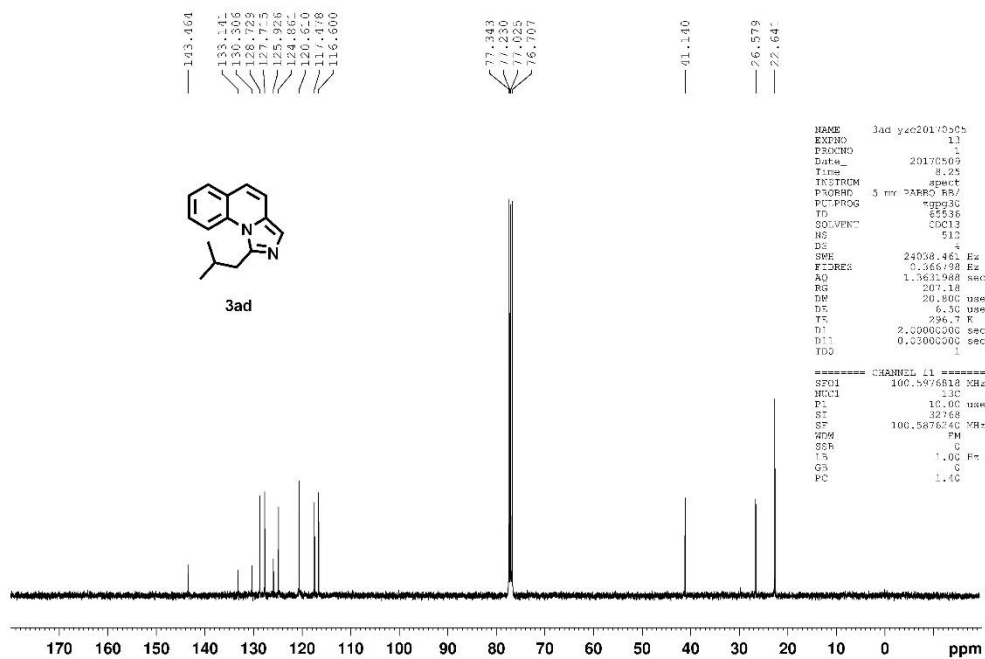
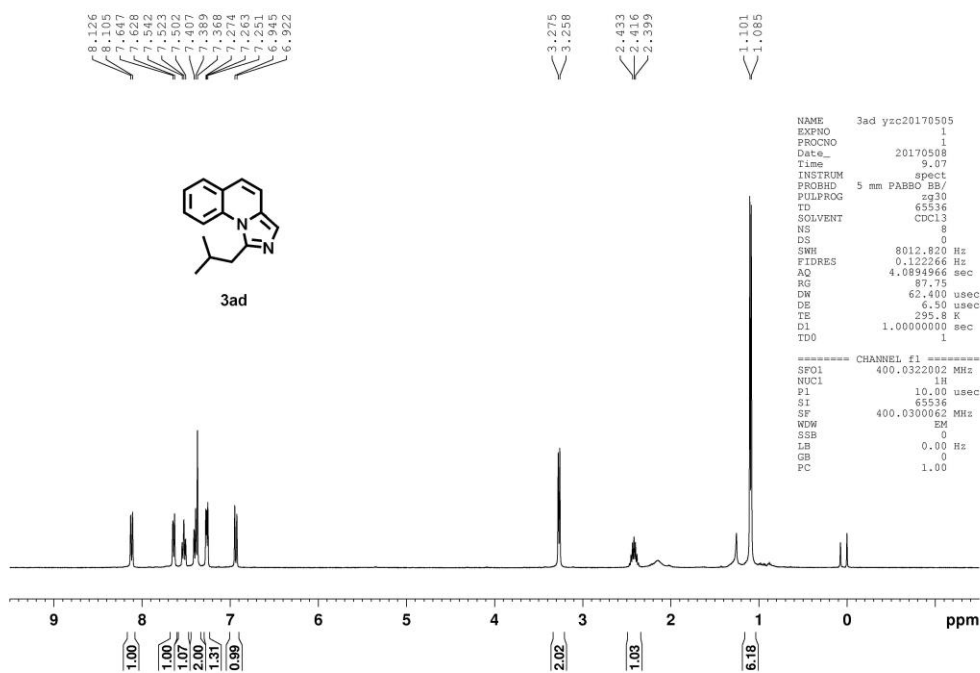


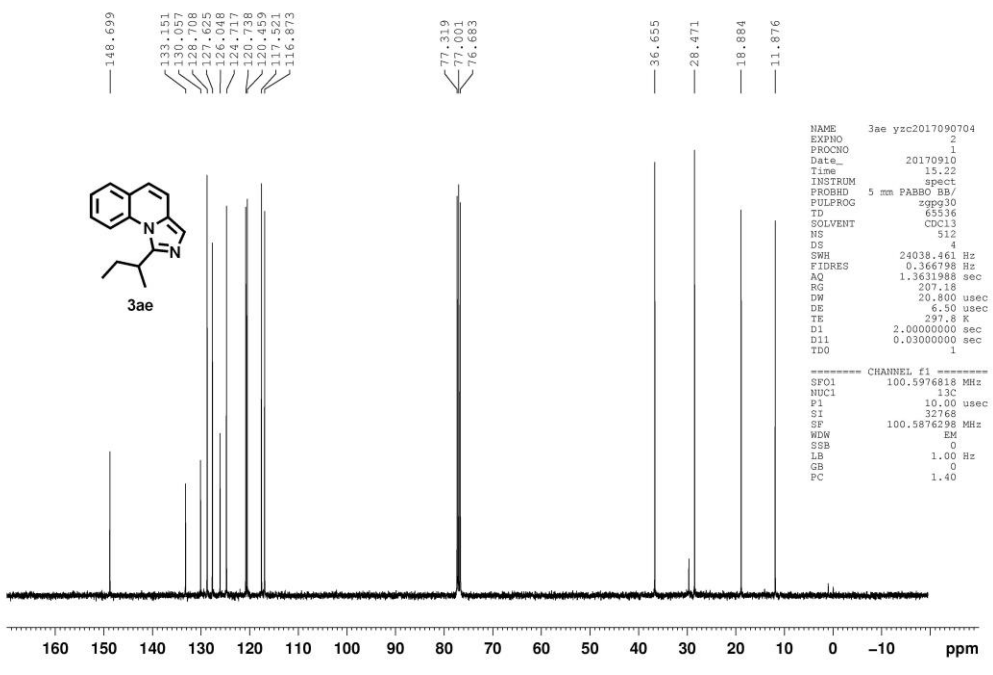
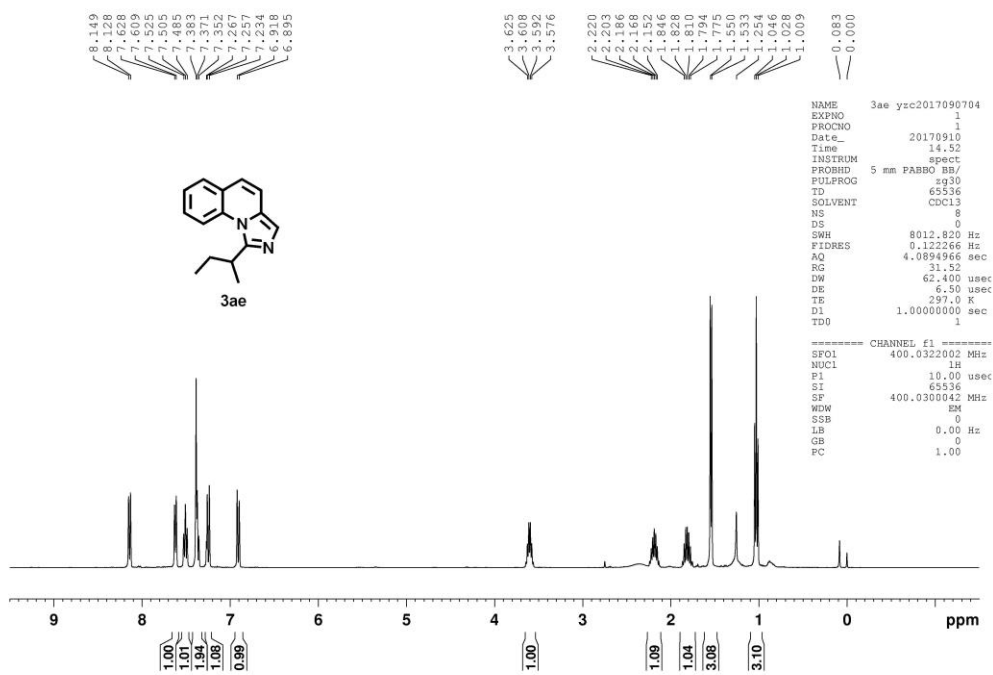


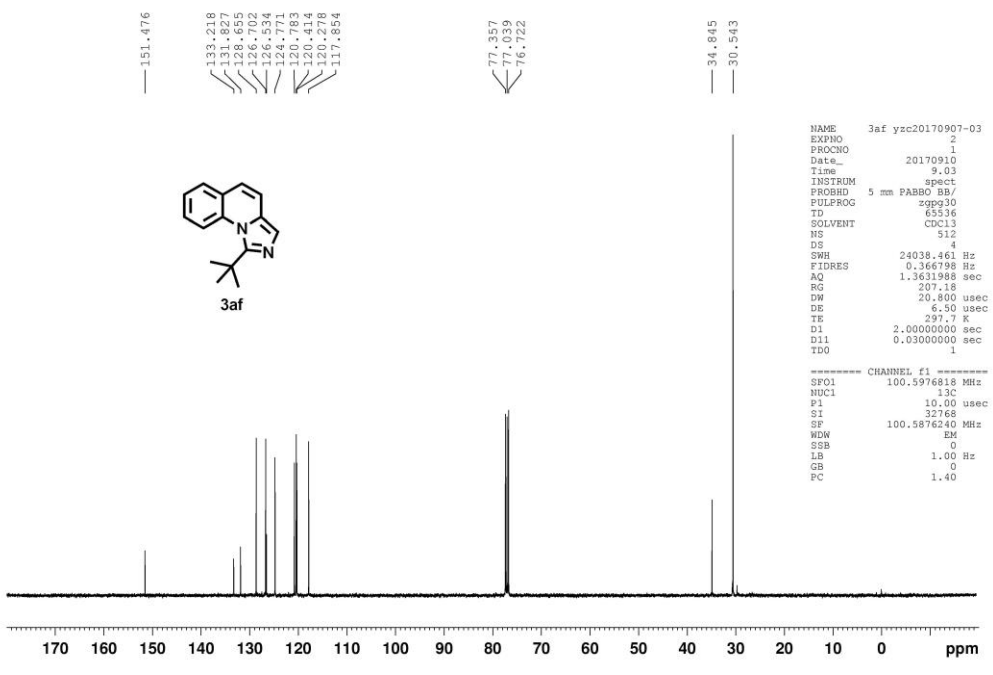
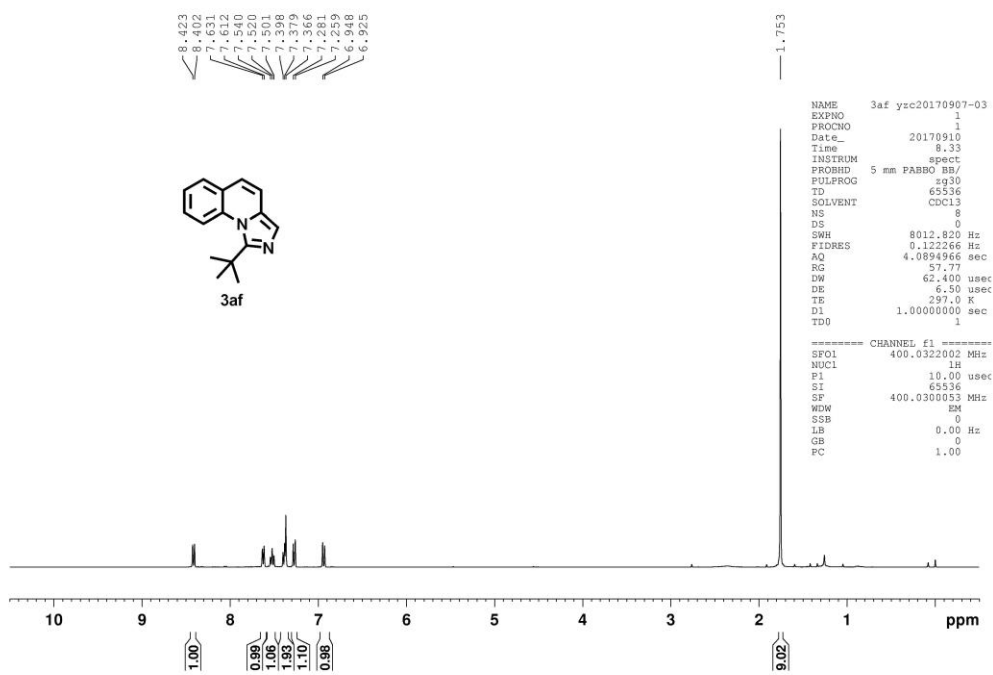


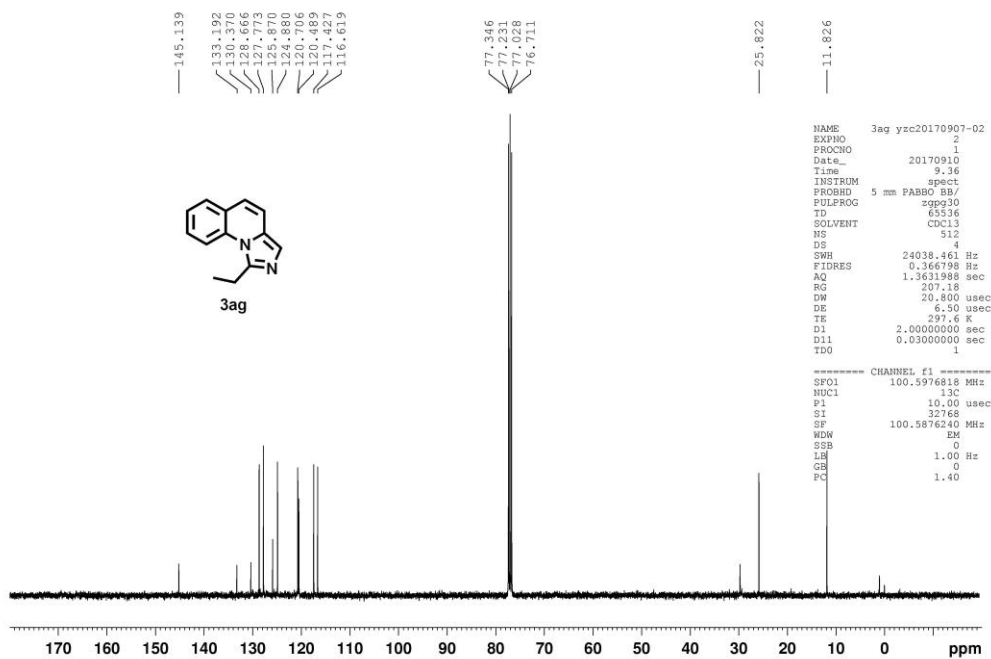
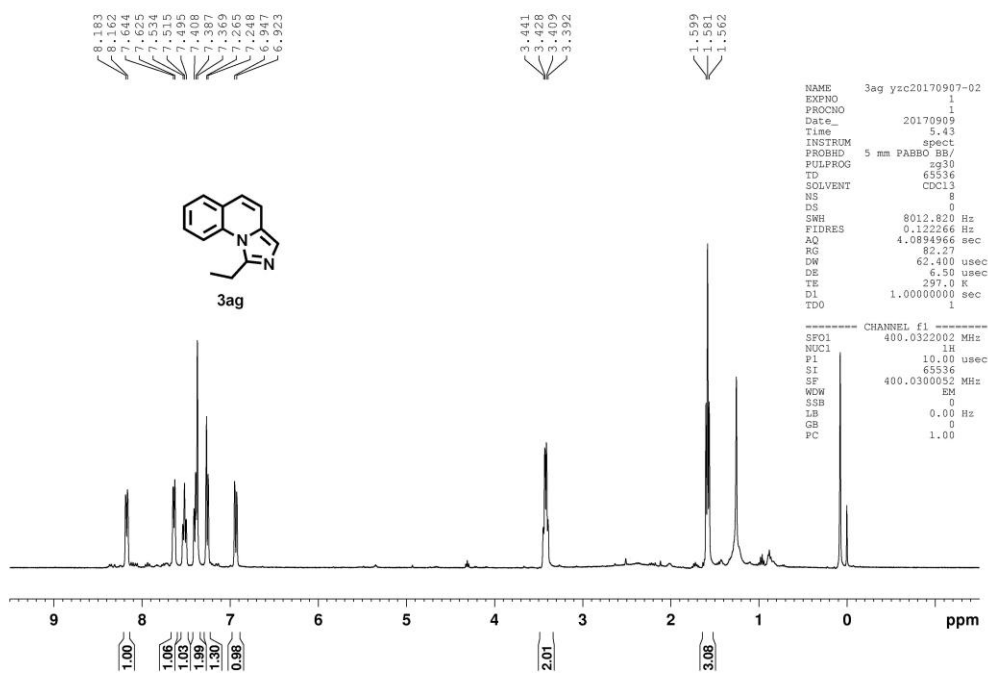


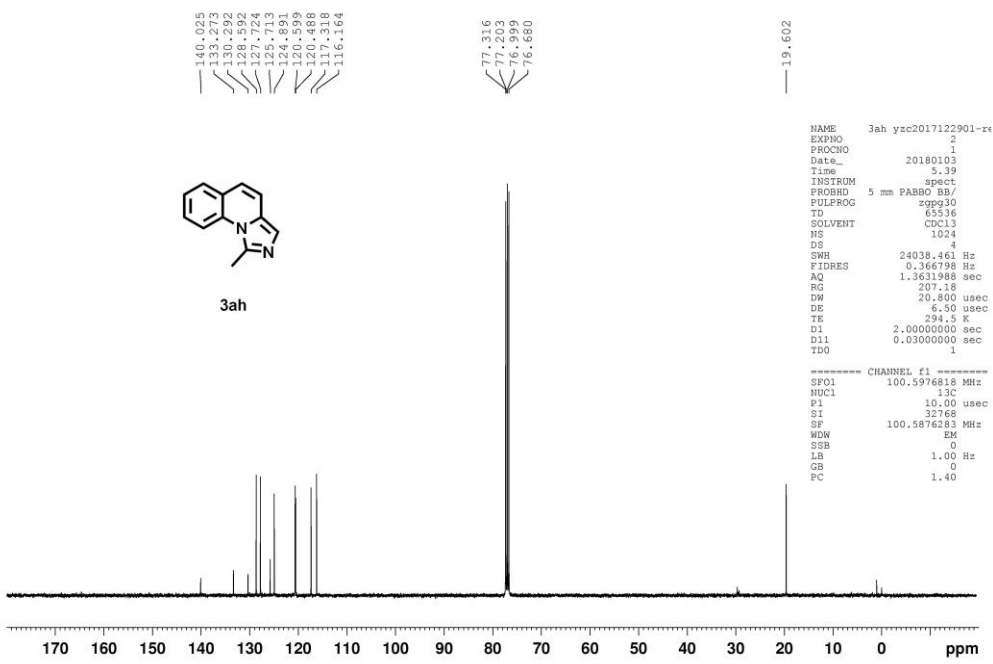
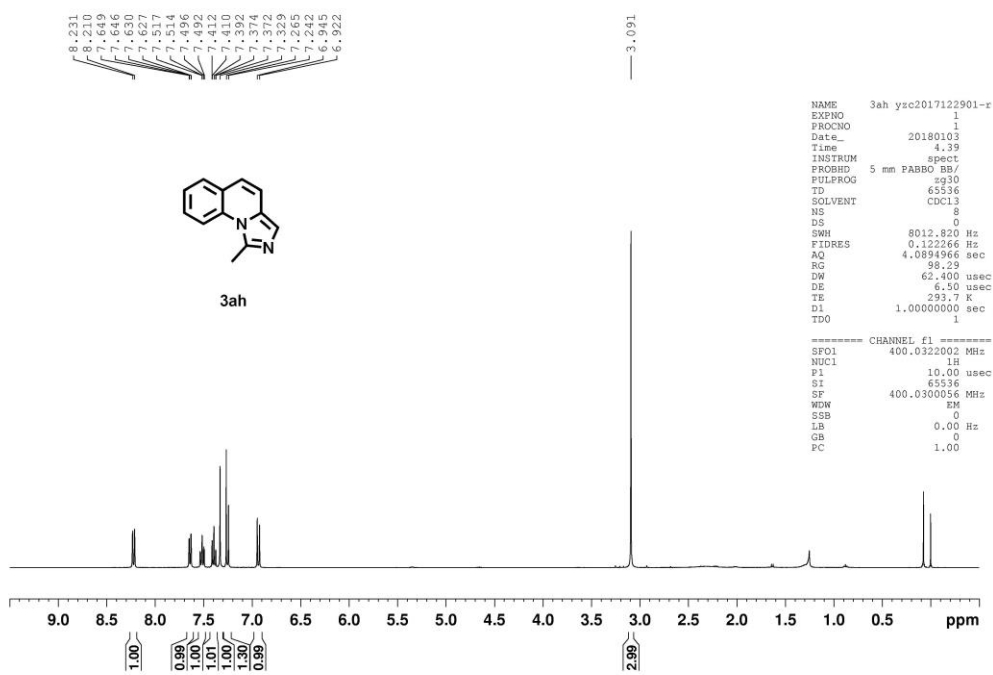


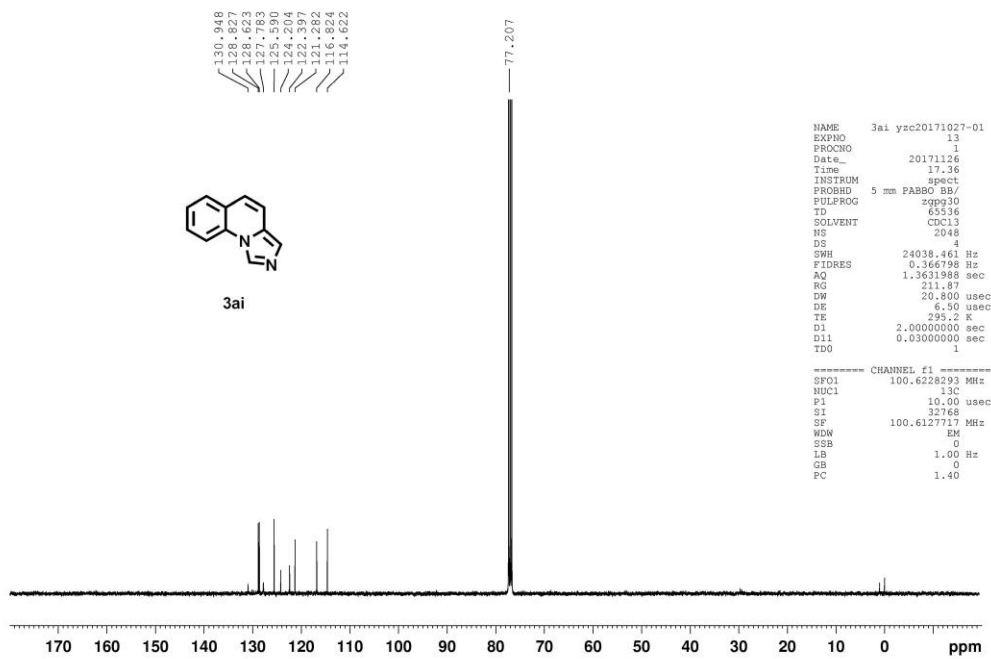
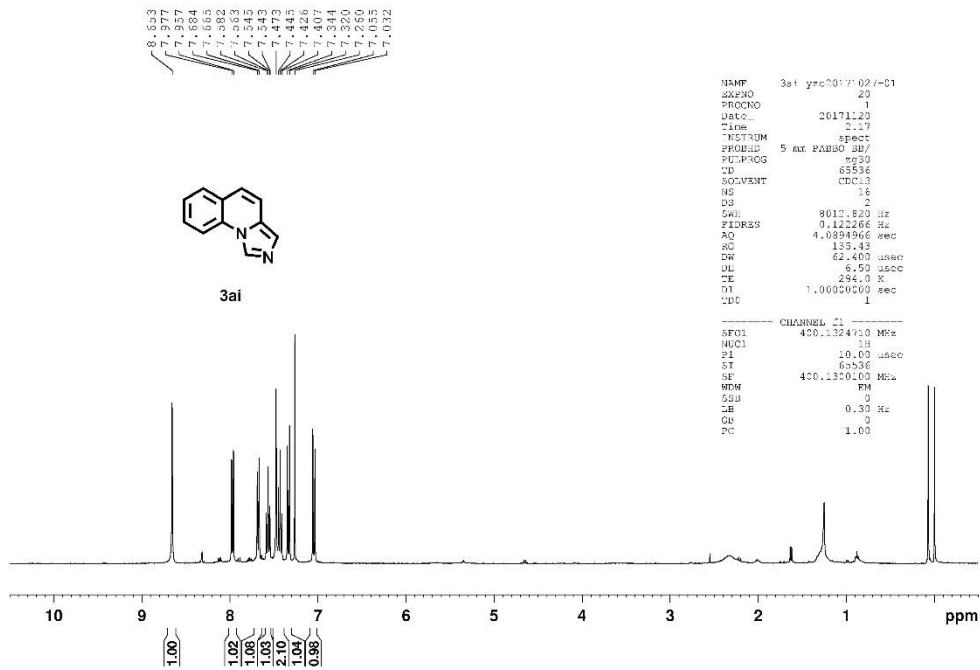


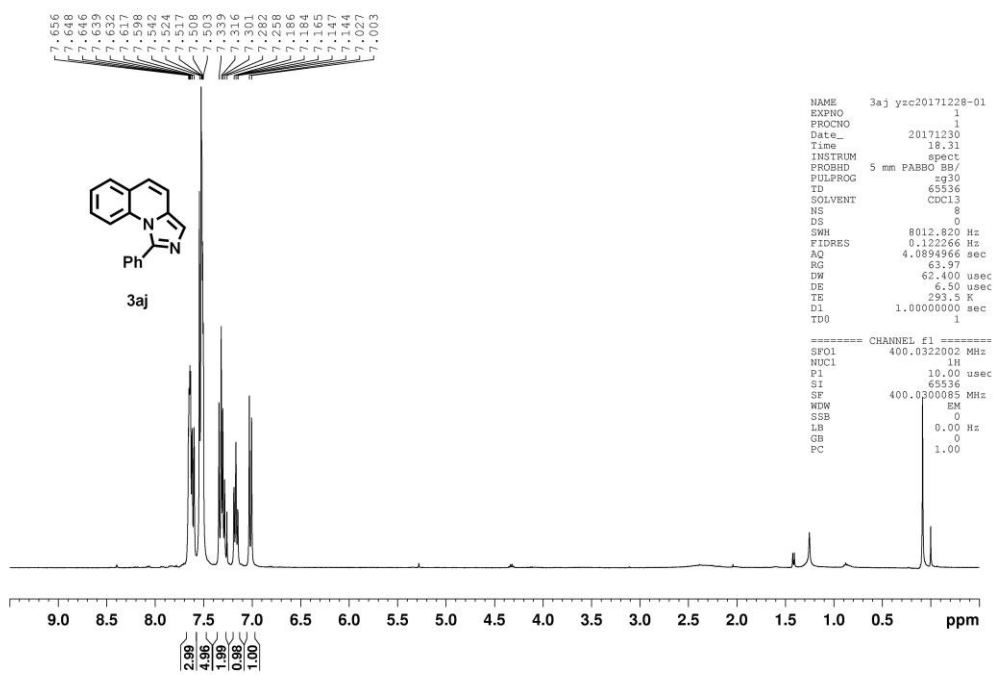










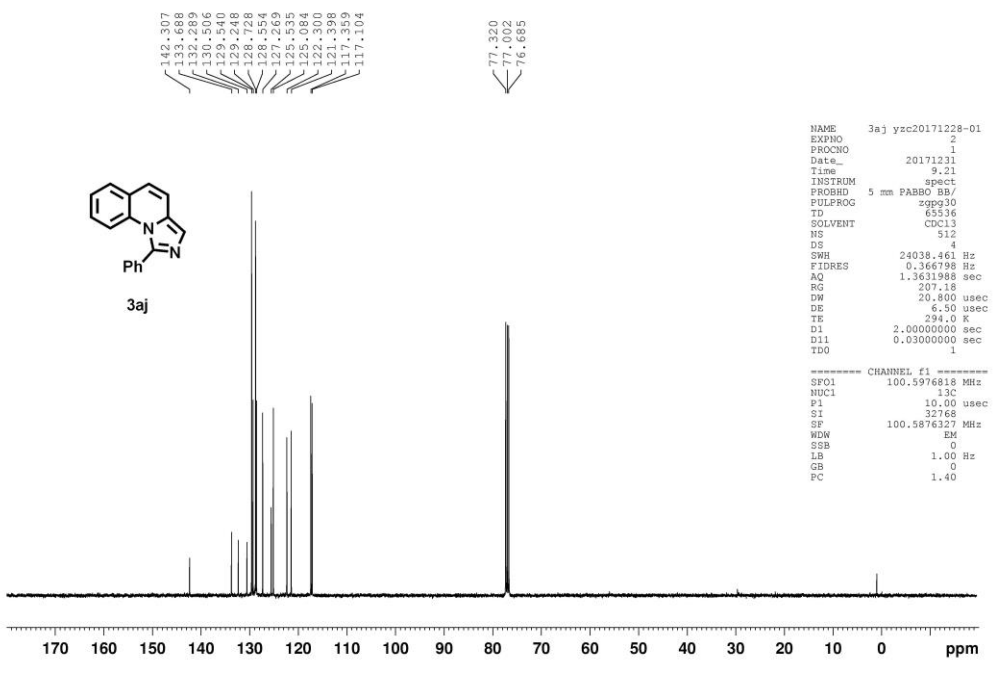


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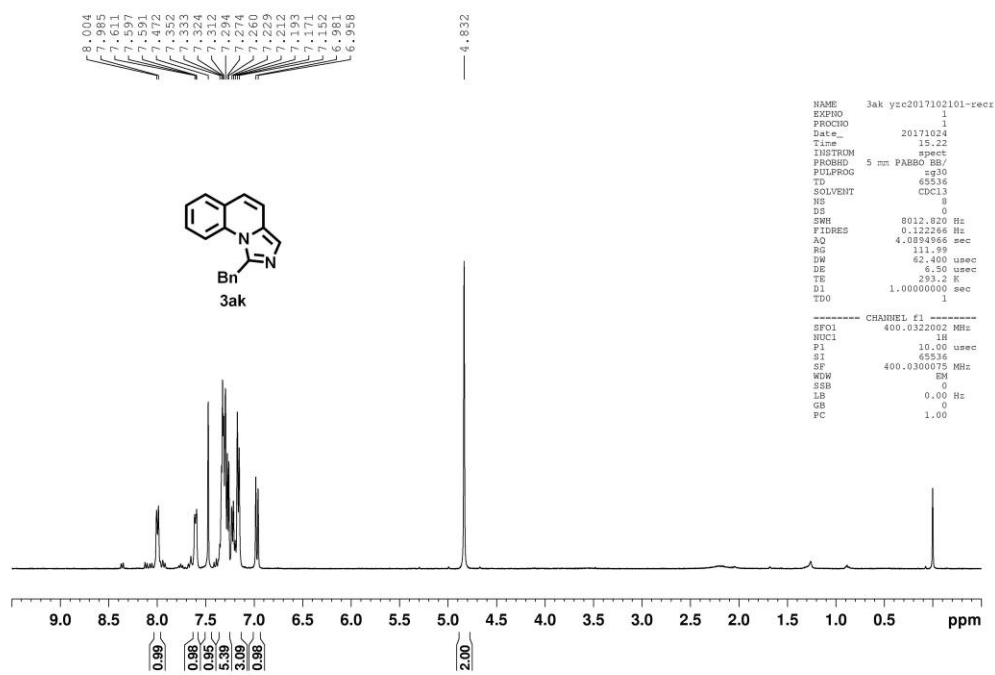


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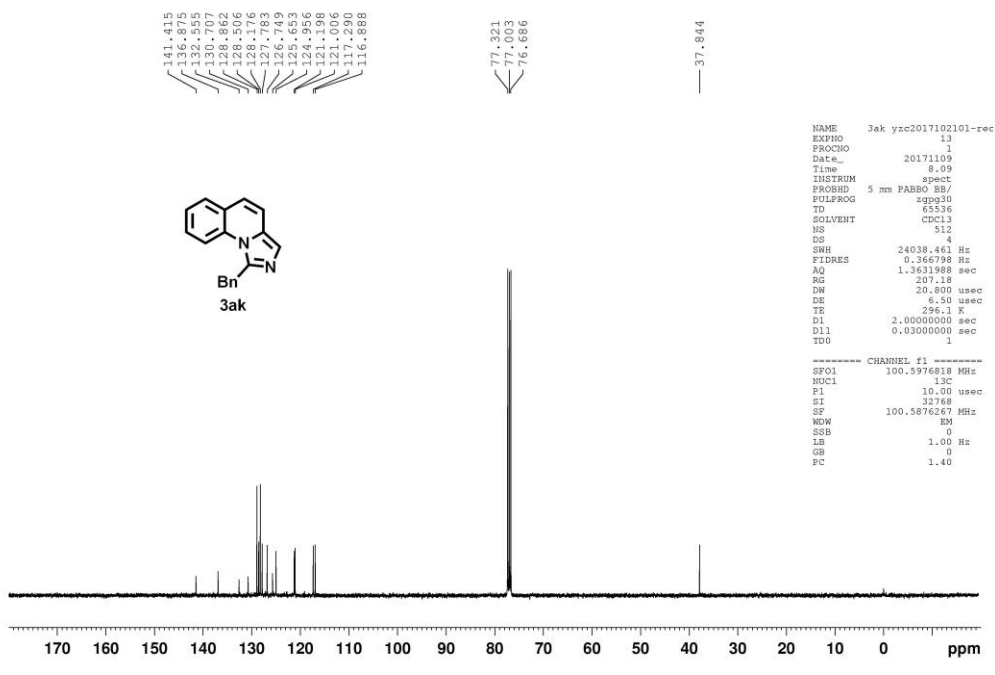
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