

# Design, synthesis, and biological evaluation of novel N-acylhydrazone bond linked heterobivalent $\beta$ -carbolines as potential anticancer agents

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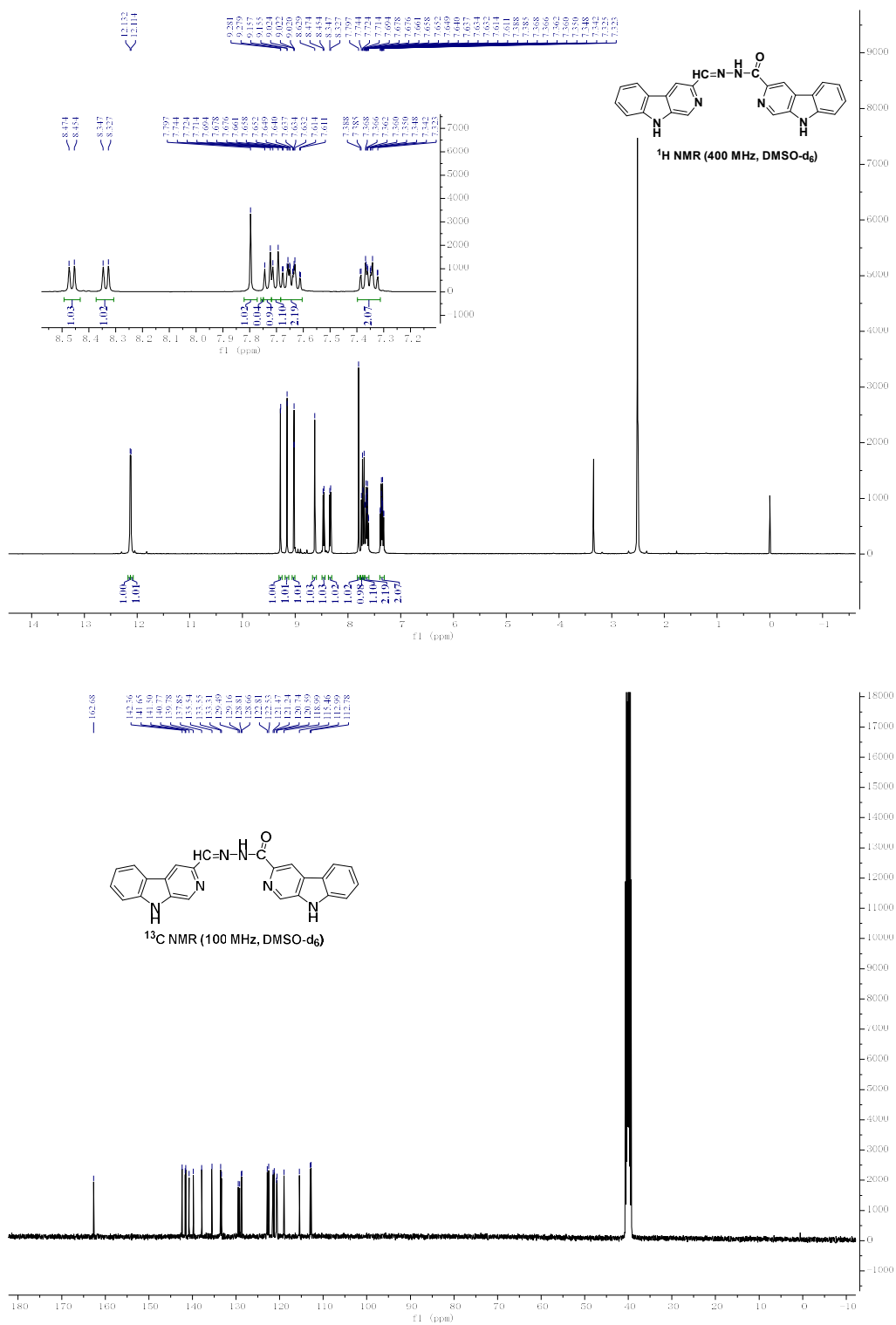


Figure S1 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound **8a**

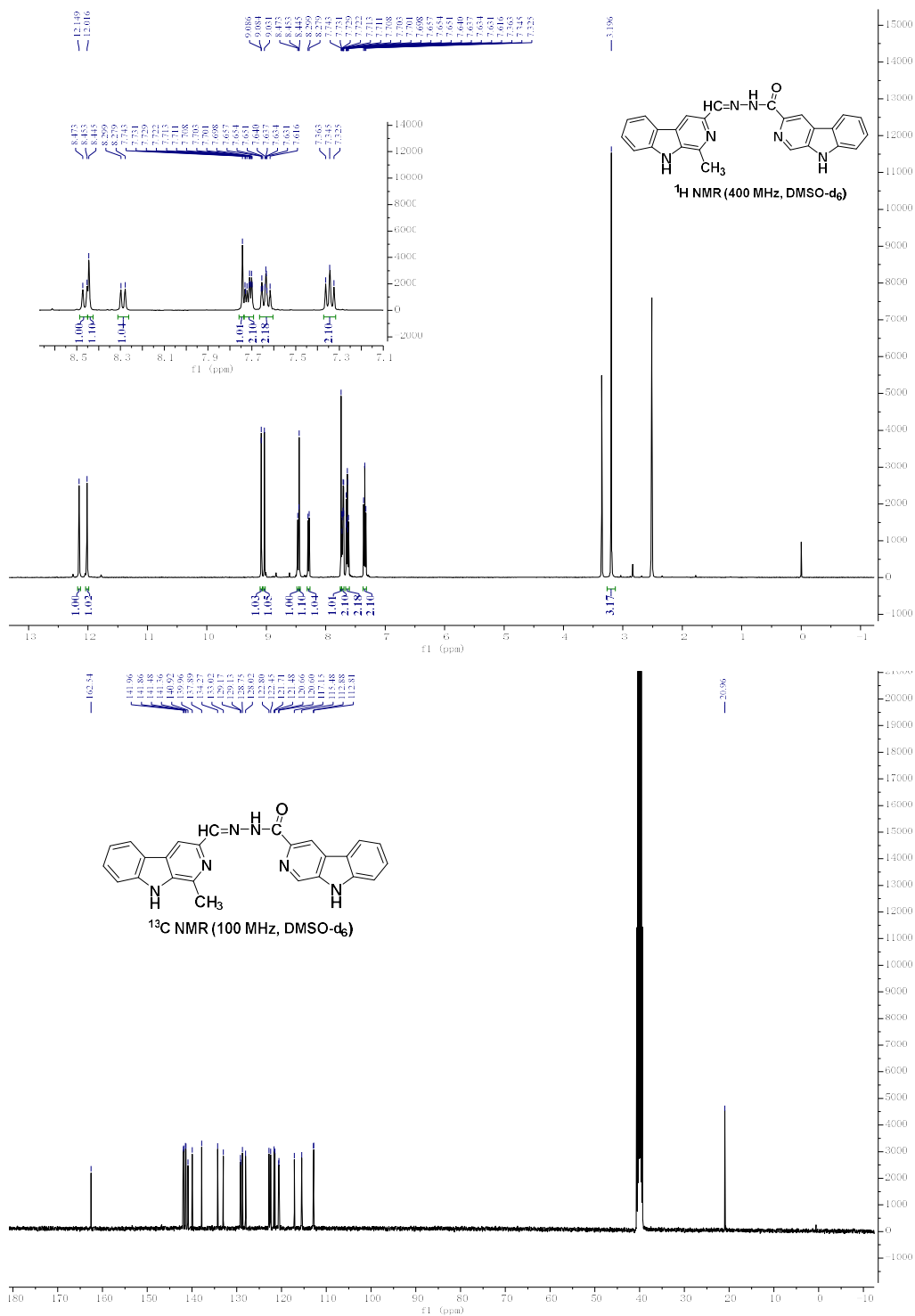
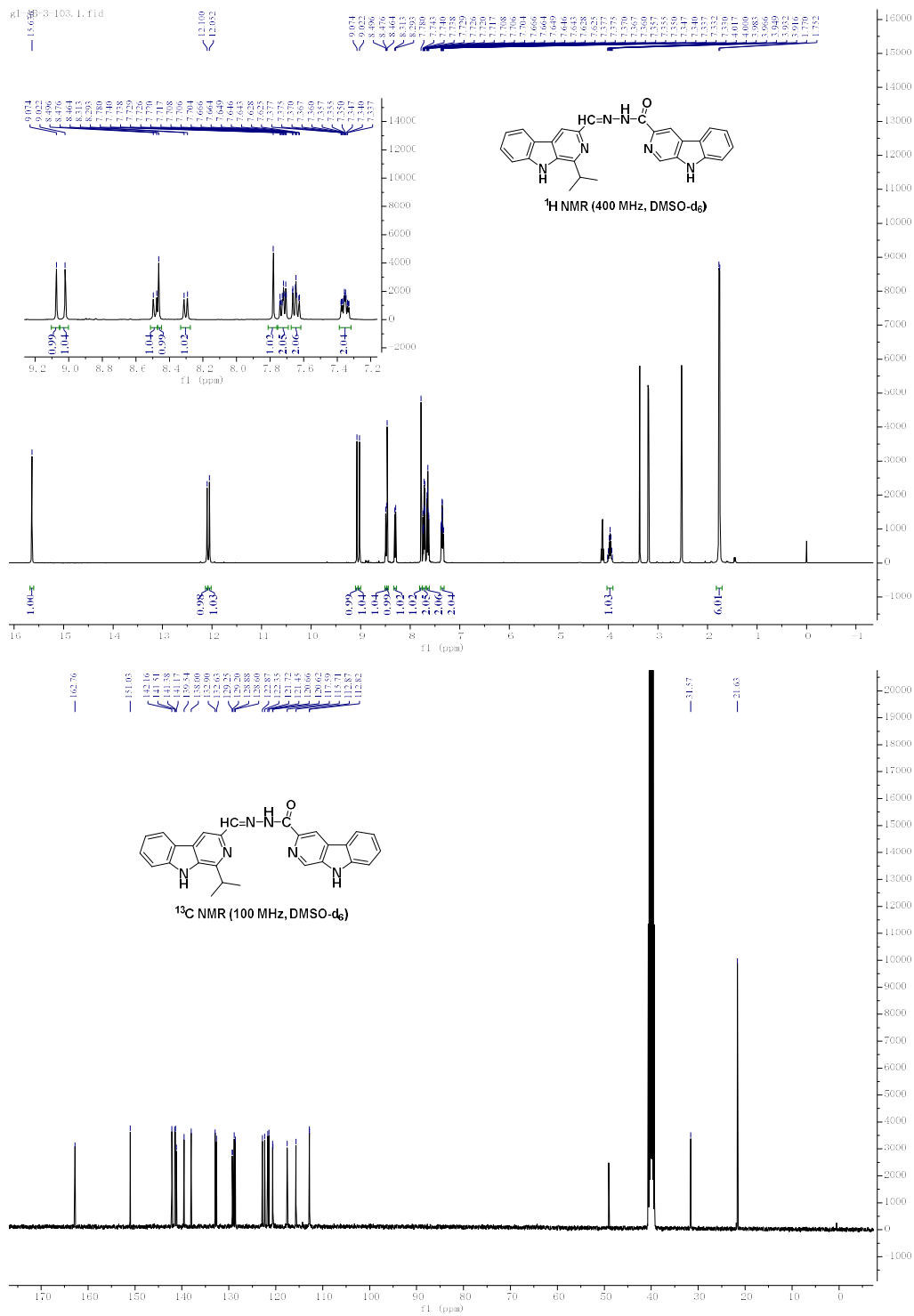


Figure S2 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8b



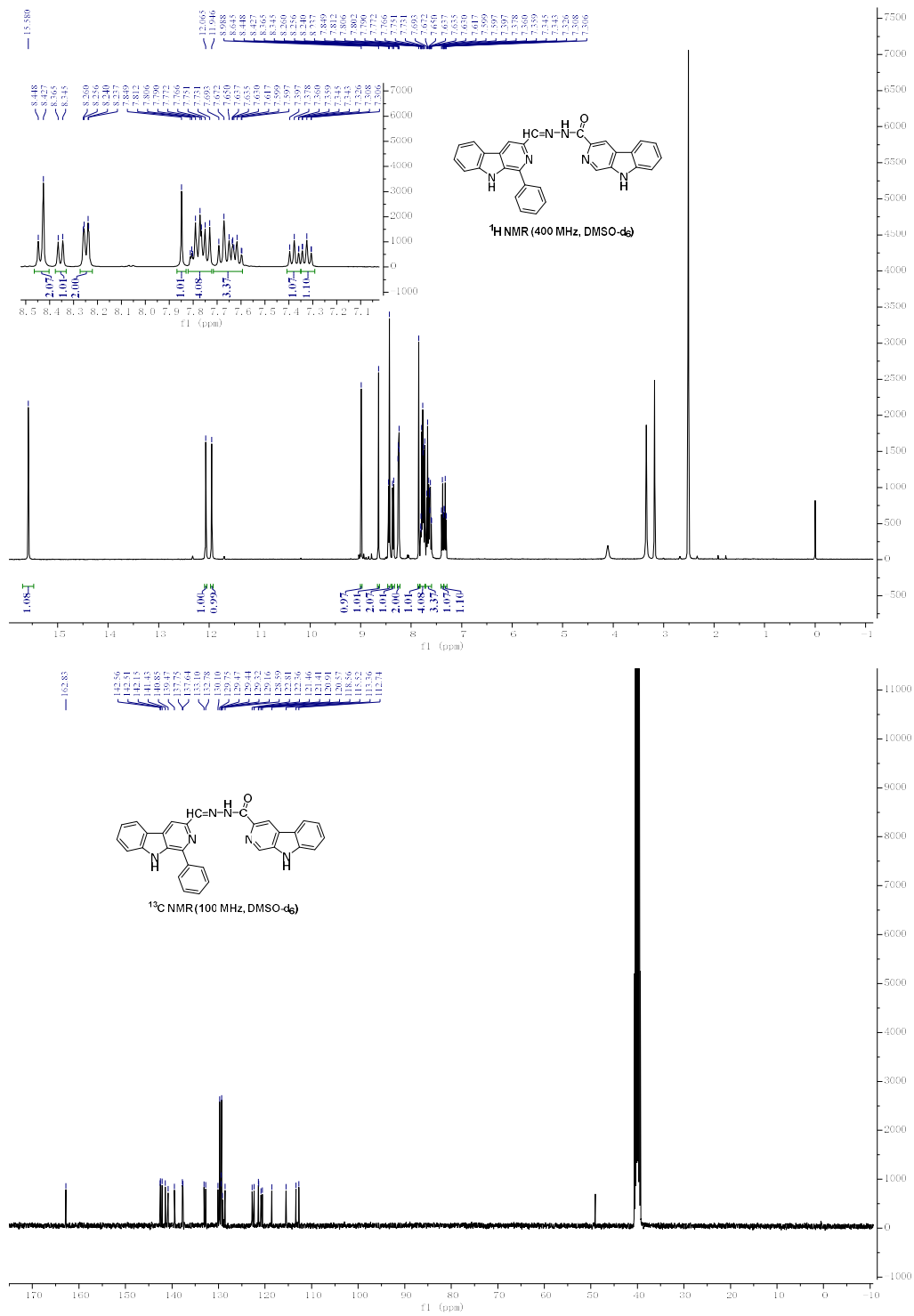
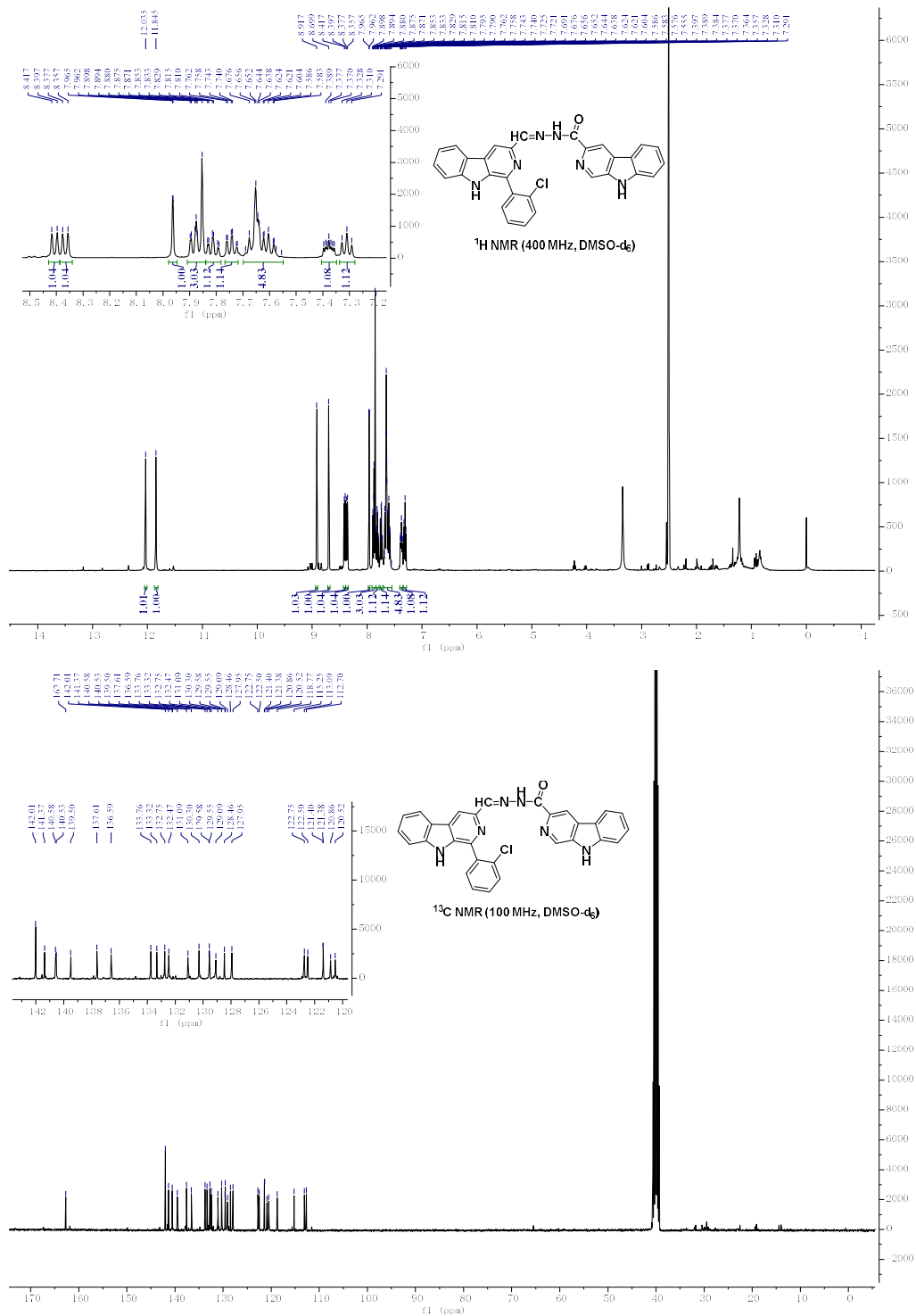


Figure S4 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8d









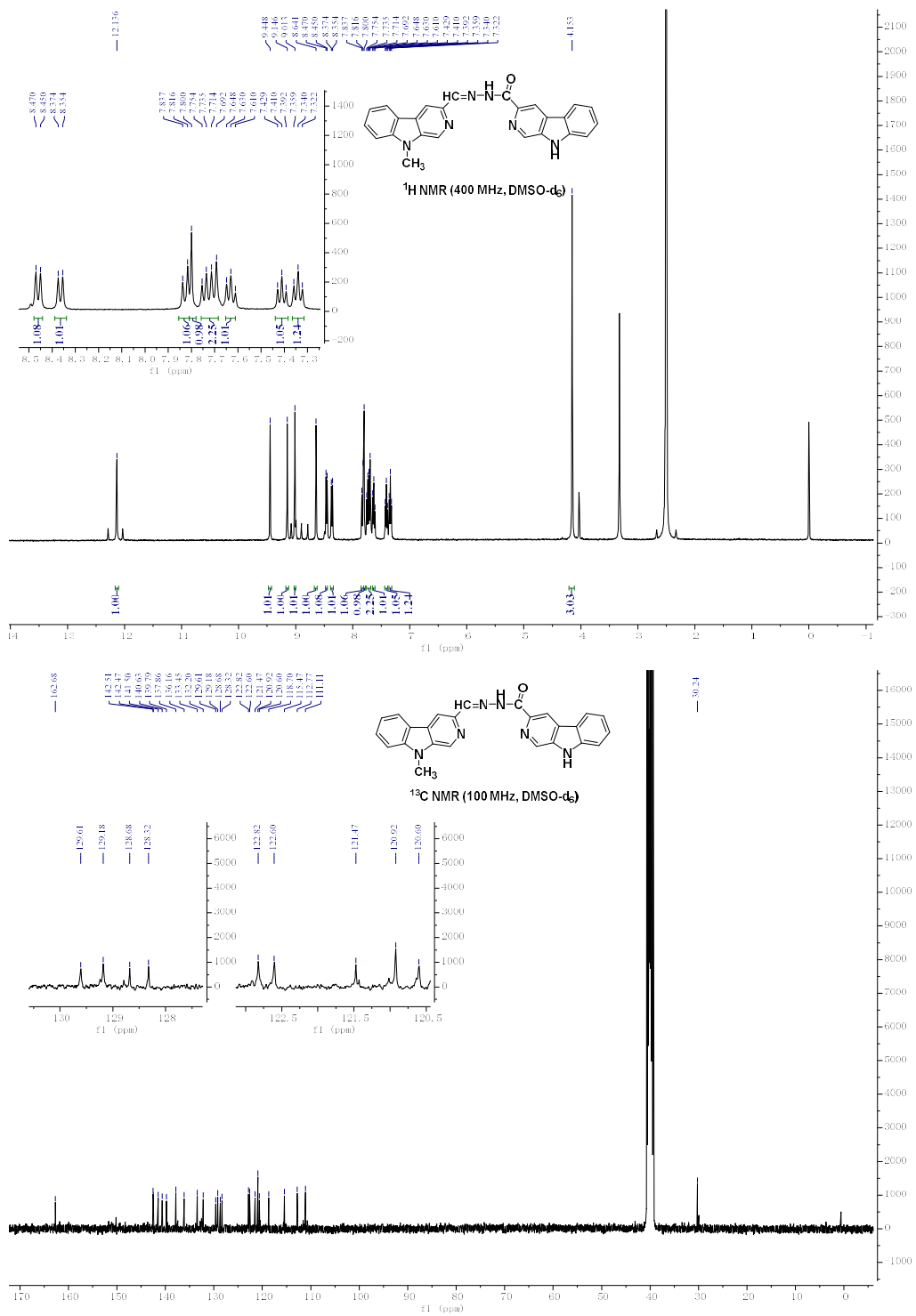


Figure S8 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8h

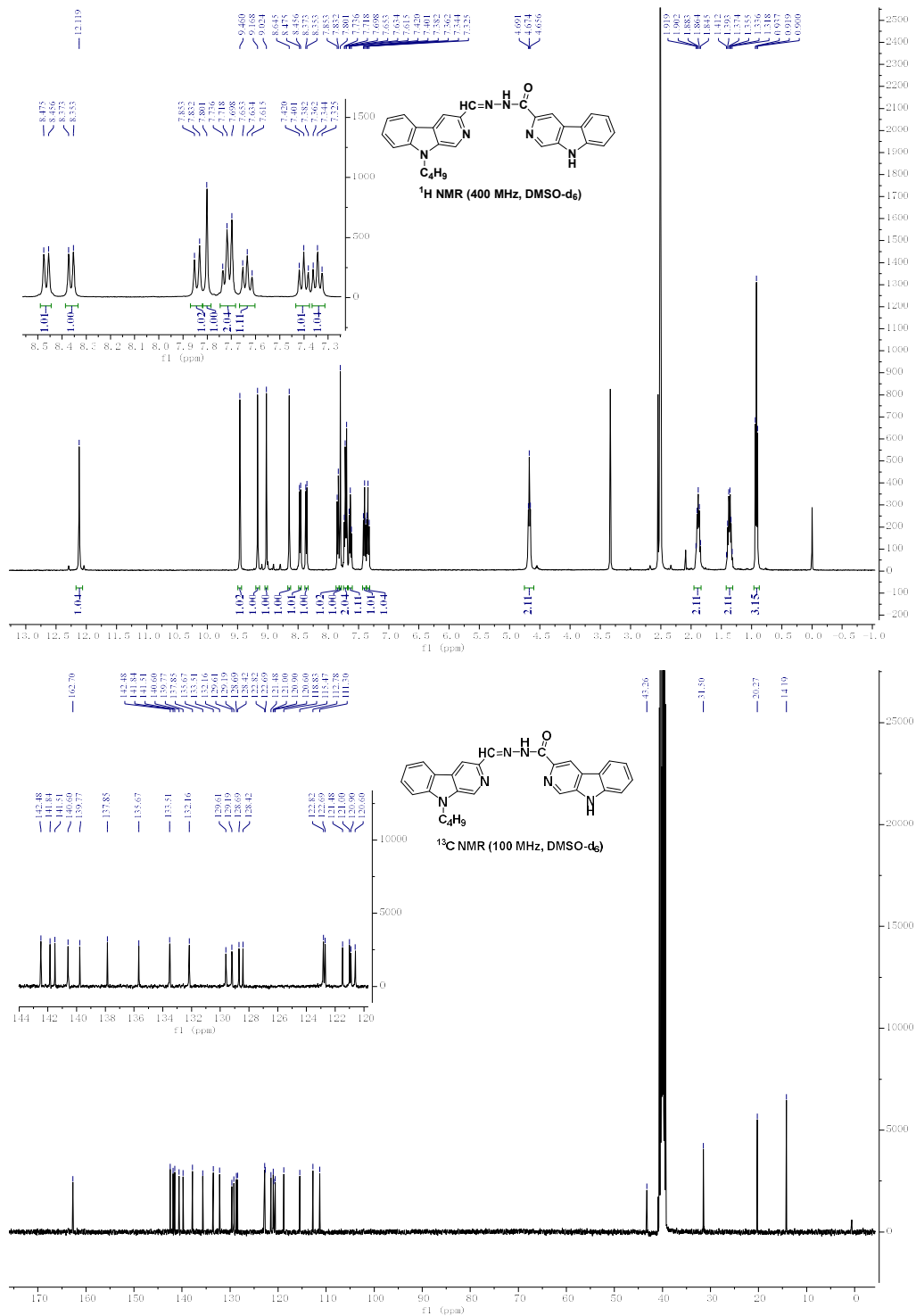


Figure S9 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound **8i**

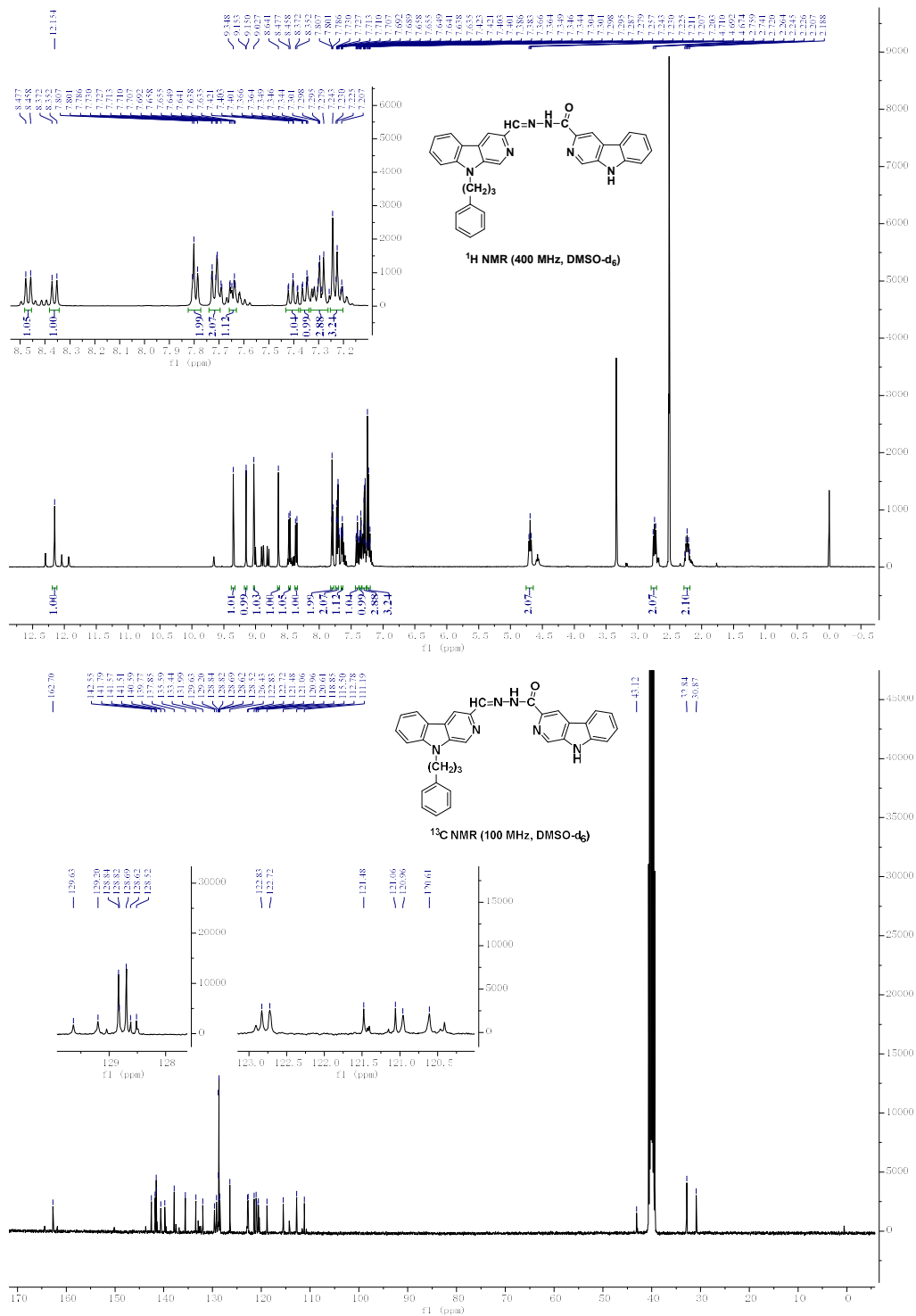


Figure S10 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound **8j**

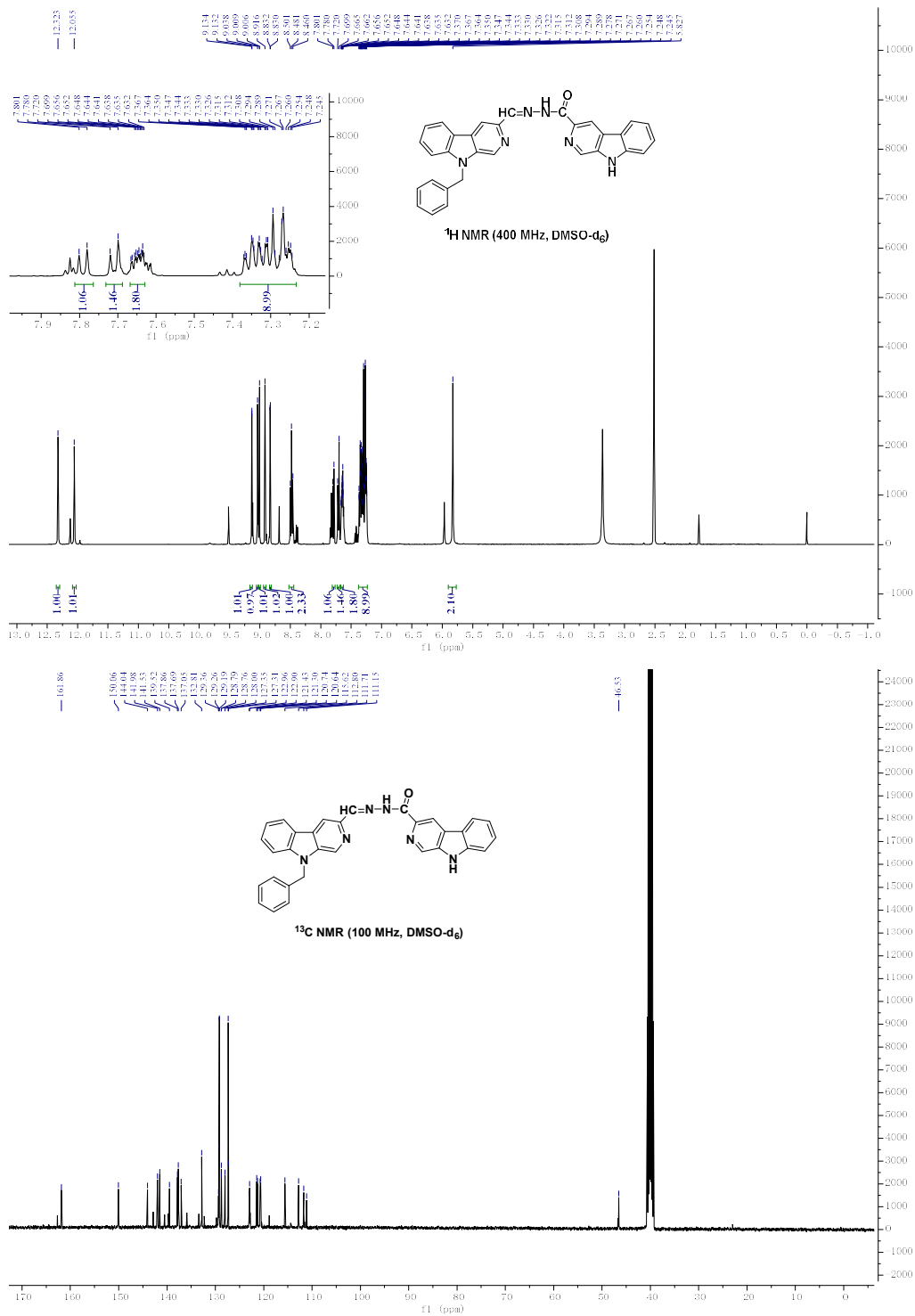


Figure S11 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8k

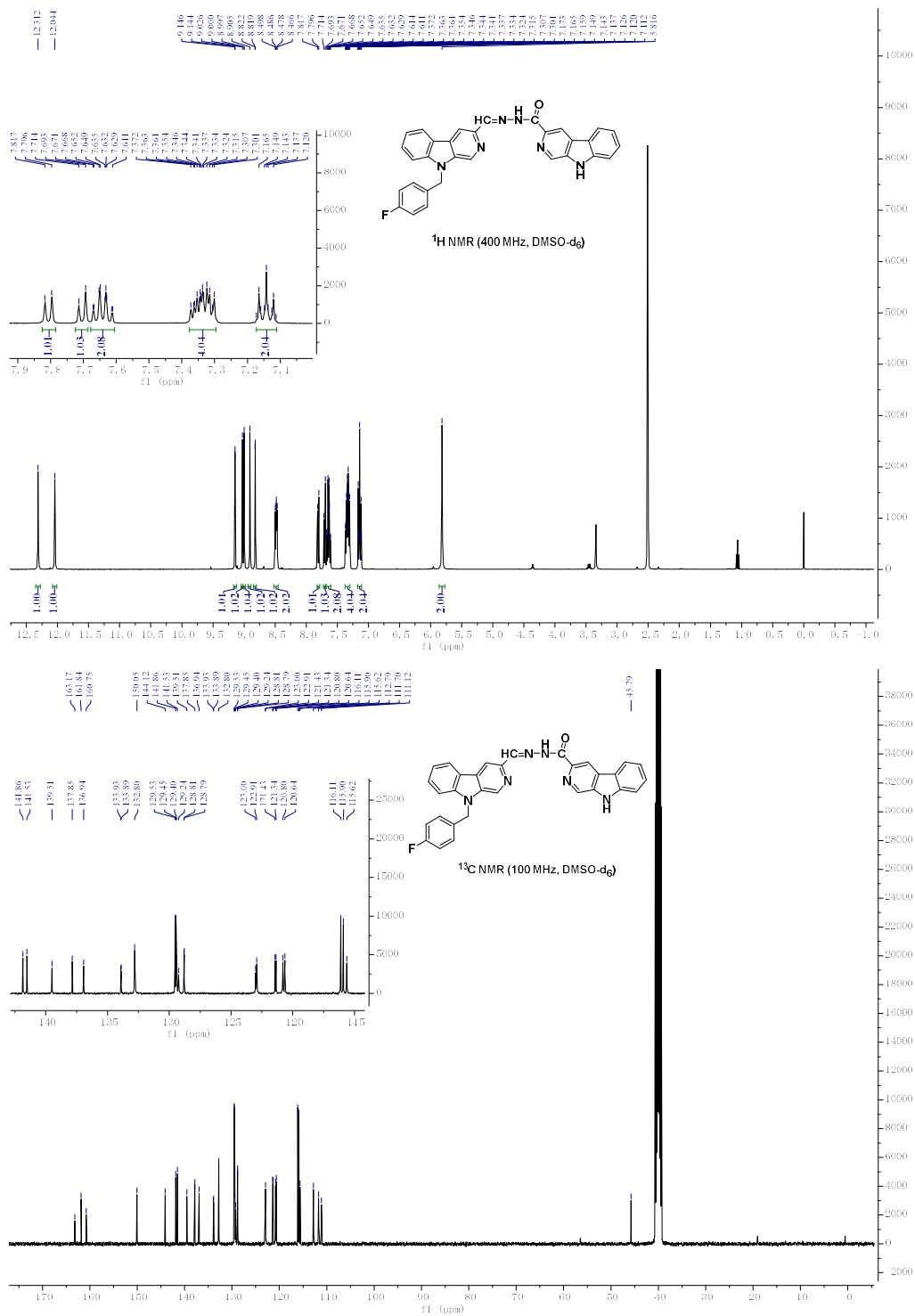
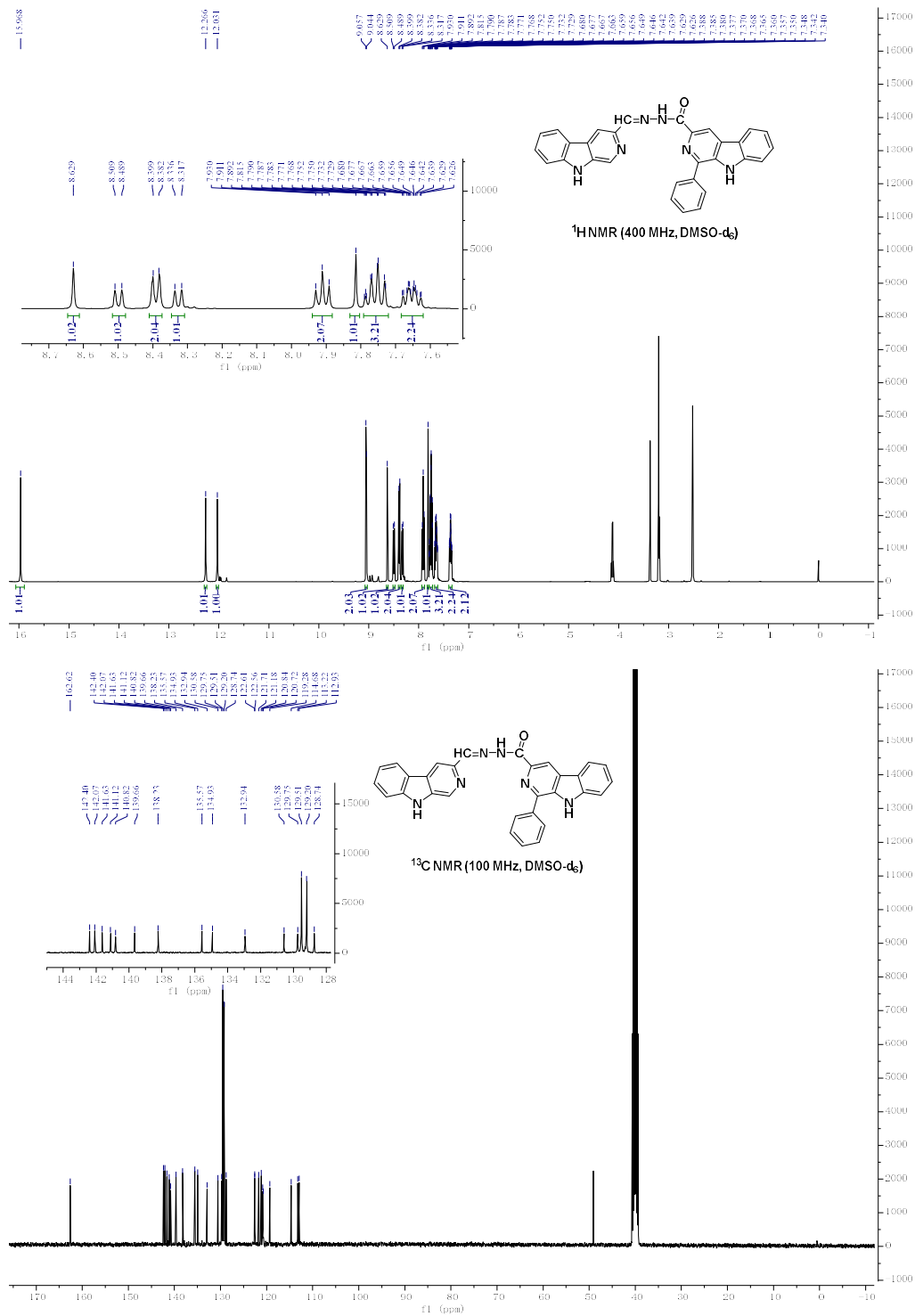


Figure S12 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 81















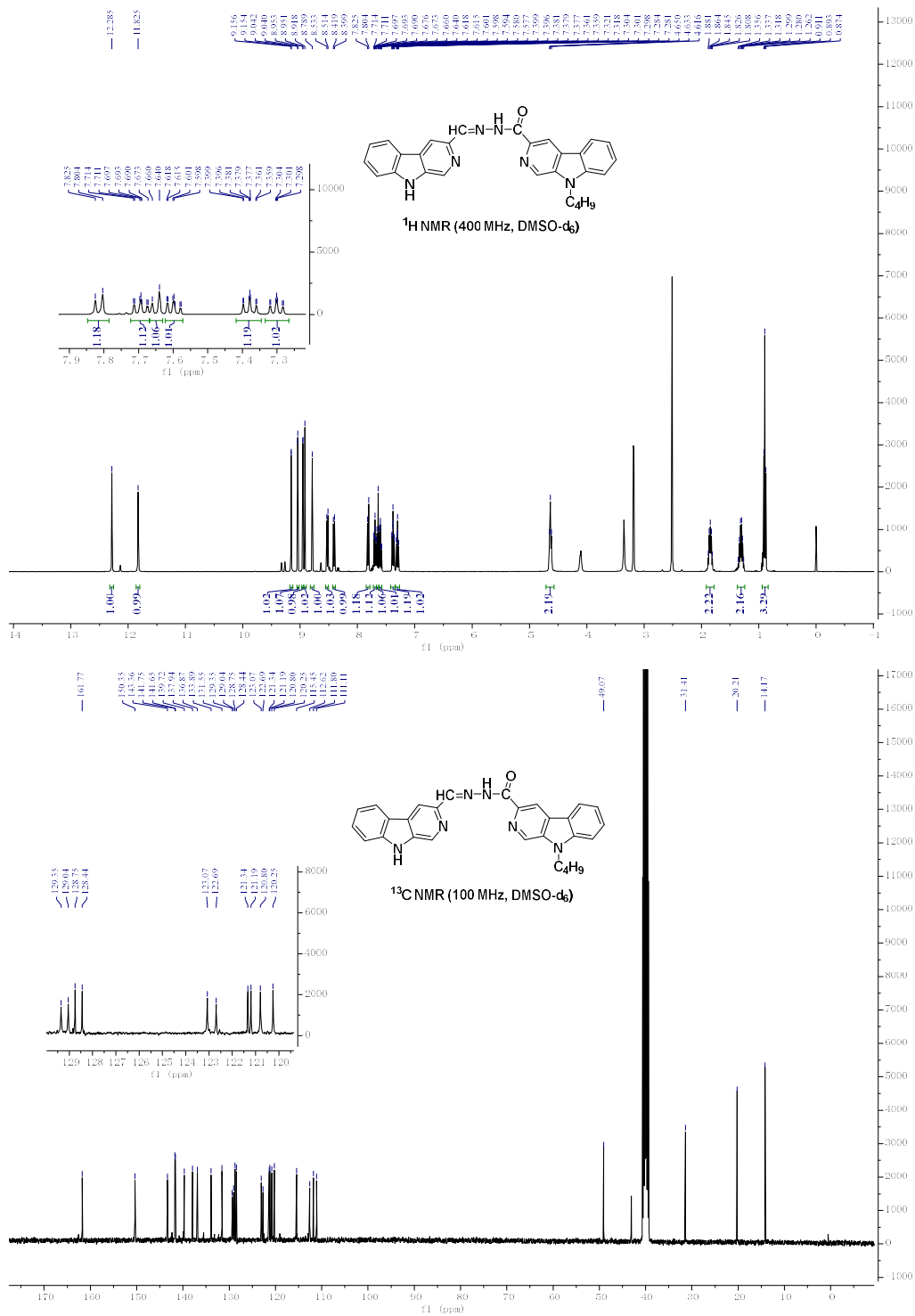


Figure S19 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8s

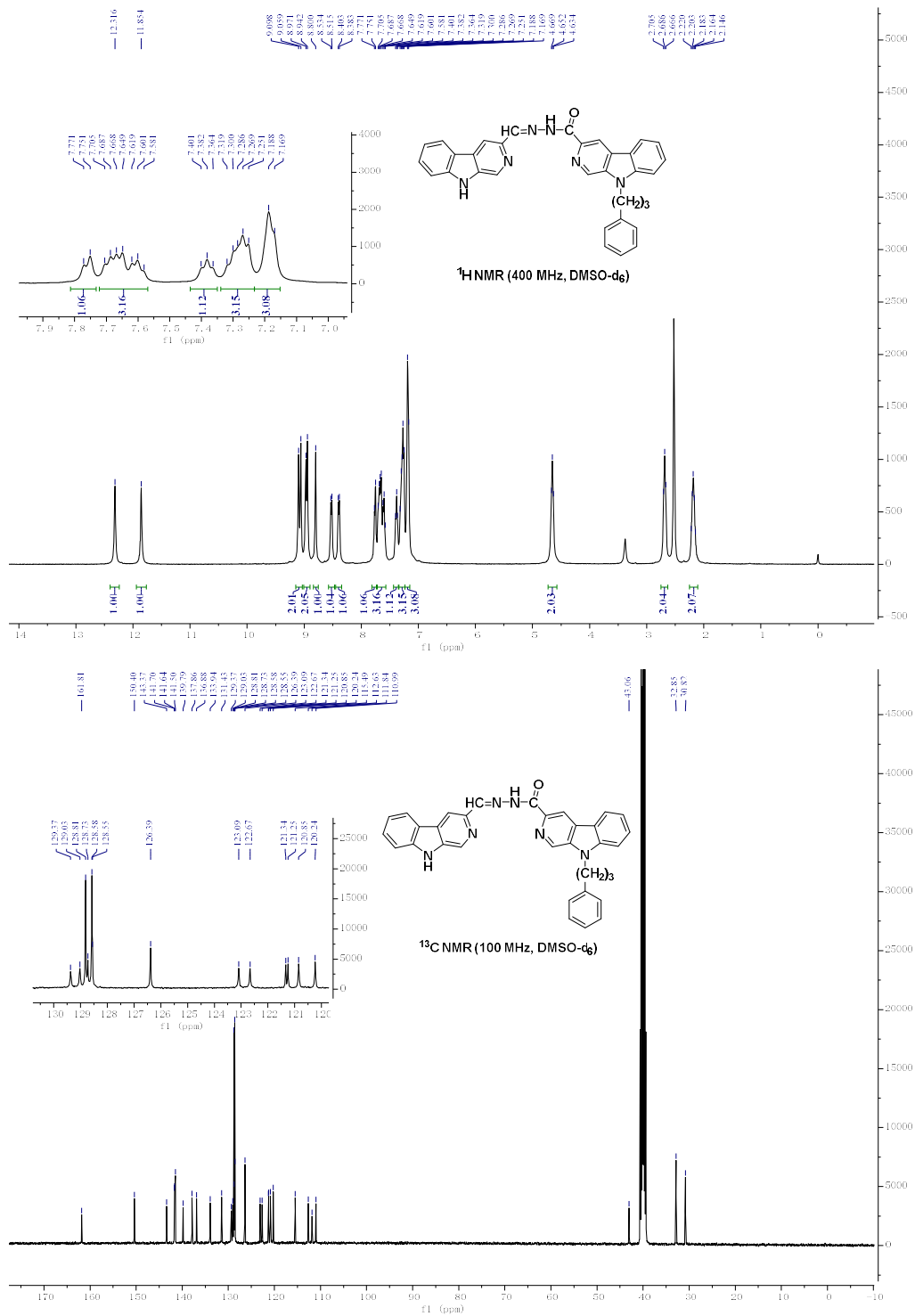


Figure S20 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8t



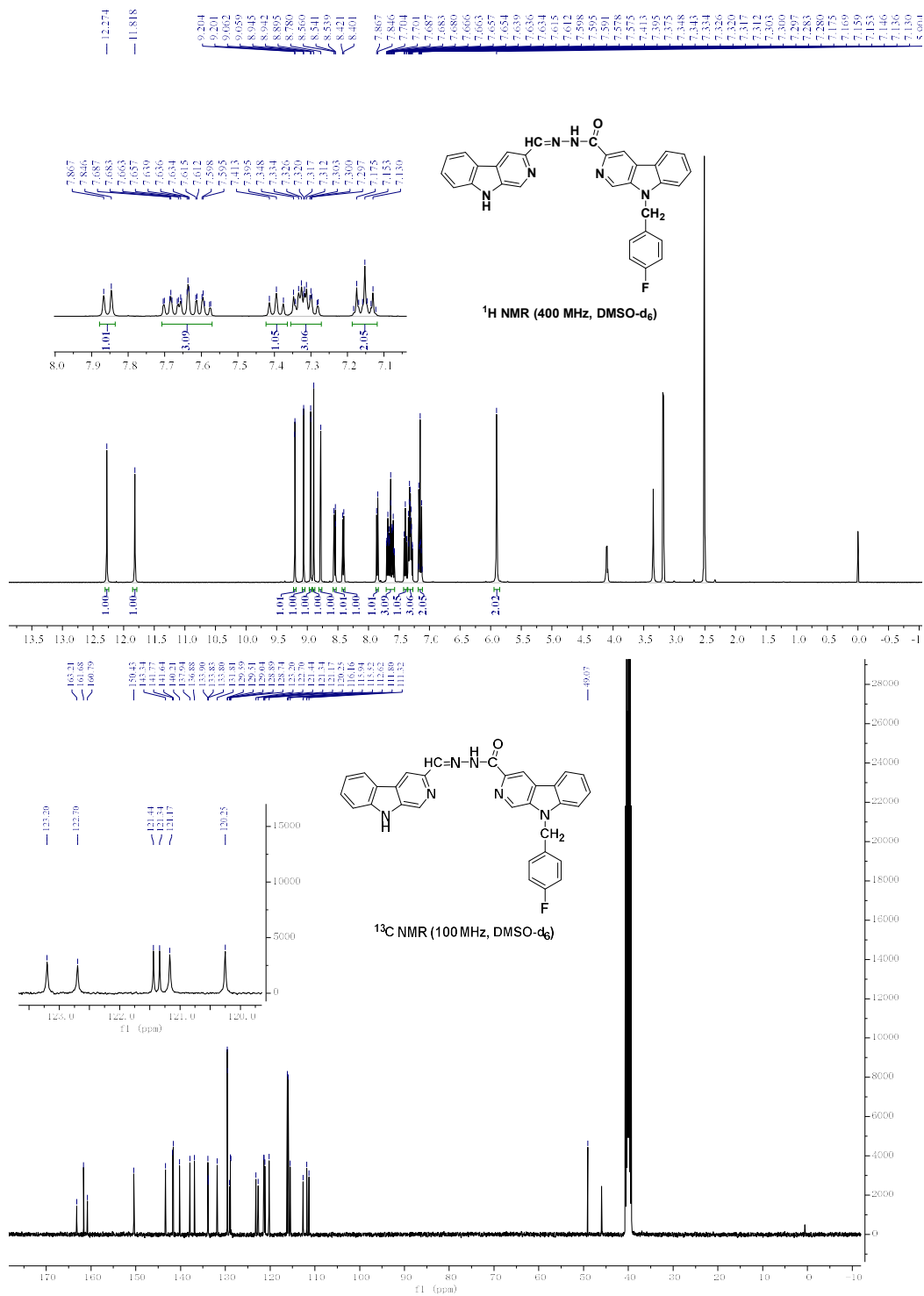


Figure S22 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound **8v**



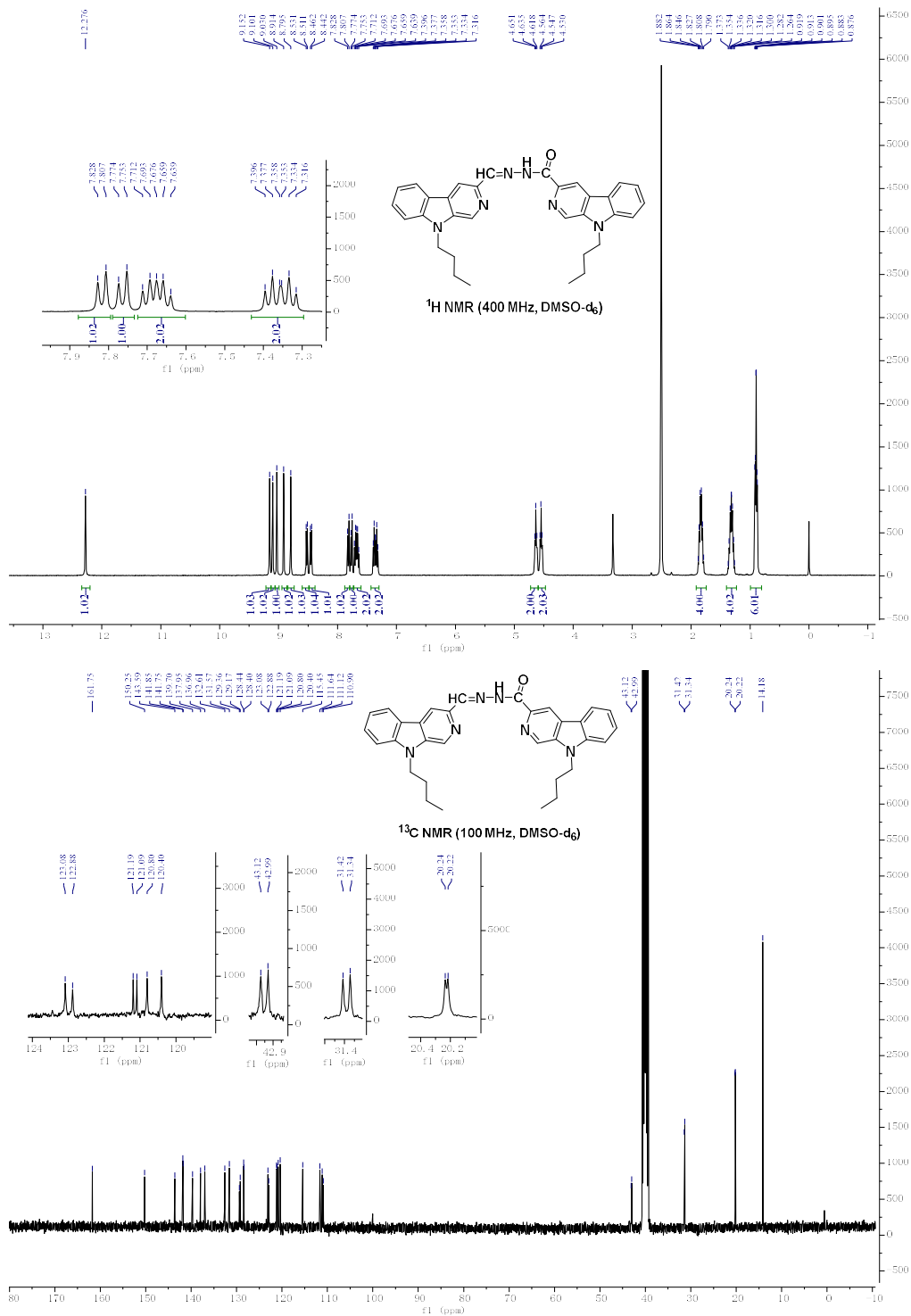


Figure S23 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8w

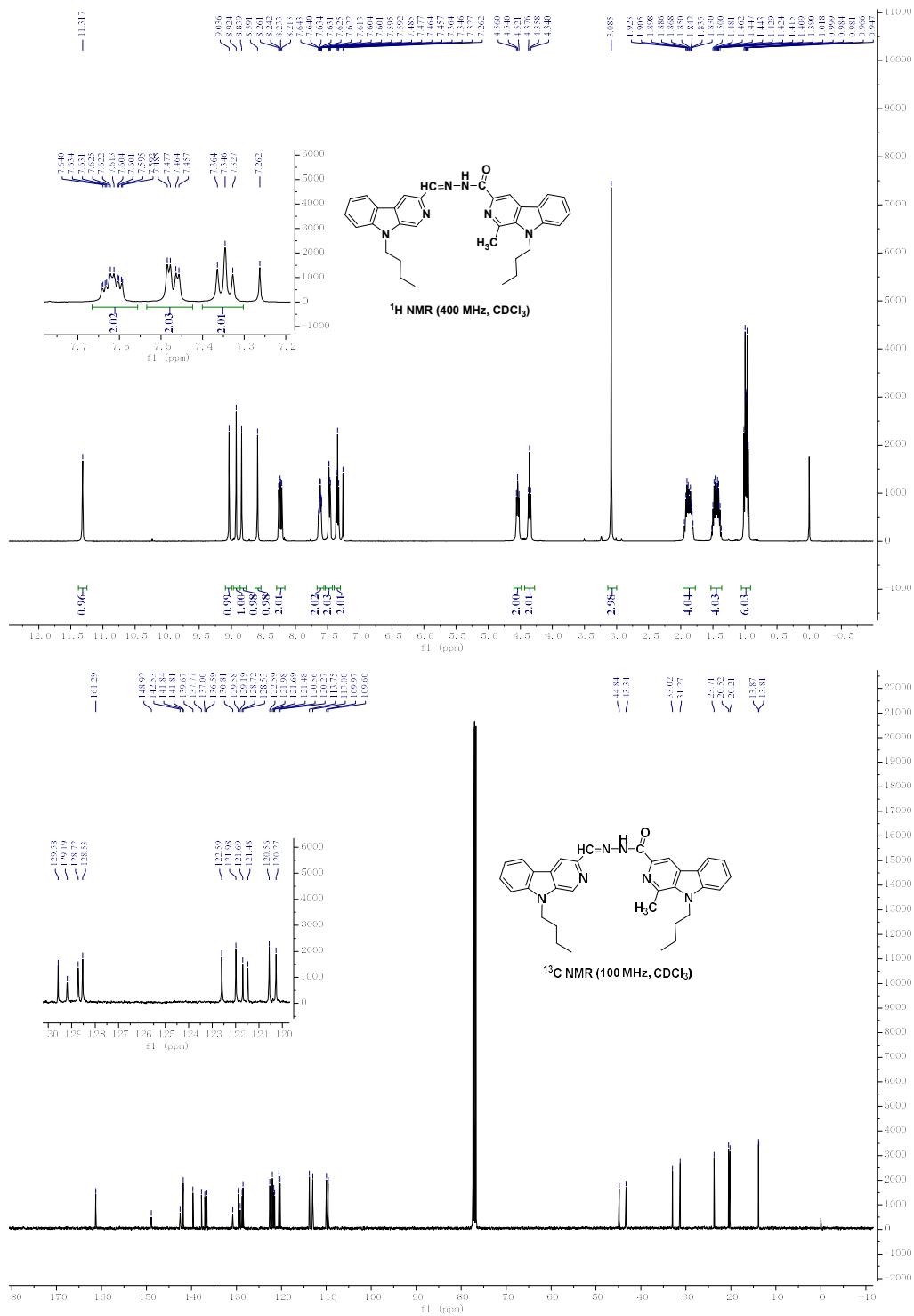


Figure S24 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8x

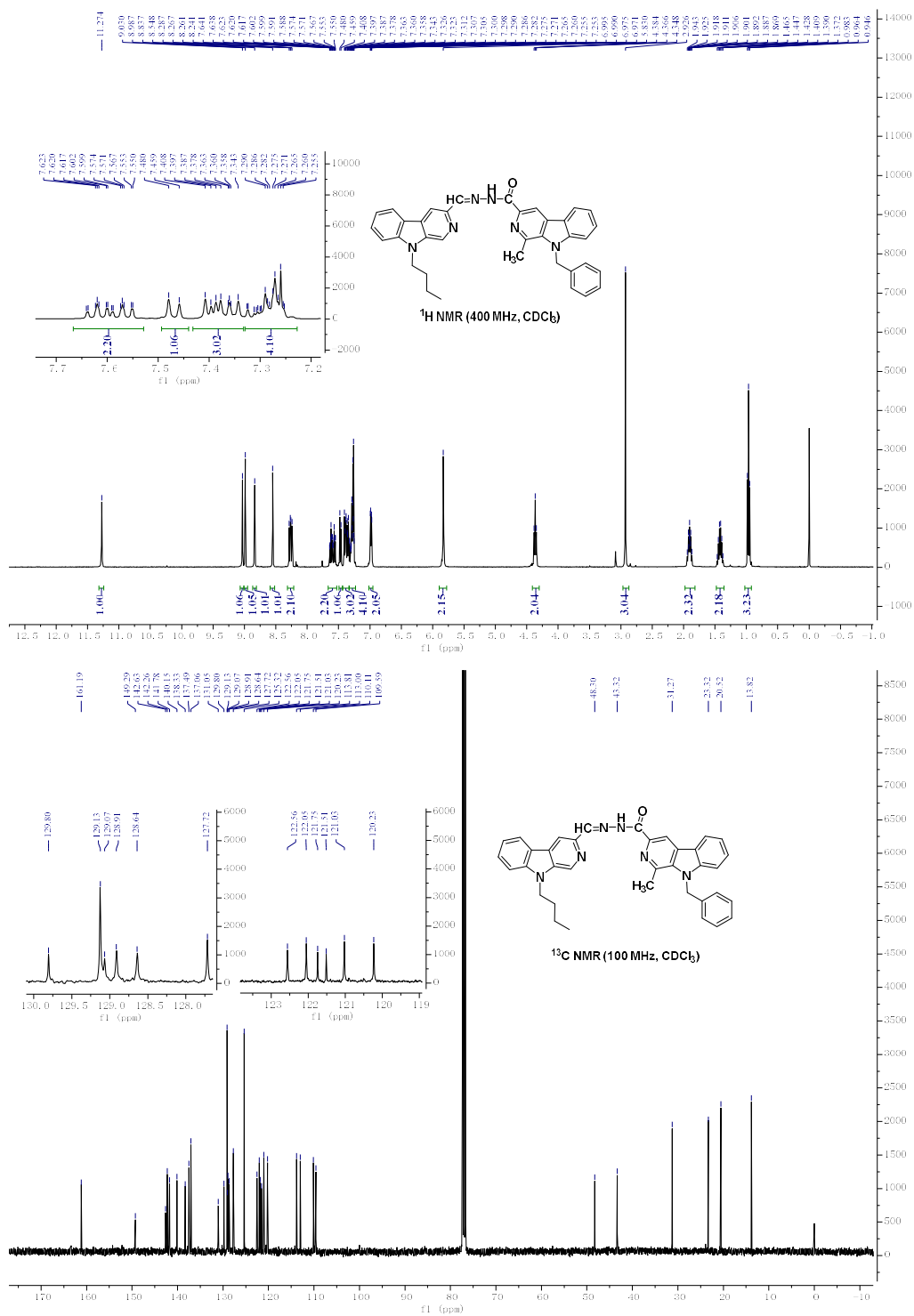


Figure S25 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8y

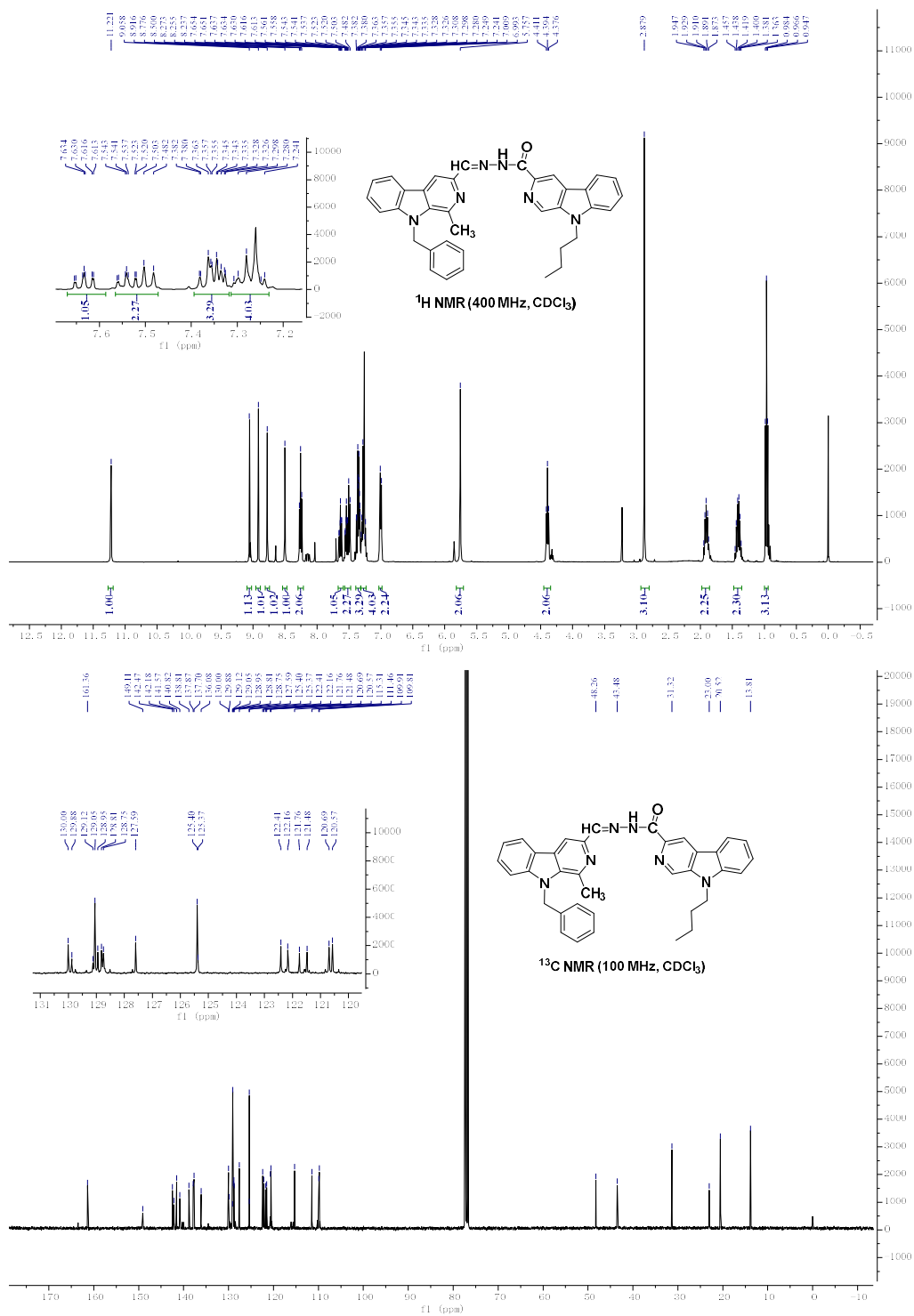
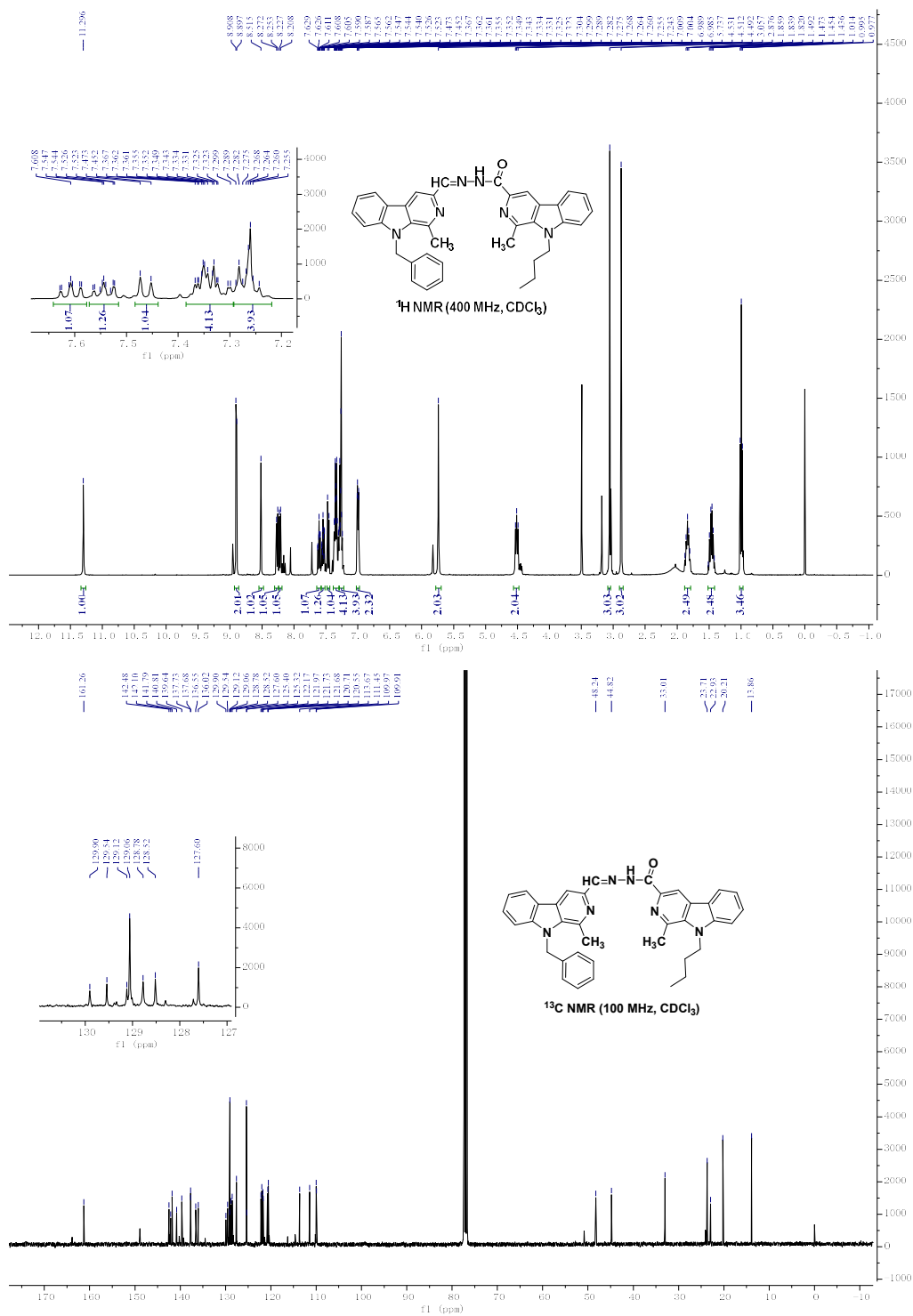


Figure S26 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8z



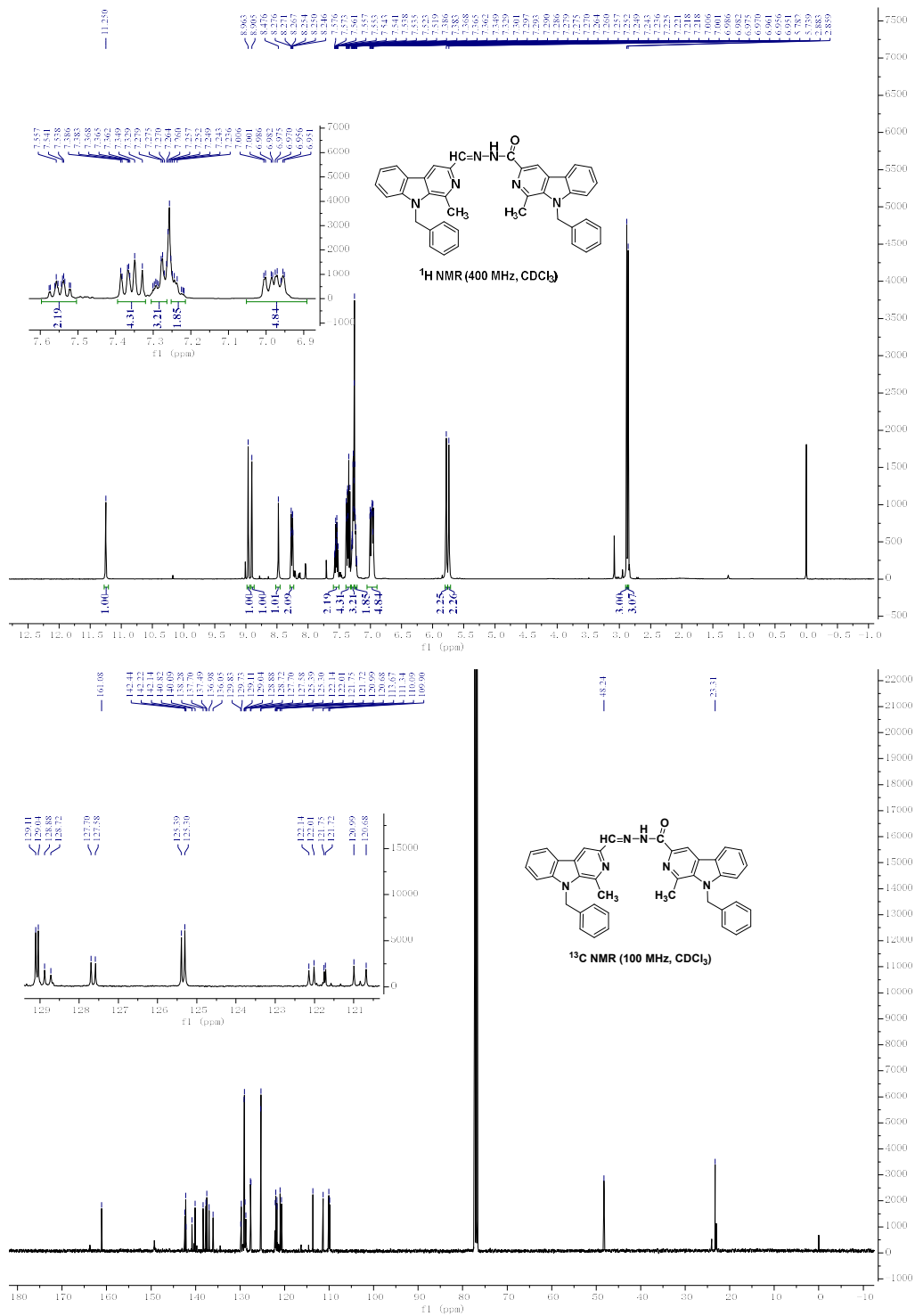


Figure S28 the <sup>1</sup>H NMR spectrum and <sup>13</sup>C NMR spectrum of compound 8ab