Supplementary materials

Synthesis and Pharmacological Evaluation of (+)-Usnic Acid Derivatives as Hypoglycemic Agents

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Chemistry

^{1}H and ^{13}C NMR spectra were recorded in $CDCl_3$ with solvent resonances (H 7.24, C 76.90 ppm) as internal standards on a Bruker AV-400 spectrometer (operating frequency 400.13 MHz for ^{1}H and 100.61 MHz for ^{13}C). Mass spectra (ionizing-electron energy 70 eV) were recorded on a DFS high-resolution mass spectrometer (Thermo Scientific). HPLC analyses were carried out on a MilichromA-02 using a ProntoSIL 120-5-C18 AQ column (BISCHOFF, 2.0 × 75 mm column, grain size 5.0 lm). The mobile phase used MeOH with 0.1% trifluoroacetic acid at a flow rate of 150 μL/min at 35 ◦C, with UV detection at 210, 220, 240, 260, 280, 300, 320 and 360 nm.

Compound **2** was synthesized from (+)-UA in according to [1] with the yield of 95%.

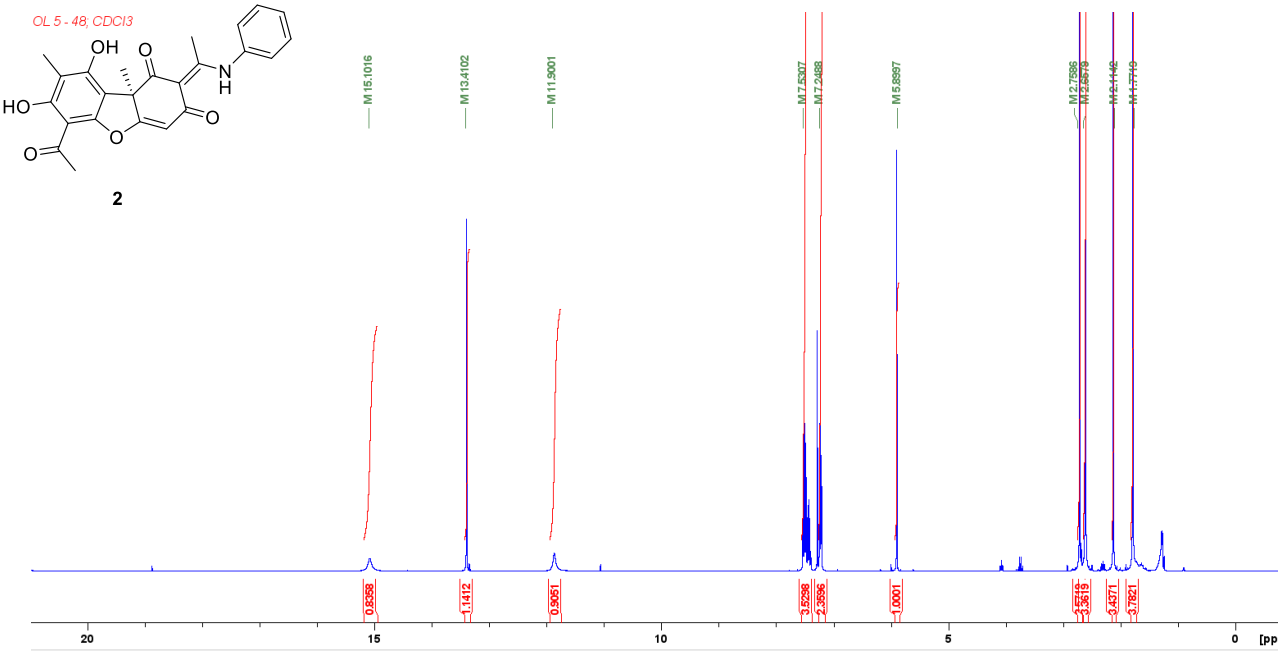


Figure S1. The ^{1}H NMR spectrum of compound **2.**

Compound **3** was synthesized from (+)-UA in according to [2] with the yield of 70%.

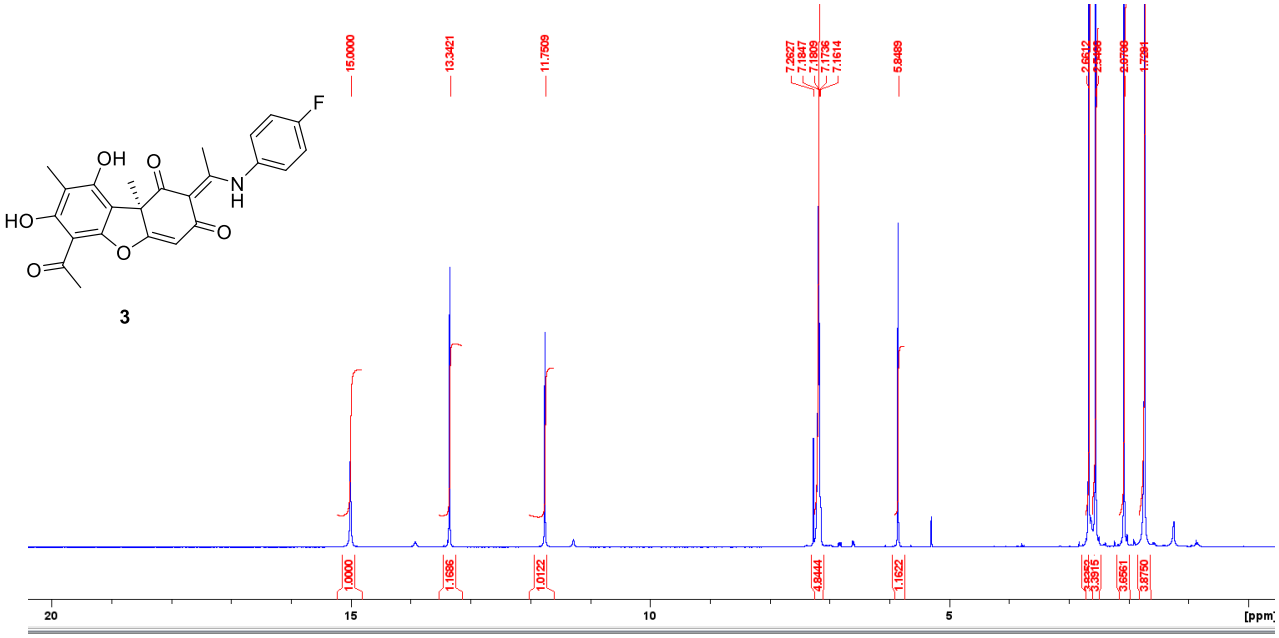


Figure S2. The ^{1}H NMR spectrum of compound **3.**

Compounds **4** and **5** were synthesized from (+)-UA in according to [3] with the yields of 87% each.

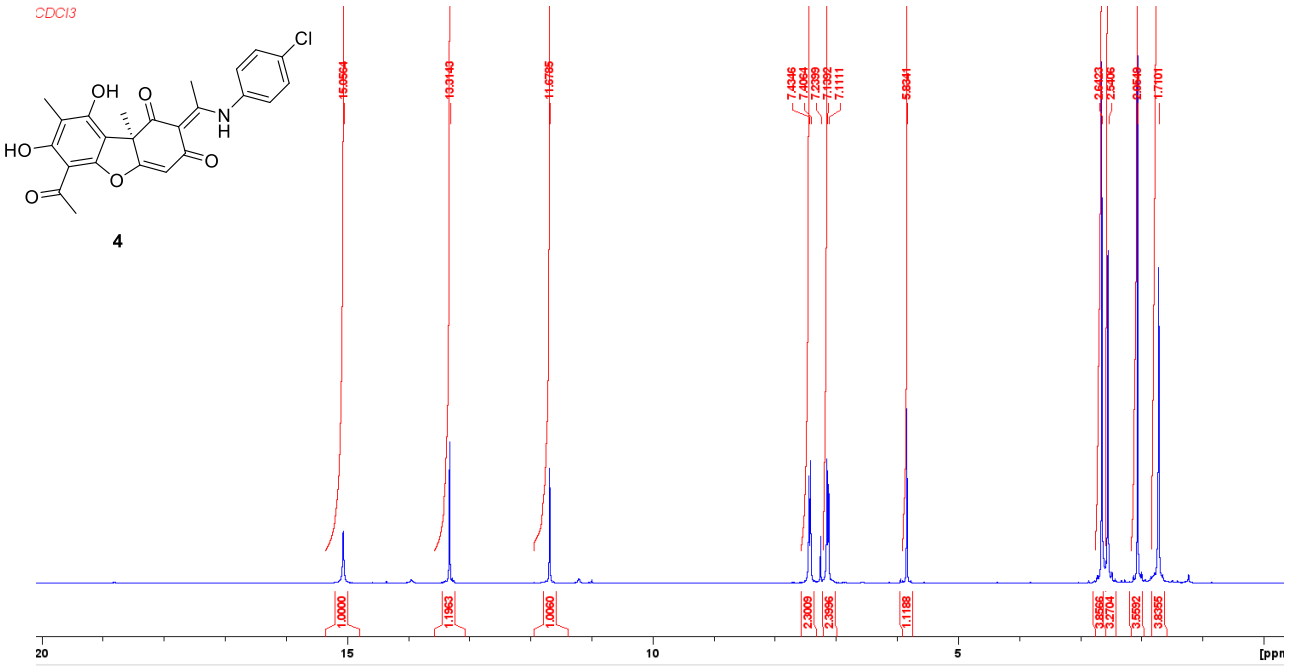


Figure S3. The ^{1}H NMR spectrum of compound **4.**

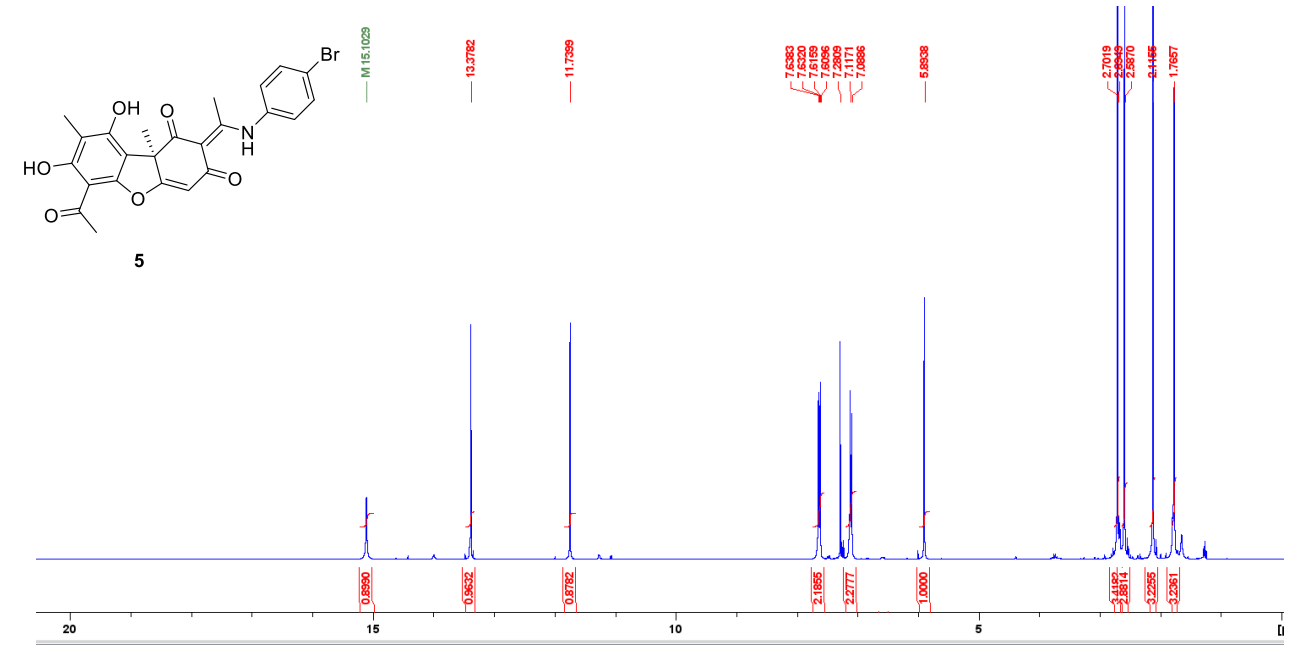


Figure S4. The ^{1}H NMR spectrum of compound **5.**

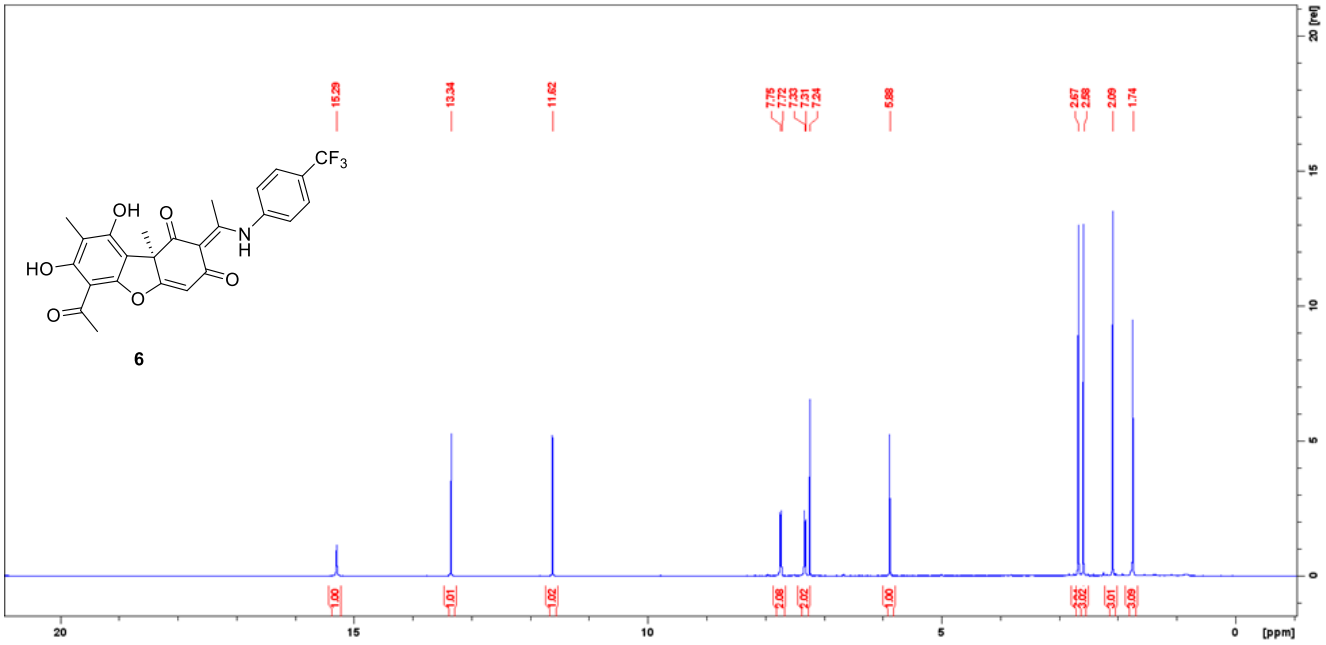


Figure S5. The ^{1}H NMR spectrum of compound 6.

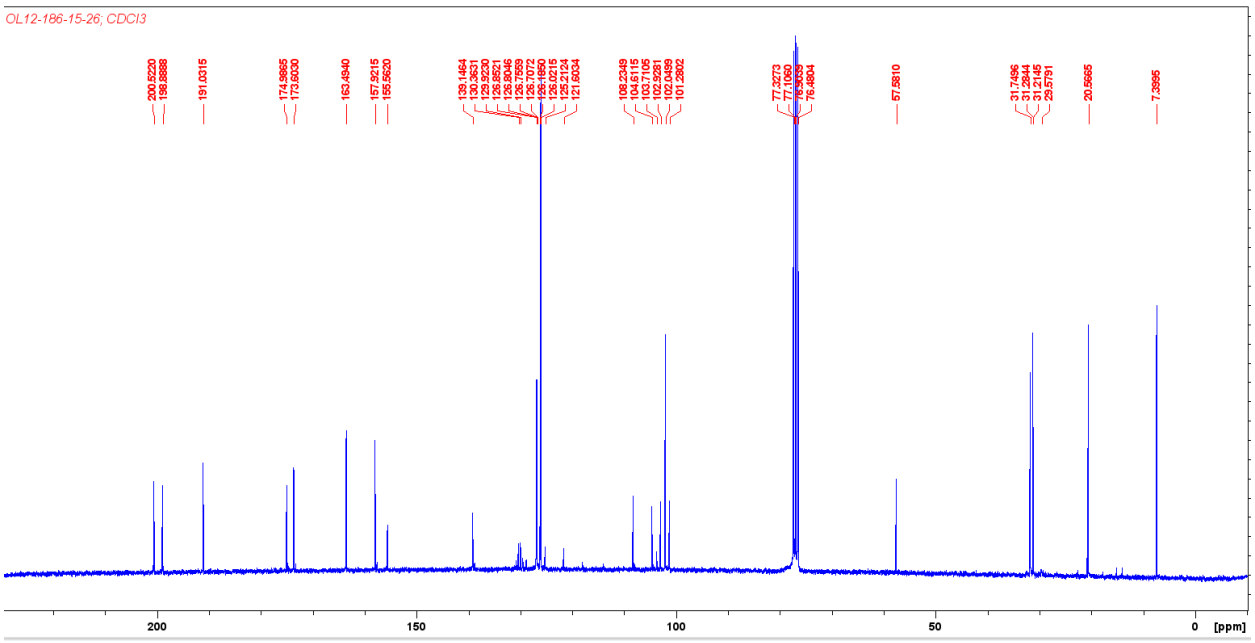


Figure S6. The ^{13}C NMR spectrum of 6

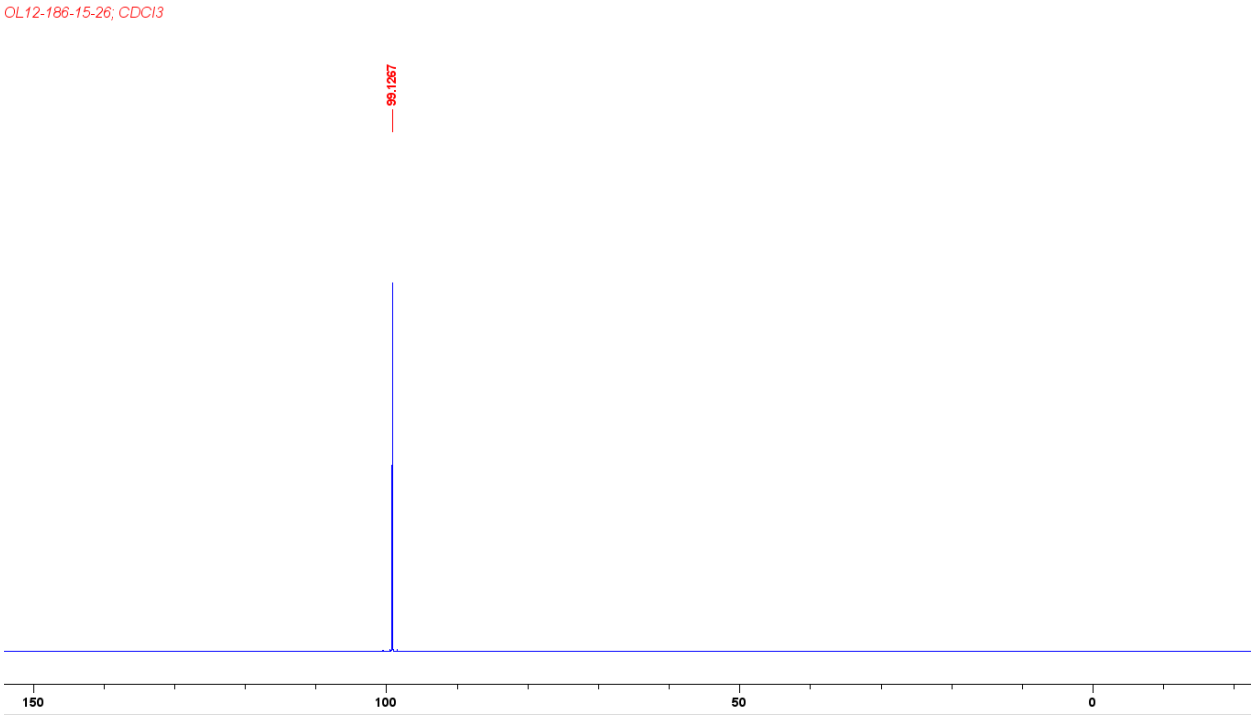


Figure S7. The ^{19}F NMR spectrum of 6 (external standard C_6F_6)

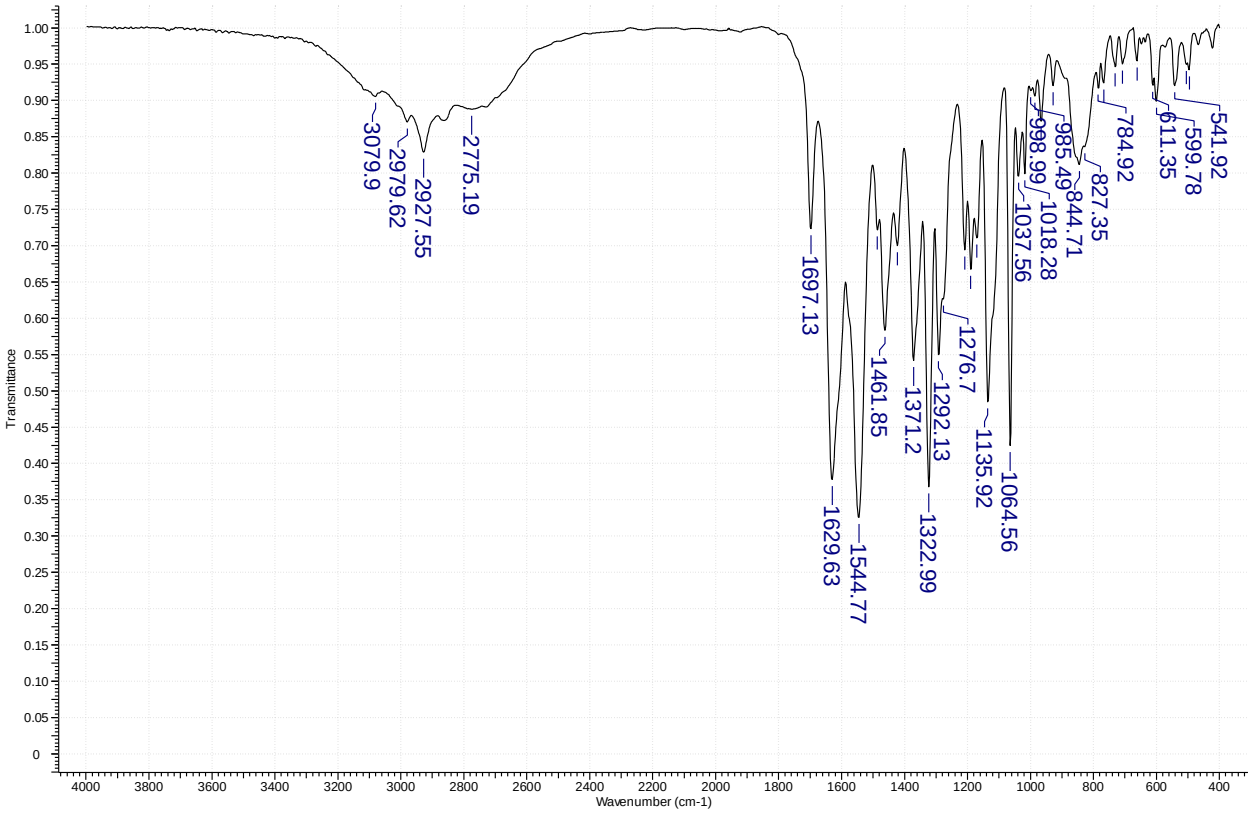
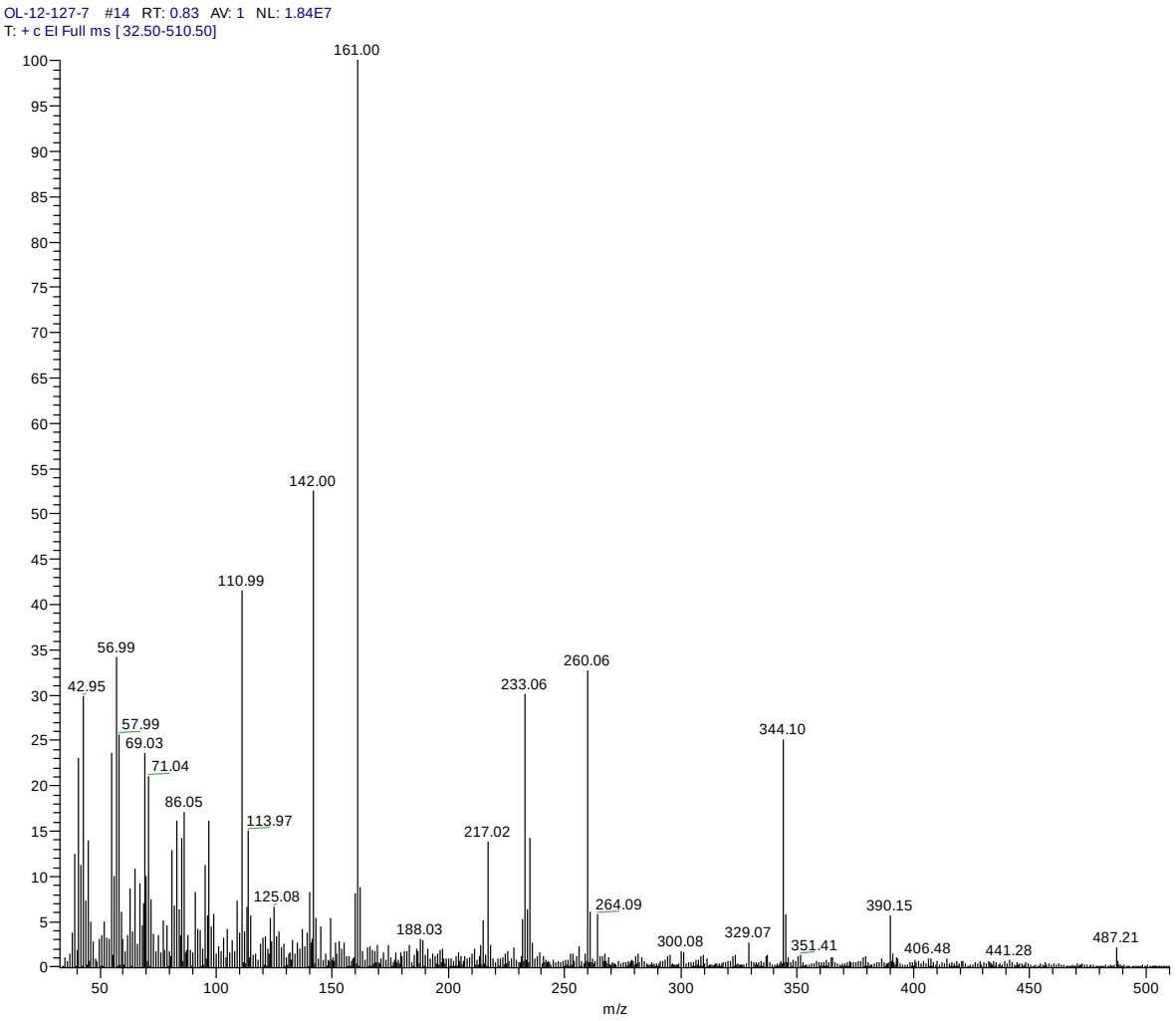


Figure S8. The IR spectrum of 6

Tsource=70˚C

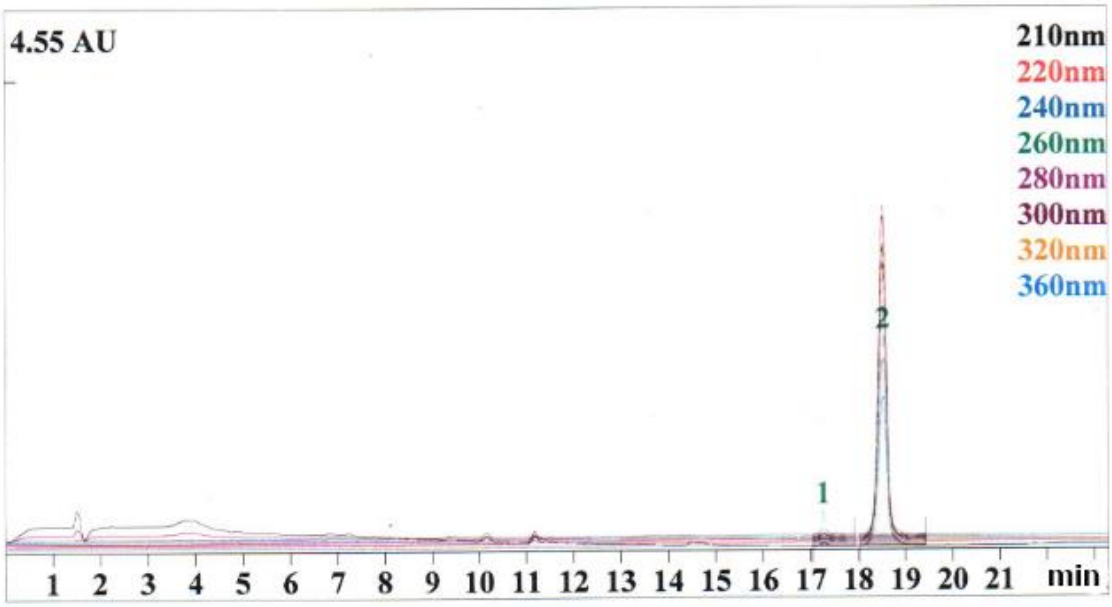
Tprobe=200˚C



M^+ calc **m/z= 487.1237 (C25 H20 O6 N1 F3) $^{+\cdot}$**

M^+ meas **m/z= 487.1238**

Figure S9. The DFS spectrum of 6.



No	Time, μL	Height, AU	Area, AU* μL	Area, %
1	2589.16	0.03	0.885	1.63
2	2779.73	1.71	53.454	98.37

Figure S10. The HPLC spectrum of 6.

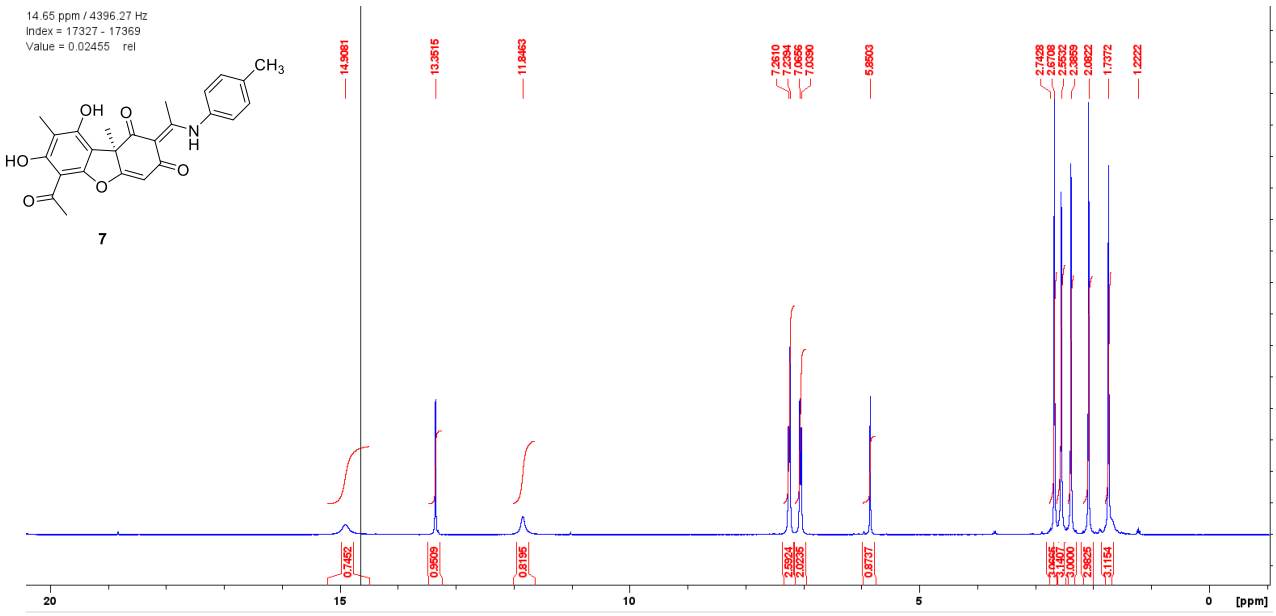


Figure S11. The ^{1}H NMR spectrum of compound **7**.

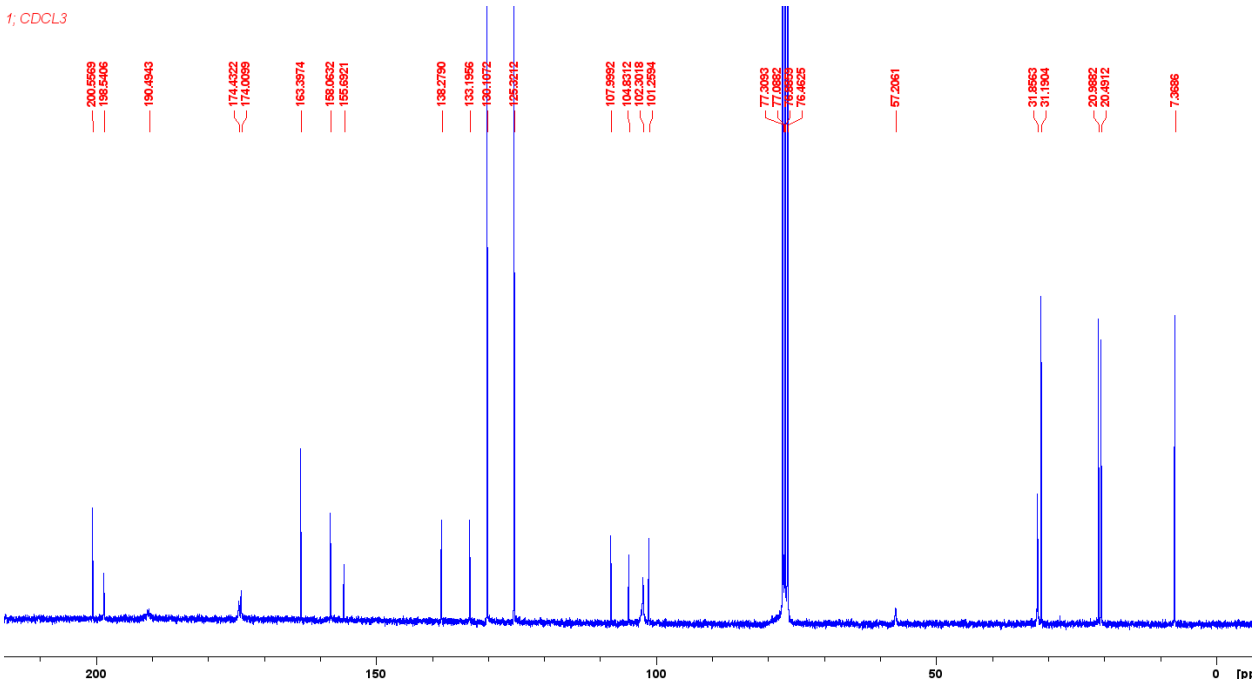


Figure S12. The ^{13}C NMR spectrum of **7**

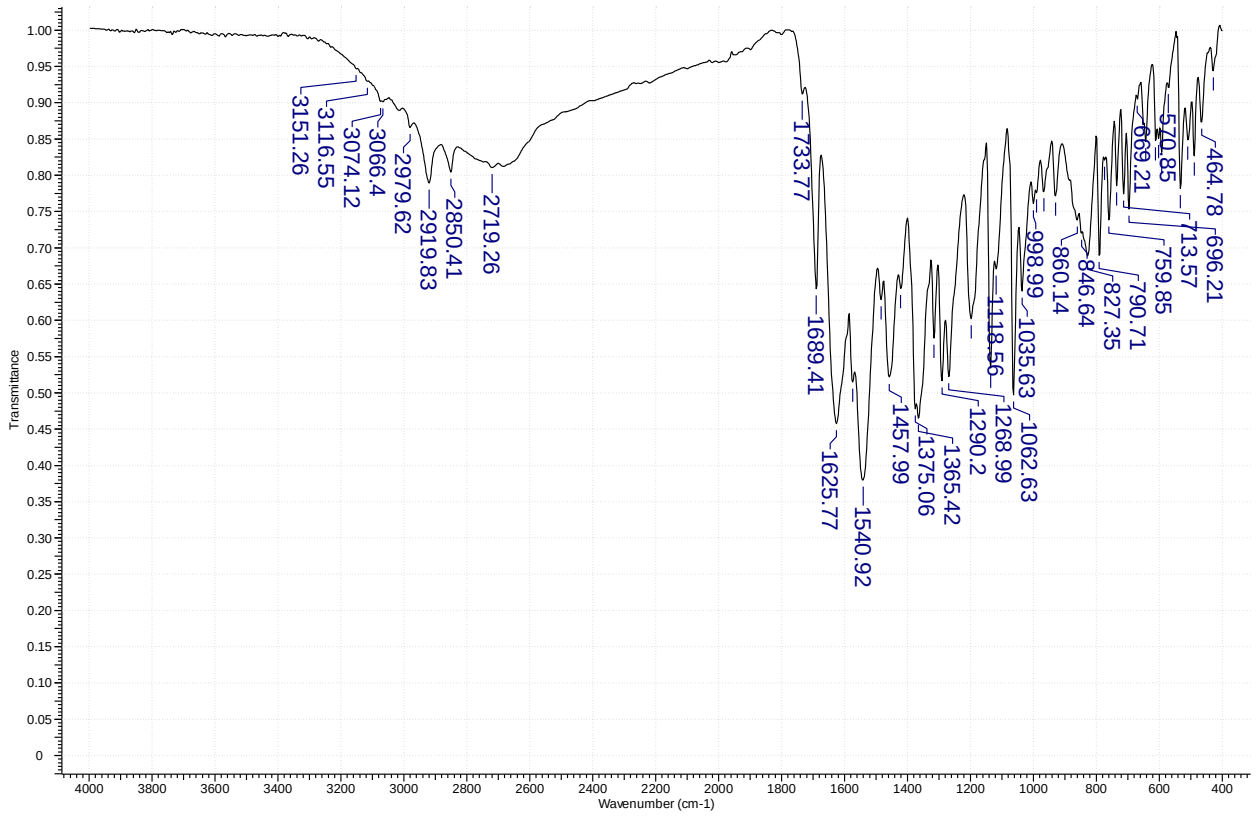
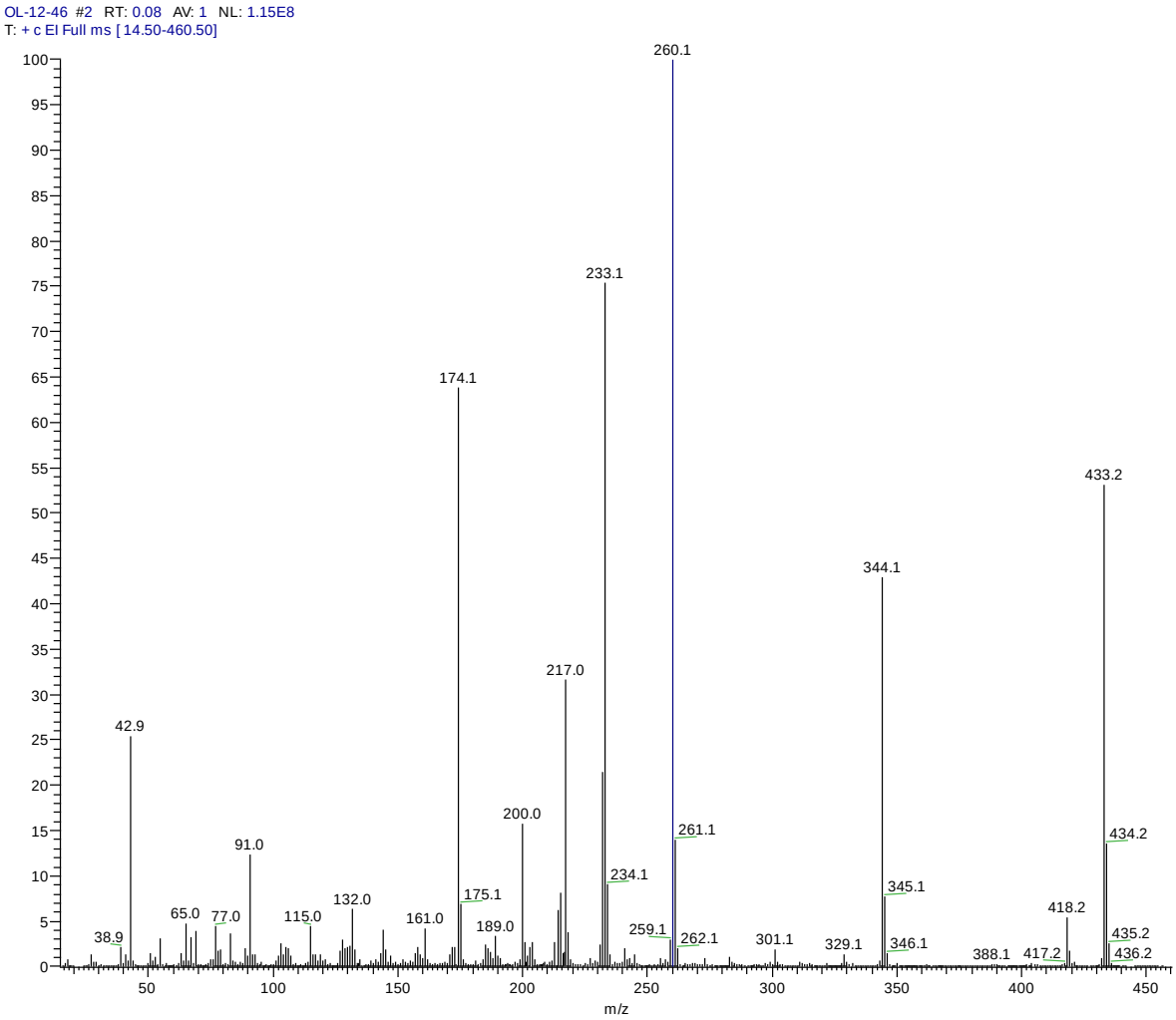


Figure S13. The IR spectrum of 7



Tsource=70˚C

Tprobe=250˚C

M^+ calc **m/z= 433.1520 ($C_{25}H_{23}O_6N_1$) $^{+\cdot}$**

M^+ meas **m/z= 433.1521**

Figure S14. The DFS spectrum of 7.