ELECTRONIC SUPORTING INFORMATION

Pd^{II}/Ag^{I} Catalyzed room temperature Reaction of γ-Hydroxy Lactams: Mechanism, Scope, and antistaphylococcal activity

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Table S1. Screening of solvent for α-amidoalkylation reaction

#	Solvent	T, °C	t, h	Yield,%
2	DCE	Rt	4	92
3	Toluene	Rt	6	56
4	DMF	Rt	6	0
5	MeCN	rt	4	<10
6	DCM	rt	4	82
7	THF	rt	6	32

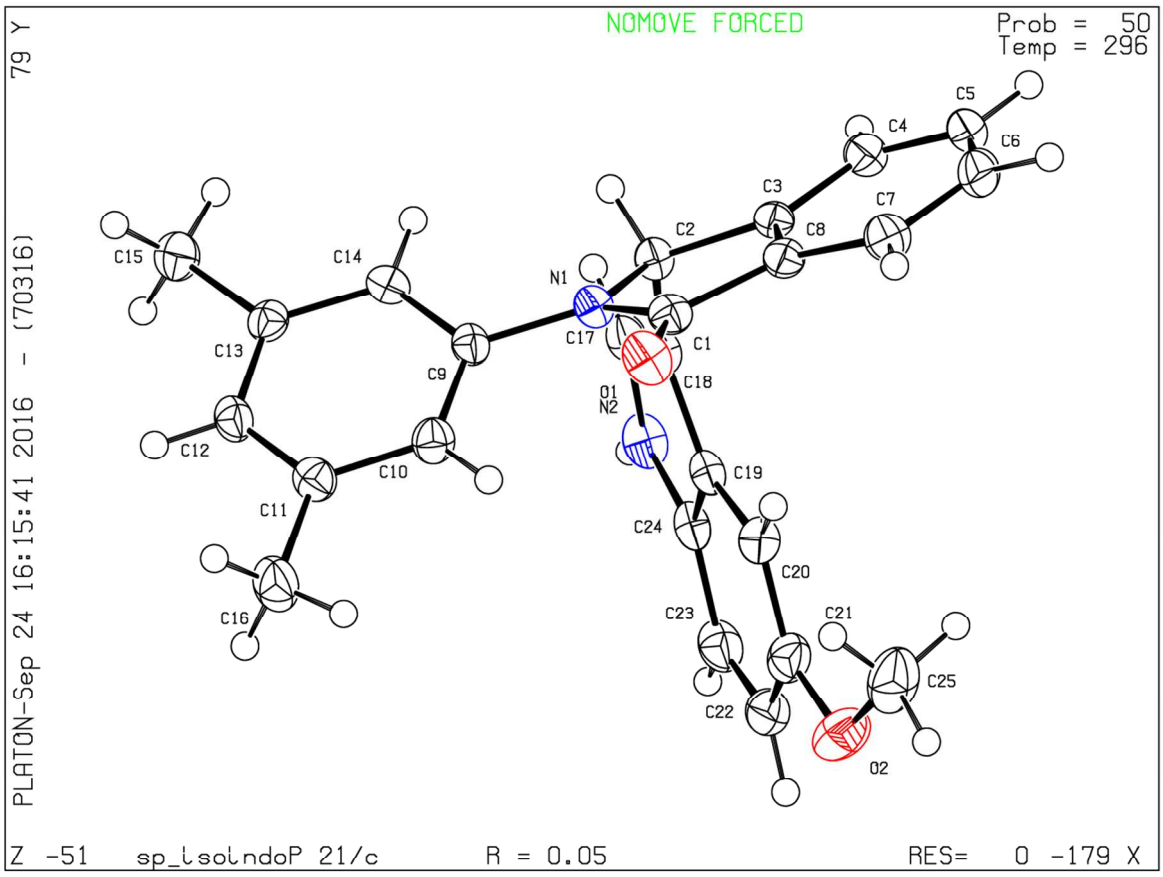

Figure S1. ORTEP diagram of compound **2f.**

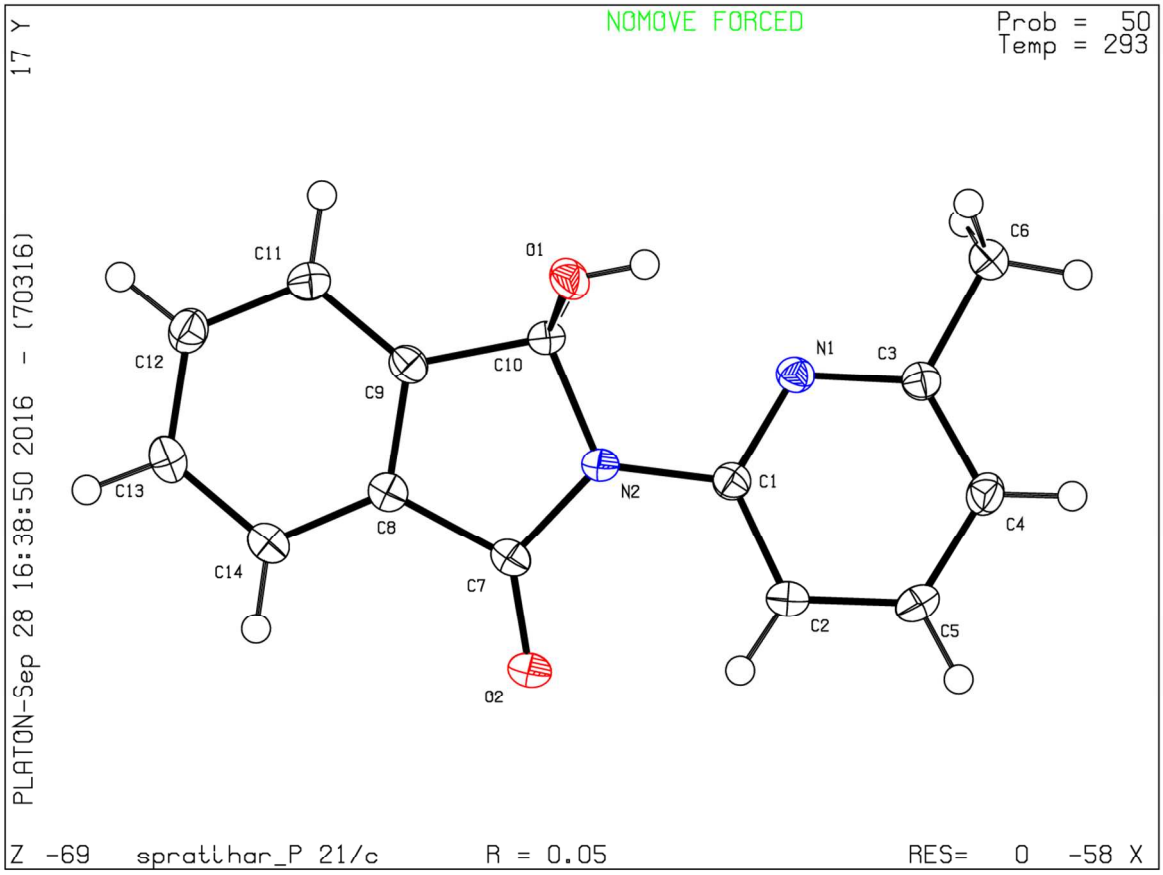

Figure S2. ORTEP diagram of compound **1c.**

Table S2. Crystal data parameter for compound **1c** and **2f**.

	1c	**2f**
Formula unit	$C_{25}H_{22}O_2N_2$	$C_{25}H_{22}O_2N_2$
Formula wt.	280.35	382.45
Crystal system	Monoclinic	Monoclinic
T [K]	296	296
a [Å]	6.9266(2)	9.2359(2)
b [Å]	14.6572(5)	14.0859(4)
c [Å]	11.4985(3)	15.6450(4)
α [°]	90	90
β [°]	103.475(2)	101.897(2)
γ [°]	90	90
Volume [$Å^3$]	1135.24(6)	1991.63(9)
Space group	$P2_1/c$	$P\ 2_1/c$
Z	4	4
D_{calc} [g cm^{-3}]	1.406	1.276
μ/mm^{-1}	0.096	0.081
Reflns. Collected	2609	4620
Unique reflns.	2320	3180
R_1 [I>2σ(I)], wR_2	0.0466; 0.1450	0.0502; 0.1611
GOF	1.172	1.099
Instrument	Bruker APEX-II	Bruker APEX-II
X-ray	MoK\α; λ=0.71073	MoK\α; λ=0.71073
CCDC Reference No.	**1501922**	**1506191**

Antimicrobial assay: Compounds were tested for antimicrobial against three strains, one negative control strain (Methicillin susceptible strain), S. aureus ATCC25923; one positive control strain (Methicillin resistant strain), S. aureus ATCC43300 and one clinical isolate which is both methicillin and vancomycin resistant, S. aureus U07 (Am J Infect Control. 2015 Dec 1;43(12):e87-8). Minimum inhibitory concentration (MIC) values of all compounds were determined following CLSI guidelines (CLSI, 2007). Compounds were dissolved in DMSO and concentration of each compound for the assay ranged from 500 μg.mL-1 to 0.24 μg.mL-1. MIC

values were determined where no visible growth was observed. The culture conditions and bacterial growth were monitored in Muller Hinton Broth at 37°C. Two rows of wells, ones in which no compounds were added as positive controls, and the ones in which only medium were used as negative controls in order to maintain the experimental sterility. All experiments were repeated three times.

Table S3. Effect of pthalimide derivatives on MRSA and VRSA positive strains

Compounds	*S. aureus* U07 (VRSA+ & MRSA+)	*S. aureus* ATCC25923 (Control strain)	*S. aureus* ATCC43300 (MRSA+ Control)
Vancomycin	31.2	1.95	3.9
Methicillin	125	1.95	31.2
Tetracycline	500	3.9	500
Gentamicin	16	0.975	0.975
Levofloxacin	0.48	0.24	0.24
2c	15.6	7.8	15.6
2d	3.9	1.95	3.9
2e	1.95	0.975	0.975
2f	125	62.5	62.5
2g	>1000	>1000	>1000
2h	500	250	500
2i	>1000	>1000	>1000
2j	>1000	>1000	>1000
2k	15.6	7.8	15.6
2l	1.95	0.975	0.975
2m	>1000	>1000	>1000
2n	>1000	>1000	>1000
2o	>1000	>1000	>1000
2p	>1000	>1000	>1000
2q	>1000	>1000	>1000
2r	500	250	500
2s	>1000	>1000	>1000
2t	7.8	0.975	1.95
2u	>1000	>1000	>1000
2v	>1000	>1000	>1000
2w	0.487	0.487	0.487

Figure S3. ^{1}H and ^{13}C NMR of **2a** in DMSO-d_6 at 298K.

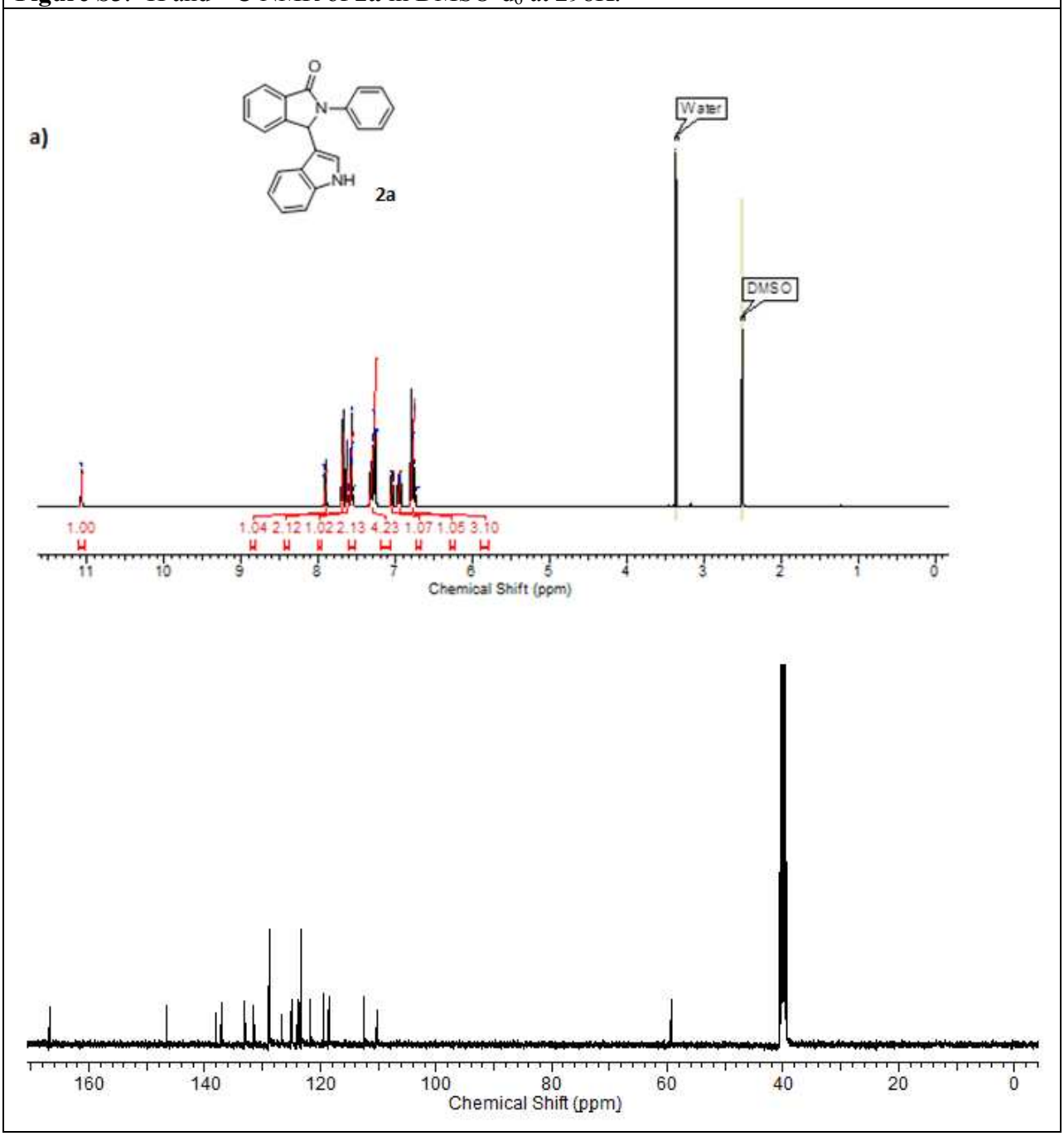

Figure S4. ^{1}H and ^{13}C NMR of **2b** in DMSO-d_6 at 298K.

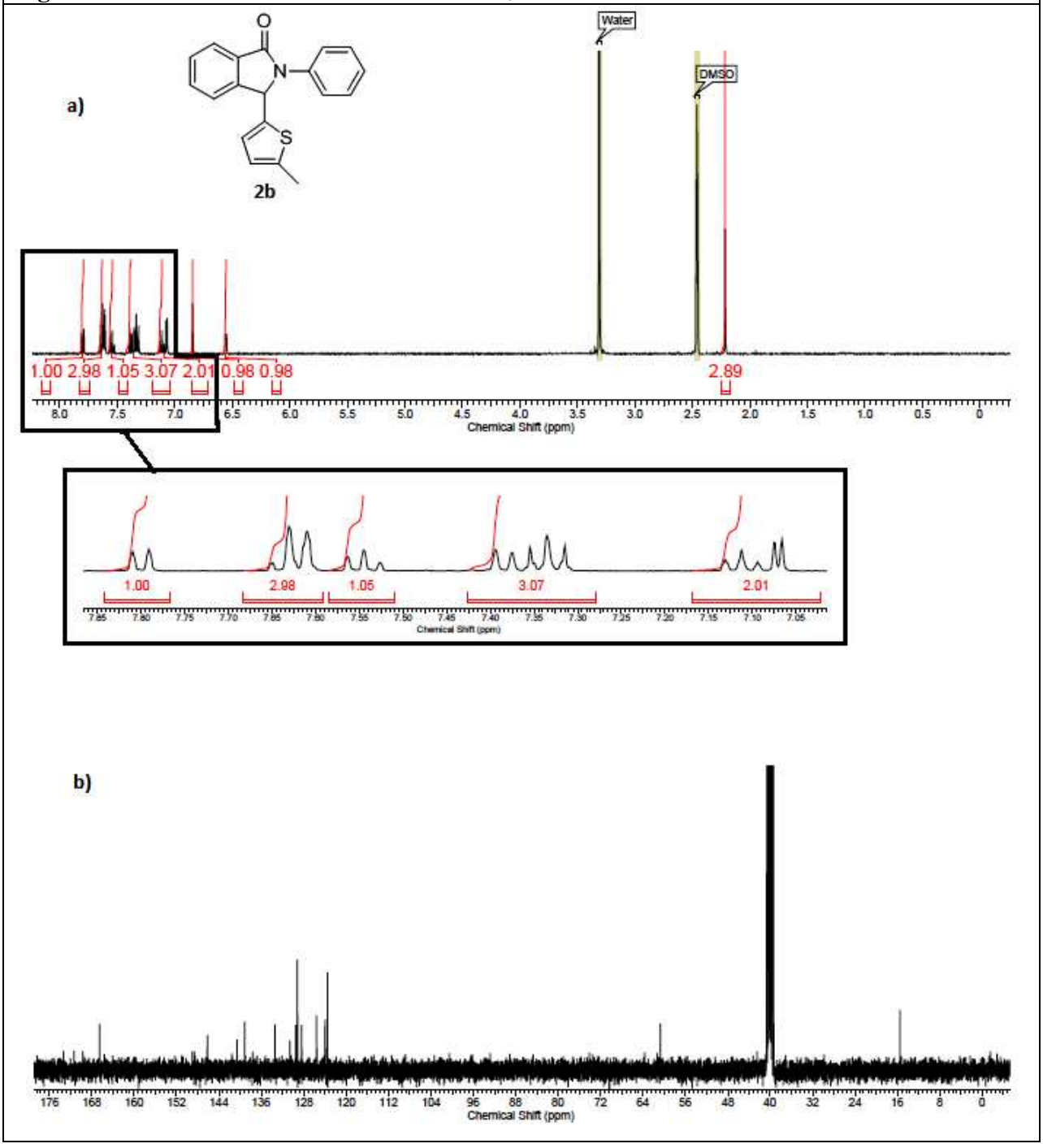

Figure S5. ^{1}H and ^{13}C NMR of **2c** in DMSO-d_6 at 298K.

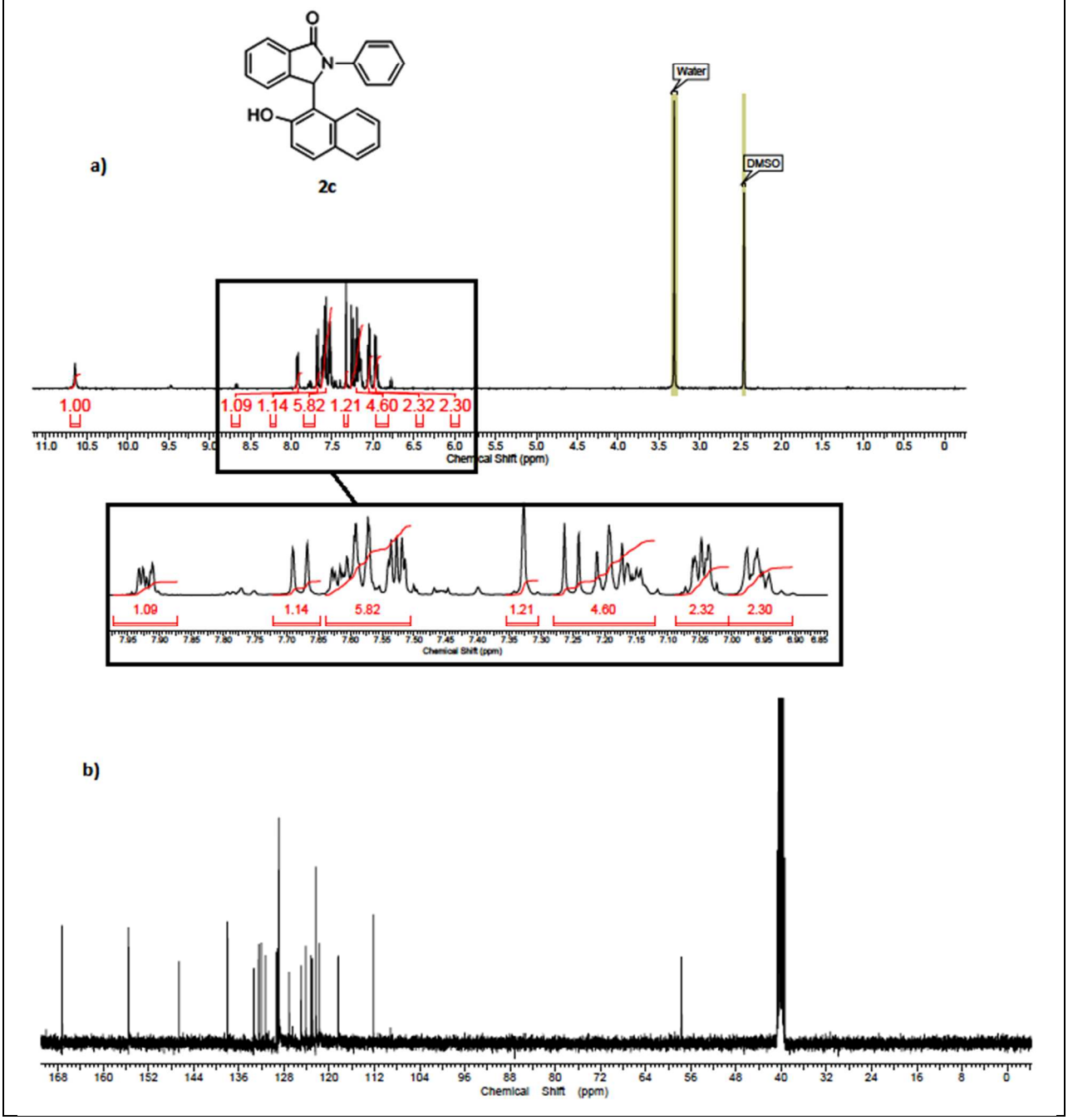

Figure S6. ^{1}H and ^{13}C NMR of **2d** in DMSO-d_6 at 298K.

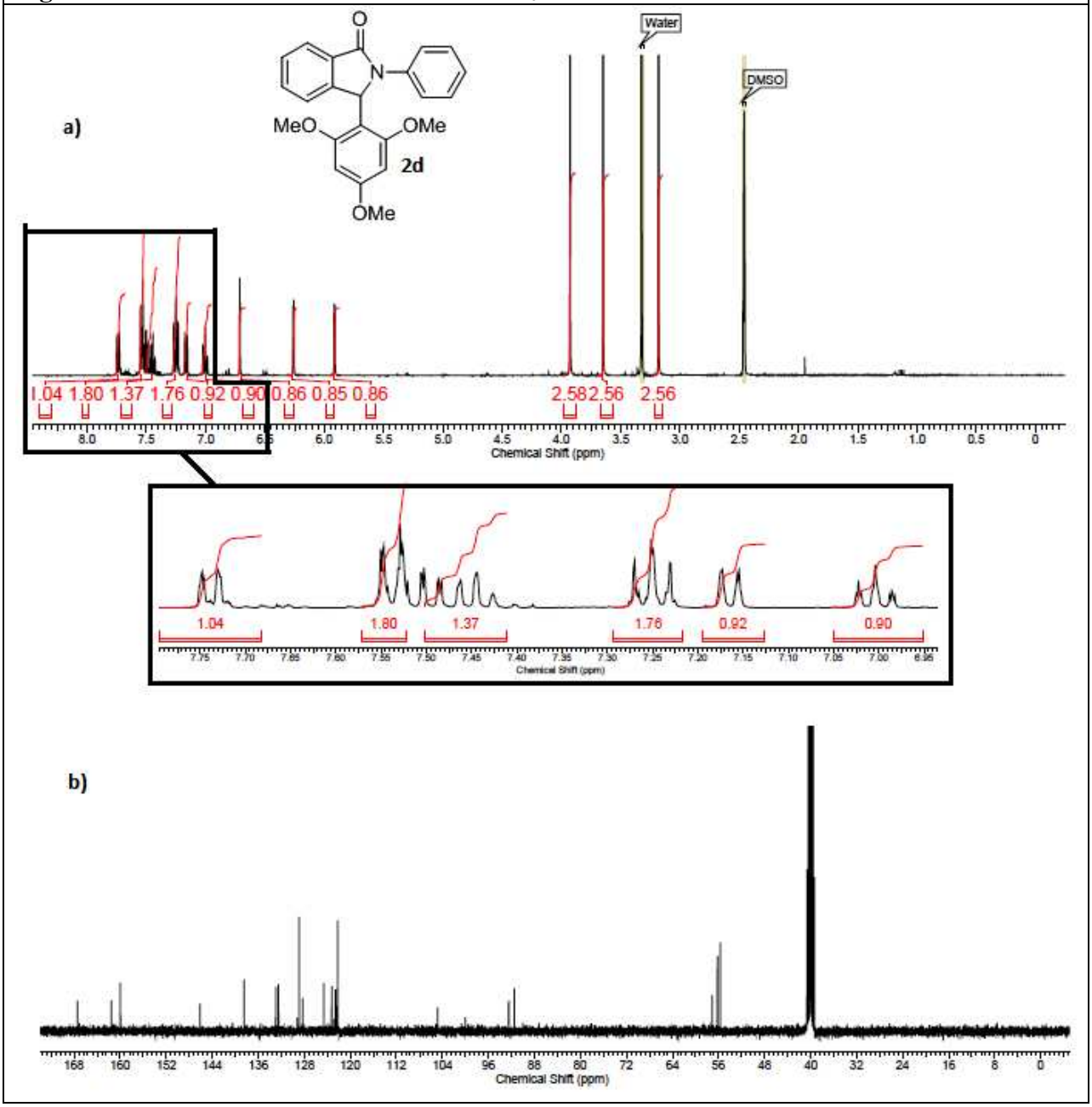

Figure S7. ^{1}H and ^{13}C NMR of **2e** in DMSO-d_6 at 298K.

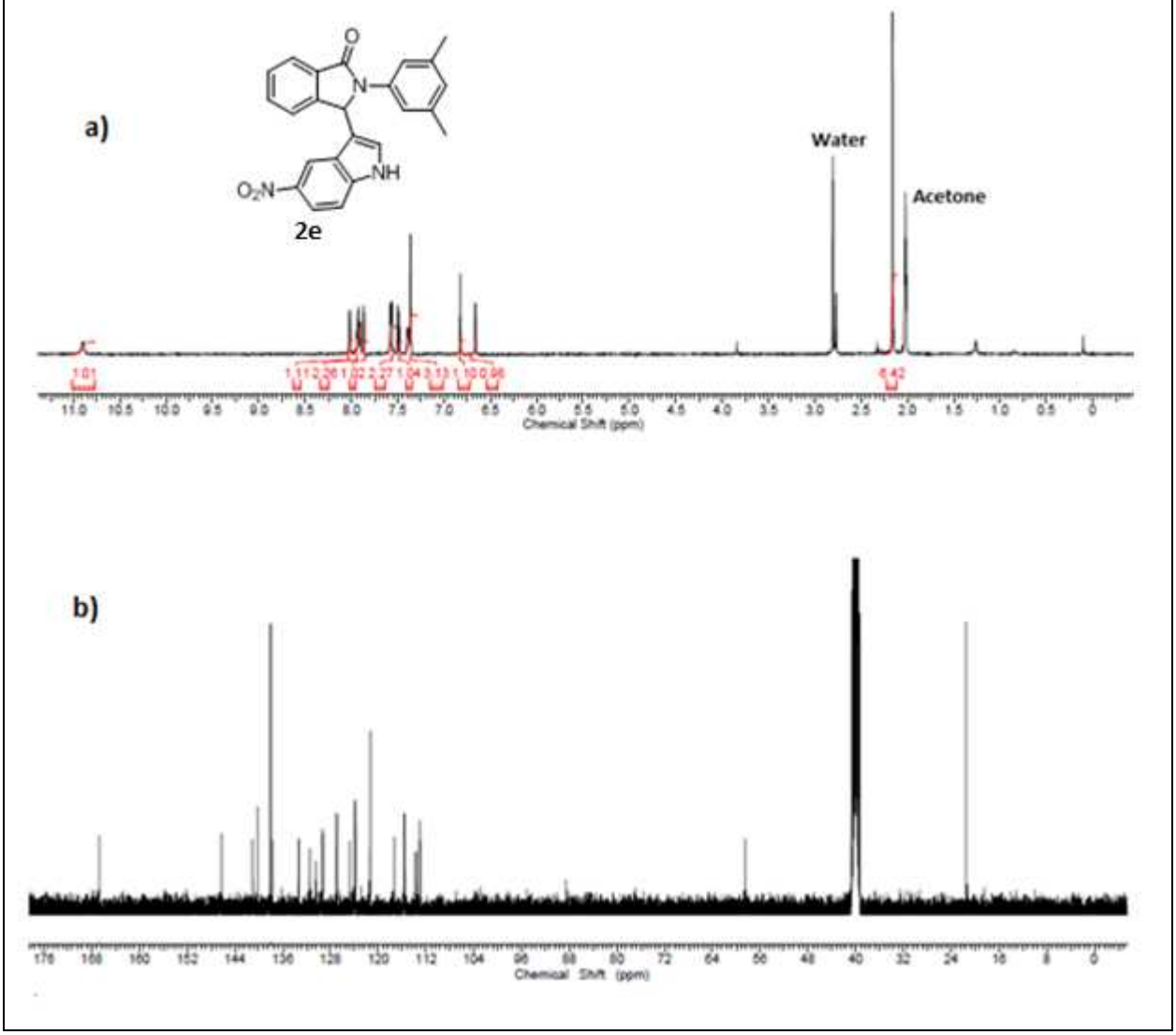

Figure S8. ^{1}H and ^{13}C NMR of **2f** in DMSO-d_6 at 298K.

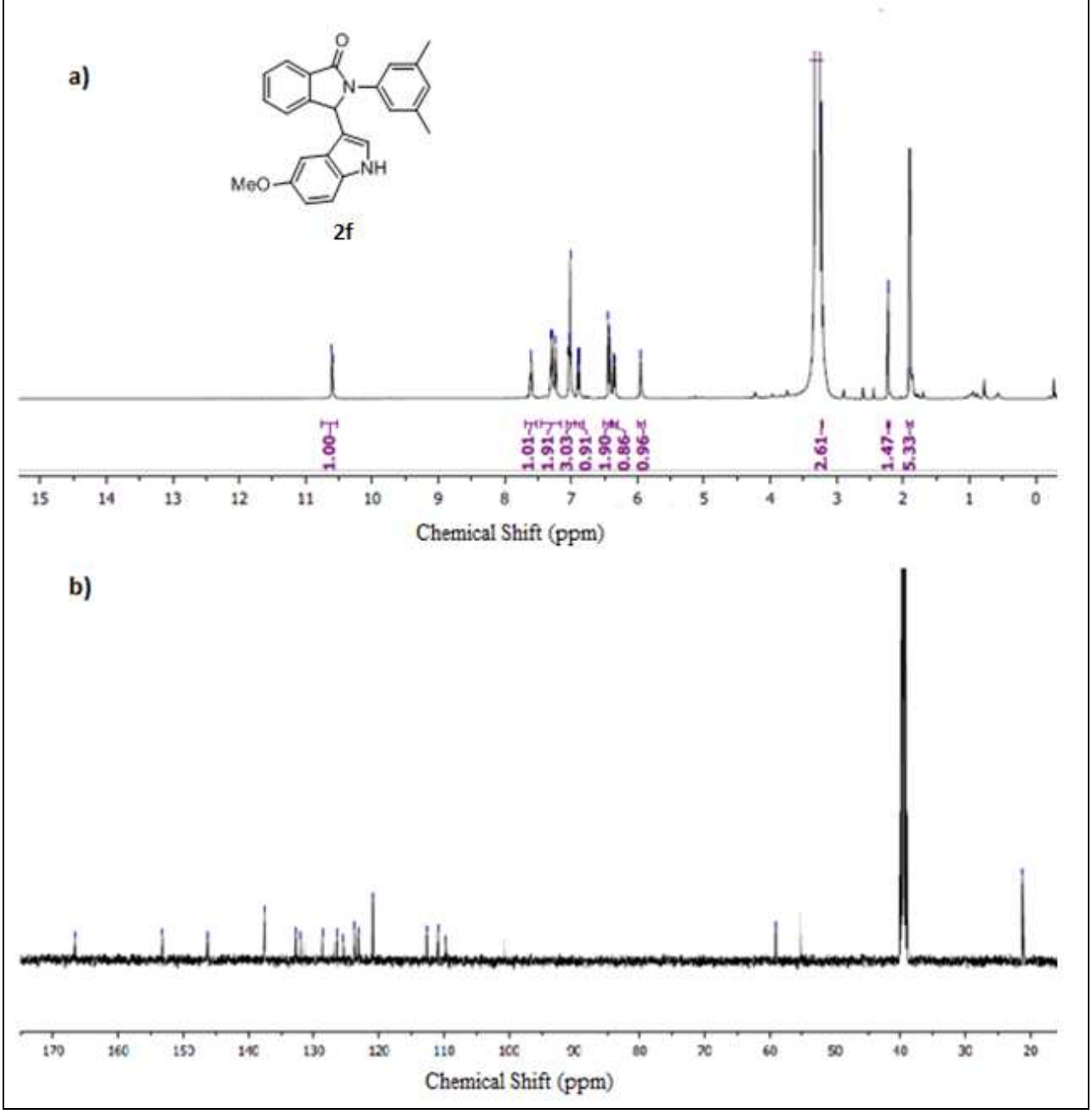

Figure S9. ^{1}H and ^{13}C NMR of **2g** in DMSO-d_6 at 298K.

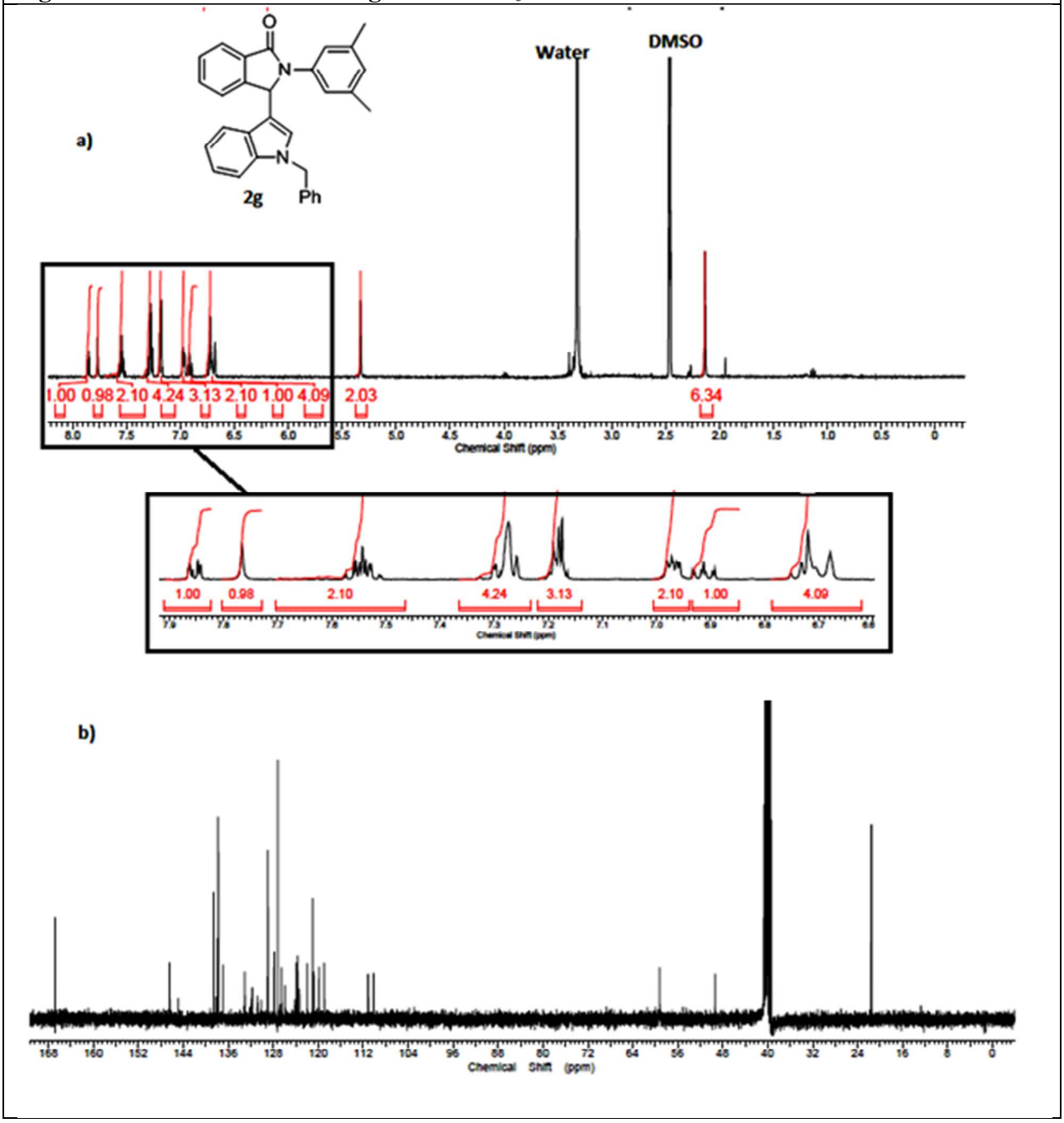

Figure S10. ^{1}H and ^{13}C NMR of **2h** in $CDCl_3$ at 298K.

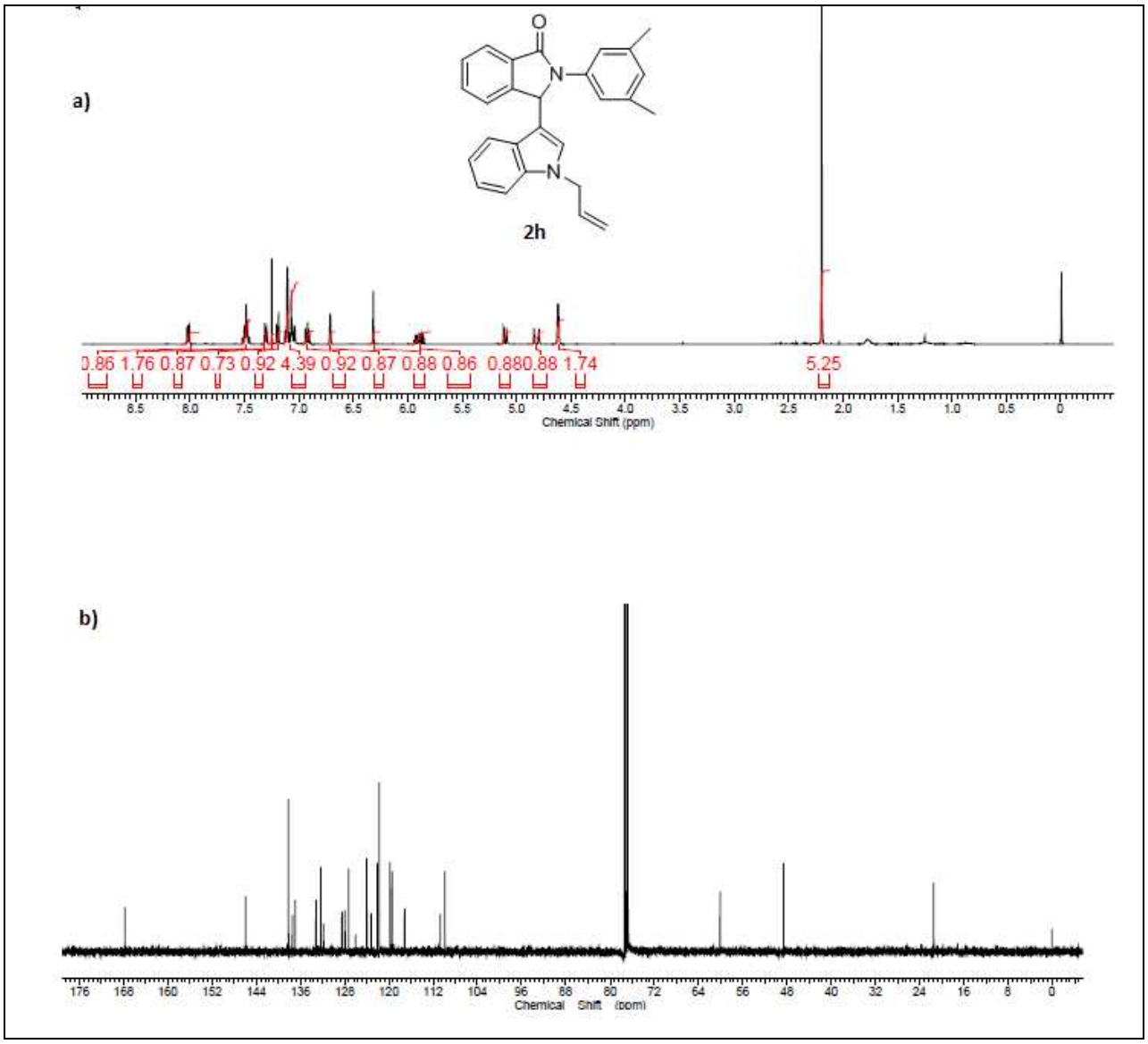
a)
O
N
N
2h
0.86 1.76 0.87 0.73 0.92 4.39 0.92 0.87 0.88 0.86 0.880.88 1.74
5.25
Chemical Shift (ppm)
b)
Chemical Shift (ppm)

Figure S11. ^{1}H and ^{13}C NMR of **2i** in $CDCl_3$ at 298K.

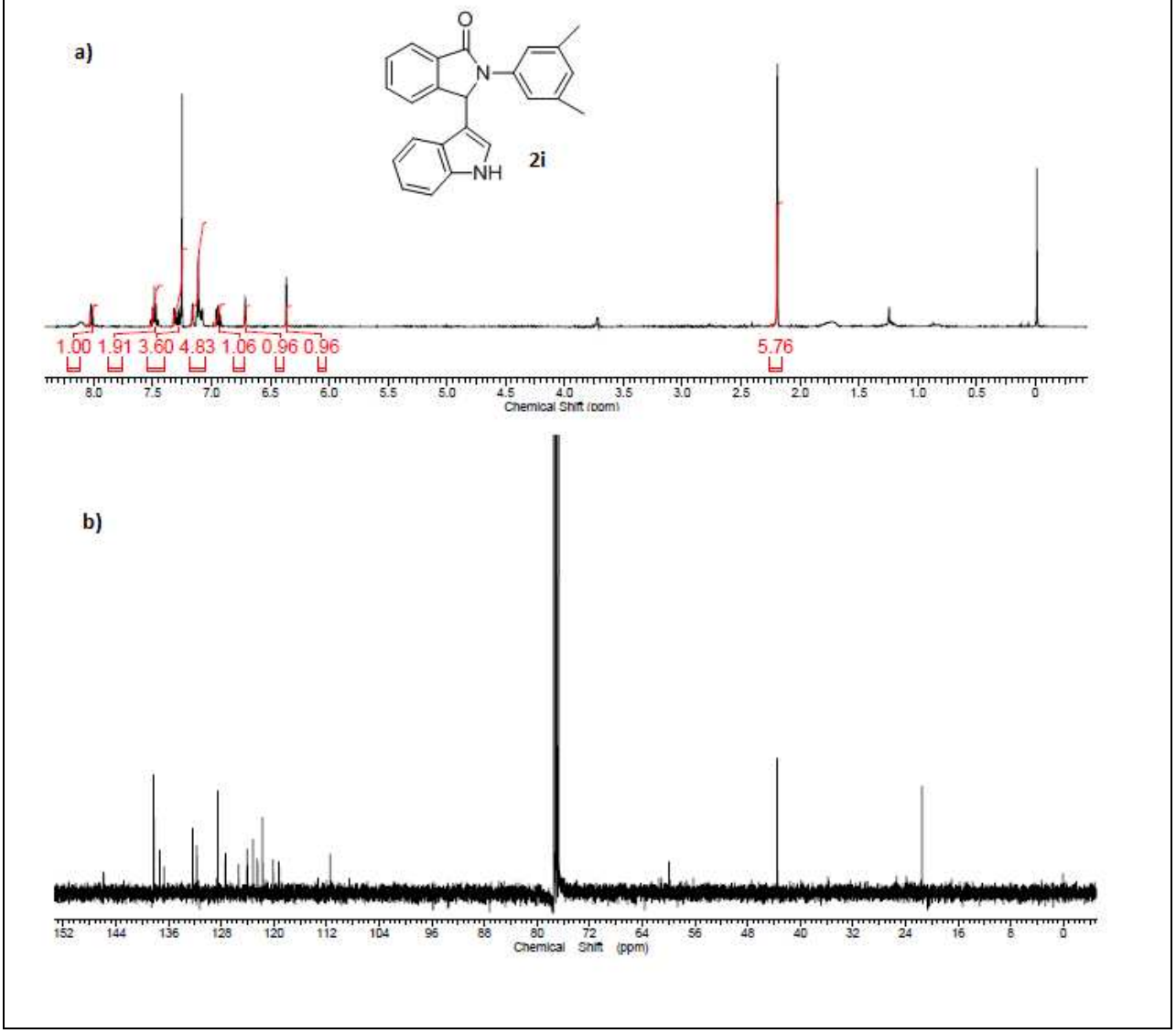

Figure S12. ^{1}H and ^{13}C NMR of **2j** in $CDCl_3$ at 298K.

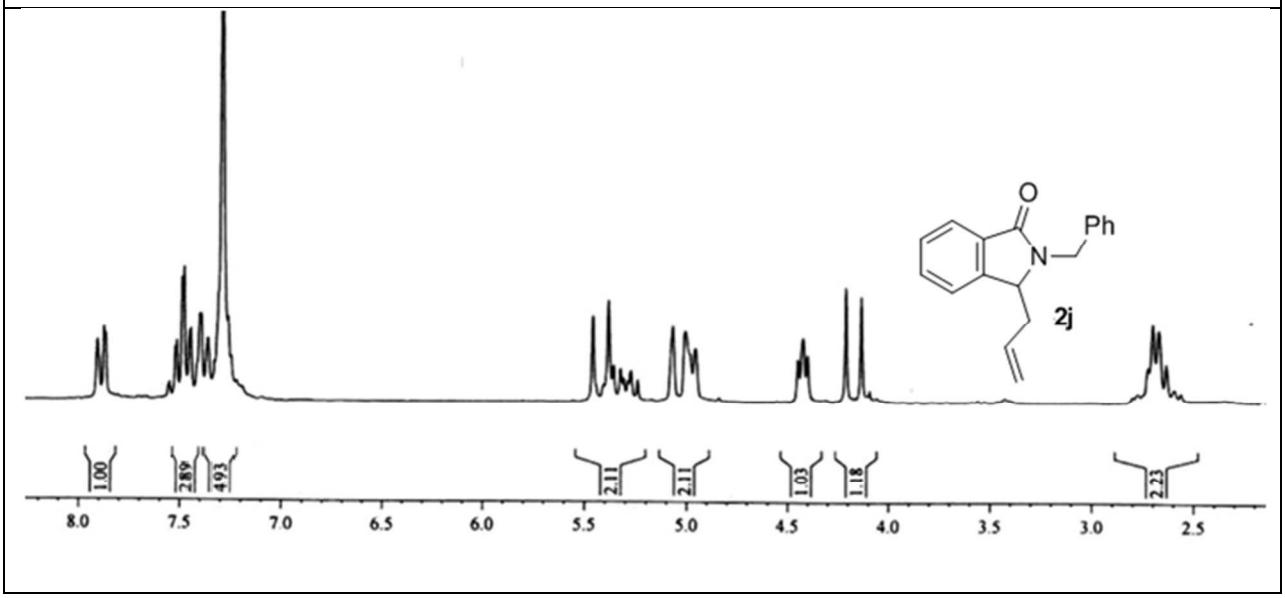

Figure S13. ^{1}H and ^{13}C NMR of **2k** in DMSO-d_6 at 298K.

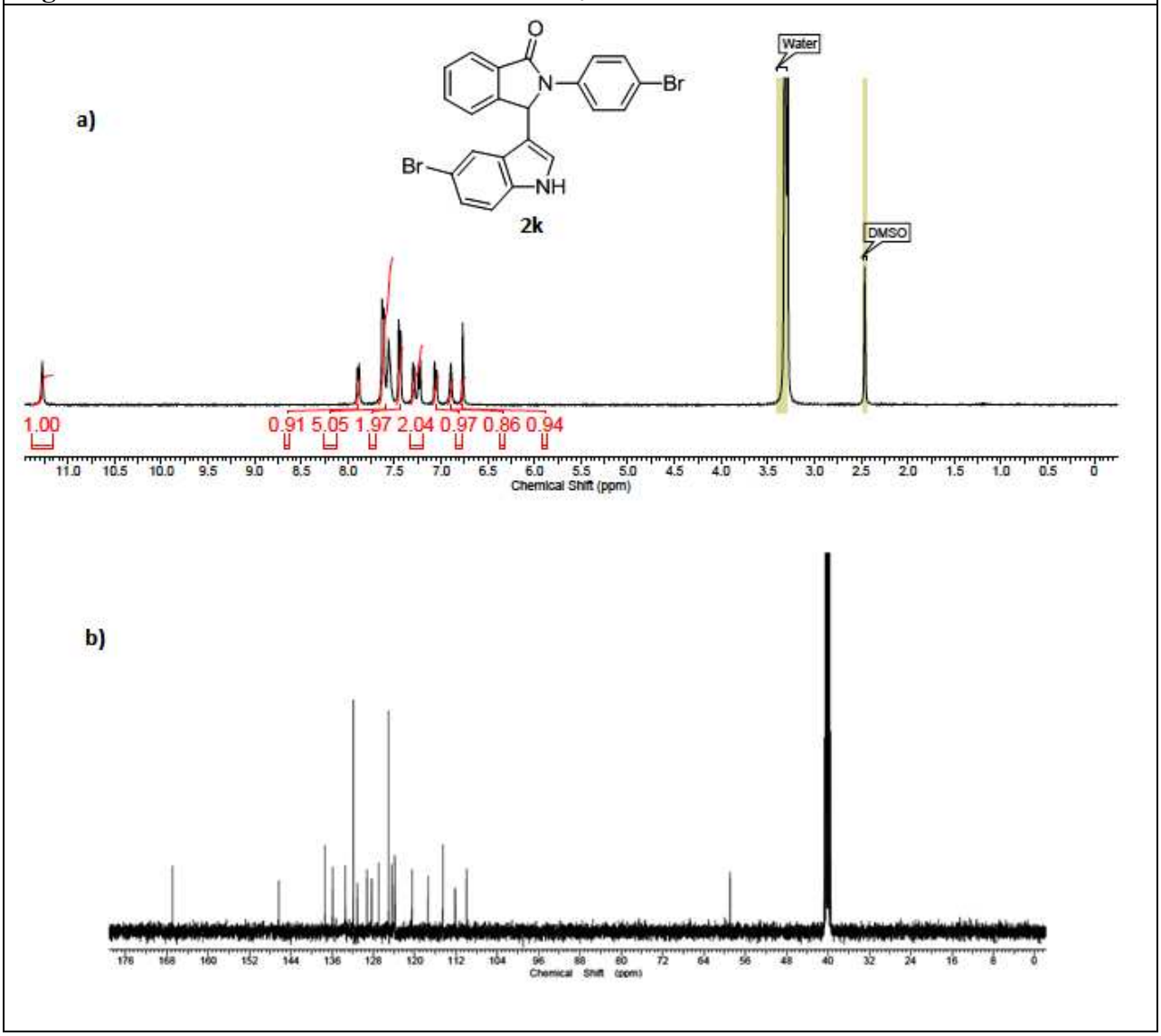

Figure S14. ^{1}H and ^{13}C NMR of **2l** in DMSO-d_6 at 298K.

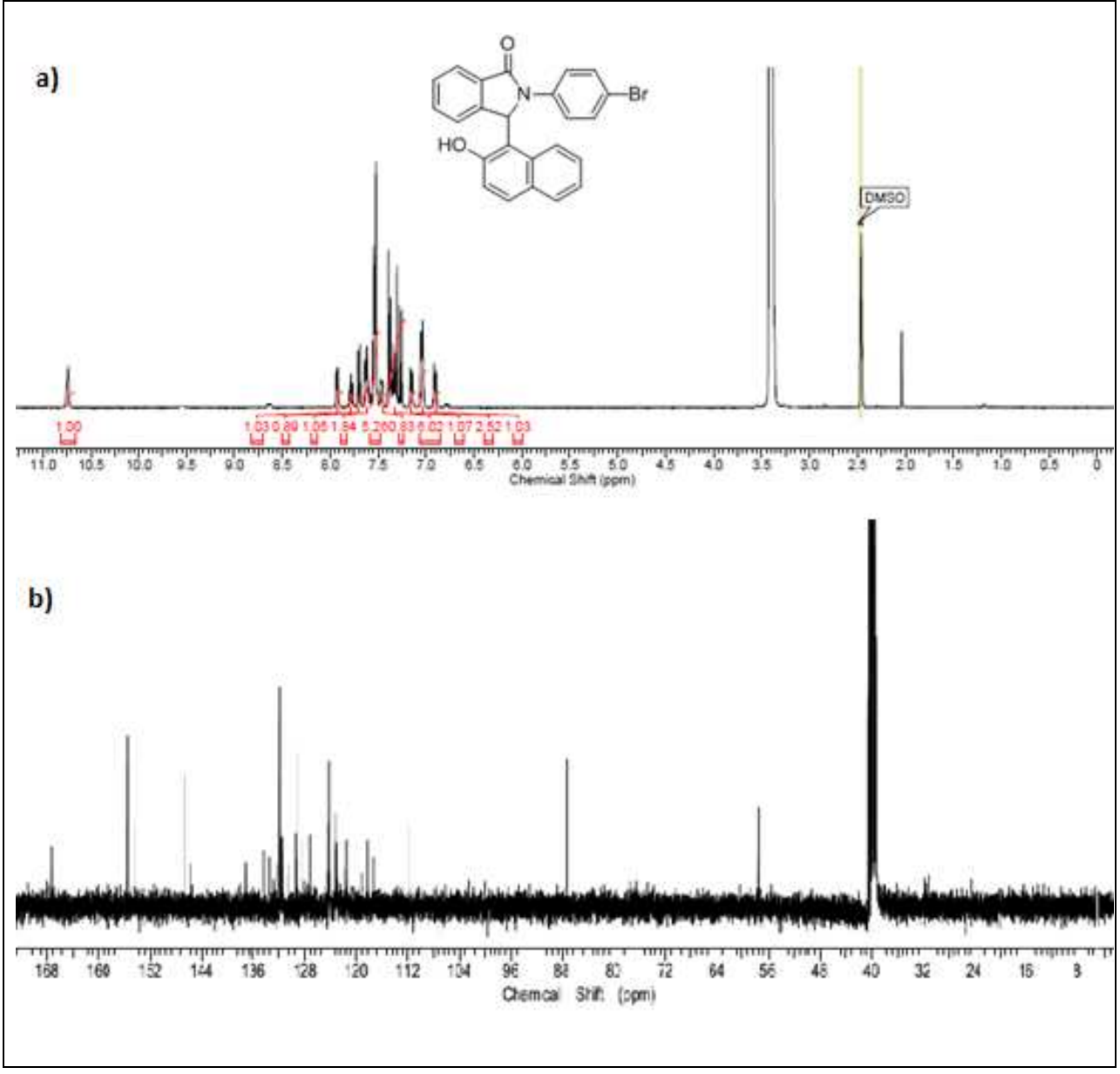

Figure S15. ^{1}H and ^{13}C NMR of **2m** in DMSO-d_6 at 298K.

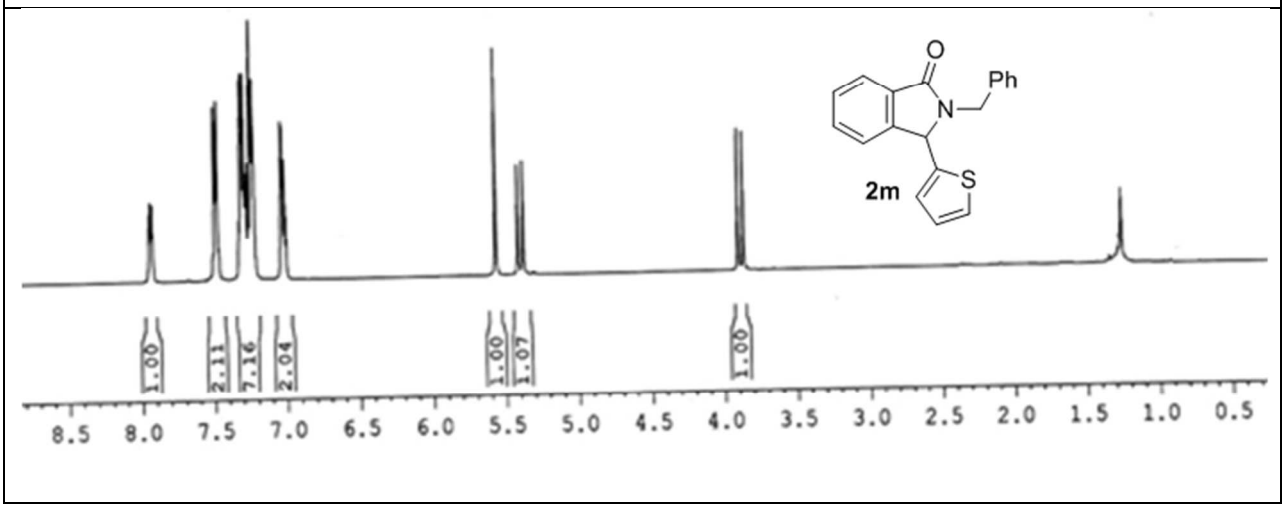

Figure S16. ^{1}H and ^{13}C NMR of **2n** in DMSO-d_6 at 298K.

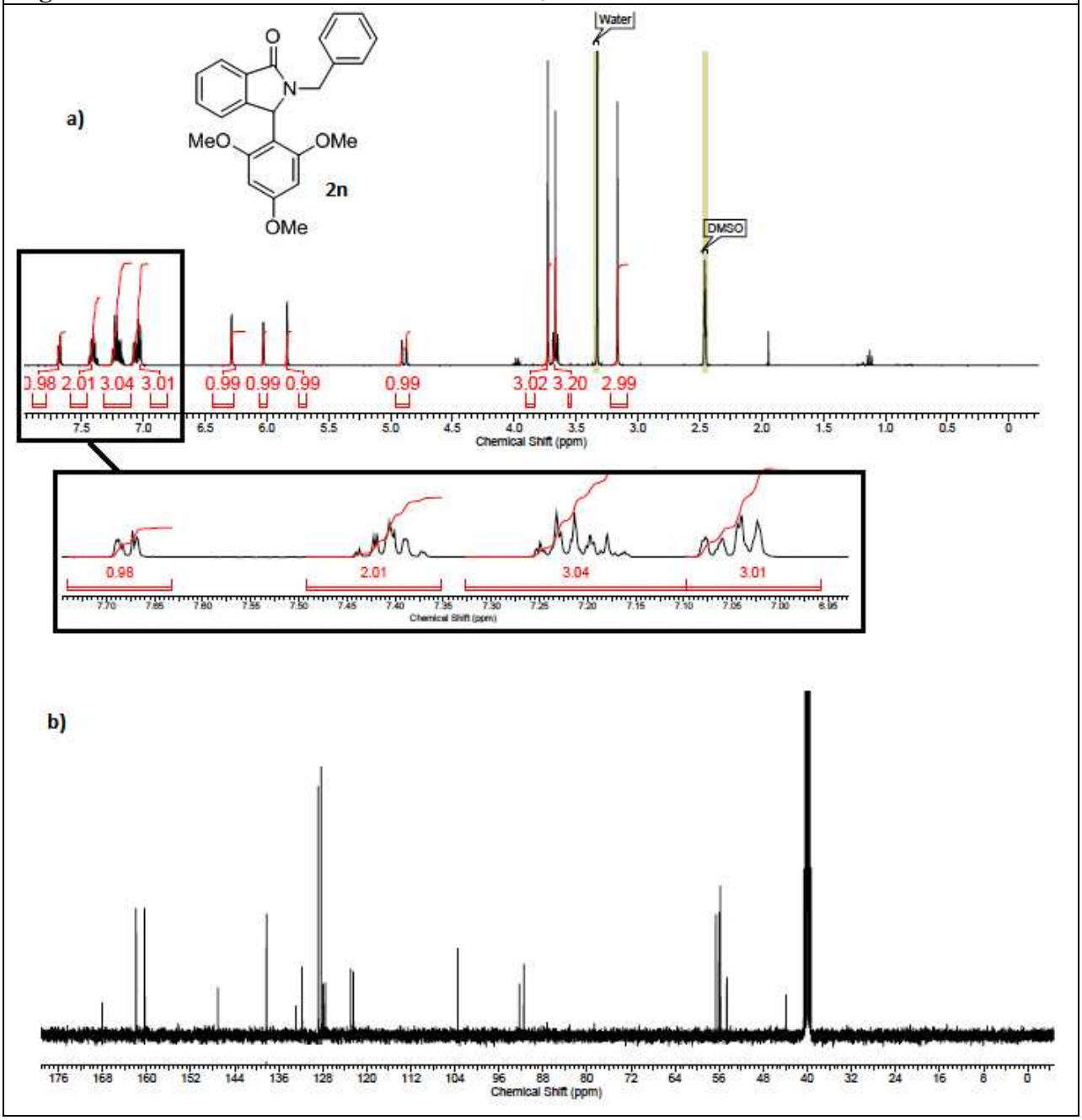

Figure S17. ^{1}H and ^{13}C NMR of **2o** in $CDCl_3$ at 298K.

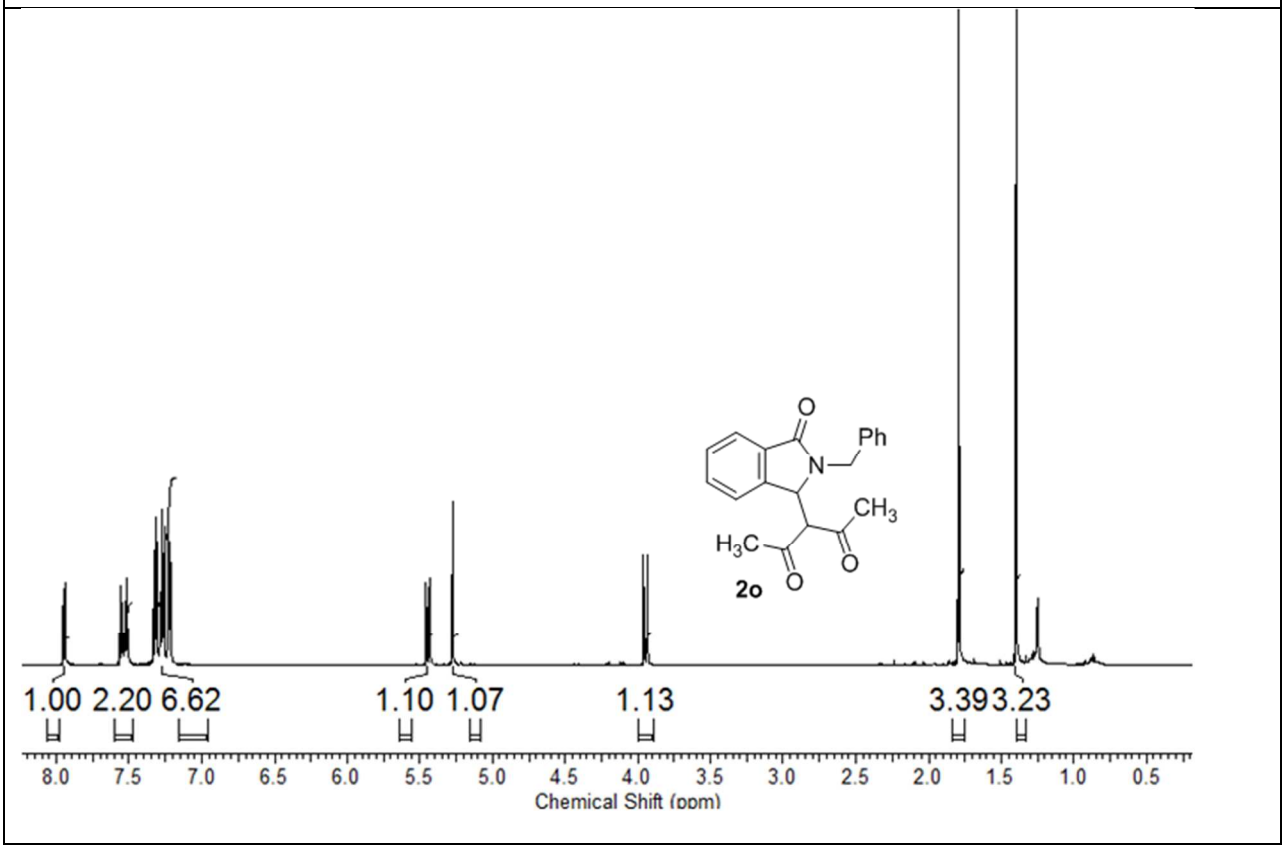

Figure S18. ^{1}H and ^{13}C NMR of **2p** in $CDCl_3$ at 298K.

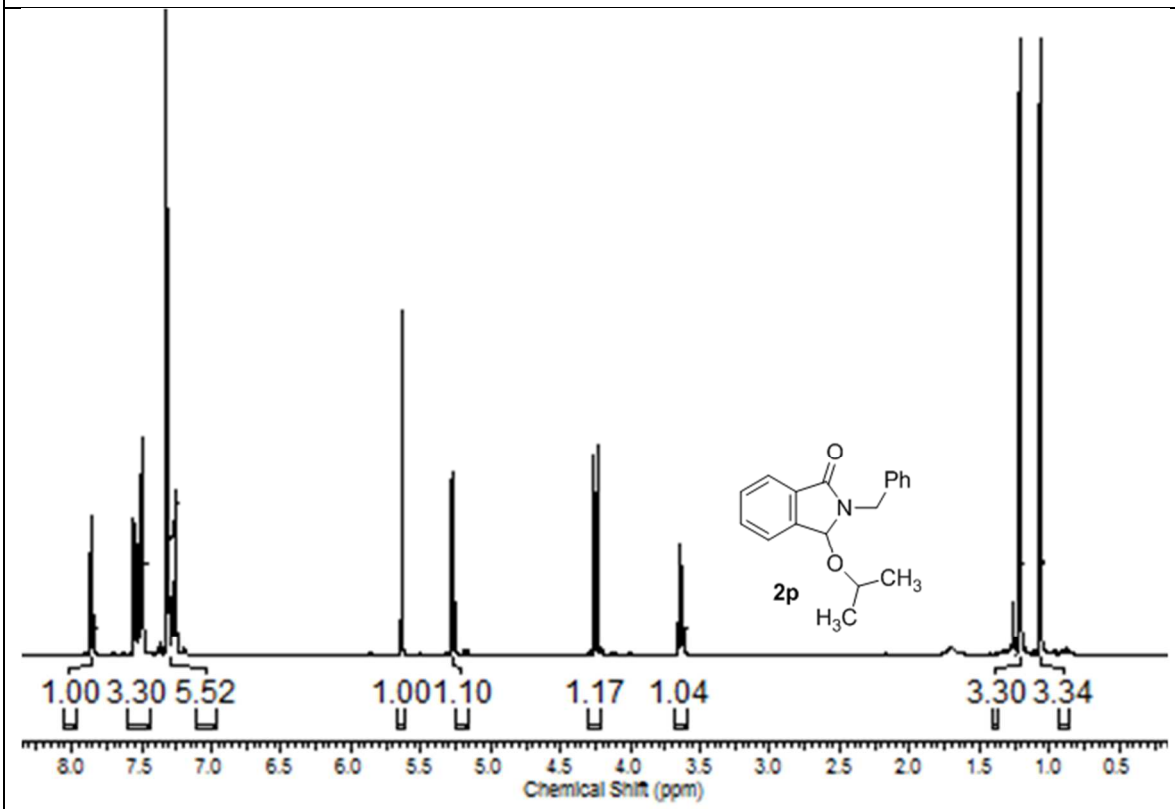

Figure S19. ^{1}H and ^{13}C NMR of **2q** in $CDCl_3$ at 298K.

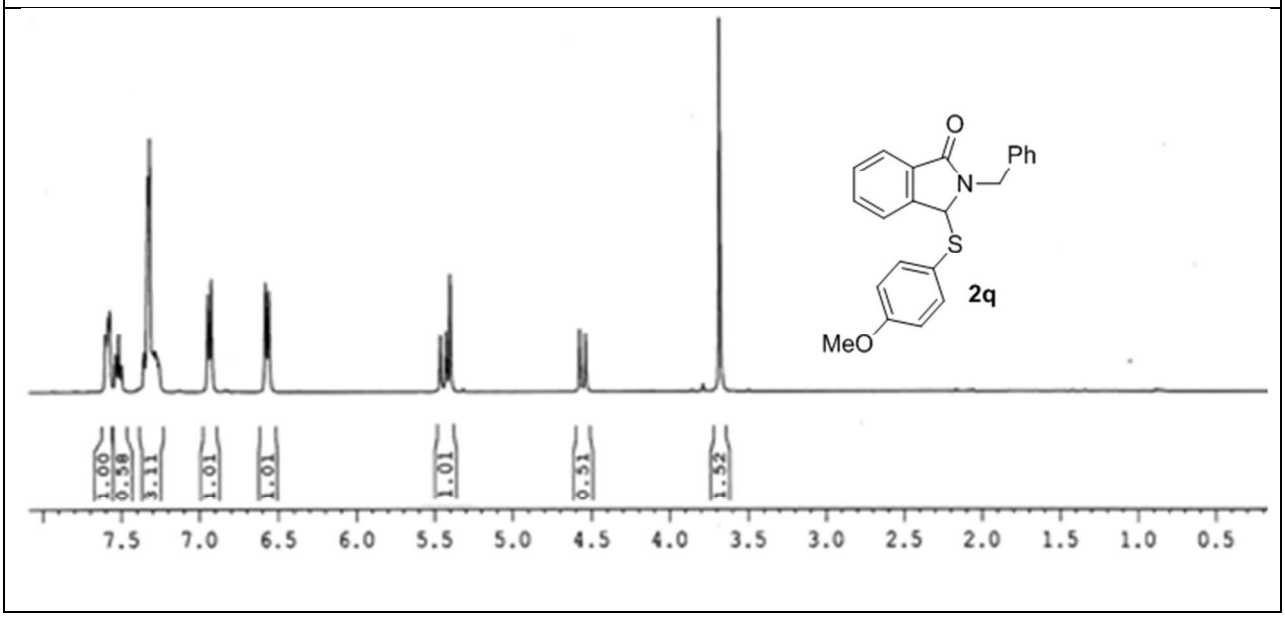

Figure S20. ^{1}H and ^{13}C NMR of **2r** in DMSO-d_6 at 298K.

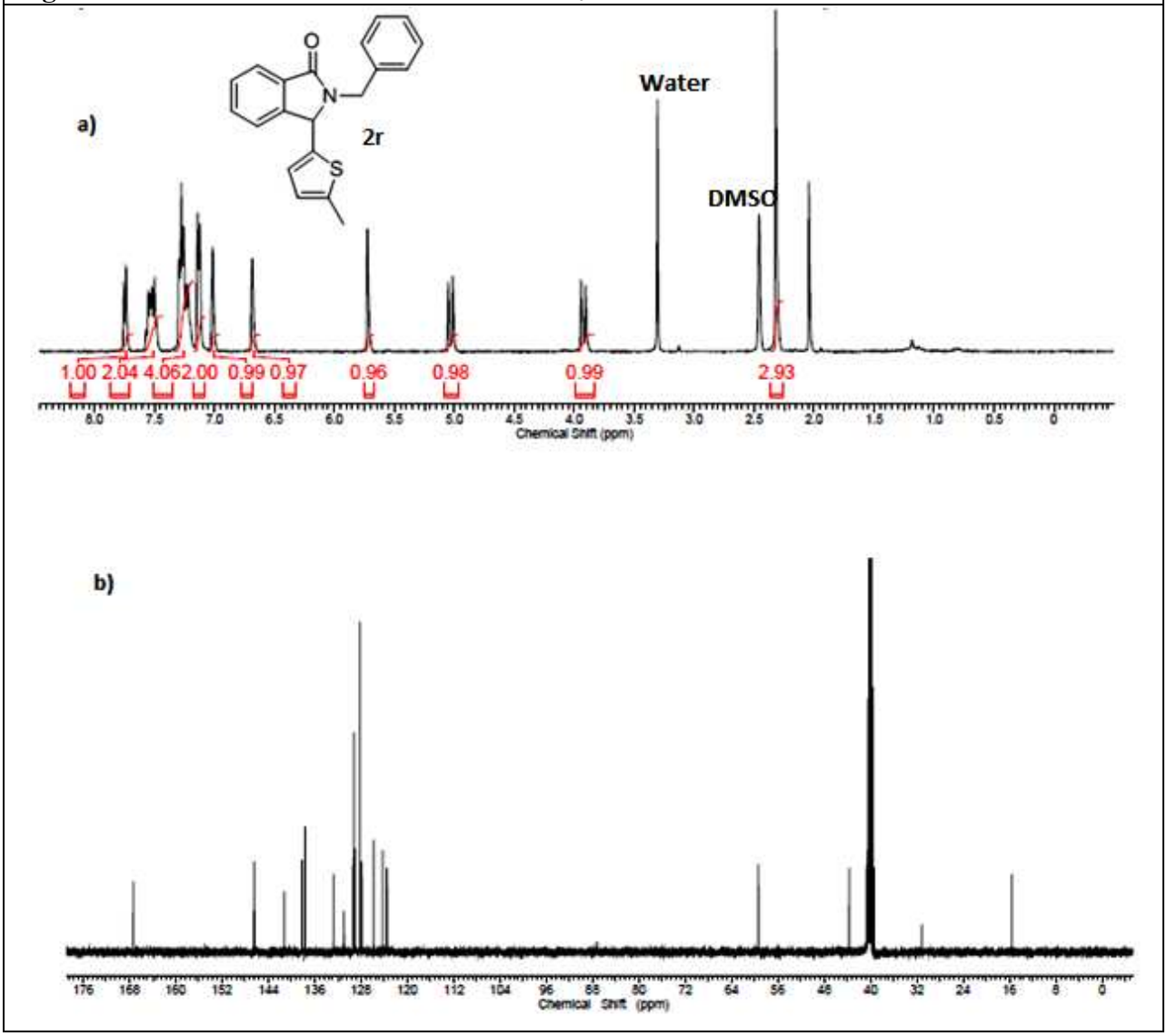

Figure S21. ^{1}H and ^{13}C NMR of **2s** in DMSO-d_6 at 298K.

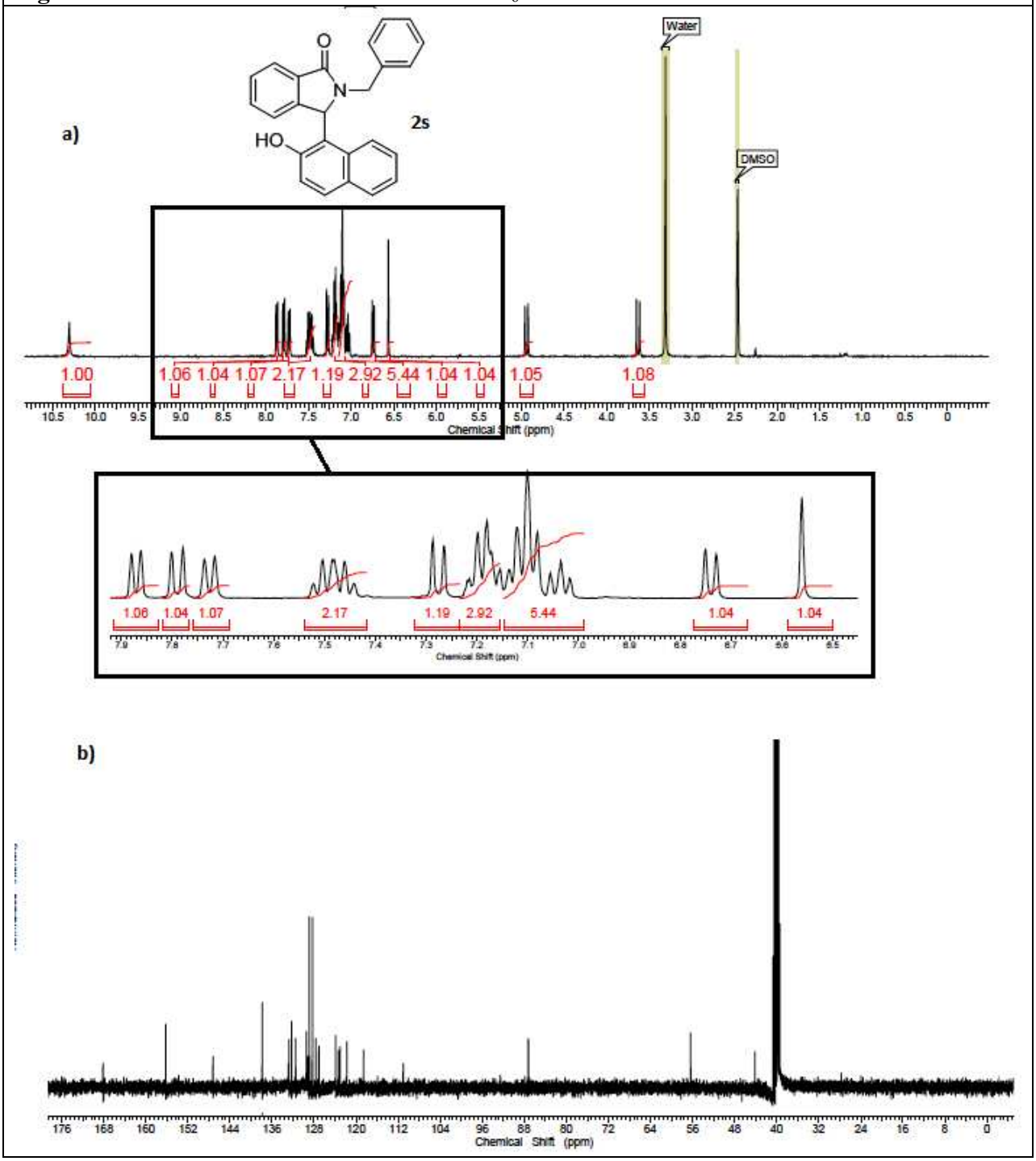

Figure S22. ^{1}H and ^{13}C NMR of **2t** in DMSO-d_6 at 298K.

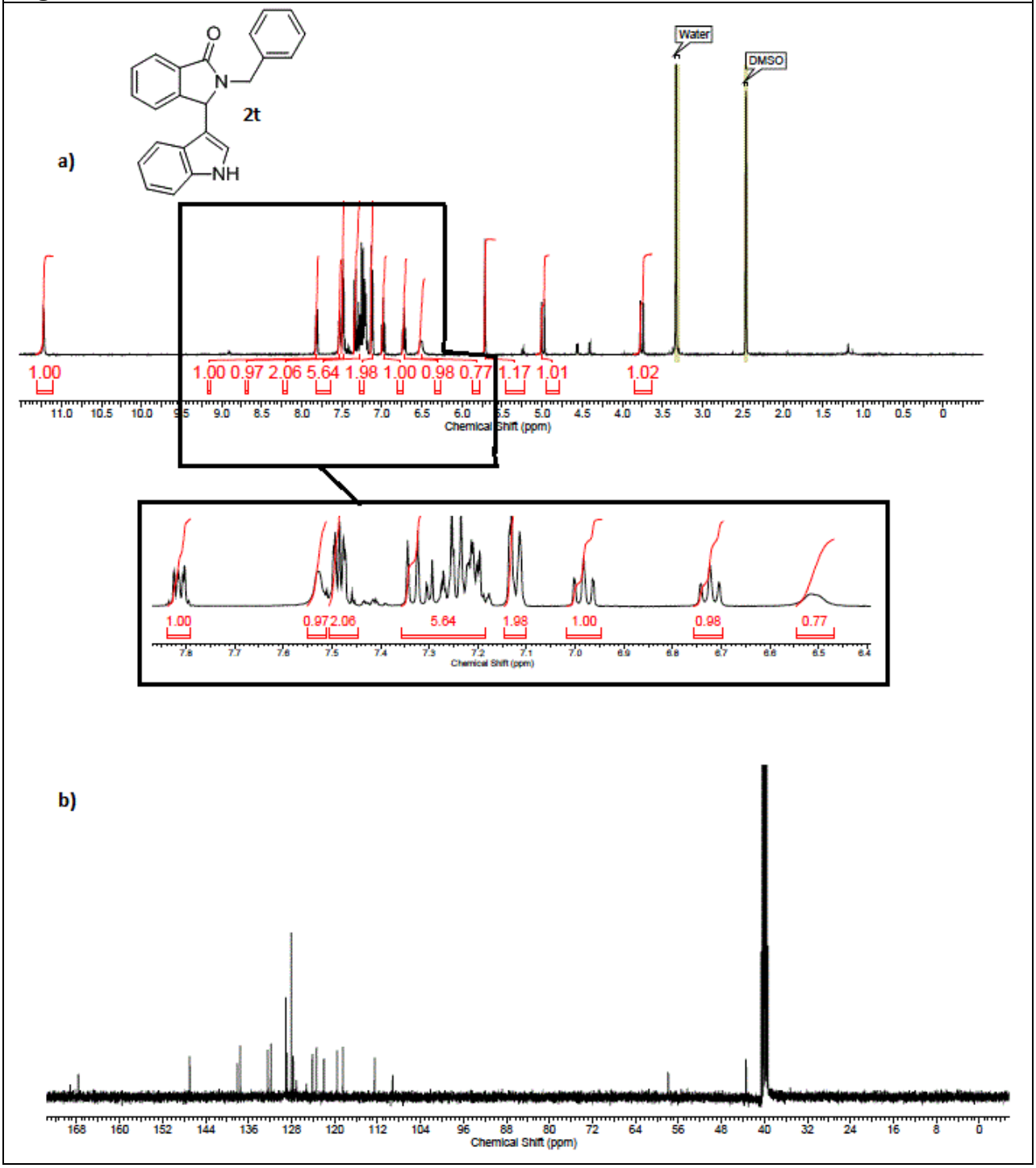

Figure S23. ^{1}H and ^{13}C NMR of **2u** in DMSO-d_6 at 298K.

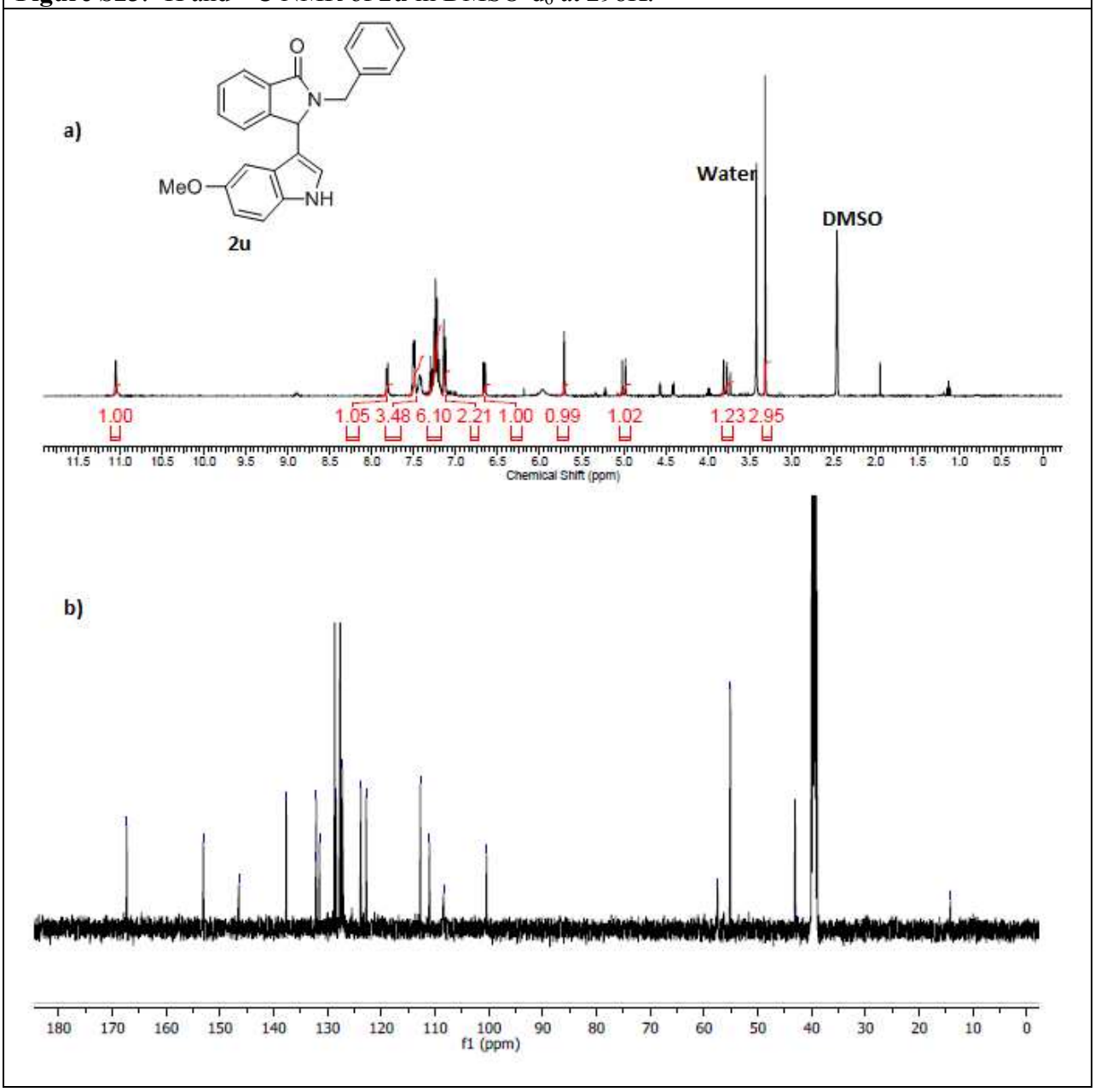

Figure S24. ^{1}H and ^{13}C NMR of **2v** in acetone-d_6 at 298K.

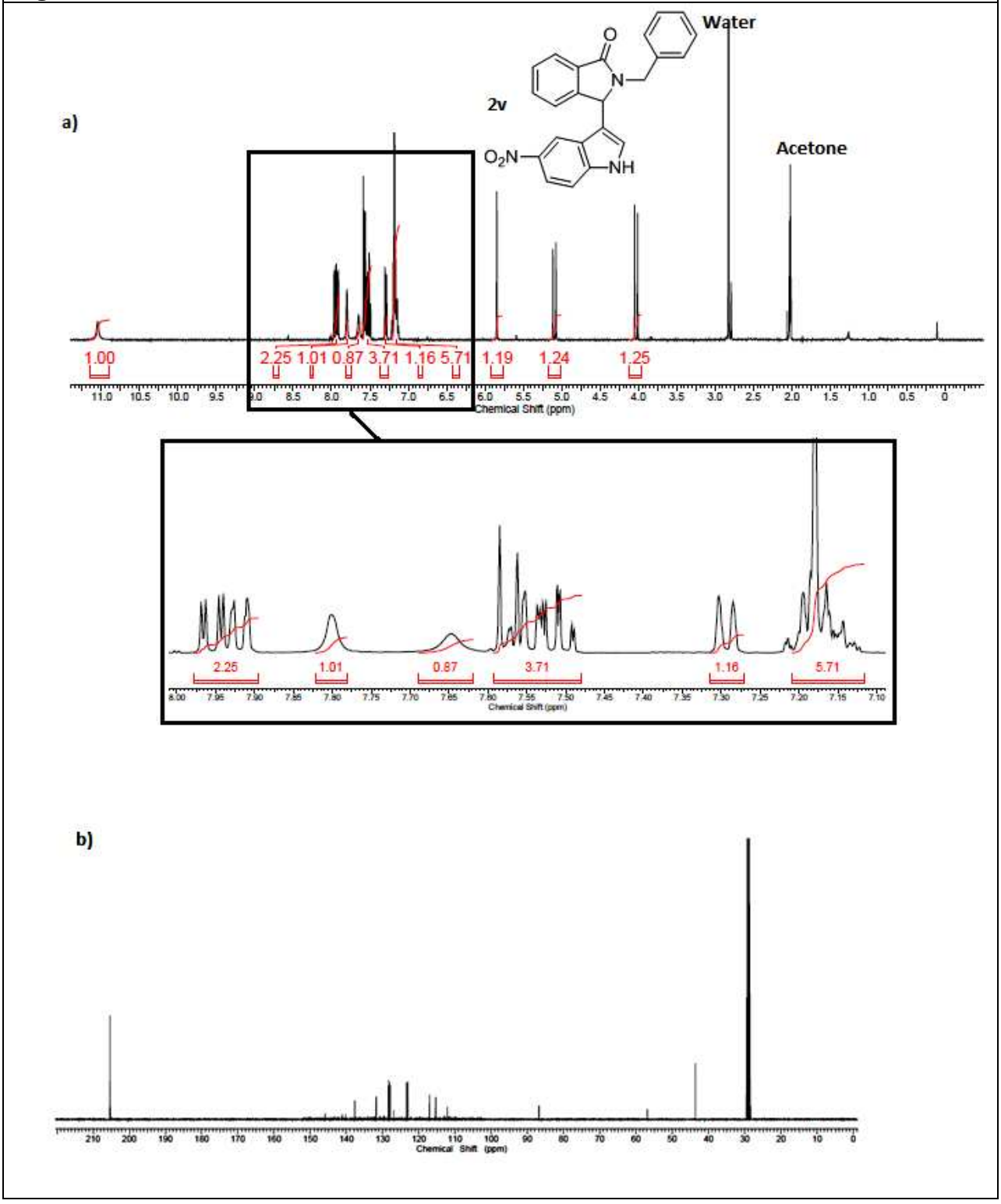

Figure S25. ^{1}H and ^{13}C NMR of **2w** in acetone-d_6 at 298K.

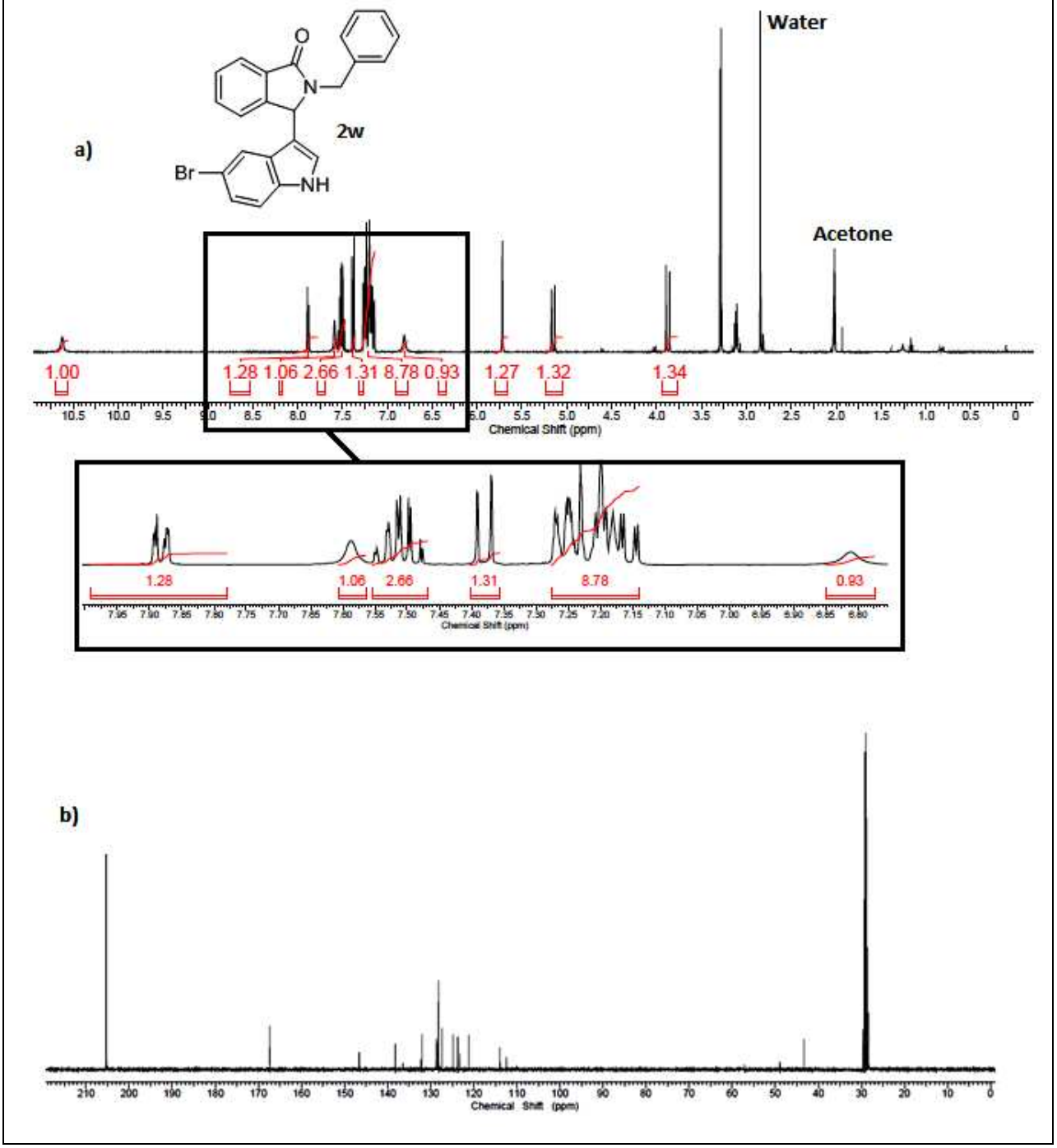

Figure S26. HRMS of **2e**

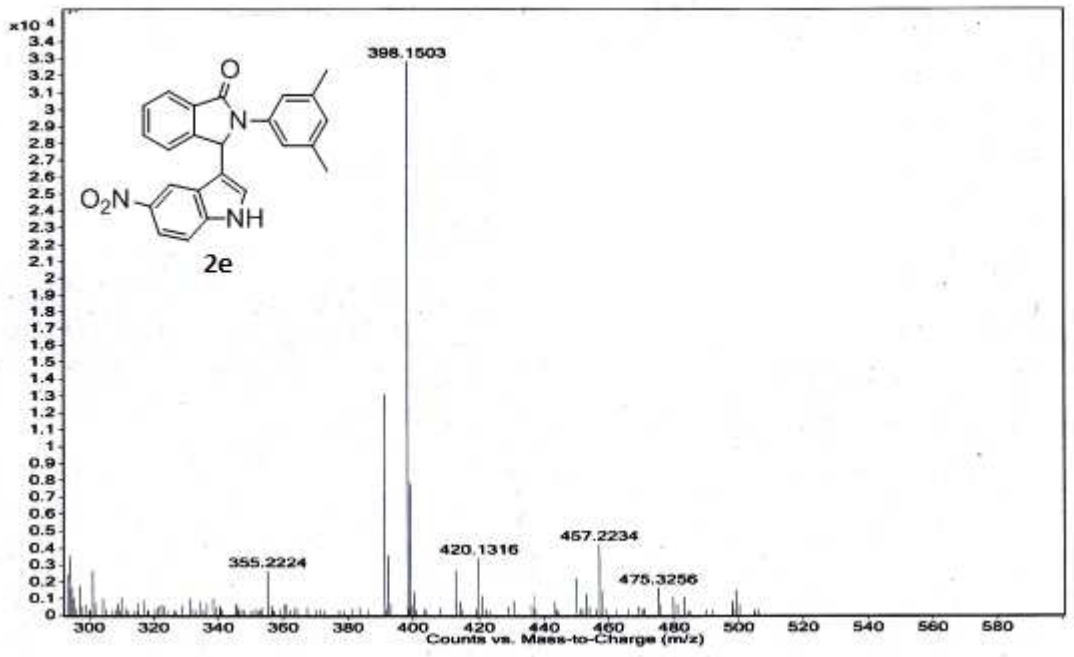

Figure S27. HRMS of **2g**

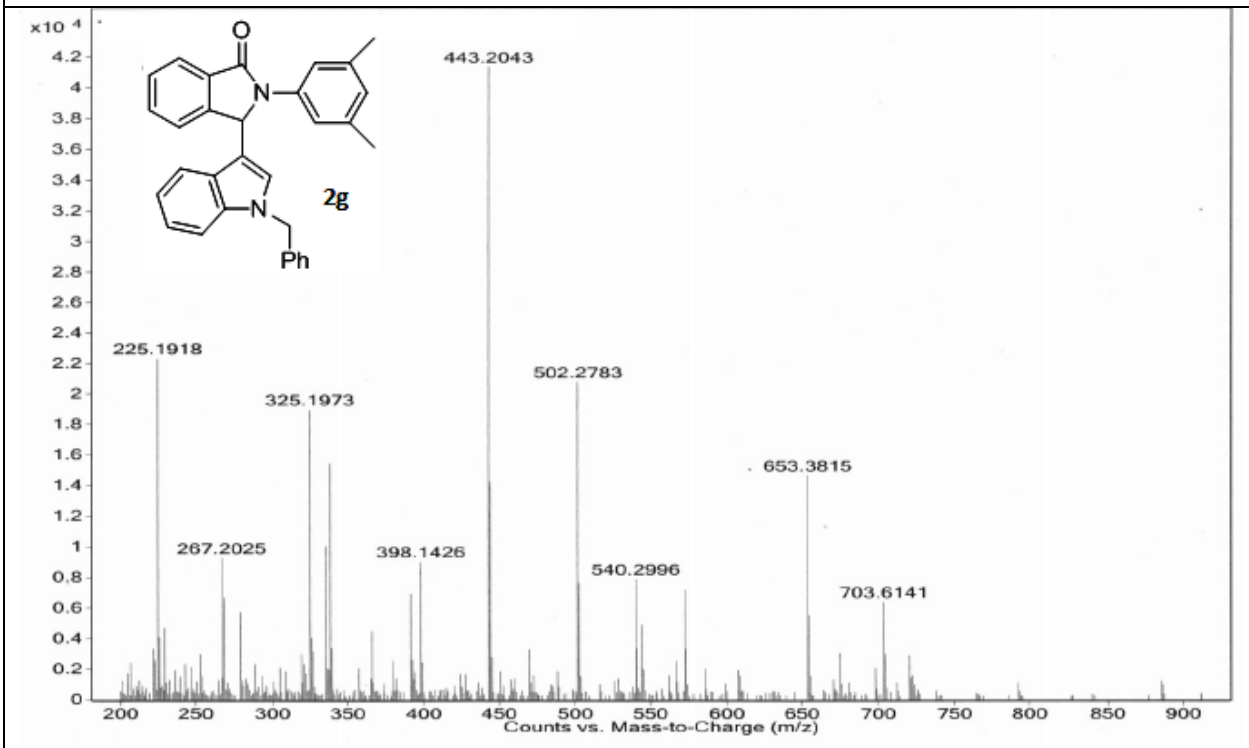

Figure S28. HRMS of **2k**

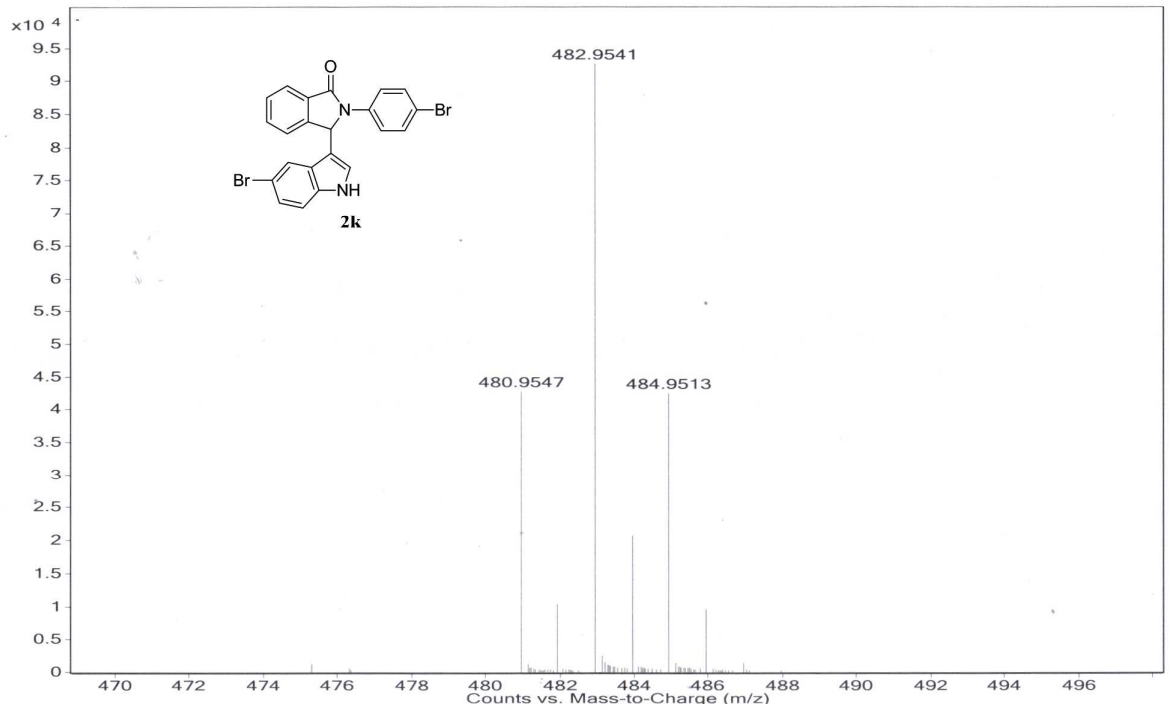

Figure S29. HRMS of **2s**