Supplementary materials

Discovery and Evaluation of Novel Sulfonamide Derivatives Targeting Aromatase in ER+ Breast Cancer

Barbara De Filippis[1], Mariangela Agamennone[1], Alessandra Ammazzalorso[1], Rosa Amoroso[1], Letizia Giampietro[1], Cristina Maccallini[1], Begüm Nurpelin Sağlık[2], Chiara De Simone[3], Maria Chiara Zuccarini[3], Zafer Asım Kaplancıklı[2], Marialuigia Fantacuzzi[1],*

[1] *Department of Pharmacy, "G. d'Annunzio" University, Chieti, Italy*

[2] *Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Anadolu University, Eskişehir, Turkey*

[3] *Department of Medical, Oral and Biotechnological Sciences, University "G. D'Annunzio" of Chieti-Pescara, 66100 Chieti, Italy*

*Corresponding author: Marialuigia Fantacuzzi, Department of Pharmacy, "G. d'Annunzio" University, Via dei Vestini 31, 66100 Chieti, Italy; Ph. +39 0871 3554685; marialuigia.fantacuzzi@unich.it

Index

Table S1	Physical and analytical data of all new synthesized compounds **1-17**	***4***
Figure S1	Identified target of compounds **1**, **3**, **9-10**, **13-14** by SwissTargetPrediction.	***4***
Figure S2	^{1}H-NMR spectra ($CDCl_3$) for *N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **1**	***15***
Figure S3	^{13}C-NMR spectra ($CDCl_3$) for *N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **1**	***16***
Figure S4	^{1}H-NMR spectra (CD_3OD) for *4-methyl-N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **2**	***17***
Figure S5	^{13}C-NMR spectra (CD_3OD) for *4-methyl-N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **2**	***18***
Figure S6	^{1}H-NMR spectra ($CDCl_3$) for *4-metyl-N-(pyridin-2-yl)benzenesulfonamide*, **3**	***19***
Figure S7	^{13}C-NMR spectra ($CDCl_3$) for *4-metyl-N-(pyridin-2-yl)benzenesulfonamide*, **3**	***20***
Figure S8	^{1}H-NMR spectra ($CDCl_3$) for *N-(5-chloropyridin-2-yl)-4-methylbenzenesulfonamide*, **4**	***21***

Figure S9	^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(5-chloropyridin-2-yl)-4-***22***methylbenzenesulfonamide*, **4**	***22***
Figure S10	^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-4-methylbenzenesulfonamide*, **5**	***23***
Figure S11	^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-4-methylbenzenesulfonamide*, **5**	***24***
Figure S12	^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-1-phenylmethanesulfonamide*, **6**	***25***
Figure S13	^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-1-phenylmethanesulfonamide*, **6**	***26***
Figure S14	^{1}H-NMR spectra (C*D*$_3$O*D*) for *N-(1-benzylpiperidin-4-yl)benzenesulfonamide*, **7**	***27***
Figure S15	^{13}C-NMR spectra (C*D*$_3$O*D*) for *N-(1-benzylpiperidin-4-yl)benzenesulfonamide*, **7**	***28***
Figure S16	^{1}H-NMR spectra (C*D*$_3$O*D*) for *N-(1-benzylpiperidin-4-yl)-4-methylbenzenesulfonamide***,** **8**	***29***
Figure S17	^{13}C-NMR spectra (C*D*$_3$O*D*) for *N-(1-benzylpiperidin-4-yl)-4-methylbenzenesulfonamide***,** **8**	***30***
Figure S18	^{1}H-NMR spectra (CDCl$_3$) for *N-(2-(piperidin-1-yl)ethyl)benzenesulfonamide,* **9**	***31***
Figure S19	^{13}C-NMR spectra (CDCl$_3$) for *N-(2-(piperidin-1-yl)ethyl)benzenesulfonamide,* **9**	***32***
Figure S20	^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-(piperidin-1-yl)ethyl)-1-(p-tolyl)methanesulfonamide*, **10**	***33***
Figure S21	^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(2-(piperidin-1-yl)ethyl)-1-(p-tolyl)methanesulfonamide*, **10**	***34***
Figure S22	^{1}H-NMR spectra (C*D*Cl$_3$) for *1-phenyl-N-(2-(piperidin-1-yl)ethyl)methanesulfonamide***,** **11**	***35***
Figure S23	: ^{13}C-NMR spectra (C*D*Cl$_3$) for *1-phenyl-N-(2-(piperidin-1-yl)ethyl)methanesulfonamide***,** **11**	***36***
Figure S24	^{1}H-NMR spectra (C*D*$_3$O*D*) for *4-methyl-N-(3-(pyrrolidin-1-yl)propyl)benzenesulfonamide*, **12**	***37***
Figure S25	^{13}C-NMR spectra (C*D*$_3$O*D*) for *4-methyl-N-(3-(pyrrolidin-1-yl)propyl)benzenesulfonamide*, **12**	***38***

Figure S26	^{1}H-NMR spectra (C*D*$_3$O*D*) for *N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **13**	***39***
Figure S27	^{13}C-NMR spectra (C*D*$_3$O*D*) for *N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **13**	***40***
Figure S28	^{1}H-NMR spectra (C*D*$_3$O*D*) for *4-methyl-N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **14**	***41***
Figure S29	^{13}C-NMR spectra (C*D*$_3$O*D*) for *4-methyl-N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **14**	***42***
Figure S30	^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-morpholinoethyl)benzenesulfonamide*, **15**	**43**
Figure S31	^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(2-morpholinoethyl)benzenesulfonamide*, **15**	***44***
Figure S32	^{1}H-NMR spectra (C*D*$_3$O*D*) for *4-methyl-N-(2-morpholinoethyl)benzenesulfonamide,* **16**	***45***
Figure S33	^{13}C-NMR spectra (C*D*$_3$O*D*) for *4-methyl-N-(2-morpholinoethyl)benzenesulfonamide,* **16**	***46***
Figure S34	^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-morpholinoethyl)-1-phenylmethanesulfonamide,* **17**	***47***
Figure S35	^{13}C-NMR spectra (CDCl$_3$) for *N-(2-morpholinoethyl)-1-phenylmethanesulfonamide,* **17**	***48***

Table S1. Physical and analytical data of all new synthesized compounds **1-17**.

cmp	MF	MW	Physical aspect	m.p. (°C)	Calculated (found)%		
					C	H	N
1	$C_{13}H_{14}N_2O_2S$	262.33	Thin needle white crystals	99.0-100.8	59.52 (59.32)	5.38 (5.37)	10.68 (10.65)
2	$C_{14}H_{16}N_2O_2S$	276.36	Thin needle crystals	119.7-120.8	60.85 (60.72)	5.84 (5.83)	10.14 (10.11)
3	$C_{12}H_{12}N_2O_2S$	248.30	Amorphous white crystal	215.5-216.1	58.05 (57.89)	4.87 (4.86)	11.28 (11.24)
4	$C_{12}H_{11}ClN_2O_2S$	282.75	Amorphous white crystal	173.2-175.4	50.97 (50.81)	3.92 (3.92)	9.91 (9.93)
5	$C_{12}H_{10}Cl_2N_2O_2S$	317.19	Amorphous white crystal	146.1-147.1	45.44 (45.34)	3.18 (3.18)	8.83 (8.80)
6	$C_{12}H_{10}Cl_2N_2O_2S$	317.19	White powder	150.2-152.7	45.44 (45.48)	3.18 (3.19)	8.83 (8.86)
7	$C_{18}H_{22}N_2O_2S$	330.45	Light Brown oil dense	-	65.42 (65.27)	6.71 (6.69)	8.48 (8.47)
8	$C_{19}H_{24}N_2O_2S$	344.47	Yellow dense oil	-	66.25 (66.04)	7.02 (7.01)	8.13 (8.11)
9	$C_{13}H_{20}N_2O_2S$	268.38	Yellow dense oil	-	58.18 (58.03)	7.51 (7.50)	10.44 (10.41)
10	$C_{14}H_{22}N_2O_2S$	282.40	White granular solid	64.9-65.3	59.54 (59.36)	7.85 (7.84)	9.92 (9.90)
11	$C_{14}H_{22}N_2O_2S$	282.40	Orange oil dense	-	59.54 (59.34)	7.85 (7.84)	9.92 (9.90)
12	$C_{14}H_{22}N_2O_2S$	282.40	Brown dense oil	-	59.54 (59.41)	7.85 (7.85)	9.92 (9.91)
13	$C_{13}H_{20}N_2O_2S$	268.38	Brown dense oil	-	58.18 (57.99)	7.51 (7.49)	10.44 (10.42)
14	$C_{14}H_{22}N_2O_2S$	282.40	Dark white powder	97.4-101.7	59.54 (59.32)	7.85 (7.84)	9.92 (9.90)
15	$C_{12}H_{18}N_2O_3S$	270.35	Brown dense oil	-	53.31 (53.15)	6.71 (6.70)	10.36 (10.33)
16	$C_{13}H_{20}N_2O_3S$	284.38	Solid white needles	110.9-111.2	54.91 (54.72)	7.09 (7.07)	9.85 (9.83)
17	$C_{13}H_{20}N_2O_3S$	284.38	Brown dense oil	-	54.91 (54.74)	7.09 (7.08)	9.85 (9.82)

Figure S1: Identified target of compounds **1**, **3**, **9-10**, **13-14** by SwissTargetPrediction. Target and common names, target class, and the Swiss Target Prediction probability were reported.

Target	Common name	Target Class	Prob*
Compound 1			
Complement C1r	C1R	Protease	0.054
Cytochrome P450 19A1	CYP19A1	Cytochrome P450	0.054
Metabotropic glutamate receptor 5	GRM5	Family C G protein-coupled receptor	0.054
Phosphodiesterase 10A	PDE10A	Phosphodiesterase	0.054
Isocitrate dehydrogenase [NADP] cytoplasmic	IDH1	Enzyme	0.054
GABA-A receptor; alpha-5/beta-3/gamma-2	GABRB3 GABRG2 GABRA5	Ligand-gated ion channel	0.054
PI3-kinase p110-delta/p85-alpha	PIK3CD PIK3R1	Enzyme	0.054

Ribosomal protein S6 kinase 1	RPS6KB1	Kinase	0.054
Serine/threonine-protein kinase Aurora-A	AURKA	Kinase	0.054
Corticotropin releasing factor receptor 1	CRHR1	Family B G protein-coupled receptor	0.054
Monoamine oxidase A	MAOA	Oxidoreductase	0.054
Monoamine oxidase B	MAOB	Oxidoreductase	0.054
Tankyrase-2	TNKS2	Enzyme	0.054
Vascular endothelial growth factor receptor 1 (by homology)	FLT1	Kinase	0.054
Dihydrofolate reductase	DHFR	Oxidoreductase	0.054
Trace amine-associated receptor 1 (by homology)	TAAR1	Family A G protein-coupled receptor	0.054
Carbonic anhydrase II	CA2	Lyase	0.054
Carbonic anhydrase VA	CA5A	Lyase	0.054
Kir3.1/Kir3.4	KCNJ5 KCNJ3	Voltage-gated ion channel	0.054
P2X purinoceptor 7	P2RX7	Ligand-gated ion channel	0.054
Alpha-2a adrenergic receptor	ADRA2A	Family A G protein-coupled receptor	0.054
Adrenergic receptor alpha-2	ADRA2C	Family A G protein-coupled receptor	0.054
Anandamide amidohydrolase	FAAH	Enzyme	0.054
Leukocyte elastase	ELANE	Protease	0.054
Histamine H4 receptor	HRH4	Family A G protein-coupled receptor	0.054
26S proteosome	PSMB1	Protease	0.054
Beta-chymotrypsin	CTRB1	Protease	0.054
Muscarinic acetylcholine receptor M2 (by homology)	CHRM2	Family A G protein-coupled receptor	0.054
Muscarinic acetylcholine receptor M1 (by homology)	CHRM1	Family A G protein-coupled receptor	0.054
Muscarinic acetylcholine receptor M3 (by homology)	CHRM3	Family A G protein-coupled receptor	0.054
Protein farnesyltransferase	FNTA FNTB	Enzyme	0.054
Cyclin-dependent kinase 1/cyclin B	CCNB3 CDK1 CCNB1 CCNB2	Other cytosolic protein	0.054
Tyrosine-protein kinase JAK3	JAK3	Kinase	0.054
Serine/threonine protein phosphatase PP1-alpha catalytic subunit	PPP1CA	Phosphatase	0.054
Glycogen synthase kinase-3 beta	GSK3B	Kinase	0.054
Tyrosine-protein kinase JAK2	JAK2	Kinase	0.054
Tankyrase-1	TNKS	Enzyme	0.054
Epoxide hydratase	EPHX2	Protease	0.054
Adenosine A2a receptor	ADORA2A	Family A G protein-coupled receptor	0.054
Hormone sensitive lipase	LIPE	Enzyme	0.054
ATP-binding cassette sub-family G member 2	ABCG2	Primary active transporter	0.054
Tyrosine-protein kinase SYK	SYK	Kinase	0.054
Focal adhesion kinase 1	PTK2	Kinase	0.054
TGF-beta receptor type I	TGFBR1	Kinase	0.054
Elongation of very long chain fatty acids protein 6	ELOVL6	Enzyme	0.054
Translocator protein (by homology)	TSPO	Membrane receptor	0.054
3-phosphoinositide dependent protein kinase-1	PDPK1	Kinase	0.054

Alpha-ketoglutarate-dependent dioxygenase alkB homolog 3	ALKBH3	Enzyme	0.054
Sodium/potassium/calcium exchanger 6 mitochondrial	SLC8B1	Electrochemical transporter	0.054
Proteinase-activated receptor 1	F2R	Family A G protein-coupled receptor	0.054
Nitric-oxide synthase endothelial	NOS3	Enzyme	0.054
Serine/threonine-protein kinase PIM1	PIM1	Kinase	0.054
Dopamine transporter (by homology)	SLC6A3	Electrochemical transporter	0.054
Interleukin-1 receptor-associated kinase 4	IRAK4	Kinase	0.054
Cyclin-dependent kinase 2	CDK2	Kinase	0.054
Fructose-1 6-bisphosphatase	FBP1	Enzyme	0.054
Huntingtin	HTT	Unclassified protein	0.054
Interferon-induced double-stranded RNA-activated protein kinase	EIF2AK2	Kinase	0.054
Tyrosine-protein kinase receptor FLT3	FLT3	Kinase	0.054
Alpha-1d adrenergic receptor	ADRA1D	Family A G protein-coupled receptor	0.054
Vascular endothelial growth factor receptor 2	KDR	Kinase	0.054
Serine/threonine-protein kinase 17B	STK17B	Kinase	0.054
Serine/threonine-protein kinase SRPK1	SRPK1	Kinase	0.054
Metabotropic glutamate receptor 2 (by homology)	GRM2	Family C G protein-coupled receptor	0.054
Geranylgeranyl transferase type I	PGGT1B FNTA	Enzyme	0.054
MAP kinase p38 alpha	MAPK14	Kinase	0.054
Glutaminyl-peptide cyclotransferase	QPCT	Enzyme	0.054
Epoxide hydrolase 1	EPHX1	Protease	0.054
Cytochrome P450 17A1 (by homology)	CYP17A1	Cytochrome P450	0.054
Protein tyrosine kinase 2 beta	PTK2B	Kinase	0.054
Phosphodiesterase 5A	PDE5A	Phosphodiesterase	0.054
GABA-A receptor; alpha-3/beta-3/gamma-2	GABRB3 GABRA3 GABRG2	Ligand-gated ion channel	0.054
GABA-A receptor; alpha-1/beta-3/gamma-2	GABRB3 GABRG2 GABRA1	Ligand-gated ion channel	0.054
GABA-A receptor; alpha-2/beta-3/gamma-2	GABRA2 GABRB3 GABRG2	Ligand-gated ion channel	0.054
Cyclooxygenase-1	PTGS1	Oxidoreductase	0.054
Death-associated protein kinase 3	DAPK3	Kinase	0.054
Melanin-concentrating hormone receptor 1	MCHR1	Family A G protein-coupled receptor	0.054
Vanilloid receptor	TRPV1	Voltage-gated ion channel	0.054
Acyl-CoA desaturase	SCD	Enzyme	0.054
Menin	MEN1	Unclassified protein	0.054
Voltage-gated L-type calcium channel alpha-1C subunit	CACNA1C	Voltage-gated ion channel	0.054
GABA-A receptor; alpha-6/beta-3/gamma-2	GABRG2 GABRB3 GABRA6	Ligand-gated ion channel	0.054
GABA A receptor alpha-4/beta-3/gamma-2	GABRB3 GABRA4 GABRG2	Ligand-gated ion channel	0.054
c-Jun N-terminal kinase 3	MAPK10	Kinase	0.054
Cyclin-dependent kinase 1	CDK1	Kinase	0.054
Metabotropic glutamate receptor 1	GRM1	Family C G protein-coupled receptor	0.054

Bile acid receptor FXR	NR1H4	Nuclear receptor	0.054
Puromycin-sensitive aminopeptidase	NPEPPS	Protease	0.054
Cytochrome P450 2C9	CYP2C9	Cytochrome P450	0.054
LXR-beta	NR1H2	Nuclear receptor	0.054
N-acylsphingosine-amidohydrolase (by homology)	NAAA	Enzyme	0.054
Butyrylcholinesterase	BCHE	Hydrolase	0.054
Macrophage migration inhibitory factor	MIF	Enzyme	0.054
Metabotropic glutamate receptor 4	GRM4	Family C G protein-coupled receptor	0.054
MAP kinase p38 beta	MAPK11	Kinase	0.054
Galanin receptor 3	GALR3	Family A G protein-coupled receptor	0.054
Fatty acid desaturase 1	FADS1	Enzyme	0.054
Macrophage colony stimulating factor receptor	CSF1R	Kinase	0.054
Phosphodiesterase 3	PDE3A	Phosphodiesterase	0.054
Compound 3			
11-beta-hydroxysteroid dehydrogenase 1	HSD11B1	Enzyme	0.103
Endothelin receptor ET-A	EDNRA	Family A G protein-coupled receptor	0.058
Protein tyrosine kinase 2 beta	PTK2B	Kinase	0.049
Cyclooxygenase-2	PTGS2	Oxidoreductase	0.049
C-C chemokine receptor type 1	CCR1	Family A G protein-coupled receptor	0.049
C-C chemokine receptor type 4	CCR4	Family A G protein-coupled receptor	0.049
C-C chemokine receptor type 2	CCR2	Family A G protein-coupled receptor	0.049
Peptide N-myristoyltransferase 1	NMT1	Enzyme	0.049
Bromodomain-containing protein 4	BRD4	Reader	0.049
Carbonic anhydrase II	CA2	Lyase	0.049
Receptor protein-tyrosine kinase erbB-2	ERBB2	Kinase	0.049
Bromodomain-containing protein 3	BRD3	Reader	0.049
Toll-like receptor 4	TLR4	Toll-like and Il-1 receptors	0.049
Cholecystokinin B receptor	CCKBR	Family A G protein-coupled receptor	0.049
Bromodomain-containing protein 7	BRD7	Reader	0.049
Adenosine A2a receptor	ADORA2A	Family A G protein-coupled receptor	0.049
Carbonic anhydrase I	CA1	Lyase	0.049
Carbonic anhydrase XII	CA12	Lyase	0.049
Carbonic anhydrase IX	CA9	Lyase	0.049
Peroxisome proliferator-activated receptor alpha	PPARA	Nuclear receptor	0.049
Coagulation factor XIII	F13A1	Aminoacyltransferase	0.049
c-Jun N-terminal kinase 3	MAPK10	Kinase	0.049
Bromodomain-containing protein 2	BRD2	Reader	0.049
fructose-2 6-bisphosphatase 3/4_UNCURATED	PFKFB4 PFKFB3	Enzyme	0.049
Serine/threonine-protein kinase AKT	AKT1	Kinase	0.049
Monoamine oxidase B	MAOB	Oxidoreductase	0.049
Poly [ADP-ribose] polymerase-1	PARP1	Enzyme	0.049
Compound 9			
Sigma opioid receptor	SIGMAR1	Membrane receptor	0.199
Serotonin 7 (5-HT7) receptor	HTR7	Family A G protein-coupled receptor	0.063

Norepinephrine transporter	SLC6A2	Electrochemical transporter	0.054
Serotonin transporter	SLC6A4	Electrochemical transporter	0.054
HERG	KCNH2	Voltage-gated ion channel	0.054
Serotonin 2a (5-HT2a) receptor	HTR2A	Family A G protein-coupled receptor	0.054
Serotonin 2c (5-HT2c) receptor	HTR2C	Family A G protein-coupled receptor	0.054
11-beta-hydroxysteroid dehydrogenase 1	HSD11B1	Enzyme	0.054
Cathepsin (B and K)	CTSB	Protease	0.054
Transient receptor potential cation channel subfamily V member 4	TRPV4	Voltage-gated ion channel	0.054
Calpain 1	CAPN1	Protease	0.054
Dopamine D2 receptor	DRD2	Family A G protein-coupled receptor	0.054
Dopamine D3 receptor	DRD3	Family A G protein-coupled receptor	0.054
Acetylcholinesterase	ACHE	Hydrolase	0.054
Polyadenylate-binding protein 1	PABPC1	Unclassified protein	0.054
FK506-binding protein 1A	FKBP1A	Isomerase	0.054
Serotonin 1a (5-HT1a) receptor	HTR1A	Family A G protein-coupled receptor	0.054
Serotonin 1b (5-HT1b) receptor	HTR1B	Family A G protein-coupled receptor	0.054
Serotonin 1d (5-HT1d) receptor	HTR1D	Family A G protein-coupled receptor	0.054
Dopamine transporter	SLC6A3	Electrochemical transporter	0.054
Phosphodiesterase 2A	PDE2A	Phosphodiesterase	0.054
Phosphodiesterase 10A (by homology)	PDE10A	Phosphodiesterase	0.054
Prolyl endopeptidase	PREP	Protease	0.054
Monoamine oxidase B	MAOB	Oxidoreductase	0.054
Lysine-specific histone demethylase 1	KDM1A	Eraser	0.054
Cannabinoid receptor 1	CNR1	Family A G protein-coupled receptor	0.054
Toll-like receptor (TLR7/TLR9)	TLR9	Toll-like and Il-1 receptors	0.054
Multidrug and toxin extrusion protein 1	SLC47A1	Electrochemical transporter	0.054
Serotonin 1f (5-HT1f) receptor	HTR1F	Family A G protein-coupled receptor	0.054
Serotonin 3a (5-HT3a) receptor	HTR3A	Ligand-gated ion channel	0.054
Cathepsin L	CTSL	Protease	0.054
Alpha-1 6-mannosyl-glycoprotein 2-beta-N-acetylglucosaminyltransferase	MGAT2	Enzyme	0.054
Serotonin 6 (5-HT6) receptor	HTR6	Family A G protein-coupled receptor	0.054
Serotonin 5a (5-HT5a) receptor	HTR5A	Family A G protein-coupled receptor	0.054
Histamine H4 receptor	HRH4	Family A G protein-coupled receptor	0.054
Dopamine D1 receptor	DRD1	Family A G protein-coupled receptor	0.054
Thrombin and coagulation factor X	F10	Protease	0.054
Metabotropic glutamate receptor 2 (by homology)	GRM2	Family C G protein-coupled receptor	0.054
Butyrylcholinesterase	BCHE	Hydrolase	0.054
Delta opioid receptor	OPRD1	Family A G protein-coupled receptor	0.054
Nociceptin receptor	OPRL1	Family A G protein-coupled receptor	0.054
Serine/threonine-protein kinase PIM1	PIM1	Kinase	0.054
Serotonin 2b (5-HT2b) receptor	HTR2B	Family A G protein-coupled receptor	0.054
Adenosine A3 receptor	ADORA3	Family A G protein-coupled receptor	0.054
Mu opioid receptor	OPRM1	Family A G protein-coupled receptor	0.054
Poly [ADP-ribose] polymerase-1	PARP1	Enzyme	0.054

Neuronal acetylcholine receptor protein alpha-4 subunit	CHRNA4	Ligand-gated ion channel	0.054
Neuronal acetylcholine receptor subunit alpha-3	CHRNA3	Ligand-gated ion channel	0.054
Dipeptidyl peptidase I	CTSC	Protease	0.054
Matrix metalloproteinase 3	MMP3	Protease	0.054
Cathepsin K	CTSK	Protease	0.054
Neuronal acetylcholine receptor; alpha4/beta4	CHRNB4 CHRNA4	Ligand-gated ion channel	0.054
Neuronal acetylcholine receptor; alpha3/beta2	CHRNA3 CHRNB2	Ligand-gated ion channel	0.054
Nicotinic acetylcholine receptor alpha2/beta4	CHRNB4 CHRNA1	Ligand-gated ion channel	0.054
Muscarinic acetylcholine receptor M4	CHRM4	Family A G protein-coupled receptor	0.054
Adrenergic receptor alpha-2	ADRA2C	Family A G protein-coupled receptor	0.054
Alpha-2b adrenergic receptor	ADRA2B	Family A G protein-coupled receptor	0.054
Muscarinic acetylcholine receptor M5	CHRM5	Family A G protein-coupled receptor	0.054
Epidermal growth factor receptor erbB1	EGFR	Kinase	0.054
Muscarinic acetylcholine receptor M2	CHRM2	Family A G protein-coupled receptor	0.054
Muscarinic acetylcholine receptor M3	CHRM3	Family A G protein-coupled receptor	0.054
Compound 10			
Acetylcholinesterase	ACHE	Hydrolase	0.120
Serotonin 6 (5-HT6) receptor	HTR6	Family A G protein-coupled receptor	0.112
Muscarinic acetylcholine receptor M1 (by homology)	CHRM1	Family A G protein-coupled receptor	0.112
Dopamine D4 receptor	DRD4	Family A G protein-coupled receptor	0.112
Norepinephrine transporter	SLC6A2	Electrochemical transporter	0.112
Serotonin transporter	SLC6A4	Electrochemical transporter	0.112
11-beta-hydroxysteroid dehydrogenase 1	HSD11B1	Enzyme	0.112
Serotonin 1a (5-HT1a) receptor	HTR1A	Family A G protein-coupled receptor	0.112
Multidrug and toxin extrusion protein 1	SLC47A1	Electrochemical transporter	0.112
Serotonin 1f (5-HT1f) receptor	HTR1F	Family A G protein-coupled receptor	0.112
Serotonin 1b (5-HT1b) receptor	HTR1B	Family A G protein-coupled receptor	0.112
Serotonin 3a (5-HT3a) receptor	HTR3A	Ligand-gated ion channel	0.112
Serotonin 1d (5-HT1d) receptor	HTR1D	Family A G protein-coupled receptor	0.112
Serotonin 1e (5-HT1e) receptor	HTR1E	Family A G protein-coupled receptor	0.112
Serotonin 2c (5-HT2c) receptor	HTR2C	Family A G protein-coupled receptor	0.112
Serotonin 5a (5-HT5a) receptor	HTR5A	Family A G protein-coupled receptor	0.112
Lethal(3)malignant brain tumor-like protein 3	L3MBTL3	Reader	0.112
Histamine H1 receptor	HRH1	Family A G protein-coupled receptor	0.112
Glutamate [NMDA] receptor subunit epsilon 2	GRIN2B	Ligand-gated ion channel	0.112
Dopamine D1 receptor	DRD1	Family A G protein-coupled receptor	0.112
Dopamine transporter	SLC6A3	Electrochemical transporter	0.112
Transient receptor potential cation channel subfamily V member 4	TRPV4	Voltage-gated ion channel	0.112
C-C chemokine receptor type 4	CCR4	Family A G protein-coupled receptor	0.112
Nociceptin receptor	OPRL1	Family A G protein-coupled receptor	0.112

Neuronal acetylcholine receptor; alpha4/beta2	CHRNA4 CHRNB2	Ligand-gated ion channel	0.112
Metabotropic glutamate receptor 2	GRM2	Family C G protein-coupled receptor	0.112
Histamine H4 receptor	HRH4	Family A G protein-coupled receptor	0.112
Rho-associated protein kinase	ROCK2 ROCK1	Kinase	0.112
Somatostatin receptor 3	SSTR3	Family A G protein-coupled receptor	0.112
Neuronal acetylcholine receptor; alpha4/beta4	CHRNB4 CHRNA4	Ligand-gated ion channel	0.112
Neuronal acetylcholine receptor; alpha3/beta4	CHRNA3 CHRNB4	Ligand-gated ion channel	0.112
Neuronal acetylcholine receptor; alpha3/beta2	CHRNA3 CHRNB2	Ligand-gated ion channel	0.112
Nicotinic acetylcholine receptor alpha2/beta4	CHRNB4 CHRNA1	Ligand-gated ion channel	0.112
Progesterone receptor	PGR	Nuclear receptor	0.112
Phosphodiesterase 2A	PDE2A	Phosphodiesterase	0.112
Phosphodiesterase 10A (by homology)	PDE10A	Phosphodiesterase	0.112
Serine/threonine-protein kinase PIM1	PIM1	Kinase	0.112
Serine/threonine-protein kinase PIM2	PIM2	Kinase	0.112
Leukotriene A4 hydrolase	LTA4H	Protease	0.112
Monoamine oxidase A	MAOA	Oxidoreductase	0.112
Monoamine oxidase B	MAOB	Oxidoreductase	0.112
Lysine-specific histone demethylase 1	KDM1A	Eraser	0.112
Synaptic vesicular amine transporter (by homology)	SLC18A2	Electrochemical transporter	0.112
Calcium sensing receptor	CASR	Family C G protein-coupled receptor	0.112
Alpha-2a adrenergic receptor	ADRA2A	Family A G protein-coupled receptor	0.112
Serotonin 2b (5-HT2b) receptor	HTR2B	Family A G protein-coupled receptor	0.112
Alpha-16-mannosyl-glycoprotein 2-beta-N-acetylglucosaminyltransferase	MGAT2	Enzyme	0.112
Telomerase reverse transcriptase	TERT	Enzyme	0.112
Dopamine D5 receptor	DRD5	Family A G protein-coupled receptor	0.112
Muscarinic acetylcholine receptor M3	CHRM3	Family A G protein-coupled receptor	0.112
Translocator protein (by homology)	TSPO	Membrane receptor	0.112
Glutamate NMDA receptor; GRIN1/GRIN2B	GRIN1 GRIN2B	Ligand-gated ion channel	0.112
Cathepsin S	CTSS	Protease	0.112
Rho-associated protein kinase 2	ROCK2	Kinase	0.112
Compound 13			
Serotonin 7 (5-HT7) receptor	HTR7	Family A G protein-coupled receptor	0.535
Serotonin 2a (5-HT2a) receptor	HTR2A	Family A G protein-coupled receptor	0.525
Serotonin 2c (5-HT2c) receptor	HTR2C	Family A G protein-coupled receptor	0.525
Serotonin 1b (5-HT1b) receptor	HTR1B	Family A G protein-coupled receptor	0.444
Serotonin 1d (5-HT1d) receptor	HTR1D	Family A G protein-coupled receptor	0.444
Dopamine D2 receptor	DRD2	Family A G protein-coupled receptor	0.444
Dopamine D3 receptor	DRD3	Family A G protein-coupled receptor	0.444
Serotonin 1a (5-HT1a) receptor	HTR1A	Family A G protein-coupled receptor	0.426
Serotonin 2b (5-HT2b) receptor	HTR2B	Family A G protein-coupled receptor	0.280
Serotonin transporter	SLC6A4	Electrochemical transporter	0.217
Alpha-1b adrenergic receptor	ADRA1B	Family A G protein-coupled receptor	0.181

Serotonin 6 (5-HT6) receptor	HTR6	Family A G protein-coupled receptor	0.181
Serotonin 5a (5-HT5a) receptor	HTR5A	Family A G protein-coupled receptor	0.181
HERG	KCNH2	Voltage-gated ion channel	0.153
Serotonin 1e (5-HT1e) receptor	HTR1E	Family A G protein-coupled receptor	0.090
Lethal(3)malignant brain tumor-like protein 3	L3MBTL3	Reader	0.090
Acetylcholinesterase	ACHE	Hydrolase	0.081
Norepinephrine transporter	SLC6A2	Electrochemical transporter	0.063
Serotonin 4 (5-HT4) receptor	HTR4	Family A G protein-coupled receptor	0.063
Carbonic anhydrase II	CA2	Lyase	0.063
Carbonic anhydrase XII	CA12	Lyase	0.063
Carbonic anhydrase IX	CA9	Lyase	0.063
Sigma opioid receptor	SIGMAR1	Membrane receptor	0.054
Glycine transporter 1	SLC6A9	Electrochemical transporter	0.054
11-beta-hydroxysteroid dehydrogenase 1	HSD11B1	Enzyme	0.054
Cathepsin K	CTSK	Protease	0.054
Cathepsin L	CTSL	Protease	0.054
Cathepsin (B and K)	CTSB	Protease	0.054
Serotonin 1f (5-HT1f) receptor	HTR1F	Family A G protein-coupled receptor	0.054
Multidrug and toxin extrusion protein 1	SLC47A1	Electrochemical transporter	0.054
Serotonin 3a (5-HT3a) receptor	HTR3A	Ligand-gated ion channel	0.054
Phosphodiesterase 2A	PDE2A	Phosphodiesterase	0.054
Phosphodiesterase 10A (by homology)	PDE10A	Phosphodiesterase	0.054
Beta amyloid A4 protein	APP	Membrane receptor	0.054
Lanosterol synthase	LSS	Enzyme	0.054
Neuronal acetylcholine receptor; alpha4/beta4	CHRNB4 CHRNA4	Ligand-gated ion channel	0.054
Neuronal acetylcholine receptor; alpha3/beta4	CHRNA3 CHRNB4	Ligand-gated ion channel	0.054
Neuronal acetylcholine receptor; alpha3/beta2	CHRNA3 CHRNB2	Ligand-gated ion channel	0.054
Nicotinic acetylcholine receptor alpha2/beta4	CHRNB4 CHRNA1	Ligand-gated ion channel	0.054
Dopamine D1 receptor	DRD1	Family A G protein-coupled receptor	0.054
Dipeptidyl peptidase IV	DPP4	Protease	0.054
Gamma-secretase	PSEN2 PSENEN NCSTN APH1A PSEN1 APH1B	Protease	0.054
Muscarinic acetylcholine receptor M4	CHRM4	Family A G protein-coupled receptor	0.054
Butyrylcholinesterase	BCHE	Hydrolase	0.054
Alpha-2b adrenergic receptor	ADRA2B	Family A G protein-coupled receptor	0.054
Muscarinic acetylcholine receptor M5	CHRM5	Family A G protein-coupled receptor	0.054
Muscarinic acetylcholine receptor M3	CHRM3	Family A G protein-coupled receptor	0.054
Toll-like receptor (TLR7/TLR9)	TLR9	Toll-like and Il-1 receptors	0.054
Monoamine oxidase B	MAOB	Oxidoreductase	0.054
Lysine-specific histone demethylase 1	KDM1A	Eraser	0.054
Glucose-6-phosphate 1-dehydrogenase	G6PD	Enzyme	0.054
Cytochrome P450 19A1	CYP19A1	Cytochrome P450	0.054
Histamine H3 receptor	HRH3	Family A G protein-coupled receptor	0.054

Neuronal acetylcholine receptor protein alpha-4 subunit	CHRNA4	Ligand-gated ion channel	0.054
Neuronal acetylcholine receptor subunit alpha-3	CHRNA3	Ligand-gated ion channel	0.054
Neuronal acetylcholine receptor protein alpha-7 subunit	CHRNA7	Ligand-gated ion channel	0.054
Beta-1 adrenergic receptor	ADRB1	Family A G protein-coupled receptor	0.054
Monoamine oxidase A	MAOA	Oxidoreductase	0.054
Histamine H4 receptor	HRH4	Family A G protein-coupled receptor	0.054
Lethal(3)malignant brain tumor-like protein 1	L3MBTL1	Reader	0.054
MBT domain-containing protein 1	MBTD1	Reader	0.054
Voltage-gated N-type calcium channel alpha-1B subunit	CACNA1B	Voltage-gated ion channel	0.054
Nociceptin receptor	OPRL1	Family A G protein-coupled receptor	0.054
MAP kinase p38 alpha	MAPK14	Kinase	0.054
Dopamine D5 receptor	DRD5	Family A G protein-coupled receptor	0.054
Neuropeptide Y receptor type 5	NPY5R	Family A G protein-coupled receptor	0.054
Myeloperoxidase	MPO	Enzyme	0.054
Nitric oxide synthase inducible	NOS2	Enzyme	0.054
Thromboxane A2 receptor	TBXA2R	Family A G protein-coupled receptor	0.054
Compound 14			
Serotonin 2a (5-HT2a) receptor	HTR2A	Family A G protein-coupled receptor	0.308
Serotonin 2c (5-HT2c) receptor	HTR2C	Family A G protein-coupled receptor	0.308
Serotonin 7 (5-HT7) receptor	HTR7	Family A G protein-coupled receptor	0.230
Serotonin 1b (5-HT1b) receptor	HTR1B	Family A G protein-coupled receptor	0.214
Serotonin 1d (5-HT1d) receptor	HTR1D	Family A G protein-coupled receptor	0.214
Serotonin 1a (5-HT1a) receptor	HTR1A	Family A G protein-coupled receptor	0.214
Dopamine D2 receptor	DRD2	Family A G protein-coupled receptor	0.214
Dopamine D3 receptor	DRD3	Family A G protein-coupled receptor	0.214
Serotonin 2b (5-HT2b) receptor	HTR2B	Family A G protein-coupled receptor	0.159
Carbonic anhydrase II	CA2	Lyase	0.143
Carbonic anhydrase XII	CA12	Lyase	0.143
Carbonic anhydrase IX	CA9	Lyase	0.143
Serotonin transporter	SLC6A4	Electrochemical transporter	0.143
Alpha-1b adrenergic receptor	ADRA1B	Family A G protein-coupled receptor	0.143
HERG	KCNH2	Voltage-gated ion channel	0.136
Acetylcholinesterase	ACHE	Hydrolase	0.136
Serotonin 6 (5-HT6) receptor	HTR6	Family A G protein-coupled receptor	0.136
Serotonin 5a (5-HT5a) receptor	HTR5A	Family A G protein-coupled receptor	0.128
Lethal(3)malignant brain tumor-like protein 3	L3MBTL3	Reader	0.128
11-beta-hydroxysteroid dehydrogenase 1	HSD11B1	Enzyme	0.120
Serotonin 1e (5-HT1e) receptor	HTR1E	Family A G protein-coupled receptor	0.112
Norepinephrine transporter	SLC6A2	Electrochemical transporter	0.112
Serotonin 4 (5-HT4) receptor	HTR4	Family A G protein-coupled receptor	0.112
Sigma opioid receptor	SIGMAR1	Membrane receptor	0.112
Voltage-gated N-type calcium channel alpha-1B subunit	CACNA1B	Voltage-gated ion channel	0.112

Phosphodiesterase 2A	PDE2A	Phosphodiesterase	0.112
Phosphodiesterase 10A (by homology)	PDE10A	Phosphodiesterase	0.112
Histamine H3 receptor	HRH3	Family A G protein-coupled receptor	0.112
Histamine H4 receptor	HRH4	Family A G protein-coupled receptor	0.112
Cathepsin K	CTSK	Protease	0.112
Epoxide hydratase	EPHX2	Protease	0.112
Serotonin 1f (5-HT1f) receptor	HTR1F	Family A G protein-coupled receptor	0.112
Lanosterol synthase	LSS	Enzyme	0.112
Glycine transporter 1	SLC6A9	Electrochemical transporter	0.112
Neuropeptide Y receptor type 5	NPY5R	Family A G protein-coupled receptor	0.112
Dopamine D1 receptor	DRD1	Family A G protein-coupled receptor	0.112
Nociceptin receptor	OPRL1	Family A G protein-coupled receptor	0.112
Beta-1 adrenergic receptor	ADRB1	Family A G protein-coupled receptor	0.112
Multidrug and toxin extrusion protein 1	SLC47A1	Electrochemical transporter	0.112
Serotonin 3a (5-HT3a) receptor	HTR3A	Ligand-gated ion channel	0.112
Glutamate [NMDA] receptor subunit epsilon 2	GRIN2B	Ligand-gated ion channel	0.112
Neuropeptide Y receptor type 1	NPY1R	Family A G protein-coupled receptor	0.112
Cytochrome P450 19A1	CYP19A1	Cytochrome P450	0.112
Muscarinic acetylcholine receptor M4	CHRM4	Family A G protein-coupled receptor	0.112
Butyrylcholinesterase	BCHE	Hydrolase	0.112
Alpha-2b adrenergic receptor	ADRA2B	Family A G protein-coupled receptor	0.112
Muscarinic acetylcholine receptor M5	CHRM5	Family A G protein-coupled receptor	0.112
Neuronal acetylcholine receptor; alpha4/beta4	CHRNB4 CHRNA4	Ligand-gated ion channel	0.112
Neuronal acetylcholine receptor; alpha3/beta4	CHRNA3 CHRNB4	Ligand-gated ion channel	0.112
Neuronal acetylcholine receptor; alpha3/beta2	CHRNA3 CHRNB2	Ligand-gated ion channel	0.112
Nicotinic acetylcholine receptor alpha2/beta4	CHRNB4 CHRNA1	Ligand-gated ion channel	0.112
Protein-glutamine gamma-glutamyltransferase	TGM2	Enzyme	0.112
Neuronal acetylcholine receptor protein alpha-7 subunit	CHRNA7	Ligand-gated ion channel	0.112
Somatostatin receptor 3	SSTR3	Family A G protein-coupled receptor	0.112
Acetylcholine receptor; alpha1/beta1/delta/gamma	CHRNB1 CHRNA1 CHRNG CHRND	Ligand-gated ion channel	0.112
Multidrug resistance-associated protein 1	ABCC1	Primary active transporter	0.112
P-glycoprotein 1 (by homology)	ABCB1	Primary active transporter	0.112
Neuronal acetylcholine receptor subunit alpha-3	CHRNA3	Ligand-gated ion channel	0.112
Urotensin II receptor	UTS2R	Family A G protein-coupled receptor	0.112
Monoamine oxidase B	MAOB	Oxidoreductase	0.112
Lysine-specific histone demethylase 1	KDM1A	Eraser	0.112
Cytochrome b-245 heavy chain	CYBB	Transmembrane 1-electron transfer carriers	0.112
Cathepsin L	CTSL	Protease	0.112
Cathepsin (B and K)	CTSB	Protease	0.112

Neuronal acetylcholine receptor protein alpha-4 subunit	CHRNA4	Ligand-gated ion channel	0.112
Monoamine oxidase A	MAOA	Oxidoreductase	0.112
Serine/threonine-protein kinase PIM1	PIM1	Kinase	0.112
Myeloperoxidase	MPO	Enzyme	0.112
Serine/threonine-protein kinase PIM2	PIM2	Kinase	0.112
Protein farnesyltransferase	FNTA FNTB	Enzyme	0.112
Neuronal acetylcholine receptor; alpha3/alpha6/beta2/beta3	CHRNB3 CHRNA6 CHRNB2 CHRNA3	Ligand-gated ion channel	0.112

Figure S2: ^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **1**

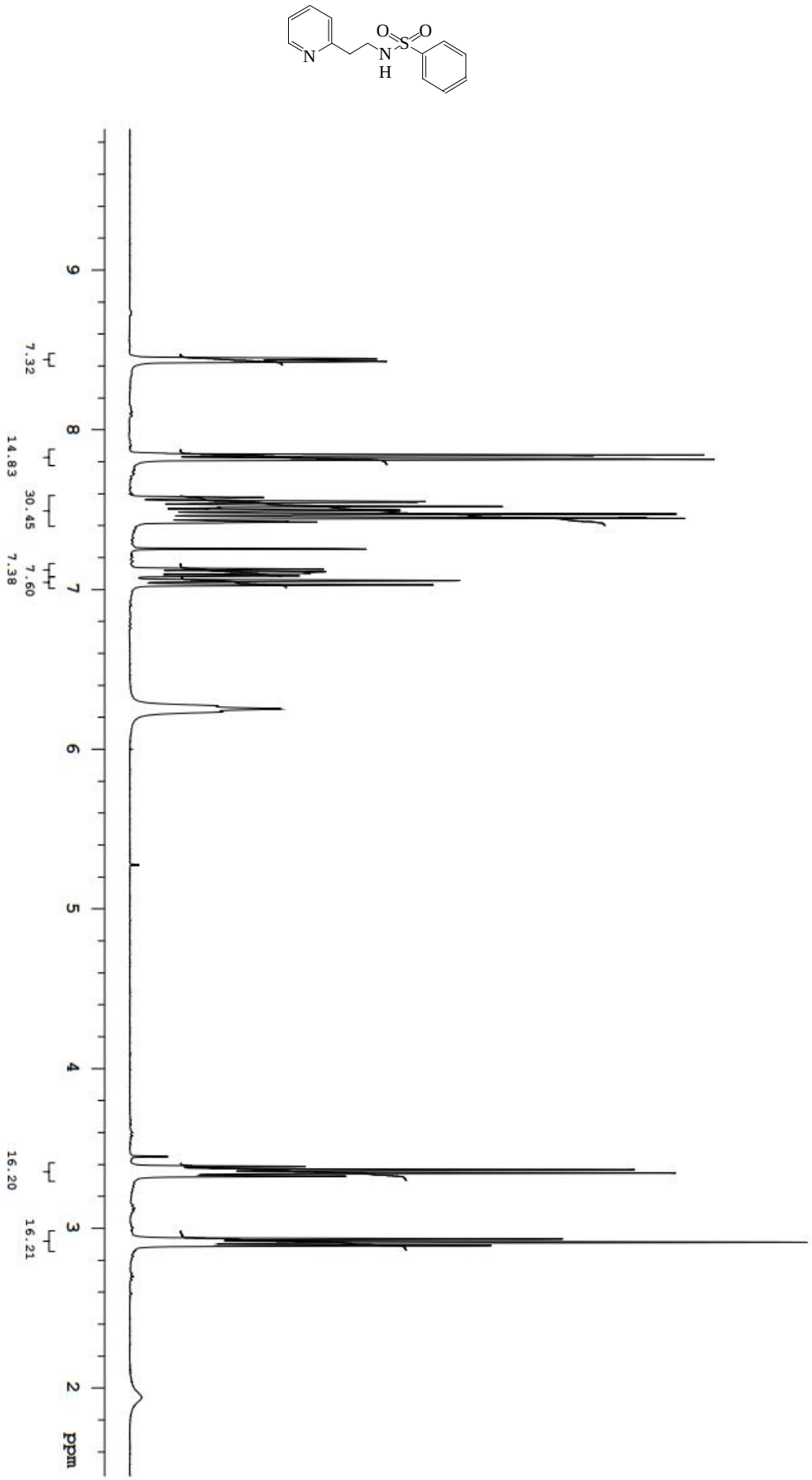
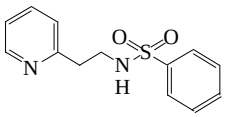


Figure S3: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **1**



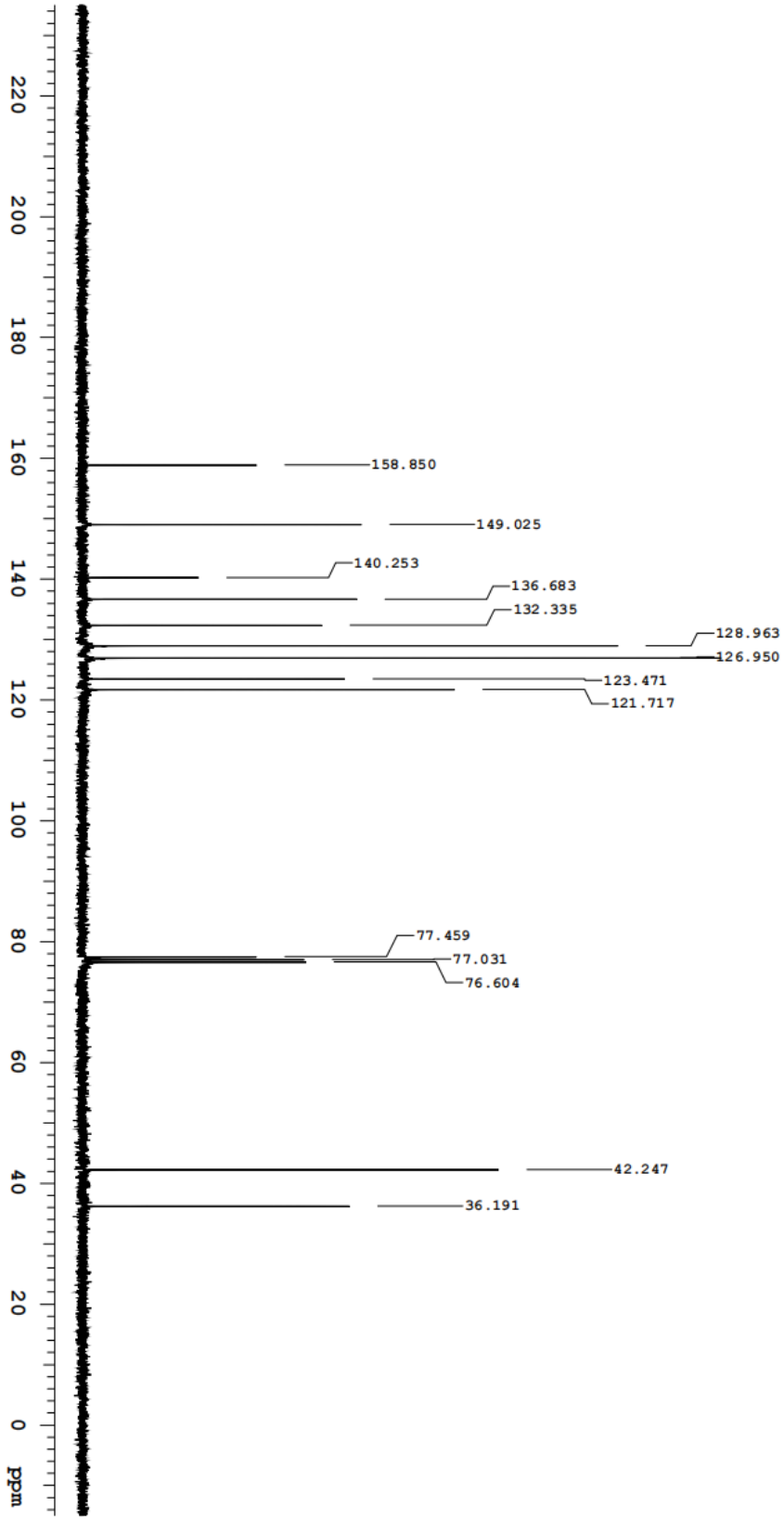
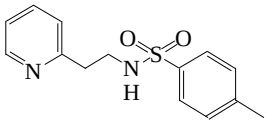


Figure S4: ^{1}H-NMR spectra (CD_3OD) for *4-methyl-N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide*, **2**



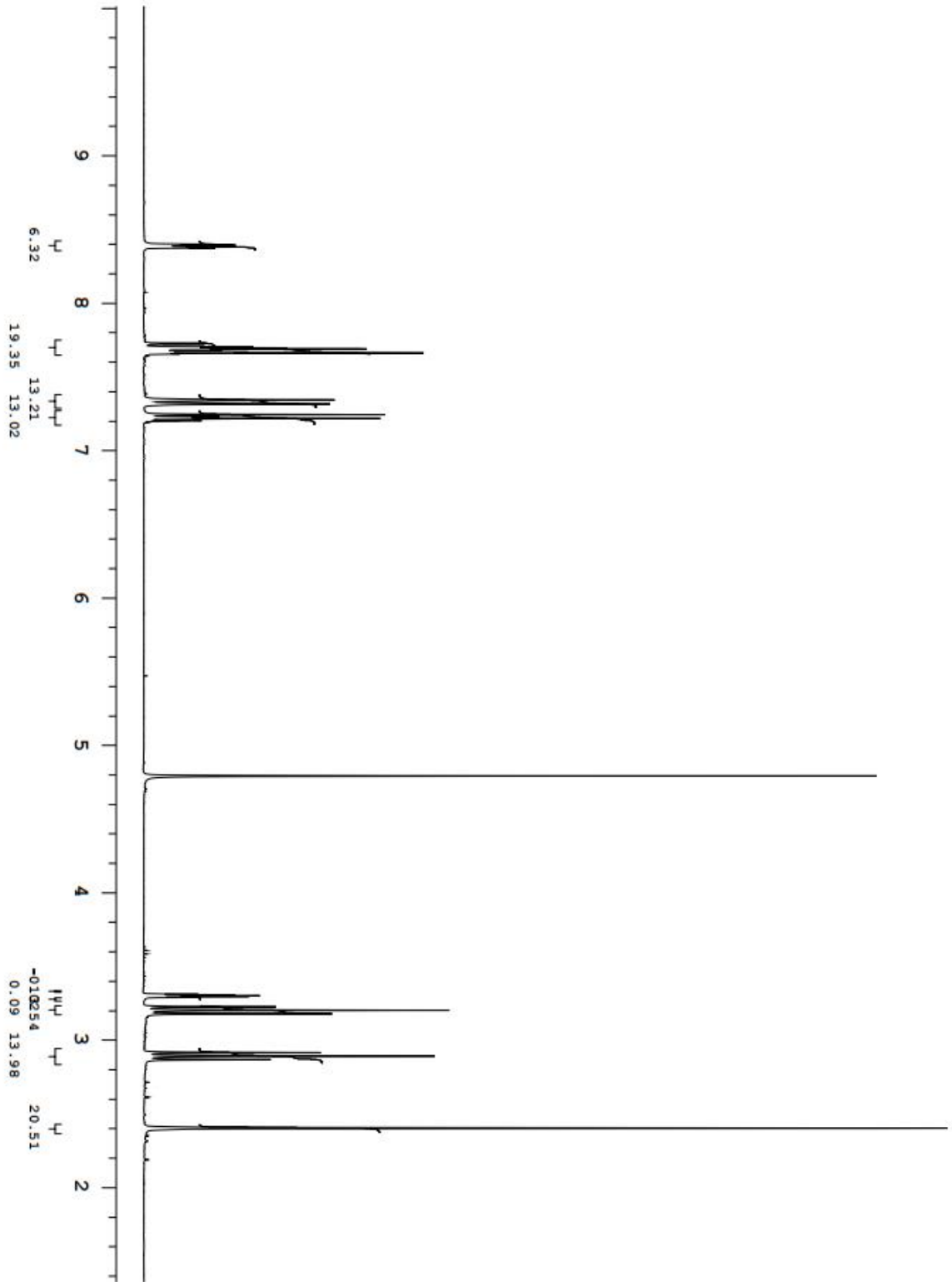
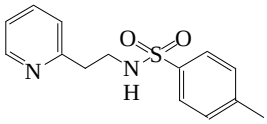


Figure S5: ^{13}C-NMR spectra (CD_3OD) for *4-methyl-N-(2-(pyridin-2-yl)ethyl)benzenesulfonamide,* **2**



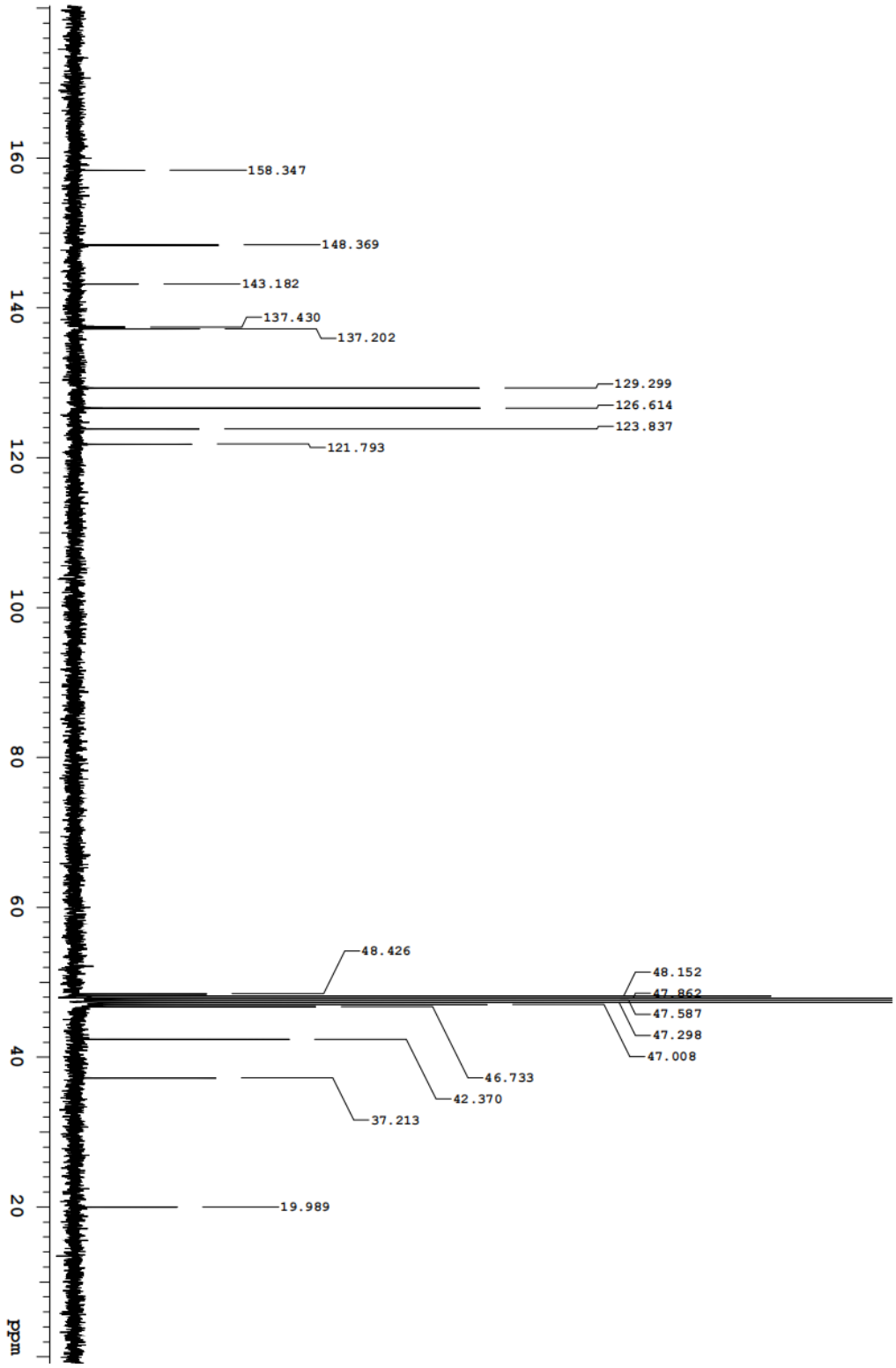


Figure S6: ^{1}H-NMR spectra ($CDCl_3$) for *4-metyl-N-(pyridin-2-yl)benzenesulfonamide*, **3**

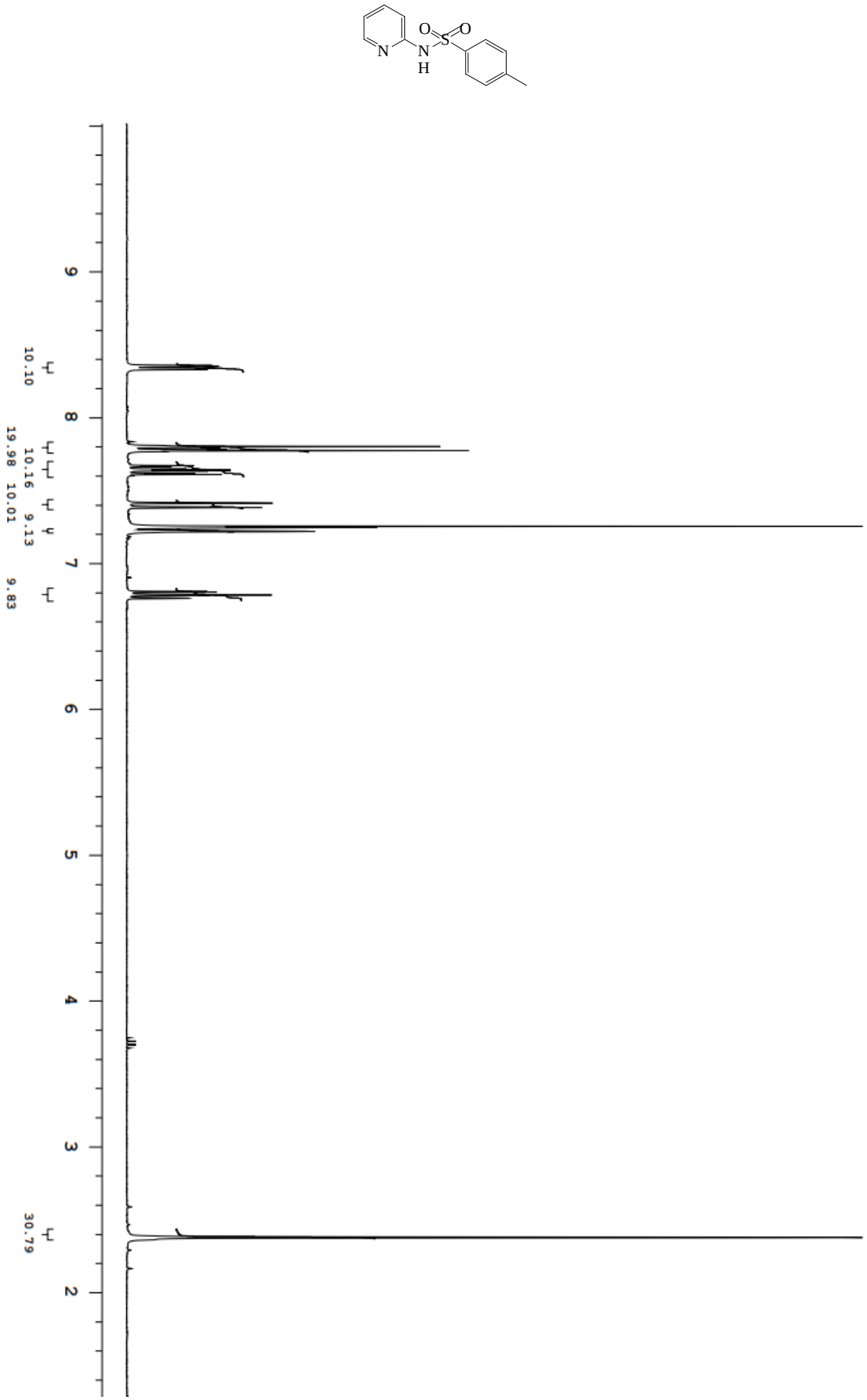


Figure S7: ^{13}C-NMR spectra ($CDCl_3$) for *4-metyl-N-(pyridin-2-yl)benzenesulfonamide*, **3**

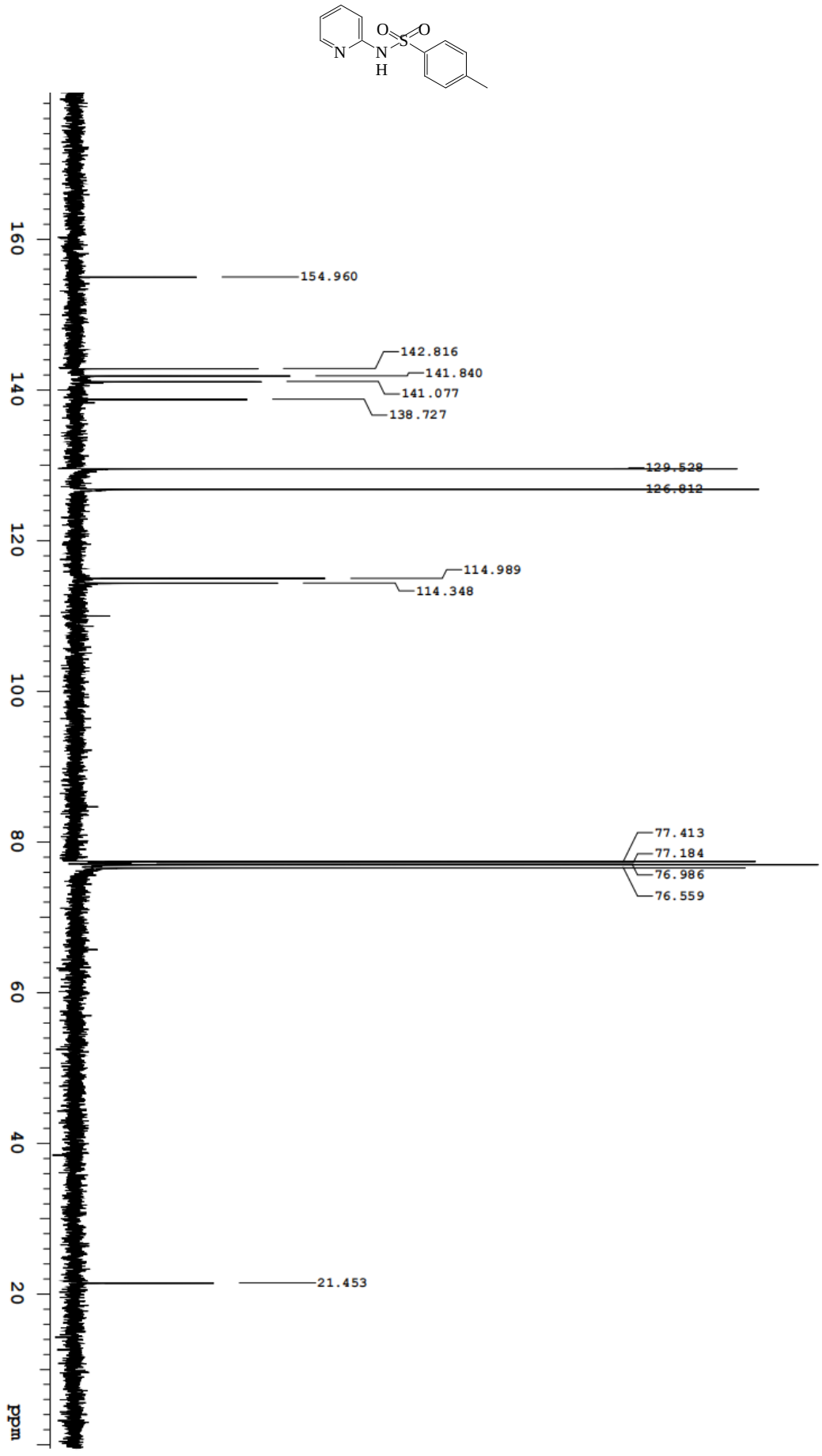


Figure S8: ^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(5-chloropyridin-2-yl)-4-methylbenzenesulfonamide*, **4**

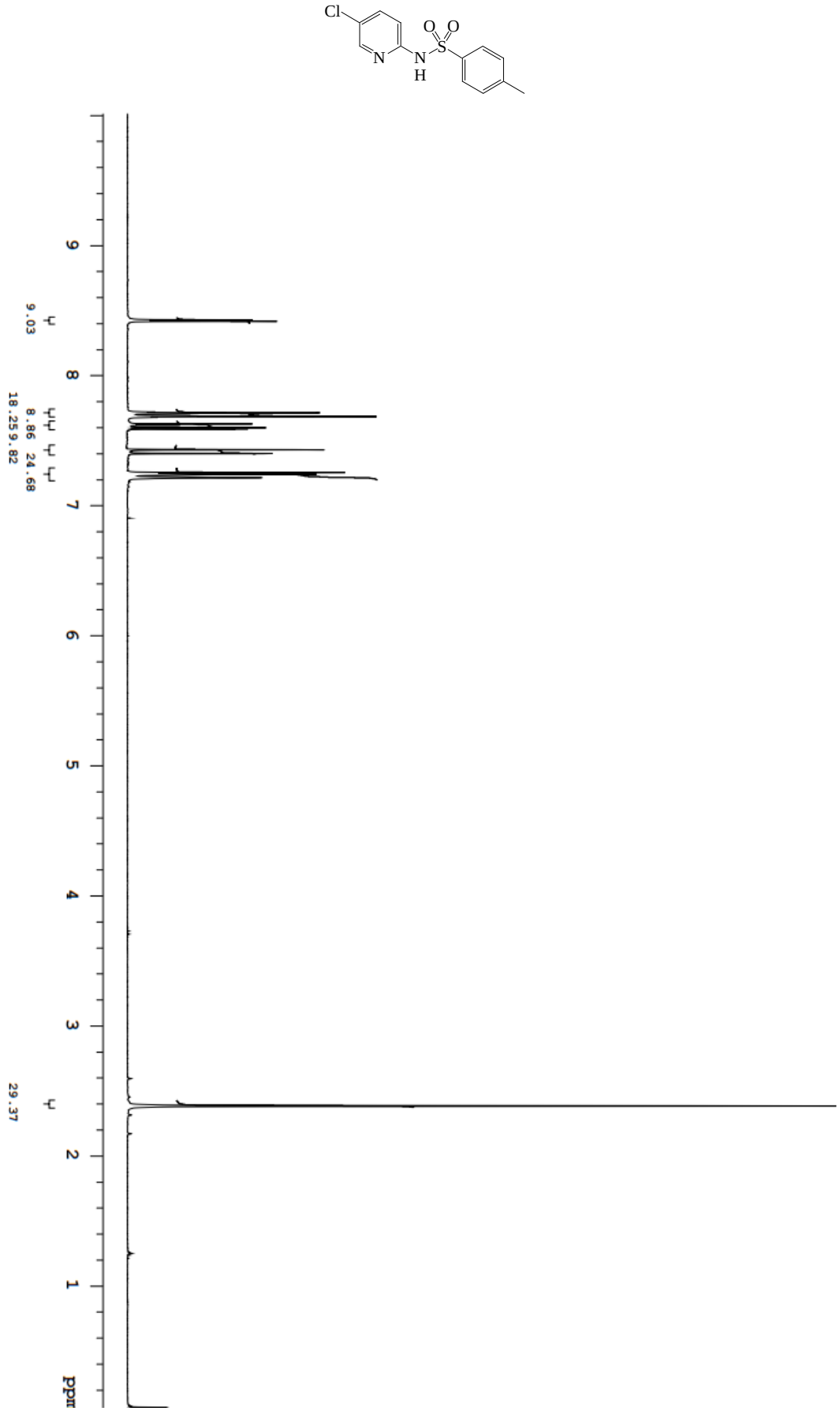
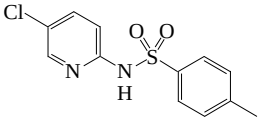


Figure S9: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(5-chloropyridin-2-yl)-4-methylbenzenesulfonamide*, **4**



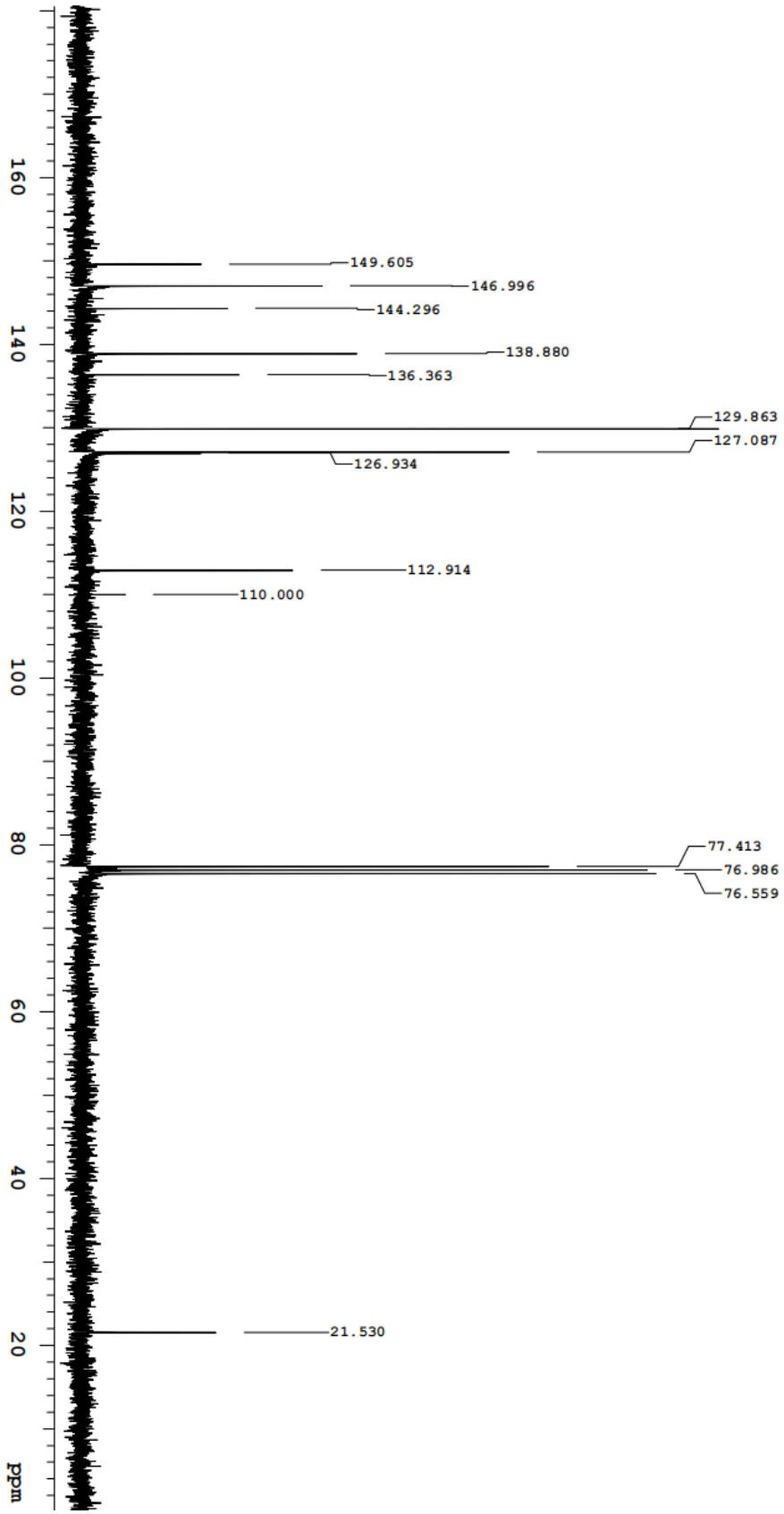


Figure S10: ^{1}H-NMR spectra (CD_3OD) for *N-(3,5-dichloropyridin-2-yl)-4-methylbenzenesulfonamide*, **5**

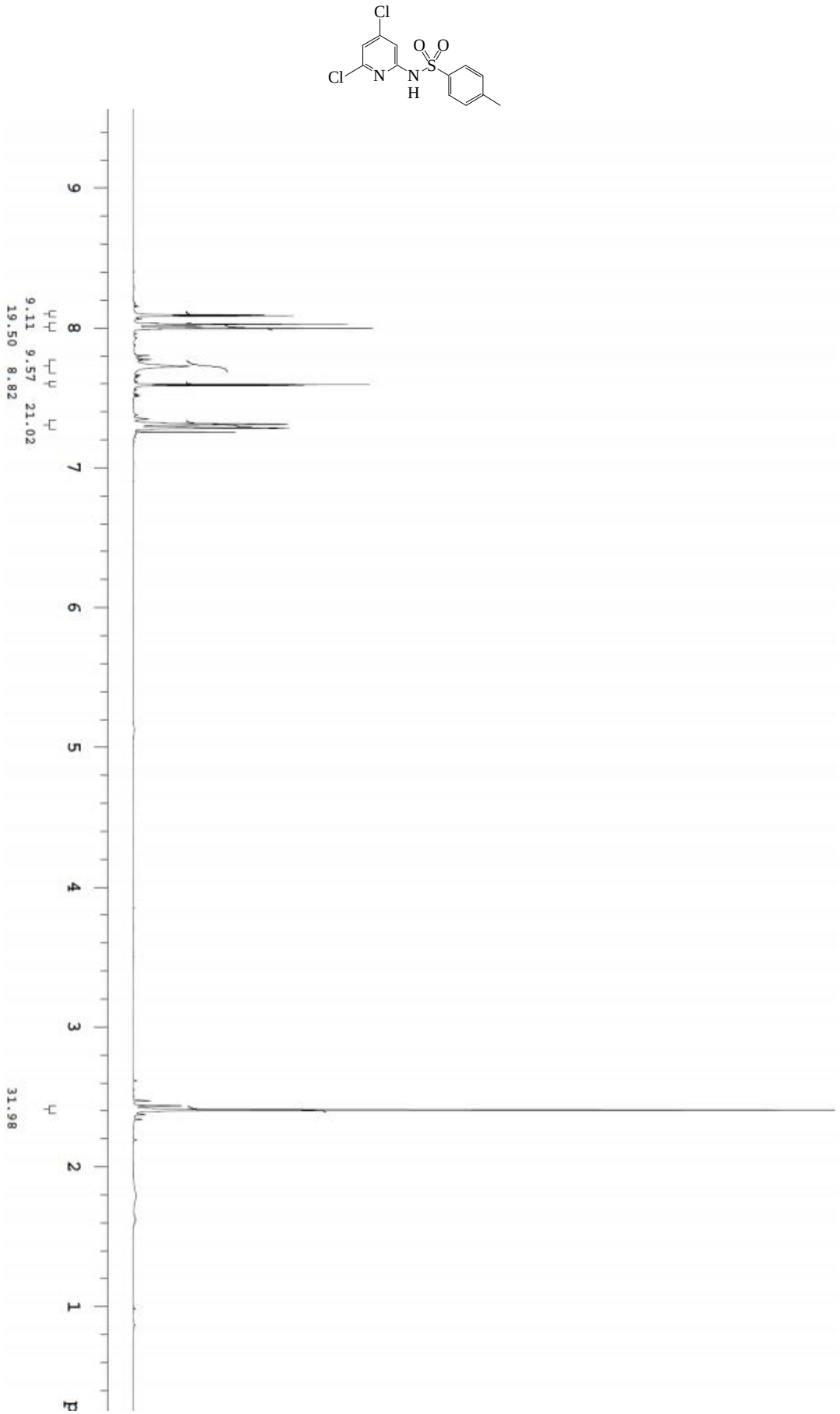


Figure S11: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-4-methylbenzenesulfonamide*, **5**

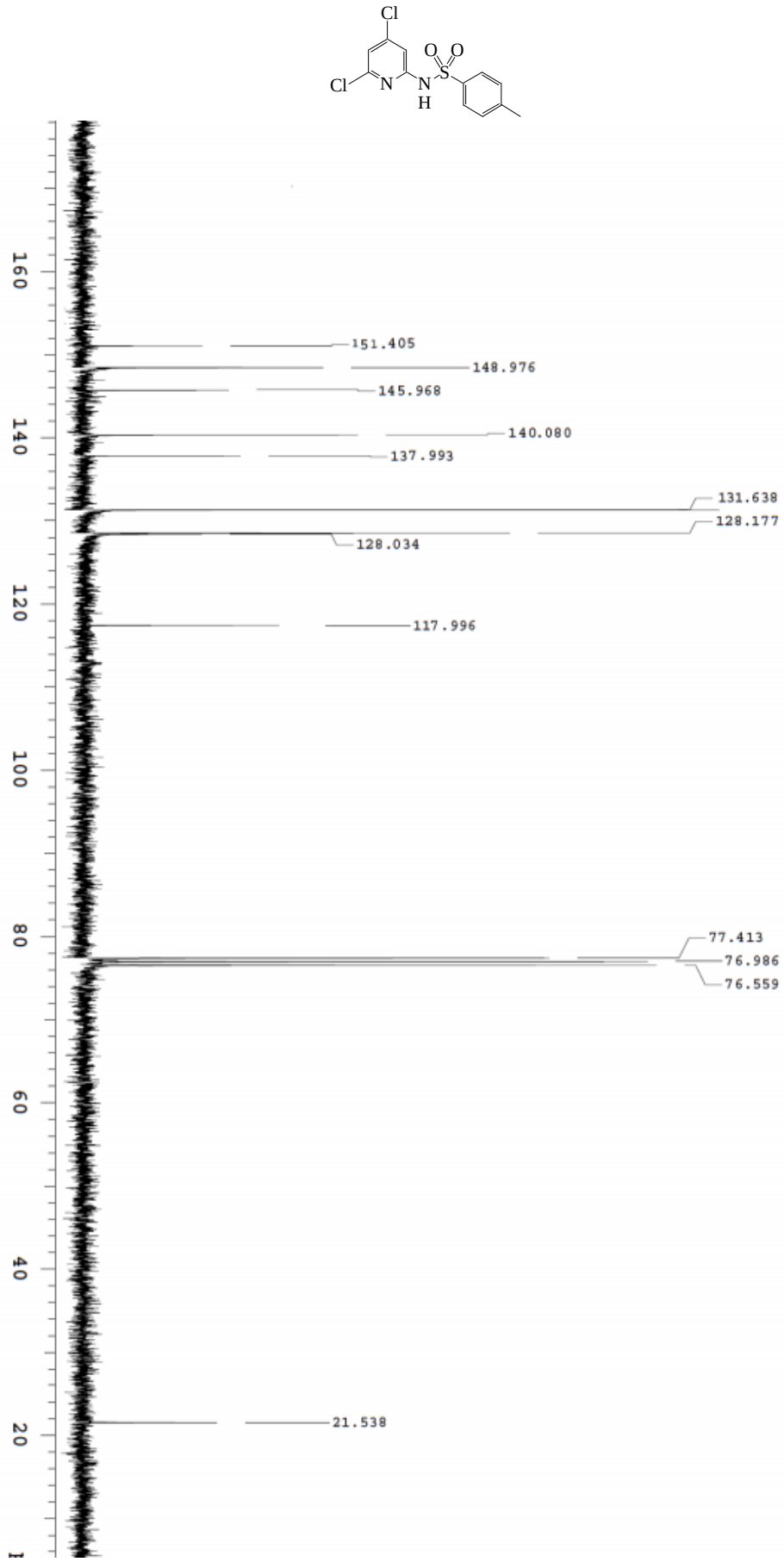
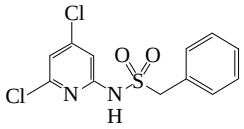


Figure S12: ^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-1-phenylmethanesulfonamide*, **6**



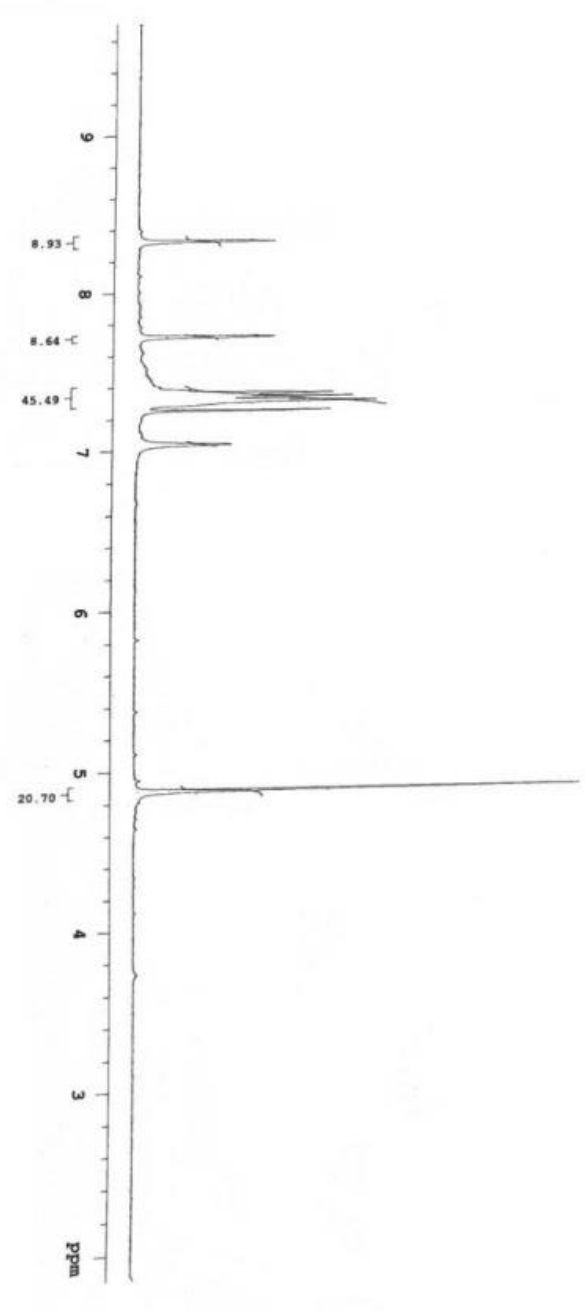


Figure S13: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(3,5-dichloropyridin-2-yl)-1-phenylmethanesulfonamide*, **6**

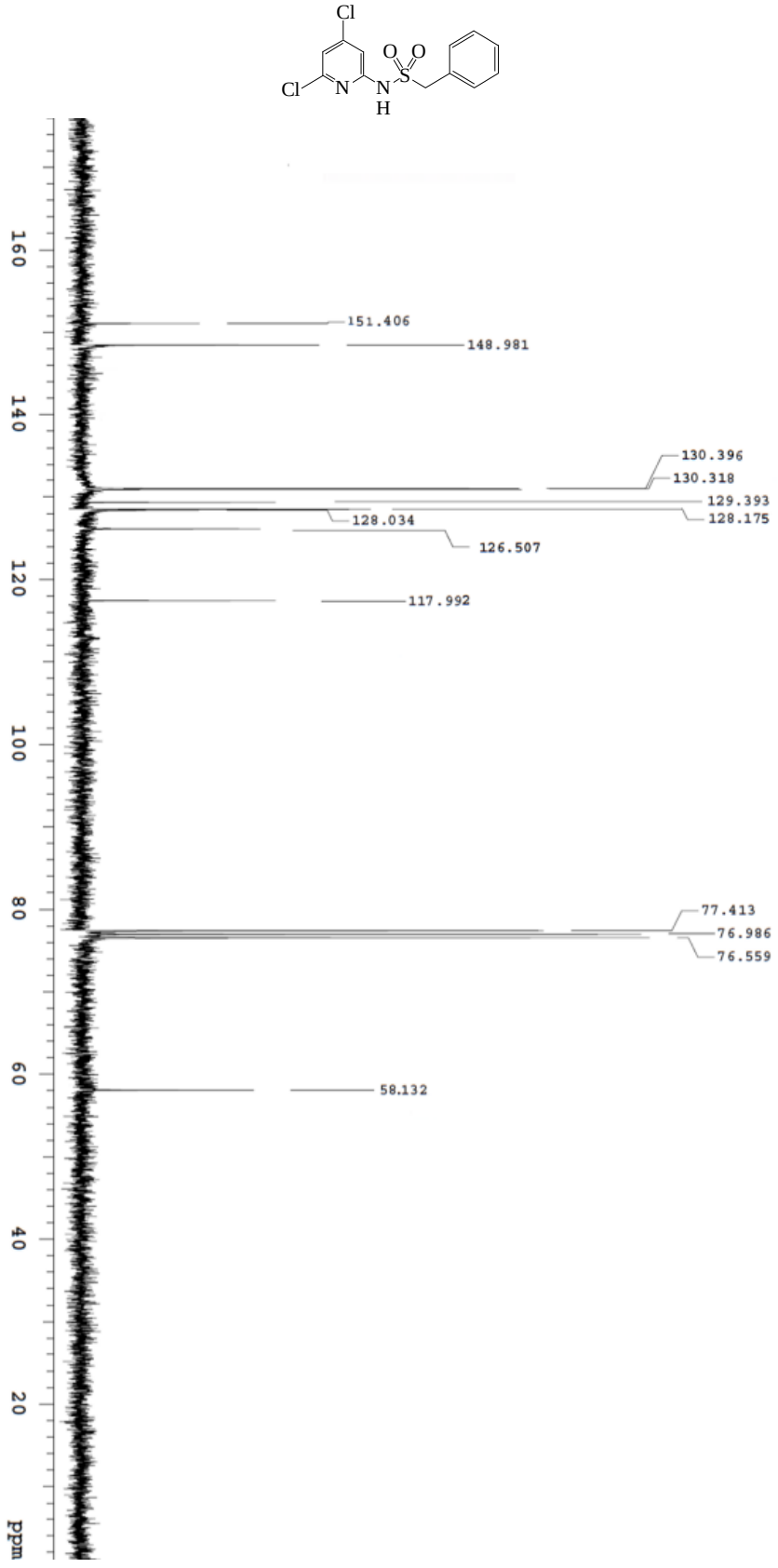


Figure S14: ^{1}H-NMR spectra (CD_3OD) for *N-(1-benzylpiperidin-4-yl)benzenesulfonamide*, **7**

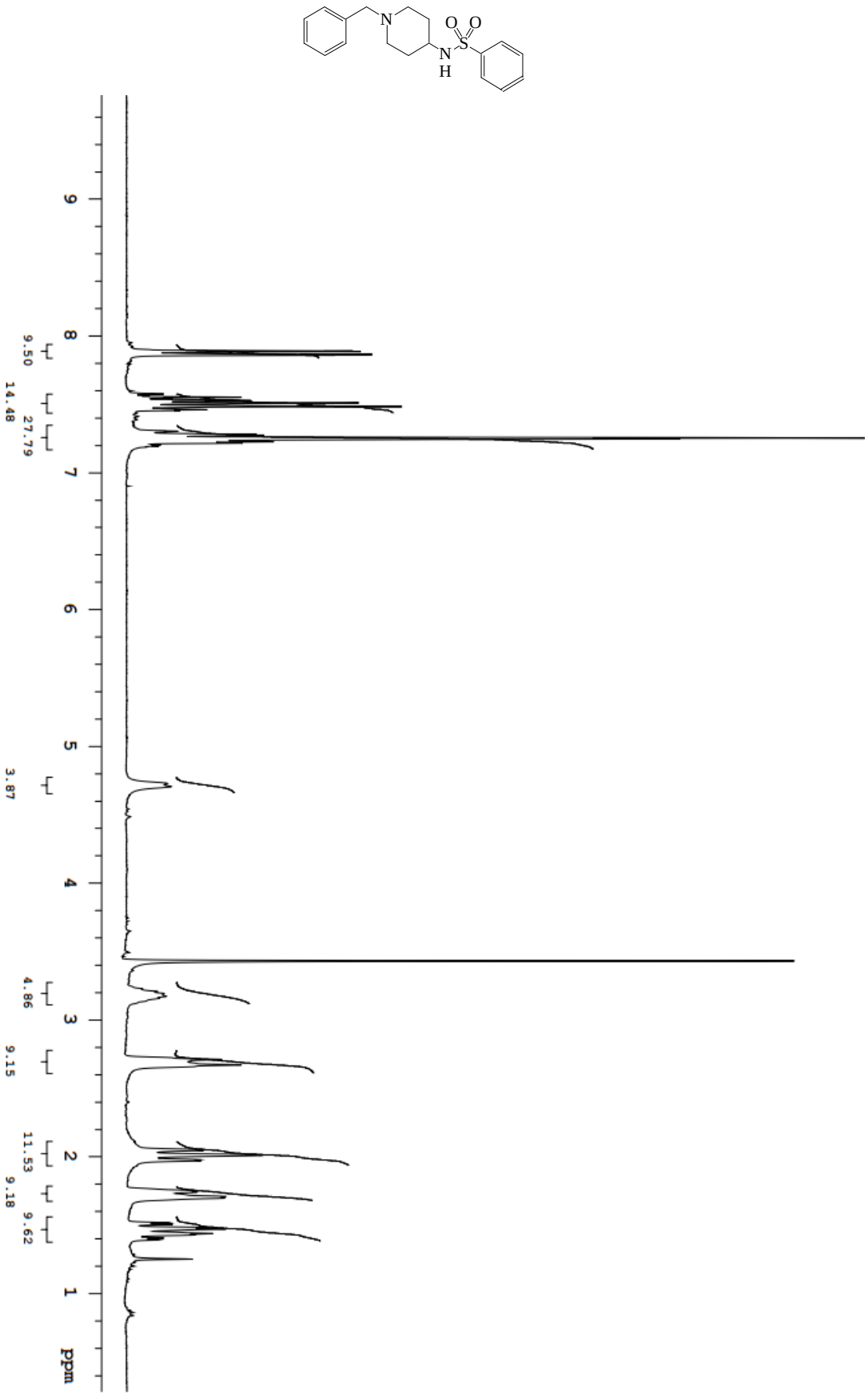
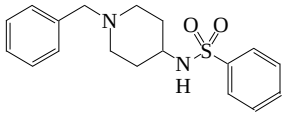


Figure S15: ^{13}C-NMR spectra (CD_3OD) for *N-(1-benzylpiperidin-4-yl)benzenesulfonamide*, **7**



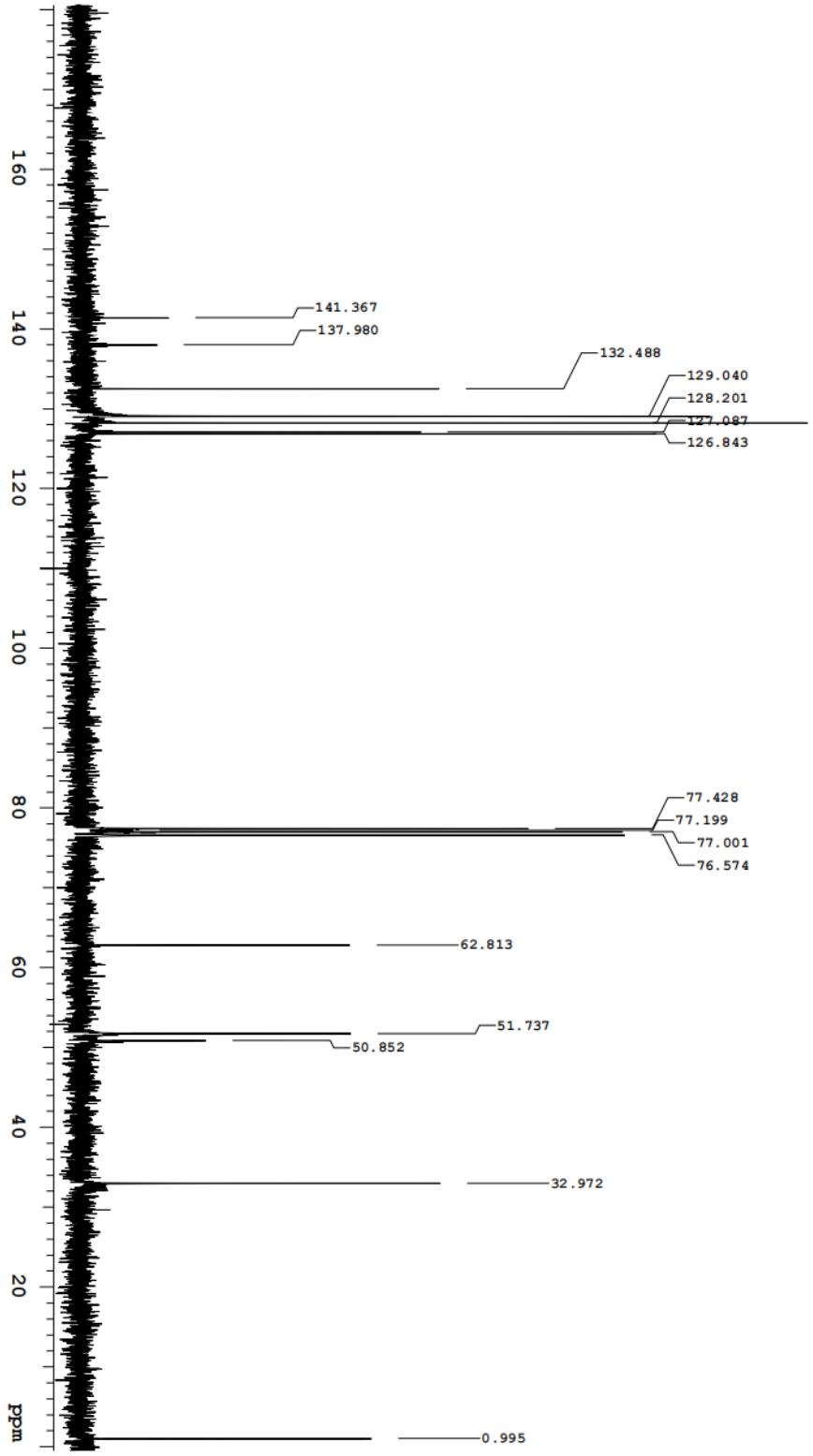


Figure S16: ^{1}H-NMR spectra (CD_3OD) for *N-(1-benzylpiperidin-4-yl)-4-methylbenzenesulfonamide*, **8**

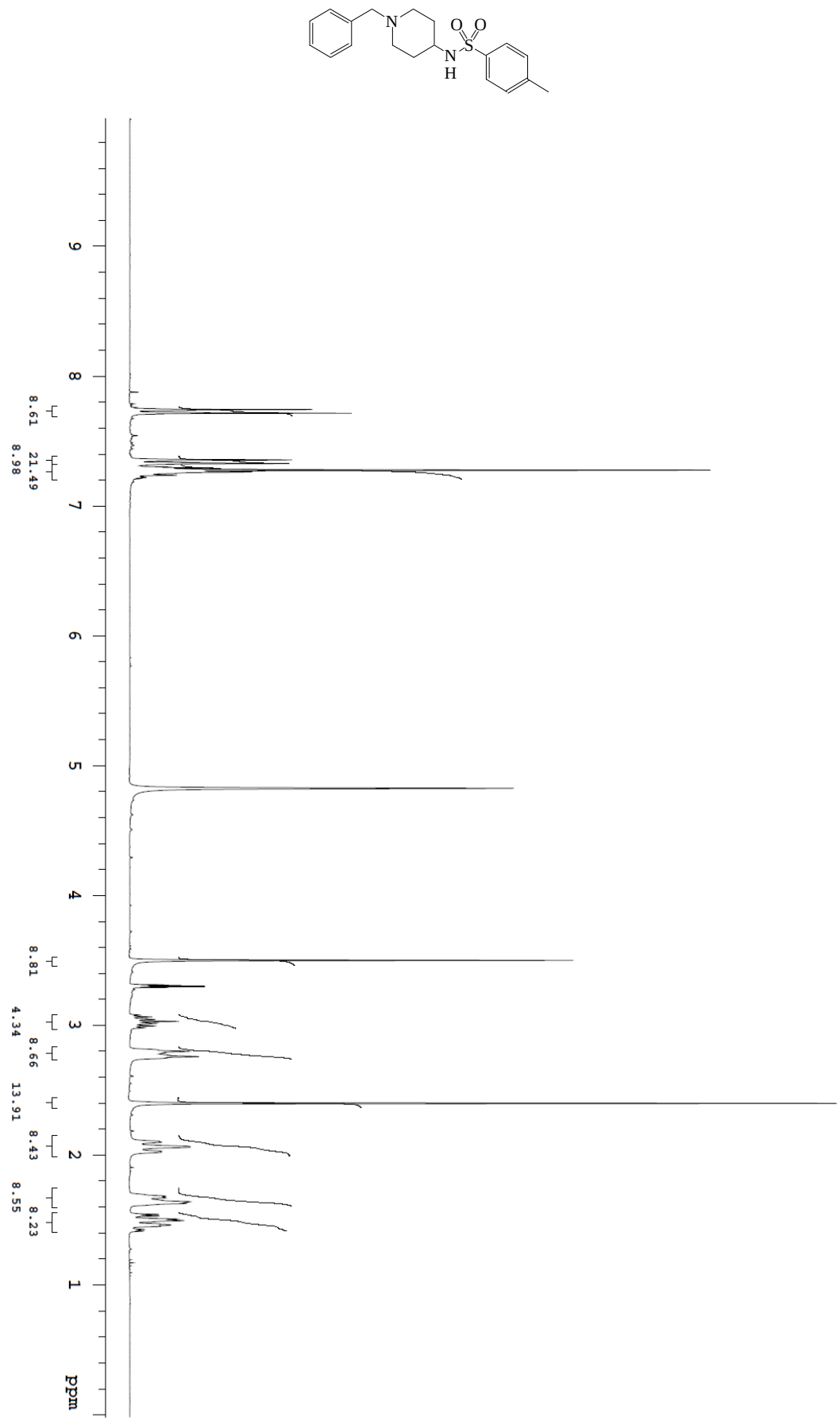
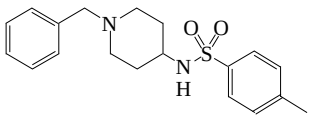


Figure S17: ^{13}C-NMR spectra (CD_3OD) for *N-(1-benzylpiperidin-4-yl)-4-methylbenzenesulfonamide*, **8**



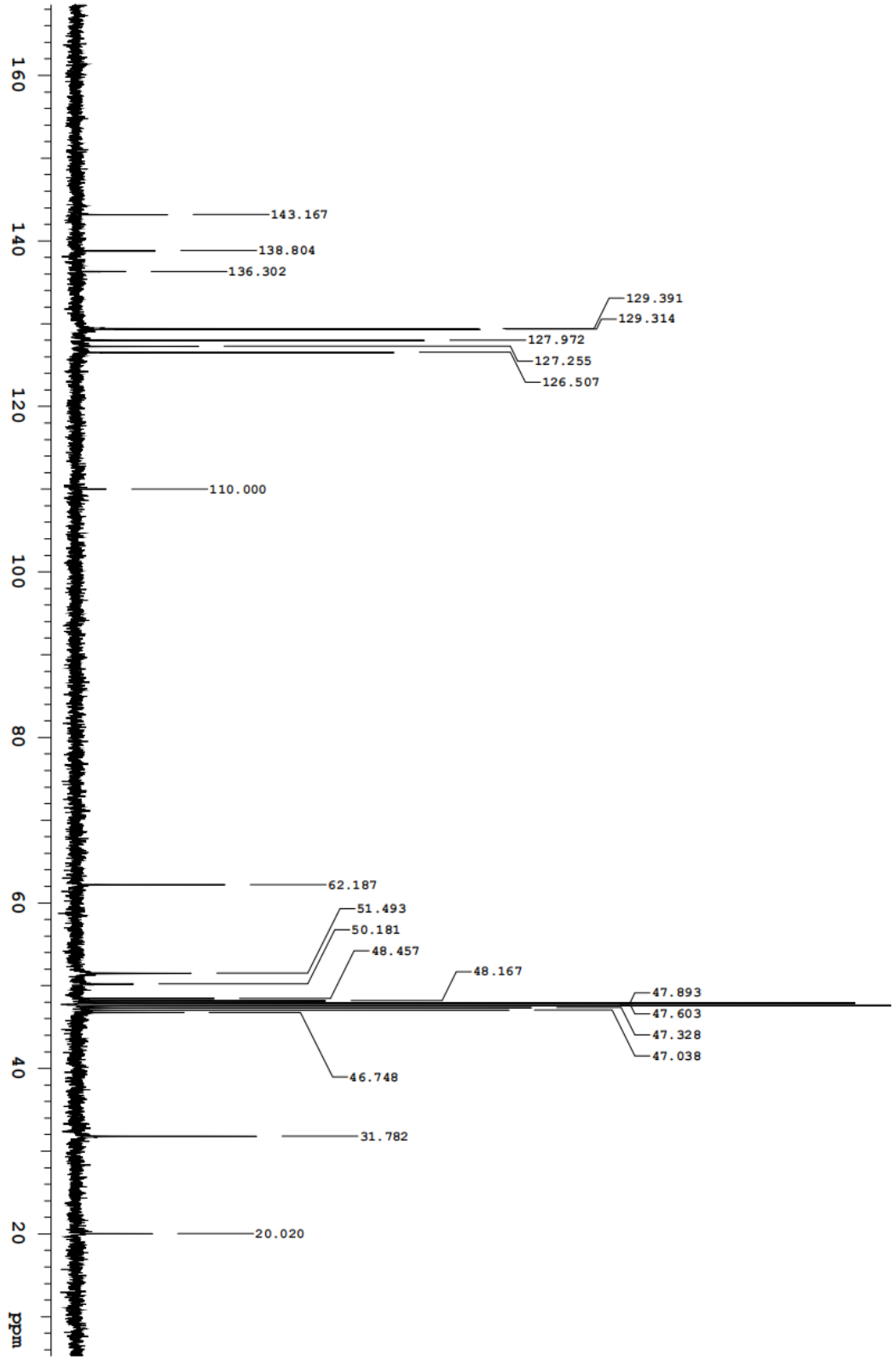
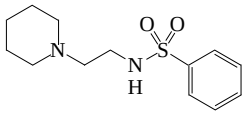


Figure S18: ^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-(piperidin-1-yl)ethyl)benzenesulfonamide,* **9**



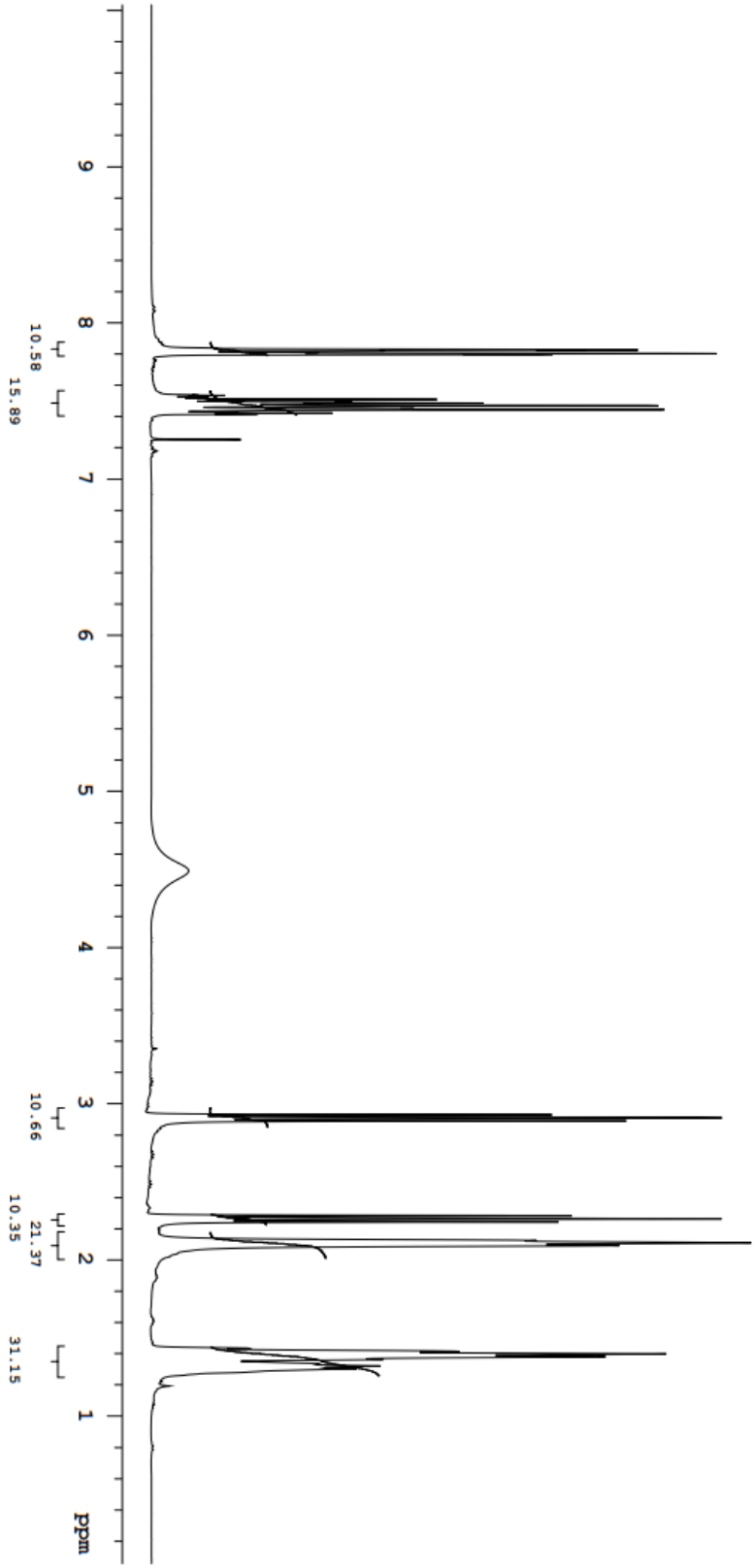


Figure S19: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(2-(piperidin-1-yl)ethyl)benzenesulfonamide,* **9**

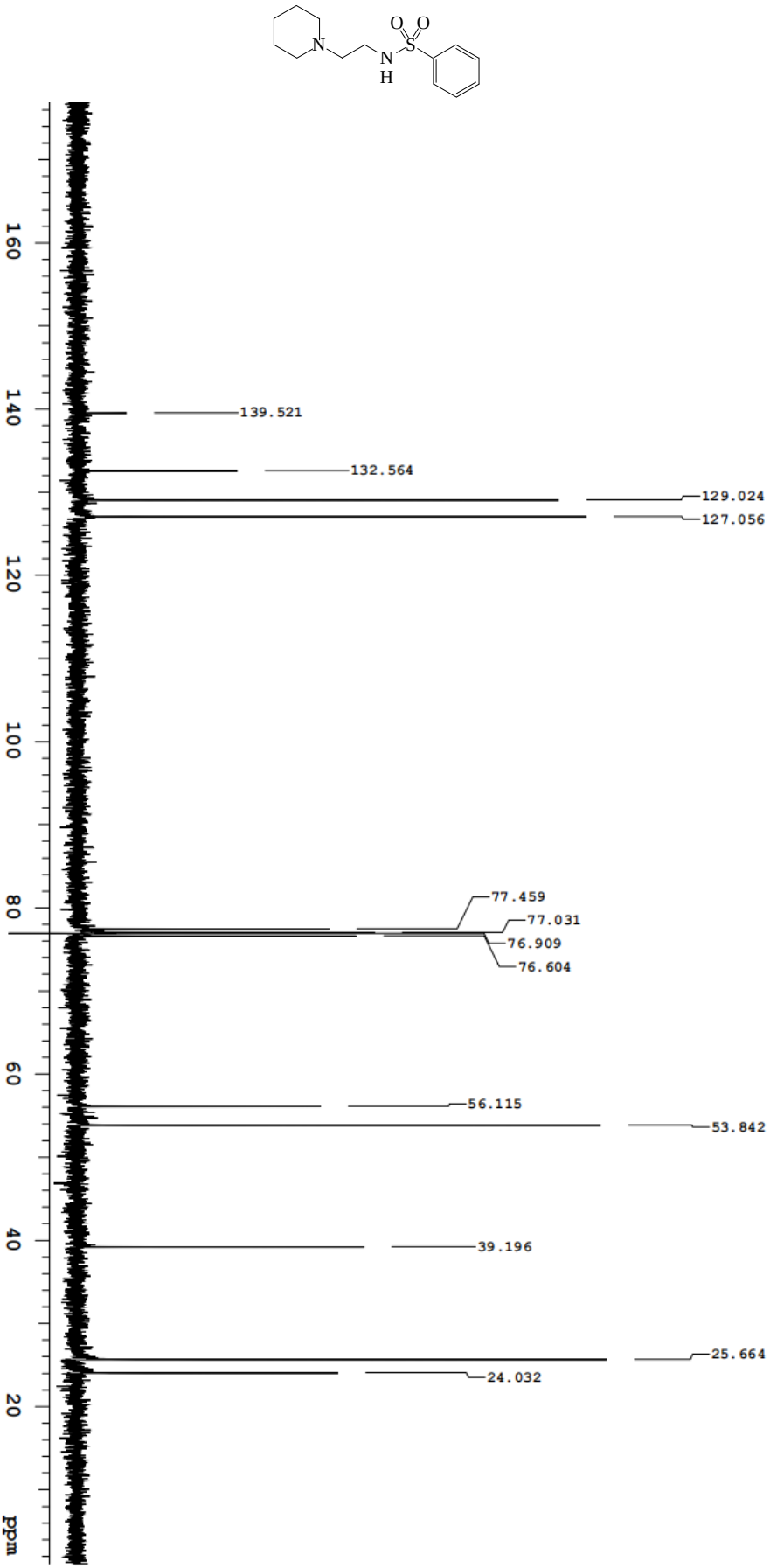


Figure S20: ^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-(piperidin-1-yl)ethyl)-1-(p-tolyl)methanesulfonamide*, **10**

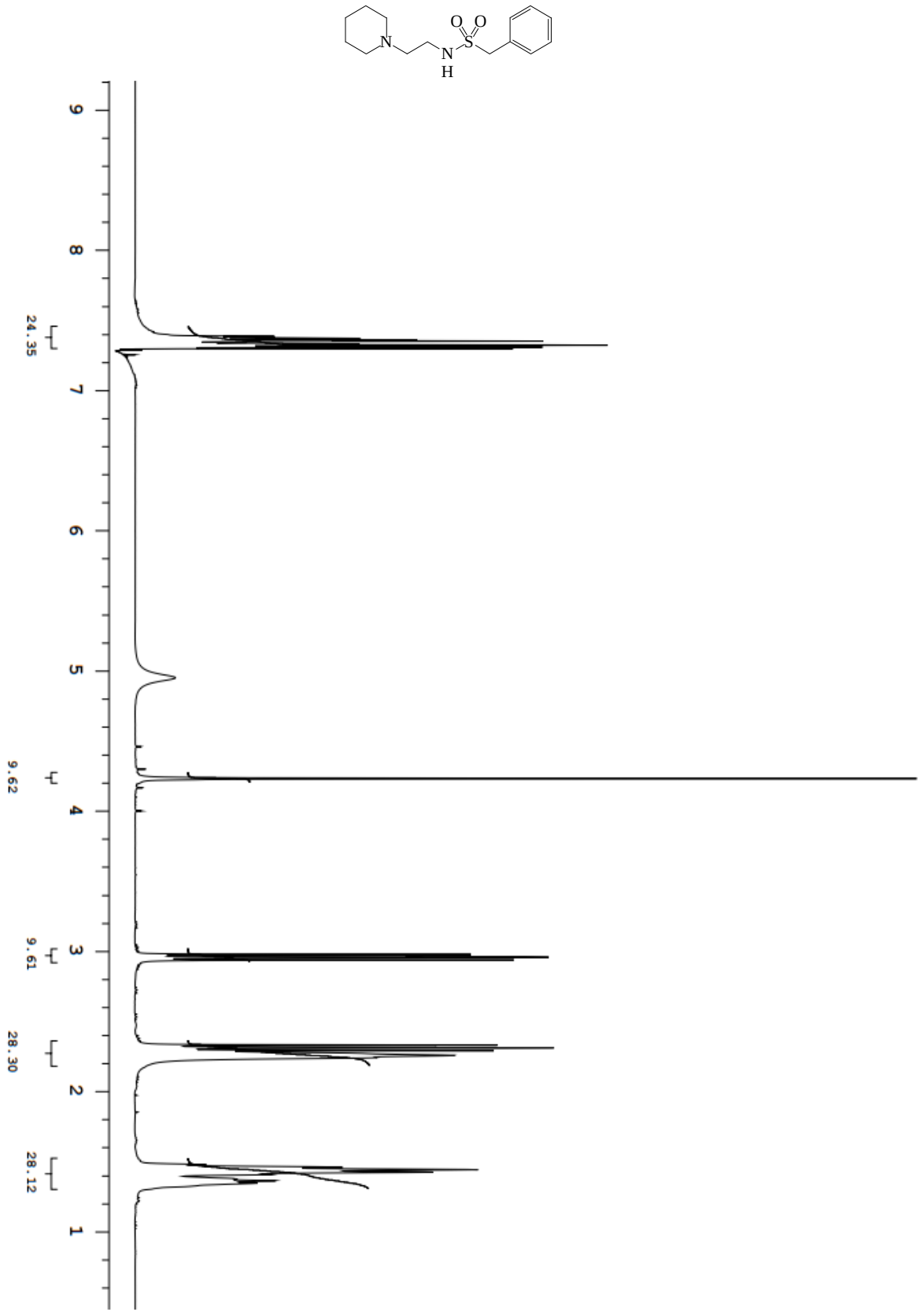


Figure S21: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(2-(piperidin-1-yl)ethyl)-1-(p-tolyl)methanesulfonamide*, **10**

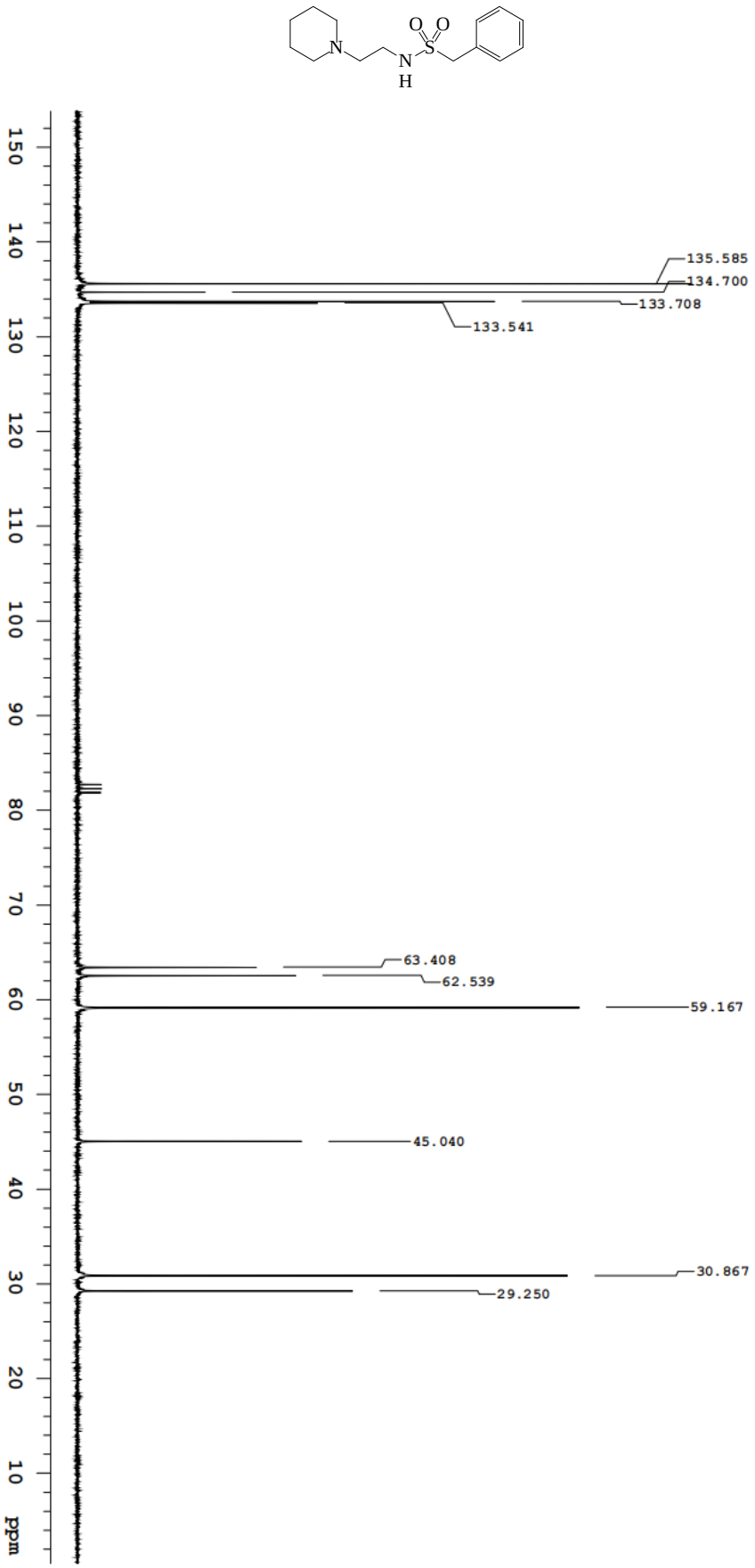


Figure S22: ^{1}H-NMR spectra (C*D*Cl$_3$) for *1-phenyl-N-(2-(piperidin-1-yl)ethyl)methanesulfonamide*, **11**

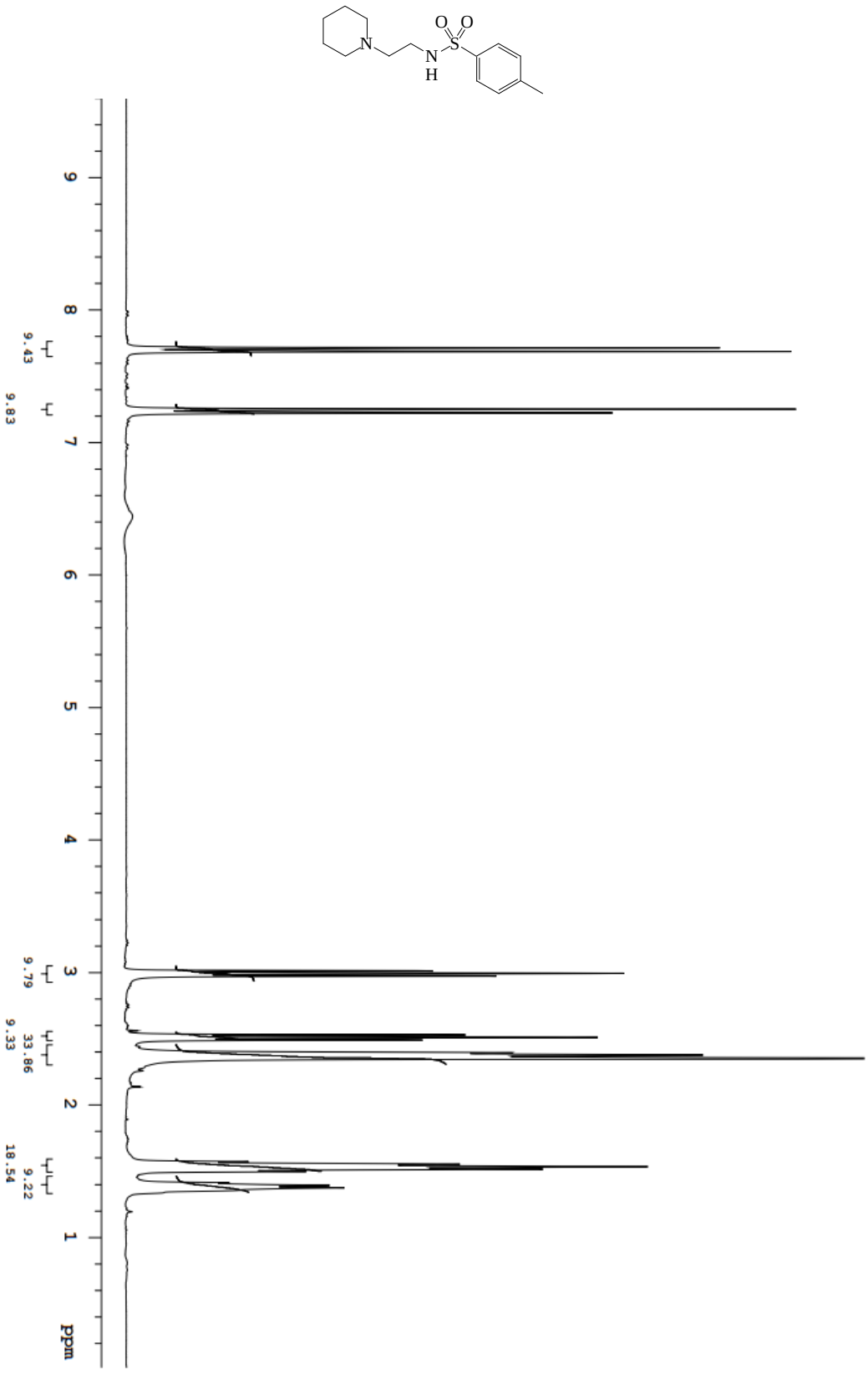


Figure S23: ^{13}C-NMR spectra ($CDCl_3$) for *1-phenyl-N-(2-(piperidin-1-yl)ethyl)methanesulfonamide*, **11**

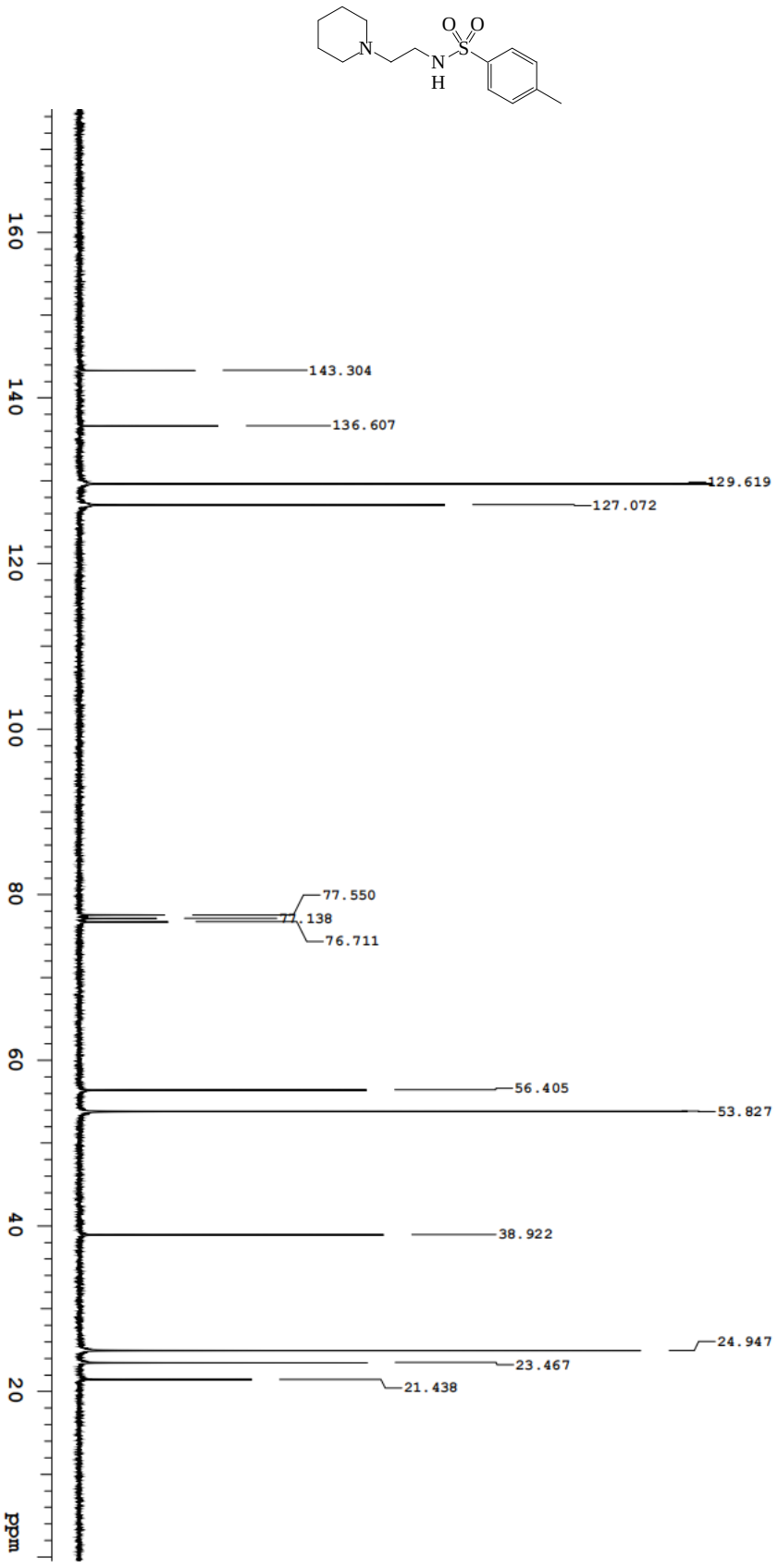
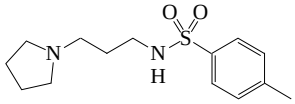


Figure S24: ^{1}H-NMR spectra (CD_3OD) for *4-methyl-N-(3-(pyrrolidin-1-yl)propyl)benzenesulfonamide*, **12**



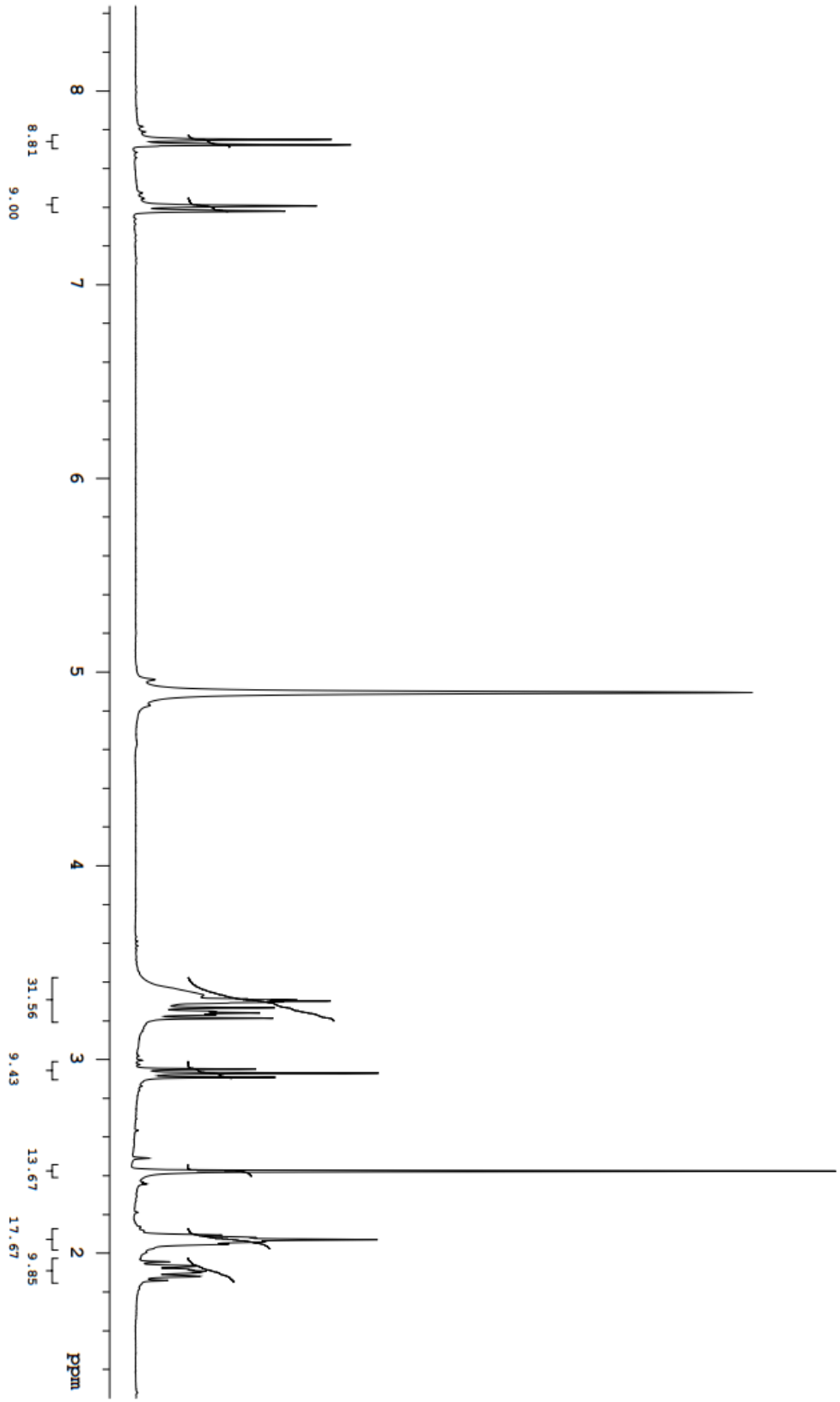


Figure S25: ^{13}C-NMR spectra (CD_3OD) for *4-methyl-N-(3-(pyrrolidin-1-yl)propyl)benzenesulfonamide*, **12**

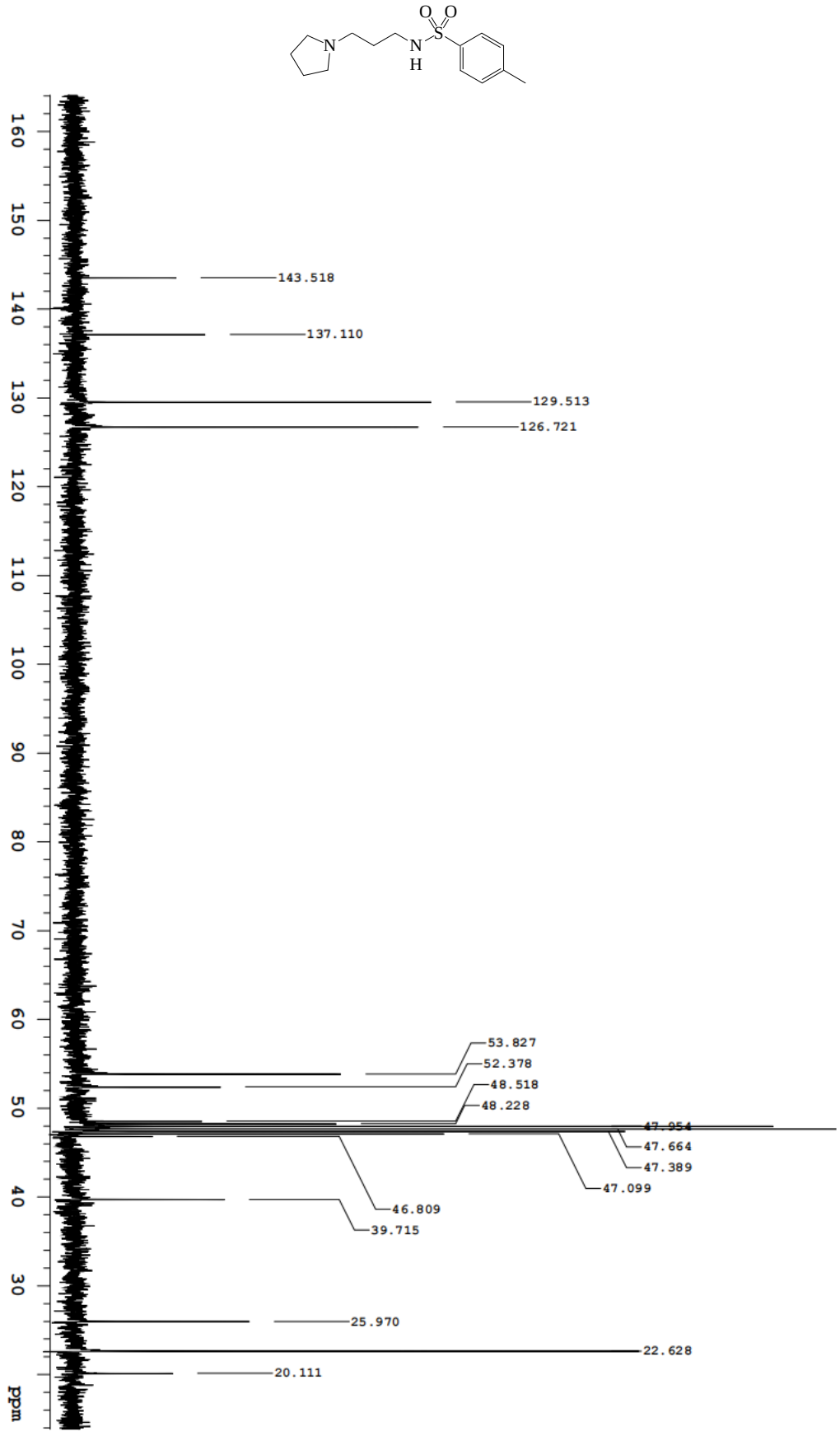


Figure S26: ^{1}H-NMR spectra (CD_3OD) for *N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **13**

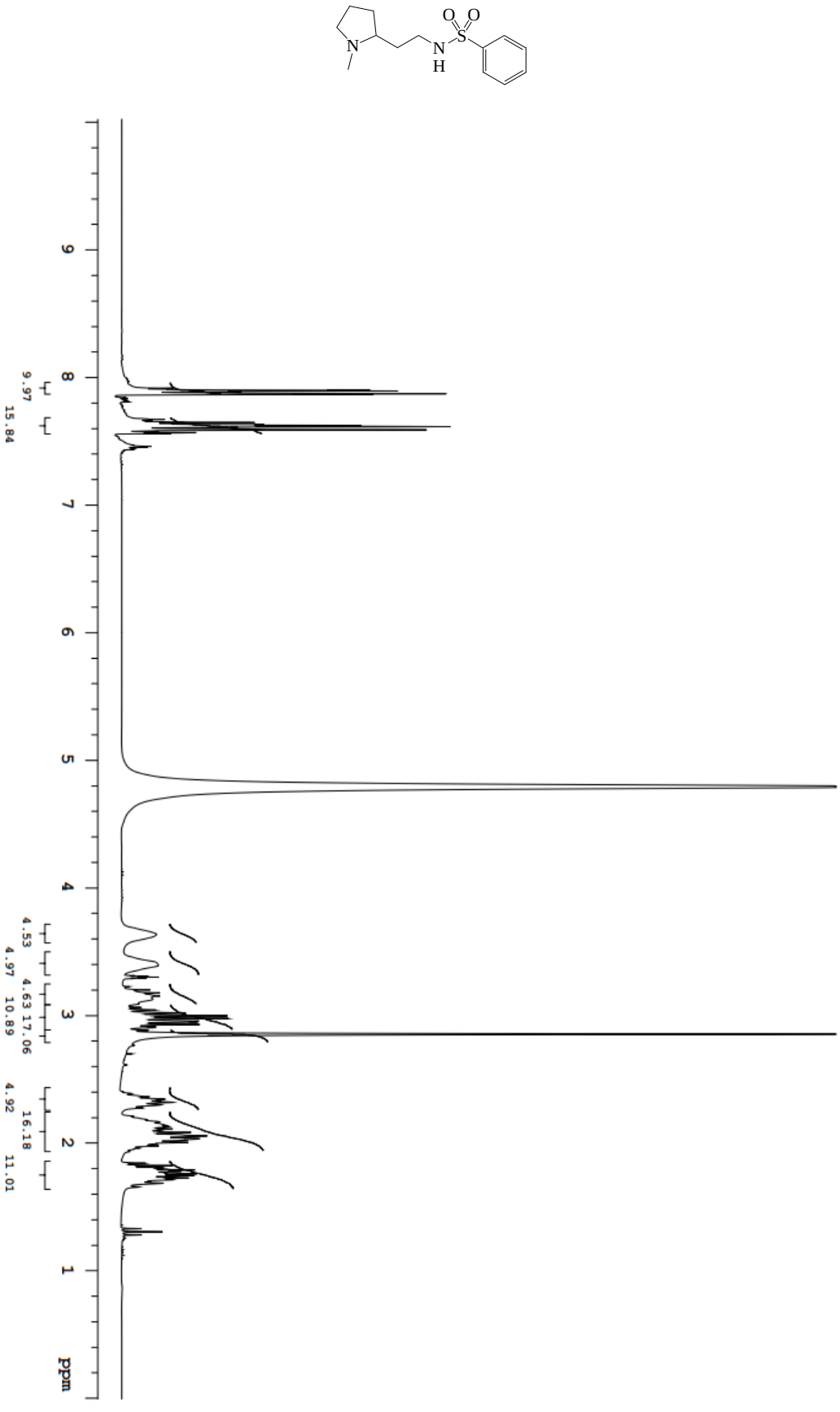
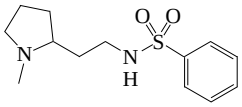


Figure S27: ^{13}C-NMR spectra (CD_3OD) for *N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **13**



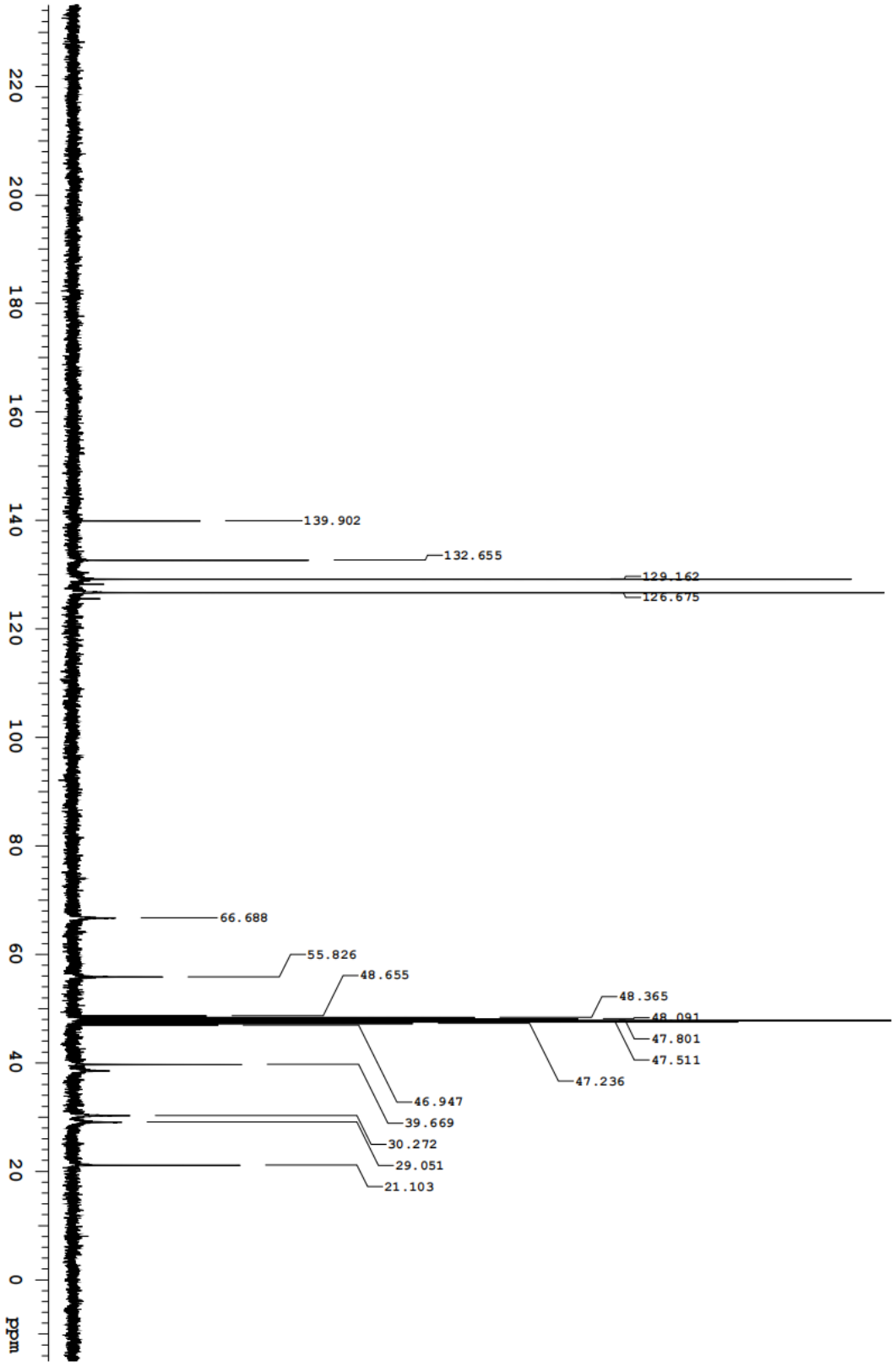
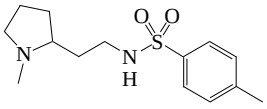


Figure S28: ^{1}H-NMR spectra (CD_3OD) for *4-methyl-N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **14**



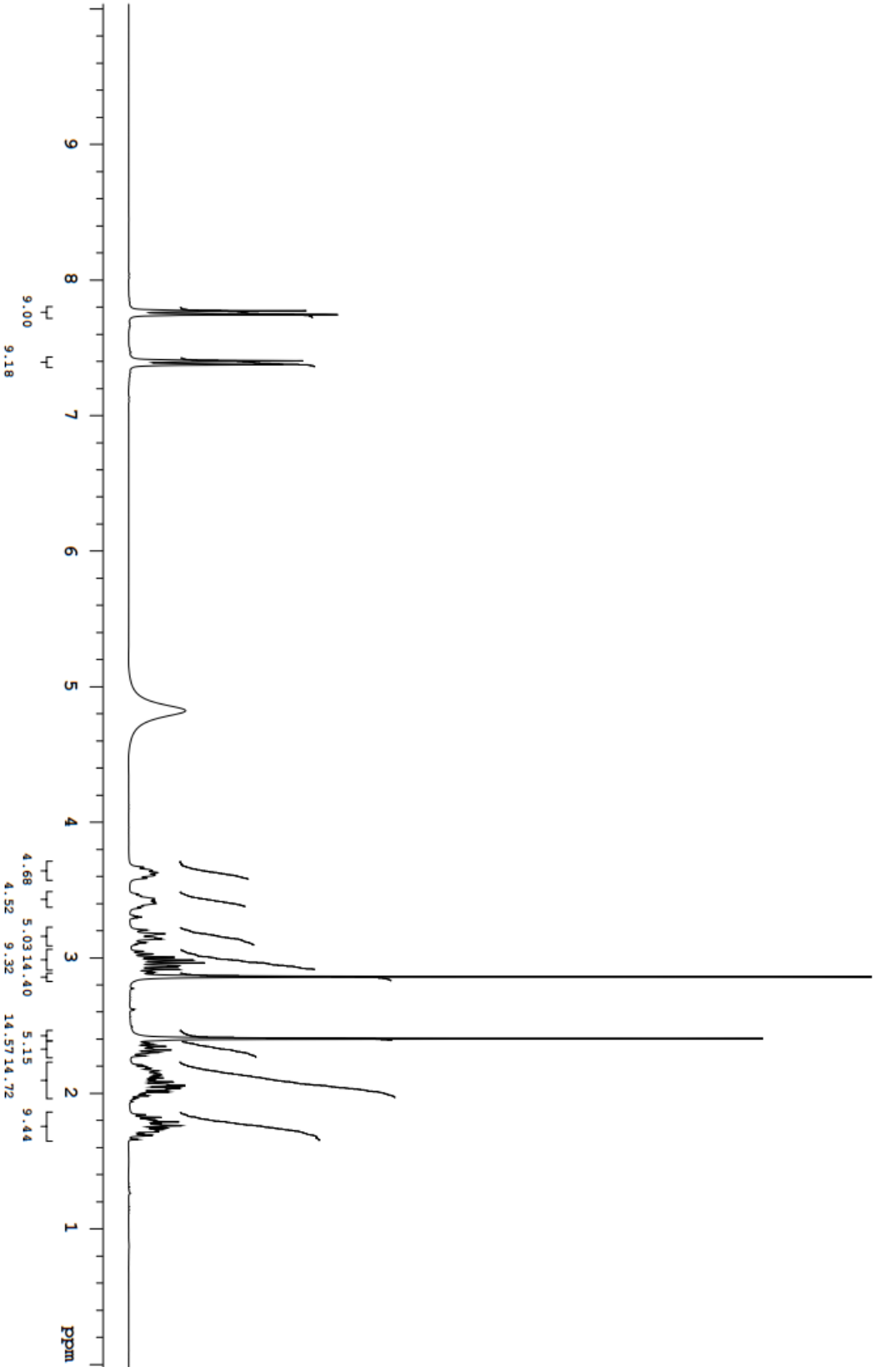


Figure S29: ^{13}C-NMR spectra (CD_3OD) for *4-methyl-N-(2-(1-methylpyrrolidin-2-yl)ethyl)benzenesulfonamide*, **14**

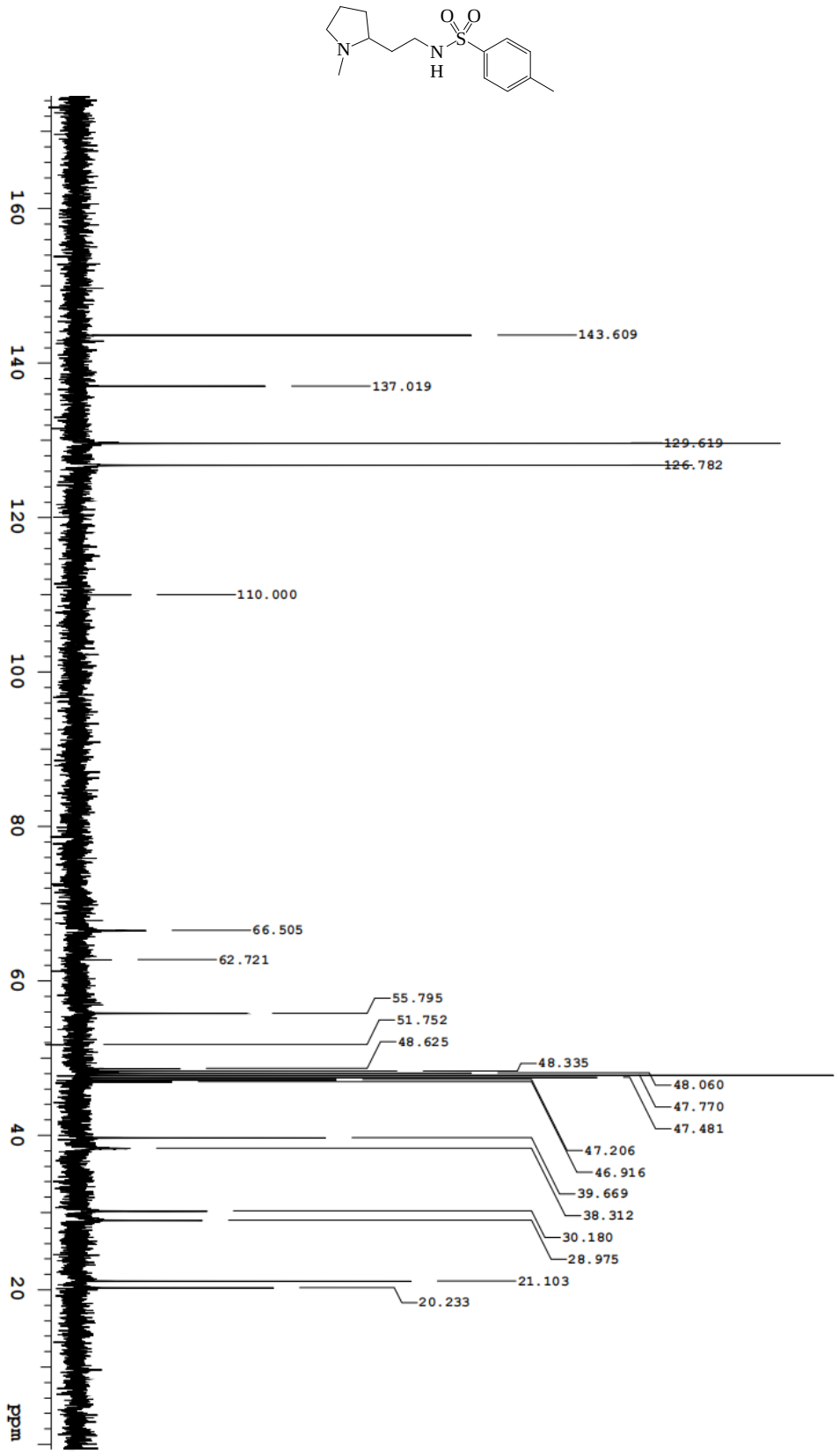


Figure S30: ^{1}H-NMR spectra (C*D*Cl$_3$) for *N-(2-morpholinoethyl)benzenesulfonamide*, **15**

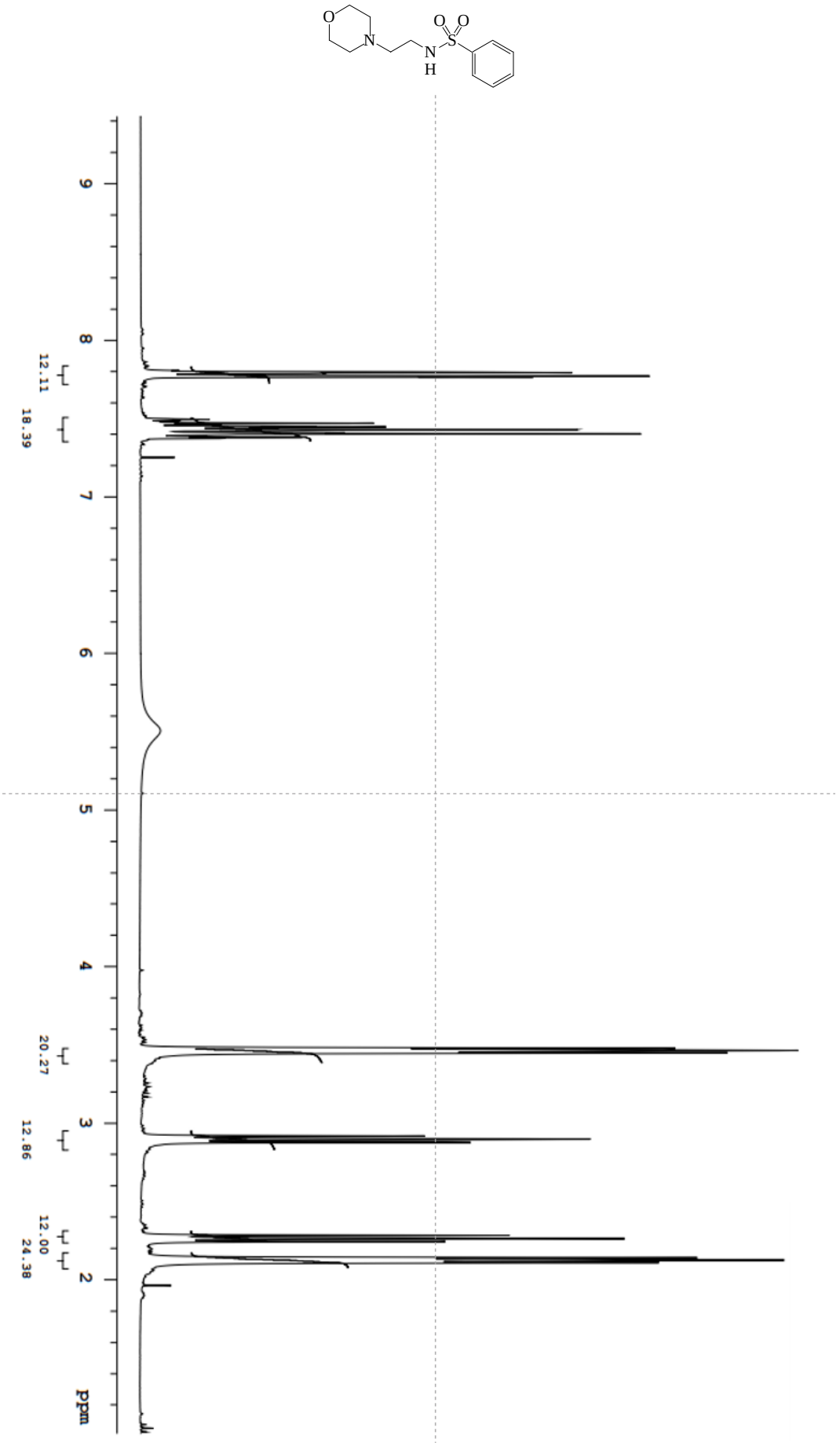


Figure S31: ^{13}C-NMR spectra (C*D*Cl$_3$) for *N-(2-morpholinoethyl)benzenesulfonamide*, **15**

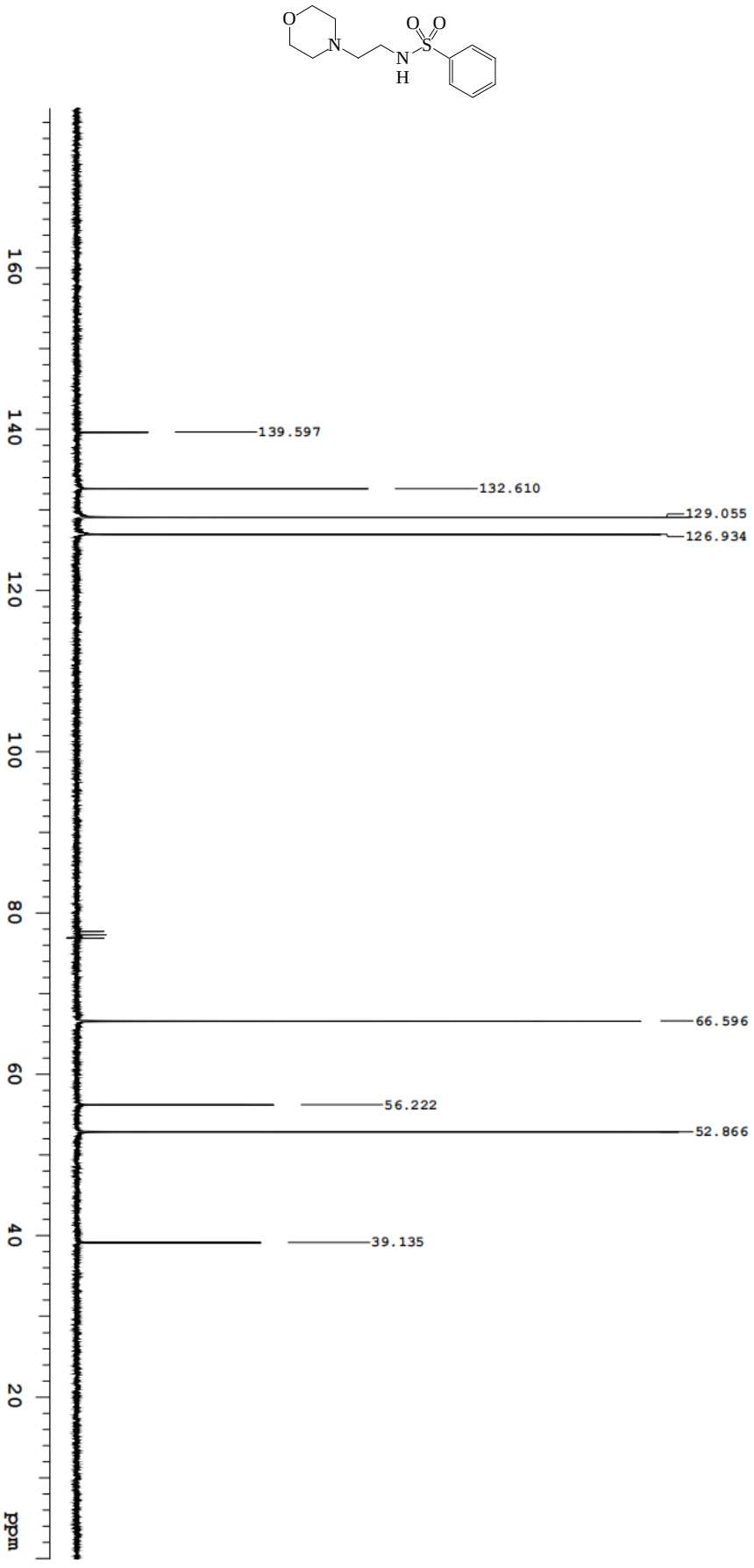
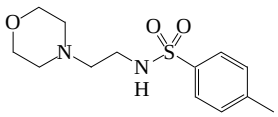


Figure S32: ^{1}H-NMR spectra (CD_3OD) for *4-methyl-N-(2-morpholinoethyl)benzenesulfonamide,* **16**



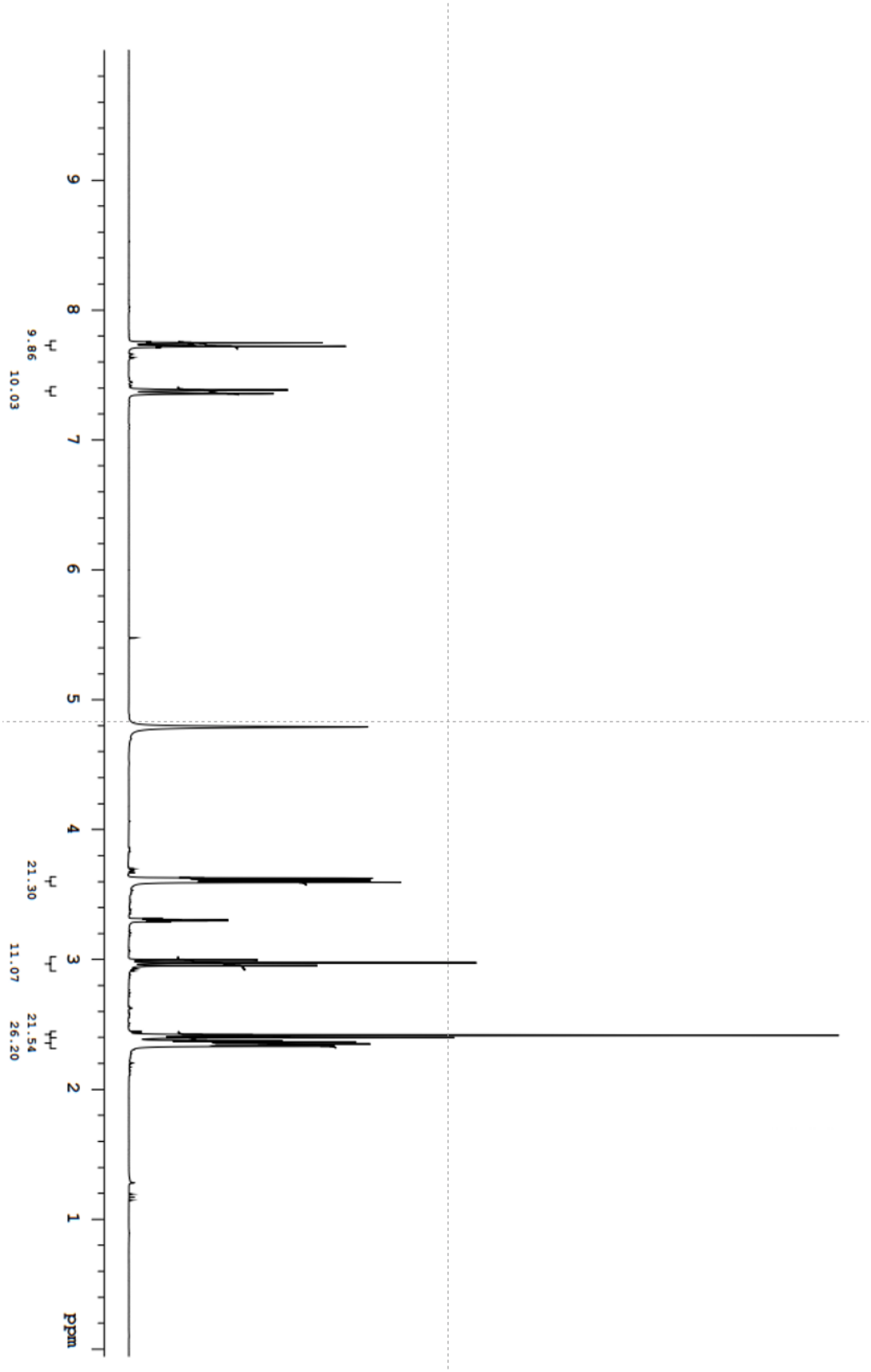


Figure S33: ^{13}C-NMR spectra (CD_3OD) for *4-methyl-N-(2-morpholinoethyl)benzenesulfonamide,* **16**

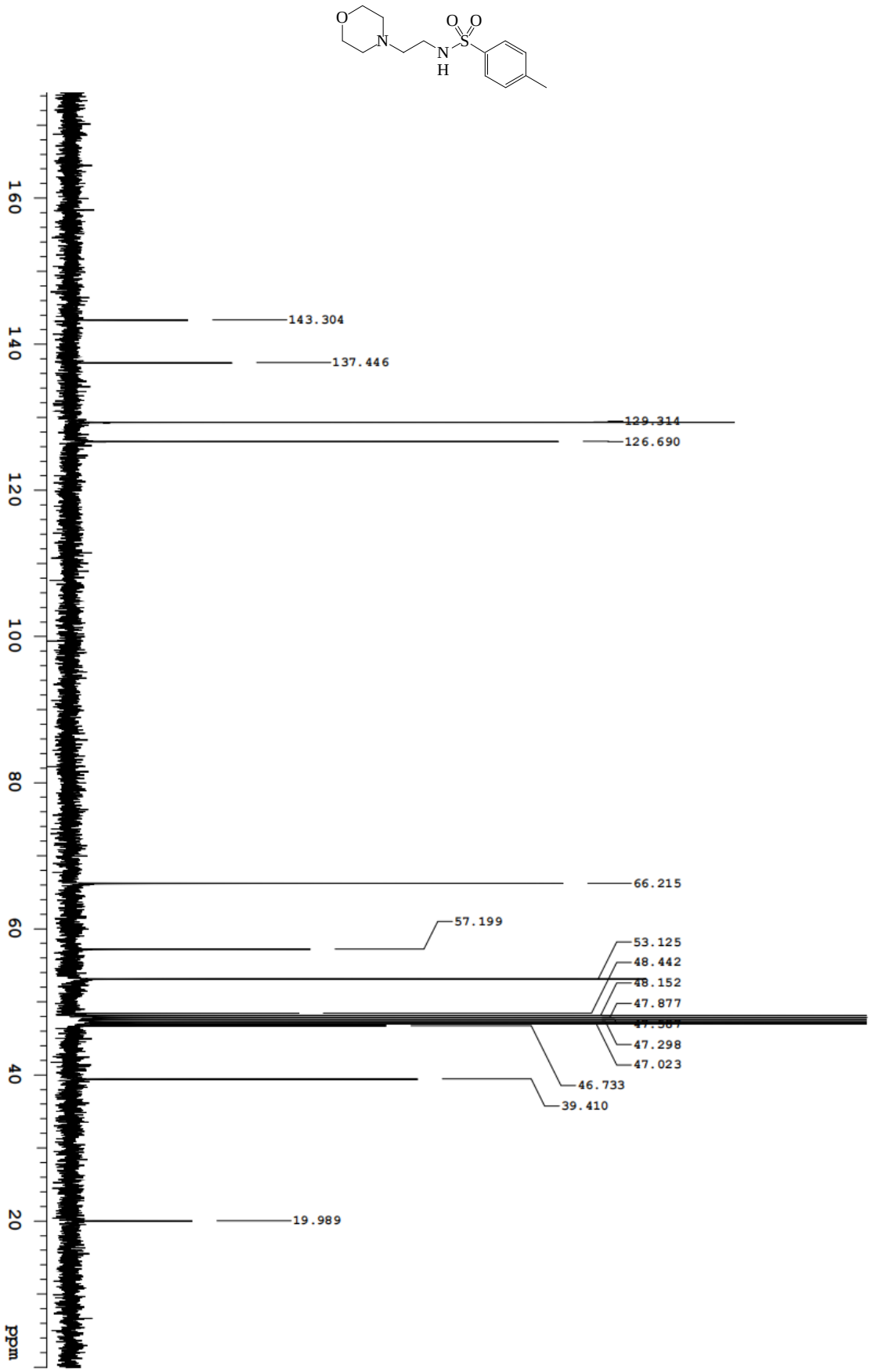


Figure S34: ^{1}H-NMR spectra ($CDCl_3$) for *N-(2-morpholinoethyl)-1-phenylmethanesulfonamide,* **17**

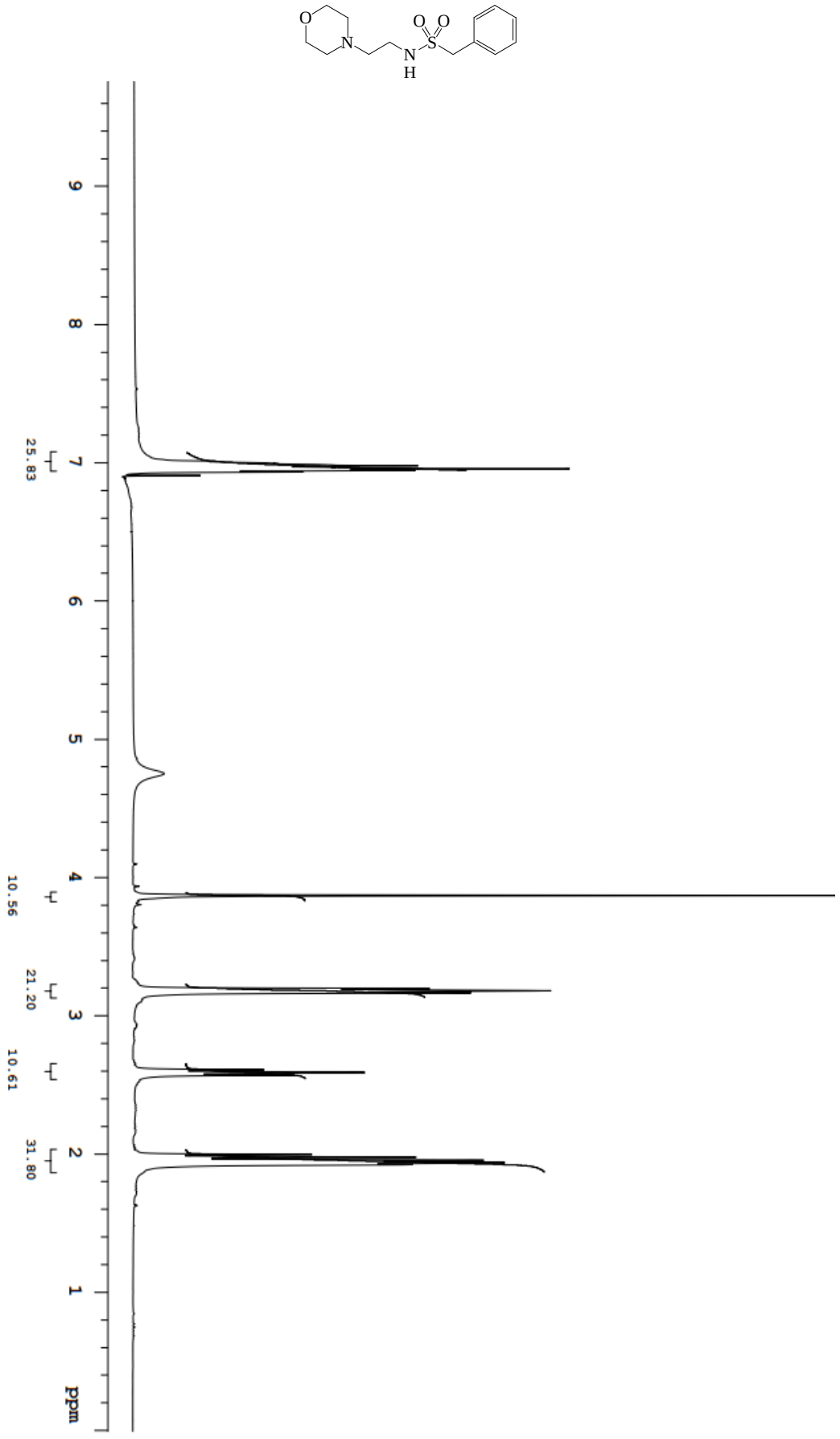


Figure S35: ^{13}C-NMR spectra ($CDCl_3$) for *N-(2-morpholinoethyl)-1-phenylmethanesulfonamide,* **17**

