Table 1. Crystal data and structure refinement for *d*,*l*-**20**.

Identification code	br42n	
Empirical formula	C38 H18 Co4 O12	
Formula weight	902.24	
Temperature	173(2) K	
Wavelength	1.54178 Å	
Crystal system	Tetragonal	
Space group	P4(1)	
Unit cell dimensions	a = 11.3000(3) Å	a= 90°.
	b = 11.3000(3) Å	b= 90°.
	c = 28.1345(18) Å	g = 90°.
Volume	3592.5(3) $Å^3$	
Z	4	
Density (calculated)	1.668 Mg/m^3	
Absorption coefficient	14.773 mm^{-1}	
F(000)	1800	
Crystal size	0.26 x 0.10 x 0.08 mm^3	
Theta range for data collection	3.91 to 67.37°.	
Index ranges	-13<=h<=13, -12<=k<=12, -33<=l<=32	
Reflections collected	41758	
Independent reflections	6404 [R(int) = 0.1378]	
Completeness to theta = 67.37°	99.9 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	0.3845 and 0.1139	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	6404 / 33 / 269	
Goodness-of-fit on F^2	1.050	
Final R indices [I>2sigma(I)]	R1 = 0.0920, wR2 = 0.2480	
R indices (all data)	R1 = 0.1380, wR2 = 0.2777	
Absolute structure parameter	0.056(10)	
Extinction coefficient	0.0014(3)	
Largest diff. peak and hole	1.029 and -0.890 $e.Å^{-3}$	

Table 2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters ($Å^2$x 10^3) for *d,l*-**20**. U(eq) is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	U(eq)
C(1)	7505(11)	6051(11)	2263(5)	53(3)
C(2)	7099(12)	7527(12)	1482(5)	63(3)
C(3)	8955(13)	8006(13)	2154(5)	69(4)
C(4)	10772(16)	7858(17)	1350(6)	87(5)
C(5)	10679(16)	5984(16)	715(7)	84(4)
C(6)	8852(14)	7593(14)	693(6)	73(4)
C(7)	6894(13)	2872(12)	2774(5)	65(3)
C(8)	8689(13)	1367(13)	2912(6)	71(4)
C(9)	7053(12)	919(13)	2170(5)	65(3)
C(10)	10826(14)	1645(13)	2267(5)	70(4)
C(11)	10552(11)	2884(11)	1464(4)	54(3)
C(12)	9218(13)	848(13)	1556(5)	69(4)
C(13)	9656(10)	5760(10)	1668(4)	52(3)
C(14)	8800(10)	5462(10)	1375(4)	51(3)
C(15)	8117(11)	4438(11)	1145(4)	53(3)
C(16)	7424(10)	3754(10)	1517(4)	50(3)
C(17)	8209(9)	3180(10)	1900(4)	48(3)
C(18)	8932(11)	3435(11)	2247(4)	53(3)
C(19)	7483(9)	4864(9)	718(3)	79(4)
C(20)	6345(9)	5329(11)	706(3)	104(5)
C(21)	5899(7)	5798(10)	286(4)	117(7)
C(22)	6592(9)	5802(9)	-122(3)	96(5)
C(23)	7730(9)	5337(10)	-110(3)	83
C(24)	8176(7)	4868(9)	310(4)	83
C(25)	6271(11)	6209(13)	-585(4)	83
C(26)	5157(12)	6723(17)	-603(5)	119(7)
C(27)	4503(11)	6765(13)	-188(4)	83
C(28)	4794(10)	6293(13)	251(4)	83
C(29)	6635(8)	2800(8)	1303(3)	59(3)
C(30)	5491(9)	2647(10)	1475(4)	100(5)
C(31)	4812(8)	1698(11)	1320(5)	134(8)

C(32)	5276(10)	901(9)	993(5)	123(7)
C(33)	6419(11)	1054(9)	821(4)	110(6)
C(34)	7098(8)	2004(9)	976(4)	85(4)
C(35)	4743(14)	-138(13)	805(7)	117(7)
C(36)	3587(14)	-238(16)	960(7)	118(7)
C(37)	3082(16)	497(19)	1299(9)	162(11)
C(38)	3655(13)	1512(19)	1468(8)	150(9)
Co(1)	8335(2)	6807(2)	1794(1)	50(1)
Co(2)	9768(2)	6764(2)	1133(1)	59(1)
Co(3)	7938(2)	2084(2)	2423(1)	53(1)
Co(4)	9644(2)	2148(2)	1882(1)	53(1)
O(1)	9231(12)	879(12)	3190(4)	104(4)
O(2)	11554(11)	1365(13)	2524(5)	110(4)
O(3)	11169(9)	3352(8)	1206(4)	77(3)
O(4)	8905(10)	19(8)	1337(4)	79(3)
O(5)	6158(11)	3357(9)	3006(4)	88(3)
O(6)	6481(10)	129(9)	2034(4)	86(3)
O(7)	11273(15)	5518(11)	457(6)	131(6)
O(8)	11465(14)	8478(14)	1543(7)	133(5)
O(9)	8343(10)	8073(9)	426(4)	82(3)
O(10)	6375(10)	7987(10)	1290(4)	89(3)
O(11)	9358(12)	8745(8)	2363(4)	94(3)
O(12)	7014(8)	5594(7)	2538(3)	63(2)

Table 3. Bond lengths [Å] and angles [°] for *d*,*l*-**20**.

C(1)-O(12)	1.083(14)
C(1)-Co(1)	1.830(13)
C(2)-O(10)	1.110(16)
C(2)-Co(1)	1.840(14)
C(3)-O(11)	1.120(16)
C(3)-Co(1)	1.830(15)
C(4)-O(8)	1.18(2)
C(4)-Co(2)	1.786(19)
C(5)-O(7)	1.12(2)
C(5)-Co(2)	1.795(19)
C(6)-O(9)	1.091(18)
C(6)-Co(2)	1.865(17)
C(7)-O(5)	1.192(17)
C(7)-Co(3)	1.776(15)
C(8)-O(1)	1.136(18)
C(8)-Co(3)	1.808(16)
C(9)-O(6)	1.166(17)
C(9)-Co(3)	1.801(15)
C(10)-O(2)	1.142(18)
C(10)-Co(4)	1.810(16)
C(11)-O(3)	1.135(15)
C(11)-Co(4)	1.770(13)
C(12)-O(4)	1.176(17)
C(12)-Co(4)	1.798(16)
C(13)-C(14)	1.315(17)
C(13)-Co(2)	1.890(12)
C(13)-Co(1)	1.936(12)
C(13)-H(13A)	1.0000
C(14)-C(15)	1.534(17)
C(14)-Co(2)	1.956(12)
C(14)-Co(1)	1.994(12)
C(15)-C(19)	1.478(14)
C(15)-C(16)	1.520(17)

C(15)-H(15A)	1.0000
C(16)-C(29)	1.522(14)
C(16)-C(17)	1.538(16)
C(16)-H(16A)	1.0000
C(17)-C(18)	1.306(17)
C(17)-Co(3)	1.949(11)
C(17)-Co(4)	1.998(11)
C(18)-Co(4)	1.954(12)
C(18)-Co(3)	1.959(12)
C(18)-H(18A)	1.0000
C(19)-C(20)	1.3900
C(19)-C(24)	1.3900
C(20)-C(21)	1.3900
C(20)-H(20A)	0.9500
C(21)-C(28)	1.372(9)
C(21)-C(22)	1.3900
C(22)-C(23)	1.3900
C(22)-C(25)	1.429(9)
C(23)-C(24)	1.3900
C(23)-H(23A)	0.9500
C(24)-H(24A)	0.9500
C(25)-C(26)	1.387(9)
C(25)-H(25A)	0.9500
C(26)-C(27)	1.382(9)
C(26)-H(26A)	0.9500
C(27)-C(28)	1.385(9)
C(27)-H(27A)	0.9500
C(28)-H(28A)	0.9500
C(29)-C(30)	1.3900
C(29)-C(34)	1.3900
C(30)-C(31)	1.3900
C(30)-H(30A)	0.9500
C(31)-C(38)	1.388(10)
C(31)-C(32)	1.3900
C(32)-C(33)	1.3900
C(32)-C(35)	1.421(9)

C(33)-C(34)	1.3900
C(33)-H(33A)	0.9500
C(34)-H(34A)	0.9500
C(35)-C(36)	1.382(9)
C(35)-H(35A)	0.9500
C(36)-C(37)	1.387(9)
C(36)-H(36A)	0.9500
C(37)-C(38)	1.401(9)
C(37)-H(37A)	0.9500
C(38)-H(38A)	0.9500
Co(1)-Co(2)	2.467(3)
Co(3)-Co(4)	2.458(3)

O(12)-C(1)-Co(1)	179.3(12)
O(10)-C(2)-Co(1)	178.0(14)
O(11)-C(3)-Co(1)	178.0(14)
O(8)-C(4)-Co(2)	171.0(17)
O(7)-C(5)-Co(2)	178.0(19)
O(9)-C(6)-Co(2)	177.8(15)
O(5)-C(7)-Co(3)	176.9(12)
O(1)-C(8)-Co(3)	173.8(14)
O(6)-C(9)-Co(3)	175.6(13)
O(2)-C(10)-Co(4)	176.9(14)
O(3)-C(11)-Co(4)	177.5(12)
O(4)-C(12)-Co(4)	177.7(13)
C(14)-C(13)-Co(2)	72.7(8)
C(14)-C(13)-Co(1)	72.8(7)
Co(2)-C(13)-Co(1)	80.3(5)
C(14)-C(13)-H(13A)	135.0
Co(2)-C(13)-H(13A)	135.0
Co(1)-C(13)-H(13A)	135.0
C(13)-C(14)-C(15)	145.9(11)
C(13)-C(14)-Co(2)	67.3(7)
C(15)-C(14)-Co(2)	134.6(8)
C(13)-C(14)-Co(1)	68.1(7)
C(15)-C(14)-Co(1)	133.8(8)

Co(2)-C(14)-Co(1)	77.3(4)
C(19)-C(15)-C(16)	118.4(10)
C(19)-C(15)-C(14)	109.9(10)
C(16)-C(15)-C(14)	110.6(10)
C(19)-C(15)-H(15A)	105.7
C(16)-C(15)-H(15A)	105.7
C(14)-C(15)-H(15A)	105.7
C(15)-C(16)-C(29)	112.9(9)
C(15)-C(16)-C(17)	113.5(9)
C(29)-C(16)-C(17)	108.5(9)
C(15)-C(16)-H(16A)	107.2
C(29)-C(16)-H(16A)	107.2
C(17)-C(16)-H(16A)	107.2
C(18)-C(17)-C(16)	142.4(11)
C(18)-C(17)-Co(3)	70.9(7)
C(16)-C(17)-Co(3)	134.9(8)
C(18)-C(17)-Co(4)	68.9(7)
C(16)-C(17)-Co(4)	134.2(8)
Co(3)-C(17)-Co(4)	77.0(4)
C(17)-C(18)-Co(4)	72.5(7)
C(17)-C(18)-Co(3)	70.1(7)
Co(4)-C(18)-Co(3)	77.8(5)
C(17)-C(18)-H(18A)	136.2
Co(4)-C(18)-H(18A)	136.2
Co(3)-C(18)-H(18A)	136.2
C(20)-C(19)-C(24)	120.0
C(20)-C(19)-C(15)	126.3(8)
C(24)-C(19)-C(15)	113.5(8)
C(21)-C(20)-C(19)	120.0
C(21)-C(20)-H(20A)	120.0
C(19)-C(20)-H(20A)	120.0
C(28)-C(21)-C(20)	123.1(9)
C(28)-C(21)-C(22)	116.8(9)
C(20)-C(21)-C(22)	120.0
C(21)-C(22)-C(23)	120.0
C(21)-C(22)-C(25)	127.7(8)

C(23)-C(22)-C(25)	112.3(8)
C(24)-C(23)-C(22)	120.0
C(24)-C(23)-H(23A)	120.0
C(22)-C(23)-H(23A)	120.0
C(23)-C(24)-C(19)	120.0
C(23)-C(24)-H(24A)	120.0
C(19)-C(24)-H(24A)	120.0
C(26)-C(25)-C(22)	113.5(9)
C(26)-C(25)-H(25A)	123.3
C(22)-C(25)-H(25A)	123.3
C(27)-C(26)-C(25)	117.9(10)
C(27)-C(26)-H(26A)	121.0
C(25)-C(26)-H(26A)	121.0
C(26)-C(27)-C(28)	127.8(10)
C(26)-C(27)-H(27A)	116.1
C(28)-C(27)-H(27A)	116.1
C(21)-C(28)-C(27)	116.0(10)
C(21)-C(28)-H(28A)	122.0
C(27)-C(28)-H(28A)	122.0
C(30)-C(29)-C(34)	120.0
C(30)-C(29)-C(16)	119.7(8)
C(34)-C(29)-C(16)	119.9(8)
C(31)-C(30)-C(29)	120.0
C(31)-C(30)-H(30A)	120.0
C(29)-C(30)-H(30A)	120.0
C(38)-C(31)-C(30)	122.8(11)
C(38)-C(31)-C(32)	117.2(11)
C(30)-C(31)-C(32)	120.0
C(33)-C(32)-C(31)	120.0
C(33)-C(32)-C(35)	111.6(10)
C(31)-C(32)-C(35)	128.4(10)
C(32)-C(33)-C(34)	120.0
C(32)-C(33)-H(33A)	120.0
C(34)-C(33)-H(33A)	120.0
C(33)-C(34)-C(29)	120.0
C(33)-C(34)-H(34A)	120.0

C(29)-C(34)-H(34A)	120.0
C(36)-C(35)-C(32)	110.6(11)
C(36)-C(35)-H(35A)	124.7
C(32)-C(35)-H(35A)	124.7
C(35)-C(36)-C(37)	123.8(11)
C(35)-C(36)-H(36A)	118.1
C(37)-C(36)-H(36A)	118.1
C(36)-C(37)-C(38)	122.3(12)
C(36)-C(37)-H(37A)	118.9
C(38)-C(37)-H(37A)	118.9
C(31)-C(38)-C(37)	117.2(12)
C(31)-C(38)-H(38A)	121.4
C(37)-C(38)-H(38A)	121.4
C(1)-Co(1)-C(3)	98.3(6)
C(1)-Co(1)-C(2)	99.3(6)
C(3)-Co(1)-C(2)	103.1(6)
C(1)-Co(1)-C(13)	104.0(5)
C(3)-Co(1)-C(13)	105.0(6)
C(2)-Co(1)-C(13)	140.2(6)
C(1)-Co(1)-C(14)	101.9(5)
C(3)-Co(1)-C(14)	142.2(6)
C(2)-Co(1)-C(14)	104.7(6)
C(13)-Co(1)-C(14)	39.1(5)
C(1)-Co(1)-Co(2)	150.6(4)
C(3)-Co(1)-Co(2)	100.4(5)
C(2)-Co(1)-Co(2)	98.4(4)
C(13)-Co(1)-Co(2)	49.0(4)
C(14)-Co(1)-Co(2)	50.7(3)
C(4)-Co(2)-C(5)	101.5(8)
C(4)-Co(2)-C(6)	103.4(8)
C(5)-Co(2)-C(6)	97.5(8)
C(4)-Co(2)-C(13)	100.7(7)
C(5)-Co(2)-C(13)	105.4(7)
C(6)-Co(2)-C(13)	142.5(6)
C(4)-Co(2)-C(14)	139.2(7)
C(5)-Co(2)-C(14)	100.3(7)

C(6)-Co(2)-C(14)	107.4(6)
C(13)-Co(2)-C(14)	40.0(5)
C(4)-Co(2)-Co(1)	98.4(6)
C(5)-Co(2)-Co(1)	151.7(6)
C(6)-Co(2)-Co(1)	97.3(5)
C(13)-Co(2)-Co(1)	50.7(4)
C(14)-Co(2)-Co(1)	52.0(4)
C(7)-Co(3)-C(9)	102.6(6)
C(7)-Co(3)-C(8)	96.6(7)
C(9)-Co(3)-C(8)	103.6(7)
C(7)-Co(3)-C(17)	101.9(6)
C(9)-Co(3)-C(17)	104.6(6)
C(8)-Co(3)-C(17)	141.8(6)
C(7)-Co(3)-C(18)	97.5(6)
C(9)-Co(3)-C(18)	142.0(6)
C(8)-Co(3)-C(18)	105.8(6)
C(17)-Co(3)-C(18)	39.0(5)
C(7)-Co(3)-Co(4)	148.2(5)
C(9)-Co(3)-Co(4)	102.2(5)
C(8)-Co(3)-Co(4)	96.7(5)
C(17)-Co(3)-Co(4)	52.4(3)
C(18)-Co(3)-Co(4)	51.0(4)
C(11)-Co(4)-C(12)	101.5(6)
C(11)-Co(4)-C(10)	96.7(6)
C(12)-Co(4)-C(10)	104.2(7)
C(11)-Co(4)-C(18)	103.8(5)
C(12)-Co(4)-C(18)	140.0(6)
C(10)-Co(4)-C(18)	102.9(6)
C(11)-Co(4)-C(17)	102.3(5)
C(12)-Co(4)-C(17)	105.8(6)
C(10)-Co(4)-C(17)	140.1(6)
C(18)-Co(4)-C(17)	38.6(5)
C(11)-Co(4)-Co(3)	151.8(4)
C(12)-Co(4)-Co(3)	94.7(5)
C(10)-Co(4)-Co(3)	101.5(5)
C(18)-Co(4)-Co(3)	51.2(4)

C(17)-Co(4)-Co(3)	50.6(3)

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters ($Å^2 x\ 10^3$) for *d,l*-**20**. The anisotropic displacement factor exponent takes the form: $-2\pi^2[h^2 a^{*2} U^{11} + ... + 2 h k a^* b^* U^{12}]$

	U^{11}	U^{22}	U^{33}	U^{23}	U^{13}	U^{12}
Co(1)	52(1)	36(1)	61(1)	-1(1)	-4(1)	2(1)
Co(2)	61(1)	39(1)	78(1)	8(1)	7(1)	1(1)
Co(3)	63(1)	43(1)	52(1)	4(1)	1(1)	0(1)
Co(4)	63(1)	41(1)	57(1)	6(1)	5(1)	7(1)
O(1)	124(10)	119(10)	68(7)	35(7)	-1(7)	31(8)
O(2)	92(8)	129(10)	109(10)	25(8)	-13(7)	38(7)
O(3)	64(6)	60(6)	108(8)	4(5)	20(5)	-11(4)
O(4)	107(8)	47(5)	83(7)	-15(5)	16(5)	-14(5)
O(5)	97(8)	59(6)	108(8)	-2(6)	37(6)	3(5)
O(6)	106(8)	66(6)	86(7)	6(5)	-17(6)	-16(6)
O(7)	167(13)	83(8)	144(12)	36(8)	96(11)	46(8)
O(8)	105(10)	115(11)	177(15)	3(10)	-12(10)	-29(9)
O(9)	93(7)	68(6)	84(7)	31(5)	7(6)	17(5)
O(10)	81(7)	85(7)	101(8)	9(6)	-12(6)	43(6)
O(11)	143(10)	43(5)	95(8)	-13(5)	-27(7)	-10(6)
O(12)	73(6)	49(5)	68(6)	0(4)	9(4)	-2(4)

Table 5. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$x 10^3) for *d*,*l*-**20**.

	x	y	z	U(eq)
H(13A)	10235	5317	1869	63
H(15A)	8734	3877	1025	64
H(16A)	6895	4332	1682	60
H(18A)	9219	4172	2407	64
H(20A)	5871	5326	985	124
H(23A)	8204	5340	-389	99
H(24A)	8954	4550	318	99
H(25A)	6771	6135	-855	99
H(26A)	4853	7037	-892	143
H(27A)	3765	7165	-206	99
H(28A)	4261	6312	512	99
H(30A)	5174	3192	1699	119
H(33A)	6736	510	597	132
H(34A)	7880	2108	859	102
H(35A)	5129	-688	602	140
H(36A)	3110	-844	826	142
H(37A)	2322	304	1421	195
H(38A)	3269	2050	1676	180

Table 6. Torsion angles [°] for *d*,*l*-**20**.

Co(2)-C(13)-C(14)-C(15)	137.7(19)
Co(1)-C(13)-C(14)-C(15)	-137.4(19)
Co(1)-C(13)-C(14)-Co(2)	84.9(4)
Co(2)-C(13)-C(14)-Co(1)	-84.9(4)
C(13)-C(14)-C(15)-C(19)	-161.6(17)
Co(2)-C(14)-C(15)-C(19)	-42.3(15)
Co(1)-C(14)-C(15)-C(19)	78.8(13)
C(13)-C(14)-C(15)-C(16)	66(2)
Co(2)-C(14)-C(15)-C(16)	-174.8(9)
Co(1)-C(14)-C(15)-C(16)	-53.7(15)
C(19)-C(15)-C(16)-C(29)	46.4(14)
C(14)-C(15)-C(16)-C(29)	174.4(9)
C(19)-C(15)-C(16)-C(17)	170.3(10)
C(14)-C(15)-C(16)-C(17)	-61.6(12)
C(15)-C(16)-C(17)-C(18)	65(2)
C(29)-C(16)-C(17)-C(18)	-168.3(15)
C(15)-C(16)-C(17)-Co(3)	-172.4(9)
C(29)-C(16)-C(17)-Co(3)	-46.1(14)
C(15)-C(16)-C(17)-Co(4)	-50.7(14)
C(29)-C(16)-C(17)-Co(4)	75.6(12)
C(16)-C(17)-C(18)-Co(4)	-136.4(17)
Co(3)-C(17)-C(18)-Co(4)	83.0(3)
C(16)-C(17)-C(18)-Co(3)	140.6(17)
Co(4)-C(17)-C(18)-Co(3)	-83.0(3)
C(16)-C(15)-C(19)-C(20)	39.2(14)
C(14)-C(15)-C(19)-C(20)	-89.2(11)
C(16)-C(15)-C(19)-C(24)	-146.4(9)
C(14)-C(15)-C(19)-C(24)	85.2(10)
C(24)-C(19)-C(20)-C(21)	0.0
C(15)-C(19)-C(20)-C(21)	174.0(11)
C(19)-C(20)-C(21)-C(28)	-178.6(12)

C(19)-C(20)-C(21)-C(22)	0.0
C(28)-C(21)-C(22)-C(23)	178.7(11)
C(20)-C(21)-C(22)-C(23)	0.0
C(28)-C(21)-C(22)-C(25)	-3.5(15)
C(20)-C(21)-C(22)-C(25)	177.9(12)
C(21)-C(22)-C(23)-C(24)	0.0
C(25)-C(22)-C(23)-C(24)	-178.2(10)
C(22)-C(23)-C(24)-C(19)	0.0
C(20)-C(19)-C(24)-C(23)	0.0
C(15)-C(19)-C(24)-C(23)	-174.7(9)
C(21)-C(22)-C(25)-C(26)	4.6(19)
C(23)-C(22)-C(25)-C(26)	-177.4(12)
C(22)-C(25)-C(26)-C(27)	-1(2)
C(25)-C(26)-C(27)-C(28)	-4(3)
C(20)-C(21)-C(28)-C(27)	177.4(11)
C(22)-C(21)-C(28)-C(27)	-1.2(18)
C(26)-C(27)-C(28)-C(21)	5(3)
C(15)-C(16)-C(29)-C(30)	-137.4(9)
C(17)-C(16)-C(29)-C(30)	95.9(9)
C(15)-C(16)-C(29)-C(34)	49.7(12)
C(17)-C(16)-C(29)-C(34)	-76.9(10)
C(34)-C(29)-C(30)-C(31)	0.0
C(16)-C(29)-C(30)-C(31)	-172.8(9)
C(29)-C(30)-C(31)-C(38)	-178.4(16)
C(29)-C(30)-C(31)-C(32)	0.0
C(38)-C(31)-C(32)-C(33)	178.5(15)
C(30)-C(31)-C(32)-C(33)	0.0
C(38)-C(31)-C(32)-C(35)	-4.0(18)
C(30)-C(31)-C(32)-C(35)	177.5(14)
C(31)-C(32)-C(33)-C(34)	0.0
C(35)-C(32)-C(33)-C(34)	-177.9(12)
C(32)-C(33)-C(34)-C(29)	0.0
C(30)-C(29)-C(34)-C(33)	0.0
C(16)-C(29)-C(34)-C(33)	172.8(9)
C(33)-C(32)-C(35)-C(36)	-176.7(14)
C(31)-C(32)-C(35)-C(36)	6(2)

C(32)-C(35)-C(36)-C(37)	-8(3)
C(35)-C(36)-C(37)-C(38)	9(4)
C(30)-C(31)-C(38)-C(37)	-177.7(17)
C(32)-C(31)-C(38)-C(37)	4(3)
C(36)-C(37)-C(38)-C(31)	-6(4)
O(12)-C(1)-Co(1)-C(3)	-158(100)
O(12)-C(1)-Co(1)-C(2)	97(100)
O(12)-C(1)-Co(1)-C(13)	-50(100)
O(12)-C(1)-Co(1)-C(14)	-10(100)
O(12)-C(1)-Co(1)-Co(2)	-29(100)
O(11)-C(3)-Co(1)-C(1)	161(43)
O(11)-C(3)-Co(1)-C(2)	-97(43)
O(11)-C(3)-Co(1)-C(13)	54(43)
O(11)-C(3)-Co(1)-C(14)	39(43)
O(11)-C(3)-Co(1)-Co(2)	4(43)
O(10)-C(2)-Co(1)-C(1)	151(38)
O(10)-C(2)-Co(1)-C(3)	50(39)
O(10)-C(2)-Co(1)-C(13)	-84(39)
O(10)-C(2)-Co(1)-C(14)	-104(38)
O(10)-C(2)-Co(1)-Co(2)	-53(39)
C(14)-C(13)-Co(1)-C(1)	91.7(8)
Co(2)-C(13)-Co(1)-C(1)	166.4(5)
C(14)-C(13)-Co(1)-C(3)	-165.6(8)
Co(2)-C(13)-Co(1)-C(3)	-90.8(6)
C(14)-C(13)-Co(1)-C(2)	-32.3(12)
Co(2)-C(13)-Co(1)-C(2)	42.5(9)
Co(2)-C(13)-Co(1)-C(14)	74.8(7)
C(14)-C(13)-Co(1)-Co(2)	-74.8(7)
C(13)-C(14)-Co(1)-C(1)	-97.7(8)
C(15)-C(14)-Co(1)-C(1)	50.6(12)
Co(2)-C(14)-Co(1)-C(1)	-168.1(4)
C(13)-C(14)-Co(1)-C(3)	23.1(13)
C(15)-C(14)-Co(1)-C(3)	171.4(11)
Co(2)-C(14)-Co(1)-C(3)	-47.3(10)
C(13)-C(14)-Co(1)-C(2)	159.3(8)
C(15)-C(14)-Co(1)-C(2)	-52.4(12)

Co(2)-C(14)-Co(1)-C(2)	88.9(5)
C(15)-C(14)-Co(1)-C(13)	148.3(15)
Co(2)-C(14)-Co(1)-C(13)	-70.4(7)
C(13)-C(14)-Co(1)-Co(2)	70.4(7)
C(15)-C(14)-Co(1)-Co(2)	-141.3(13)
O(8)-C(4)-Co(2)-C(5)	-96(11)
O(8)-C(4)-Co(2)-C(6)	163(11)
O(8)-C(4)-Co(2)-C(13)	12(11)
O(8)-C(4)-Co(2)-C(14)	25(12)
O(8)-C(4)-Co(2)-Co(1)	64(11)
O(7)-C(5)-Co(2)-C(4)	2(50)
O(7)-C(5)-Co(2)-C(6)	108(50)
O(7)-C(5)-Co(2)-C(13)	-103(50)
O(7)-C(5)-Co(2)-C(14)	-143(50)
O(7)-C(5)-Co(2)-Co(1)	-132(50)
O(9)-C(6)-Co(2)-C(4)	81(40)
O(9)-C(6)-Co(2)-C(5)	-23(40)
O(9)-C(6)-Co(2)-C(13)	-151(40)
O(9)-C(6)-Co(2)-C(14)	-126(40)
O(9)-C(6)-Co(2)-Co(1)	-179(100)
C(14)-C(13)-Co(2)-C(4)	167.0(9)
Co(1)-C(13)-Co(2)-C(4)	92.1(7)
C(14)-C(13)-Co(2)-C(5)	-87.7(9)
Co(1)-C(13)-Co(2)-C(5)	-162.6(6)
C(14)-C(13)-Co(2)-C(6)	37.8(13)
Co(1)-C(13)-Co(2)-C(6)	-37.2(11)
Co(1)-C(13)-Co(2)-C(14)	-74.9(7)
C(14)-C(13)-Co(2)-Co(1)	74.9(7)
C(13)-C(14)-Co(2)-C(4)	-19.7(13)
C(15)-C(14)-Co(2)-C(4)	-167.7(12)
Co(1)-C(14)-Co(2)-C(4)	51.6(11)
C(13)-C(14)-Co(2)-C(5)	101.7(9)
C(15)-C(14)-Co(2)-C(5)	-46.2(13)
Co(1)-C(14)-Co(2)-C(5)	173.1(6)
C(13)-C(14)-Co(2)-C(6)	-157.0(8)
C(15)-C(14)-Co(2)-C(6)	55.0(13)

Co(1)-C(14)-Co(2)-C(6)	-85.7(6)
C(15)-C(14)-Co(2)-C(13)	-148.0(16)
Co(1)-C(14)-Co(2)-C(13)	71.3(7)
C(13)-C(14)-Co(2)-Co(1)	-71.3(7)
C(15)-C(14)-Co(2)-Co(1)	140.7(13)
C(1)-Co(1)-Co(2)-C(4)	-124.6(10)
C(3)-Co(1)-Co(2)-C(4)	3.9(8)
C(2)-Co(1)-Co(2)-C(4)	109.0(8)
C(13)-Co(1)-Co(2)-C(4)	-97.0(8)
C(14)-Co(1)-Co(2)-C(4)	-148.8(7)
C(1)-Co(1)-Co(2)-C(5)	9.8(15)
C(3)-Co(1)-Co(2)-C(5)	138.2(13)
C(2)-Co(1)-Co(2)-C(5)	-116.7(13)
C(13)-Co(1)-Co(2)-C(5)	37.3(13)
C(14)-Co(1)-Co(2)-C(5)	-14.5(13)
C(1)-Co(1)-Co(2)-C(6)	130.6(9)
C(3)-Co(1)-Co(2)-C(6)	-100.9(7)
C(2)-Co(1)-Co(2)-C(6)	4.2(6)
C(13)-Co(1)-Co(2)-C(6)	158.2(7)
C(14)-Co(1)-Co(2)-C(6)	106.4(7)
C(1)-Co(1)-Co(2)-C(13)	-27.6(9)
C(3)-Co(1)-Co(2)-C(13)	100.9(7)
C(2)-Co(1)-Co(2)-C(13)	-154.0(6)
C(14)-Co(1)-Co(2)-C(13)	-51.8(6)
C(1)-Co(1)-Co(2)-C(14)	24.3(9)
C(3)-Co(1)-Co(2)-C(14)	152.8(6)
C(2)-Co(1)-Co(2)-C(14)	-102.2(6)
C(13)-Co(1)-Co(2)-C(14)	51.8(6)
O(5)-C(7)-Co(3)-C(9)	13(25)
O(5)-C(7)-Co(3)-C(8)	-93(25)
O(5)-C(7)-Co(3)-C(17)	121(25)
O(5)-C(7)-Co(3)-C(18)	160(25)
O(5)-C(7)-Co(3)-Co(4)	153(24)
O(6)-C(9)-Co(3)-C(7)	-76(16)
O(6)-C(9)-Co(3)-C(8)	24(17)
O(6)-C(9)-Co(3)-C(17)	178(100)

O(6)-C(9)-Co(3)-C(18)	164(16)
O(6)-C(9)-Co(3)-Co(4)	125(16)
O(1)-C(8)-Co(3)-C(7)	-174(14)
O(1)-C(8)-Co(3)-C(9)	81(14)
O(1)-C(8)-Co(3)-C(17)	-56(14)
O(1)-C(8)-Co(3)-C(18)	-75(14)
O(1)-C(8)-Co(3)-Co(4)	-23(14)
C(18)-C(17)-Co(3)-C(7)	87.3(8)
C(16)-C(17)-Co(3)-C(7)	-59.6(12)
Co(4)-C(17)-Co(3)-C(7)	159.2(5)
C(18)-C(17)-Co(3)-C(9)	-166.2(8)
C(16)-C(17)-Co(3)-C(9)	47.0(12)
Co(4)-C(17)-Co(3)-C(9)	-94.3(5)
C(18)-C(17)-Co(3)-C(8)	-29.8(12)
C(16)-C(17)-Co(3)-C(8)	-176.7(11)
Co(4)-C(17)-Co(3)-C(8)	42.1(10)
C(16)-C(17)-Co(3)-C(18)	-146.9(15)
Co(4)-C(17)-Co(3)-C(18)	71.9(7)
C(18)-C(17)-Co(3)-Co(4)	-71.9(7)
C(16)-C(17)-Co(3)-Co(4)	141.3(13)
C(17)-C(18)-Co(3)-C(7)	-99.6(8)
Co(4)-C(18)-Co(3)-C(7)	-175.2(5)
C(17)-C(18)-Co(3)-C(9)	22.1(12)
Co(4)-C(18)-Co(3)-C(9)	-53.6(10)
C(17)-C(18)-Co(3)-C(8)	161.4(8)
Co(4)-C(18)-Co(3)-C(8)	85.7(6)
Co(4)-C(18)-Co(3)-C(17)	-75.6(7)
C(17)-C(18)-Co(3)-Co(4)	75.6(7)
O(3)-C(11)-Co(4)-C(12)	-119(27)
O(3)-C(11)-Co(4)-C(10)	-13(27)
O(3)-C(11)-Co(4)-C(18)	93(27)
O(3)-C(11)-Co(4)-C(17)	132(27)
O(3)-C(11)-Co(4)-Co(3)	118(27)
O(4)-C(12)-Co(4)-C(11)	-94(33)
O(4)-C(12)-Co(4)-C(10)	166(33)
O(4)-C(12)-Co(4)-C(18)	34(34)

O(4)-C(12)-Co(4)-C(17)	12(33)
O(4)-C(12)-Co(4)-Co(3)	63(33)
O(2)-C(10)-Co(4)-C(11)	109(27)
O(2)-C(10)-Co(4)-C(12)	-147(27)
O(2)-C(10)-Co(4)-C(18)	3(27)
O(2)-C(10)-Co(4)-C(17)	-9(28)
O(2)-C(10)-Co(4)-Co(3)	-49(27)
C(17)-C(18)-Co(4)-C(11)	92.4(8)
Co(3)-C(18)-Co(4)-C(11)	165.1(5)
C(17)-C(18)-Co(4)-C(12)	-35.4(13)
Co(3)-C(18)-Co(4)-C(12)	37.3(10)
C(17)-C(18)-Co(4)-C(10)	-167.2(8)
Co(3)-C(18)-Co(4)-C(10)	-94.5(6)
Co(3)-C(18)-Co(4)-C(17)	72.7(7)
C(17)-C(18)-Co(4)-Co(3)	-72.7(7)
C(18)-C(17)-Co(4)-C(11)	-96.9(8)
C(16)-C(17)-Co(4)-C(11)	47.1(11)
Co(3)-C(17)-Co(4)-C(11)	-171.1(5)
C(18)-C(17)-Co(4)-C(12)	157.3(8)
C(16)-C(17)-Co(4)-C(12)	-58.7(12)
Co(3)-C(17)-Co(4)-C(12)	83.0(6)
C(18)-C(17)-Co(4)-C(10)	19.7(12)
C(16)-C(17)-Co(4)-C(10)	163.7(11)
Co(3)-C(17)-Co(4)-C(10)	-54.5(9)
C(16)-C(17)-Co(4)-C(18)	144.0(15)
Co(3)-C(17)-Co(4)-C(18)	-74.2(7)
C(18)-C(17)-Co(4)-Co(3)	74.2(7)
C(16)-C(17)-Co(4)-Co(3)	-141.8(12)
C(7)-Co(3)-Co(4)-C(11)	-22.8(13)
C(9)-Co(3)-Co(4)-C(11)	117.7(10)
C(8)-Co(3)-Co(4)-C(11)	-136.8(10)
C(17)-Co(3)-Co(4)-C(11)	18.6(9)
C(18)-Co(3)-Co(4)-C(11)	-31.8(10)
C(7)-Co(3)-Co(4)-C(12)	-148.0(10)
C(9)-Co(3)-Co(4)-C(12)	-7.5(7)
C(8)-Co(3)-Co(4)-C(12)	98.0(7)

C(17)-Co(3)-Co(4)-C(12)	-106.6(6)
C(18)-Co(3)-Co(4)-C(12)	-157.0(7)
C(7)-Co(3)-Co(4)-C(10)	106.4(10)
C(9)-Co(3)-Co(4)-C(10)	-113.1(7)
C(8)-Co(3)-Co(4)-C(10)	-7.6(7)
C(17)-Co(3)-Co(4)-C(10)	147.8(6)
C(18)-Co(3)-Co(4)-C(10)	97.4(7)
C(7)-Co(3)-Co(4)-C(18)	9.0(10)
C(9)-Co(3)-Co(4)-C(18)	149.5(7)
C(8)-Co(3)-Co(4)-C(18)	-105.0(7)
C(17)-Co(3)-Co(4)-C(18)	50.4(6)
C(7)-Co(3)-Co(4)-C(17)	-41.4(10)
C(9)-Co(3)-Co(4)-C(17)	99.1(6)
C(8)-Co(3)-Co(4)-C(17)	-155.4(6)
C(18)-Co(3)-Co(4)-C(17)	-50.4(6)

Symmetry transformations used to generate equivalent atoms:

#===END

Table 1. Crystal data and structure refinement for *d,l*-**27**.

Identification code	br57s	
Empirical formula	C26 H18	
Formula weight	330.40	
Temperature	173(2) K	
Wavelength	1.54178 Å	
Crystal system	Orthorhombic	
Space group	Pca2(1)	
Unit cell dimensions	a = 11.8926(4) Å	a= 90°.
	b = 19.5888(6) Å	b= 90°.
	c = 7.6155(3) Å	g = 90°.
Volume	1774.12(11) $Å^3$	
Z	4	
Density (calculated)	1.237 Mg/m^3	
Absorption coefficient	0.530 mm^{-1}	
F(000)	696	
Crystal size	0.19 x 0.09 x 0.09 mm^3	
Theta range for data collection	2.26 to 67.39°.	
Index ranges	-14<=h<=14, -20<=k<=23, -9<=l<=6	
Reflections collected	6256	
Independent reflections	2490 [R(int) = 0.0311]	
Completeness to theta = 67.39°	95.7 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	0.9539 and 0.9061	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	2490 / 1 / 235	
Goodness-of-fit on F^2	1.030	
Final R indices [I>2sigma(I)]	R1 = 0.0419, wR2 = 0.0867	
R indices (all data)	R1 = 0.0580, wR2 = 0.0929	
Absolute structure parameter	0(2)	
Largest diff. peak and hole	0.126 and -0.176 $e.Å^{-3}$	

Table 2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters ($Å^2$x 10^3) for *d,l*-**27**. U(eq) is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	U(eq)
C(1)	3423(2)	6405(1)	5940(3)	35(1)
C(2)	2830(2)	5826(1)	5592(3)	34(1)
C(3)	3226(2)	5181(1)	6167(3)	31(1)
C(4)	2637(2)	4567(1)	5830(3)	35(1)
C(5)	3057(2)	3954(1)	6351(3)	40(1)
C(6)	4106(2)	3918(1)	7231(3)	41(1)
C(7)	4687(2)	4500(1)	7585(3)	35(1)
C(8)	4262(2)	5147(1)	7093(3)	30(1)
C(9)	4836(2)	5768(1)	7486(3)	33(1)
C(10)	4429(2)	6383(1)	6937(3)	33(1)
C(11)	5063(2)	7036(1)	7379(3)	37(1)
C(12)	4475(2)	7476(1)	8835(3)	37(1)
C(13)	5209(2)	8085(1)	9369(3)	34(1)
C(14)	6268(2)	7956(1)	10183(3)	40(1)
C(15)	6953(2)	8476(1)	10698(3)	39(1)
C(16)	6643(2)	9166(1)	10416(3)	34(1)
C(17)	7335(2)	9721(1)	10915(3)	42(1)
C(18)	7012(2)	10373(1)	10601(4)	48(1)
C(19)	5980(2)	10508(1)	9779(3)	48(1)
C(20)	5284(2)	9988(1)	9280(4)	40(1)
C(21)	5596(2)	9300(1)	9592(3)	34(1)
C(22)	4899(2)	8746(1)	9096(3)	34(1)
C(23)	5287(2)	7458(1)	5803(4)	39(1)
C(24)	5478(3)	7790(1)	4551(4)	48(1)
C(25)	3341(2)	7690(1)	8334(3)	40(1)
C(26)	2435(3)	7879(1)	7925(4)	52(1)

Table 3. Bond lengths [Å] and angles [°] for *d,l*-**27**.

C(1)-C(2)	1.363(3)
C(1)-C(10)	1.418(3)
C(1)-H(1A)	0.9500
C(2)-C(3)	1.416(3)
C(2)-H(2A)	0.9500
C(3)-C(4)	1.416(3)
C(3)-C(8)	1.421(3)
C(4)-C(5)	1.361(3)
C(4)-H(4A)	0.9500
C(5)-C(6)	1.418(3)
C(5)-H(5A)	0.9500
C(6)-C(7)	1.360(4)
C(6)-H(6A)	0.9500
C(7)-C(8)	1.416(3)
C(7)-H(7A)	0.9500
C(8)-C(9)	1.427(3)
C(9)-C(10)	1.364(3)
C(9)-H(9A)	0.9500
C(10)-C(11)	1.522(3)
C(11)-C(23)	1.481(3)
C(11)-C(12)	1.569(3)
C(11)-H(11A)	1.0000
C(12)-C(25)	1.462(4)
C(12)-C(13)	1.532(3)
C(12)-H(12A)	1.0000
C(13)-C(22)	1.363(3)
C(13)-C(14)	1.426(3)
C(14)-C(15)	1.362(3)
C(14)-H(14A)	0.9500
C(15)-C(16)	1.416(3)
C(15)-H(15A)	0.9500

C(16)-C(17)	1.415(3)
C(16)-C(21)	1.419(3)
C(17)-C(18)	1.356(3)
C(17)-H(17A)	0.9500
C(18)-C(19)	1.404(4)
C(18)-H(18A)	0.9500
C(19)-C(20)	1.366(4)
C(19)-H(19A)	0.9500
C(20)-C(21)	1.418(3)
C(20)-H(20A)	0.9500
C(21)-C(22)	1.417(3)
C(22)-H(22A)	0.9500
C(23)-C(24)	1.176(3)
C(24)-H(24)	0.9320
C(25)-C(26)	1.181(4)
C(26)-H(26)	0.9486

C(2)-C(1)-C(10)	121.1(2)
C(2)-C(1)-H(1A)	119.5
C(10)-C(1)-H(1A)	119.5
C(1)-C(2)-C(3)	120.6(2)
C(1)-C(2)-H(2A)	119.7
C(3)-C(2)-H(2A)	119.7
C(4)-C(3)-C(2)	122.4(2)
C(4)-C(3)-C(8)	118.6(2)
C(2)-C(3)-C(8)	119.0(2)
C(5)-C(4)-C(3)	121.1(2)
C(5)-C(4)-H(4A)	119.5
C(3)-C(4)-H(4A)	119.5
C(4)-C(5)-C(6)	120.3(2)
C(4)-C(5)-H(5A)	119.9
C(6)-C(5)-H(5A)	119.9
C(7)-C(6)-C(5)	120.0(2)
C(7)-C(6)-H(6A)	120.0
C(5)-C(6)-H(6A)	120.0
C(6)-C(7)-C(8)	121.1(3)

C(6)-C(7)-H(7A)	119.4
C(8)-C(7)-H(7A)	119.4
C(7)-C(8)-C(3)	118.9(2)
C(7)-C(8)-C(9)	122.5(2)
C(3)-C(8)-C(9)	118.6(2)
C(10)-C(9)-C(8)	121.3(2)
C(10)-C(9)-H(9A)	119.4
C(8)-C(9)-H(9A)	119.4
C(9)-C(10)-C(1)	119.4(2)
C(9)-C(10)-C(11)	119.9(2)
C(1)-C(10)-C(11)	120.7(2)
C(23)-C(11)-C(10)	112.2(2)
C(23)-C(11)-C(12)	110.25(18)
C(10)-C(11)-C(12)	113.4(2)
C(23)-C(11)-H(11A)	106.8
C(10)-C(11)-H(11A)	106.8
C(12)-C(11)-H(11A)	106.8
C(25)-C(12)-C(13)	111.9(2)
C(25)-C(12)-C(11)	112.6(2)
C(13)-C(12)-C(11)	111.2(2)
C(25)-C(12)-H(12A)	106.9
C(13)-C(12)-H(12A)	106.9
C(11)-C(12)-H(12A)	106.9
C(22)-C(13)-C(14)	118.3(2)
C(22)-C(13)-C(12)	122.9(2)
C(14)-C(13)-C(12)	118.8(2)
C(15)-C(14)-C(13)	121.4(2)
C(15)-C(14)-H(14A)	119.3
C(13)-C(14)-H(14A)	119.3
C(14)-C(15)-C(16)	121.0(2)
C(14)-C(15)-H(15A)	119.5
C(16)-C(15)-H(15A)	119.5
C(17)-C(16)-C(15)	122.7(2)
C(17)-C(16)-C(21)	119.1(2)
C(15)-C(16)-C(21)	118.2(2)
C(18)-C(17)-C(16)	120.9(3)

C(18)-C(17)-H(17A)	119.6
C(16)-C(17)-H(17A)	119.6
C(17)-C(18)-C(19)	120.2(2)
C(17)-C(18)-H(18A)	119.9
C(19)-C(18)-H(18A)	119.9
C(20)-C(19)-C(18)	121.0(2)
C(20)-C(19)-H(19A)	119.5
C(18)-C(19)-H(19A)	119.5
C(19)-C(20)-C(21)	120.2(3)
C(19)-C(20)-H(20A)	119.9
C(21)-C(20)-H(20A)	119.9
C(22)-C(21)-C(20)	122.0(2)
C(22)-C(21)-C(16)	119.3(2)
C(20)-C(21)-C(16)	118.7(2)
C(13)-C(22)-C(21)	121.9(2)
C(13)-C(22)-H(22A)	119.0
C(21)-C(22)-H(22A)	119.0
C(24)-C(23)-C(11)	179.2(3)
C(23)-C(24)-H(24)	174.4
C(26)-C(25)-C(12)	178.3(3)
C(25)-C(26)-H(26)	177.8

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters ($Å^2 x\ 10^3$) for *d,l*-**27**. The anisotropic displacement factor exponent takes the form: $-2p^2[\ h^2\ a^{*2}U^{11} + \ldots + 2\ h\ k\ a^*\ b^*\ U^{12}\ ]$

	U^{11}	U^{22}	U^{33}	U^{23}	U^{13}	U^{12}
C(1)	44(2)	28(1)	34(1)	1(1)	0(1)	5(1)
C(2)	34(2)	35(1)	32(1)	-1(1)	-3(1)	3(1)
C(3)	34(2)	32(1)	26(1)	-1(1)	4(1)	1(1)
C(4)	36(2)	36(1)	32(1)	-5(1)	2(1)	-2(1)
C(5)	53(2)	29(1)	38(1)	-4(1)	5(1)	-5(1)
C(6)	59(2)	27(1)	35(1)	1(1)	6(1)	5(1)
C(7)	41(2)	33(1)	30(1)	-1(1)	0(1)	7(1)
C(8)	33(2)	32(1)	26(1)	-1(1)	4(1)	1(1)
C(9)	34(2)	34(1)	30(1)	-3(1)	-2(1)	2(1)
C(10)	37(2)	31(1)	30(1)	-2(1)	2(1)	-1(1)
C(11)	41(2)	31(1)	39(1)	-2(1)	0(1)	1(1)
C(12)	48(2)	33(1)	31(1)	0(1)	4(1)	-4(1)
C(13)	44(2)	31(1)	27(1)	0(1)	2(1)	-1(1)
C(14)	58(2)	31(1)	31(1)	2(1)	-2(1)	7(1)
C(15)	43(2)	42(1)	31(1)	-1(1)	-5(1)	5(1)
C(16)	39(2)	35(1)	27(1)	-4(1)	5(1)	0(1)
C(17)	40(2)	48(2)	37(1)	-5(1)	1(1)	-7(1)
C(18)	54(2)	42(2)	48(2)	-10(1)	7(2)	-15(1)
C(19)	60(2)	29(1)	55(2)	-1(1)	10(2)	1(1)
C(20)	43(2)	32(1)	45(1)	0(1)	2(1)	2(1)
C(21)	41(2)	30(1)	31(1)	-4(1)	4(1)	-1(1)
C(22)	41(2)	32(1)	30(1)	1(1)	-1(1)	1(1)
C(23)	43(2)	34(1)	41(1)	-11(1)	6(1)	-4(1)
C(24)	59(2)	44(2)	41(1)	-2(1)	7(1)	-7(1)
C(25)	48(2)	33(1)	39(1)	-4(1)	9(1)	-8(1)
C(26)	50(2)	45(2)	60(2)	-9(1)	8(2)	-4(2)

Table 5. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$x 10^3) for *d,l*-**27**.

	x	y	z	U(eq)
H(1A)	3158	6831	5508	42
H(2A)	2143	5854	4958	41
H(4A)	1937	4584	5230	42
H(5A)	2645	3547	6125	48
H(6A)	4403	3488	7572	49
H(7A)	5390	4471	8173	42
H(9A)	5515	5753	8143	39
H(11A)	5811	6896	7859	44
H(12A)	4397	7179	9895	45
H(14A)	6501	7498	10370	48
H(15A)	7648	8375	11255	47
H(17A)	8034	9635	11476	50
H(18A)	7487	10741	10940	58
H(19A)	5762	10967	9566	57
H(20A)	4589	10088	8722	48
H(22A)	4195	8838	8557	41
H(24)	5565	8076	3583	77
H(26)	1696	8018	7623	77

Table 6. Torsion angles [°] for *d,l*-**27**.

C(10)-C(1)-C(2)-C(3)	-2.3(4)
C(1)-C(2)-C(3)-C(4)	-179.9(2)
C(1)-C(2)-C(3)-C(8)	-0.8(3)
C(2)-C(3)-C(4)-C(5)	177.9(2)
C(8)-C(3)-C(4)-C(5)	-1.1(3)
C(3)-C(4)-C(5)-C(6)	-0.7(3)
C(4)-C(5)-C(6)-C(7)	1.2(3)
C(5)-C(6)-C(7)-C(8)	0.1(3)
C(6)-C(7)-C(8)-C(3)	-1.9(3)
C(6)-C(7)-C(8)-C(9)	178.3(2)
C(4)-C(3)-C(8)-C(7)	2.4(3)
C(2)-C(3)-C(8)-C(7)	-176.7(2)
C(4)-C(3)-C(8)-C(9)	-177.8(2)
C(2)-C(3)-C(8)-C(9)	3.1(3)
C(7)-C(8)-C(9)-C(10)	177.4(2)
C(3)-C(8)-C(9)-C(10)	-2.3(3)
C(8)-C(9)-C(10)-C(1)	-0.7(4)
C(8)-C(9)-C(10)-C(11)	180.0(2)
C(2)-C(1)-C(10)-C(9)	3.0(4)
C(2)-C(1)-C(10)-C(11)	-177.6(2)
C(9)-C(10)-C(11)-C(23)	127.5(2)
C(1)-C(10)-C(11)-C(23)	-51.8(3)
C(9)-C(10)-C(11)-C(12)	-106.7(3)
C(1)-C(10)-C(11)-C(12)	74.0(3)
C(23)-C(11)-C(12)-C(25)	67.0(3)
C(10)-C(11)-C(12)-C(25)	-59.8(3)
C(23)-C(11)-C(12)-C(13)	-59.4(3)
C(10)-C(11)-C(12)-C(13)	173.8(2)
C(25)-C(12)-C(13)-C(22)	-11.2(3)
C(11)-C(12)-C(13)-C(22)	115.6(3)

C(25)-C(12)-C(13)-C(14)	169.1(2)
C(11)-C(12)-C(13)-C(14)	-64.1(3)
C(22)-C(13)-C(14)-C(15)	0.8(4)
C(12)-C(13)-C(14)-C(15)	-179.5(2)
C(13)-C(14)-C(15)-C(16)	-1.0(4)
C(14)-C(15)-C(16)-C(17)	-179.3(2)
C(14)-C(15)-C(16)-C(21)	0.4(3)
C(15)-C(16)-C(17)-C(18)	179.2(3)
C(21)-C(16)-C(17)-C(18)	-0.6(4)
C(16)-C(17)-C(18)-C(19)	0.2(4)
C(17)-C(18)-C(19)-C(20)	0.0(4)
C(18)-C(19)-C(20)-C(21)	0.1(4)
C(19)-C(20)-C(21)-C(22)	-180.0(2)
C(19)-C(20)-C(21)-C(16)	-0.5(4)
C(17)-C(16)-C(21)-C(22)	-179.8(2)
C(15)-C(16)-C(21)-C(22)	0.4(3)
C(17)-C(16)-C(21)-C(20)	0.7(3)
C(15)-C(16)-C(21)-C(20)	-179.1(2)
C(14)-C(13)-C(22)-C(21)	0.1(3)
C(12)-C(13)-C(22)-C(21)	-179.6(2)
C(20)-C(21)-C(22)-C(13)	178.8(2)
C(16)-C(21)-C(22)-C(13)	-0.7(3)
C(10)-C(11)-C(23)-C(24)	-97(20)
C(12)-C(11)-C(23)-C(24)	135(20)
C(13)-C(12)-C(25)-C(26)	16(9)
C(11)-C(12)-C(25)-C(26)	-110(9)

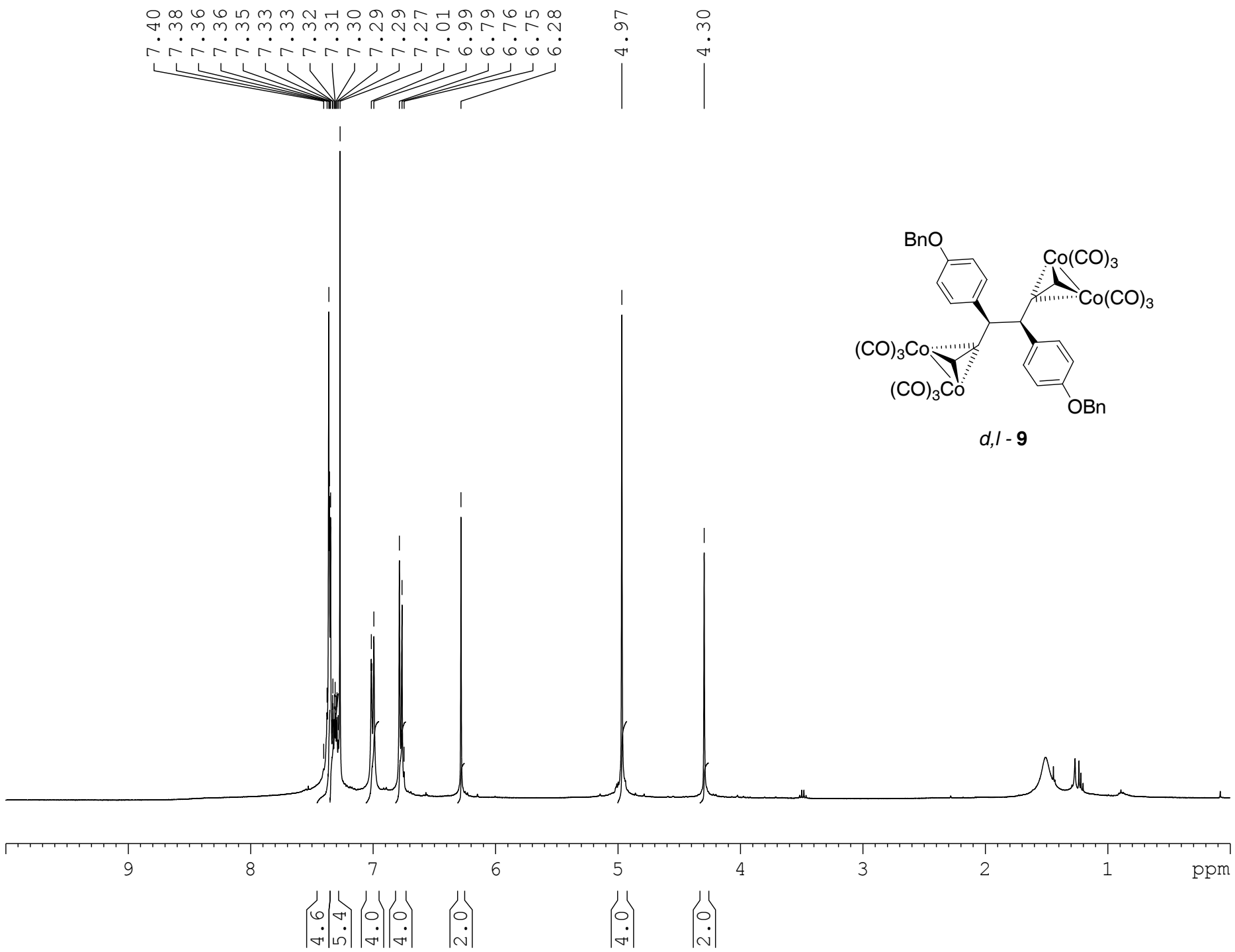
Symmetry transformations used to generate equivalent atoms:

^{1}H and ^{13}C NMR spectra

of

d,l-**9**, *meso*-**9**, *d,l*-**14**, *meso*-**20**, *d,l*-**23**, *d,l*-**24**,

d,l-**26**, and *d,l*-**27**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BnO
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Co(CO)3
(CO)3Co
(CO)3Co
OBn
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8
7
6
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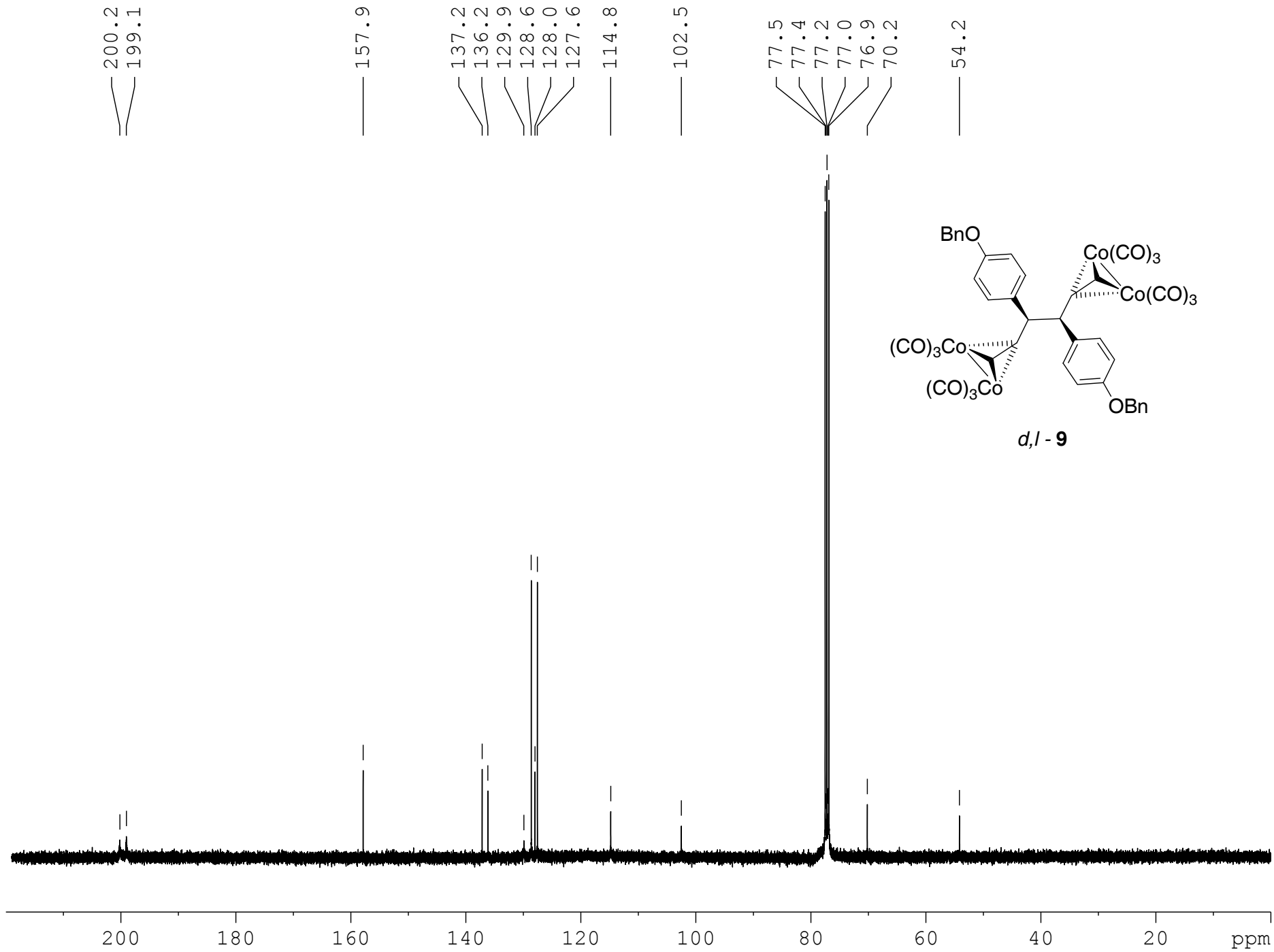
2.0

d,l - **9**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76.9
70.2
54.2
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Co(CO)3
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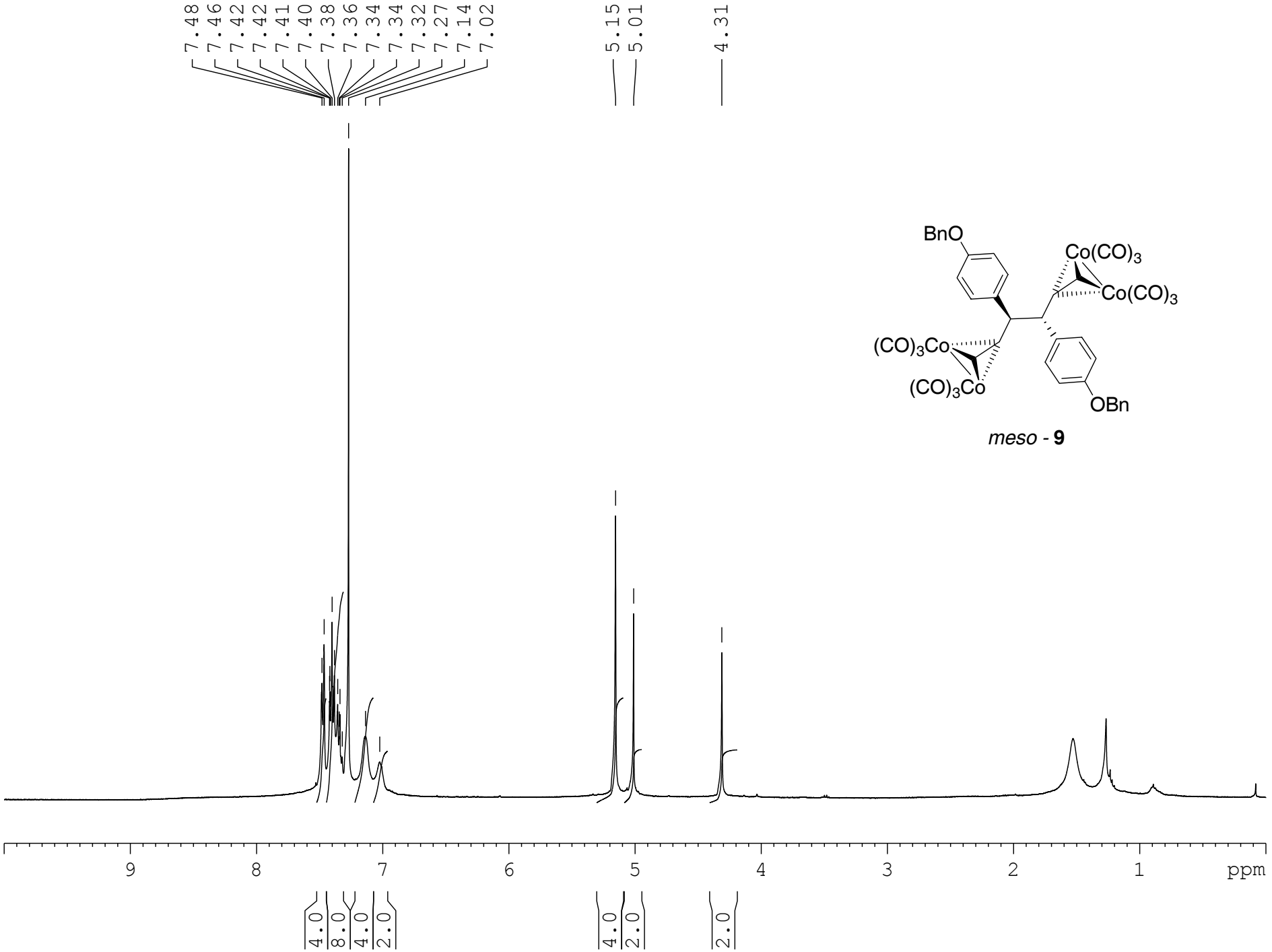
d,l - **9**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7.02
5.15
5.01
4.31
BnO
Co(CO)3
Co(CO)3
(CO)3Co
(CO)3Co
OBn
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7
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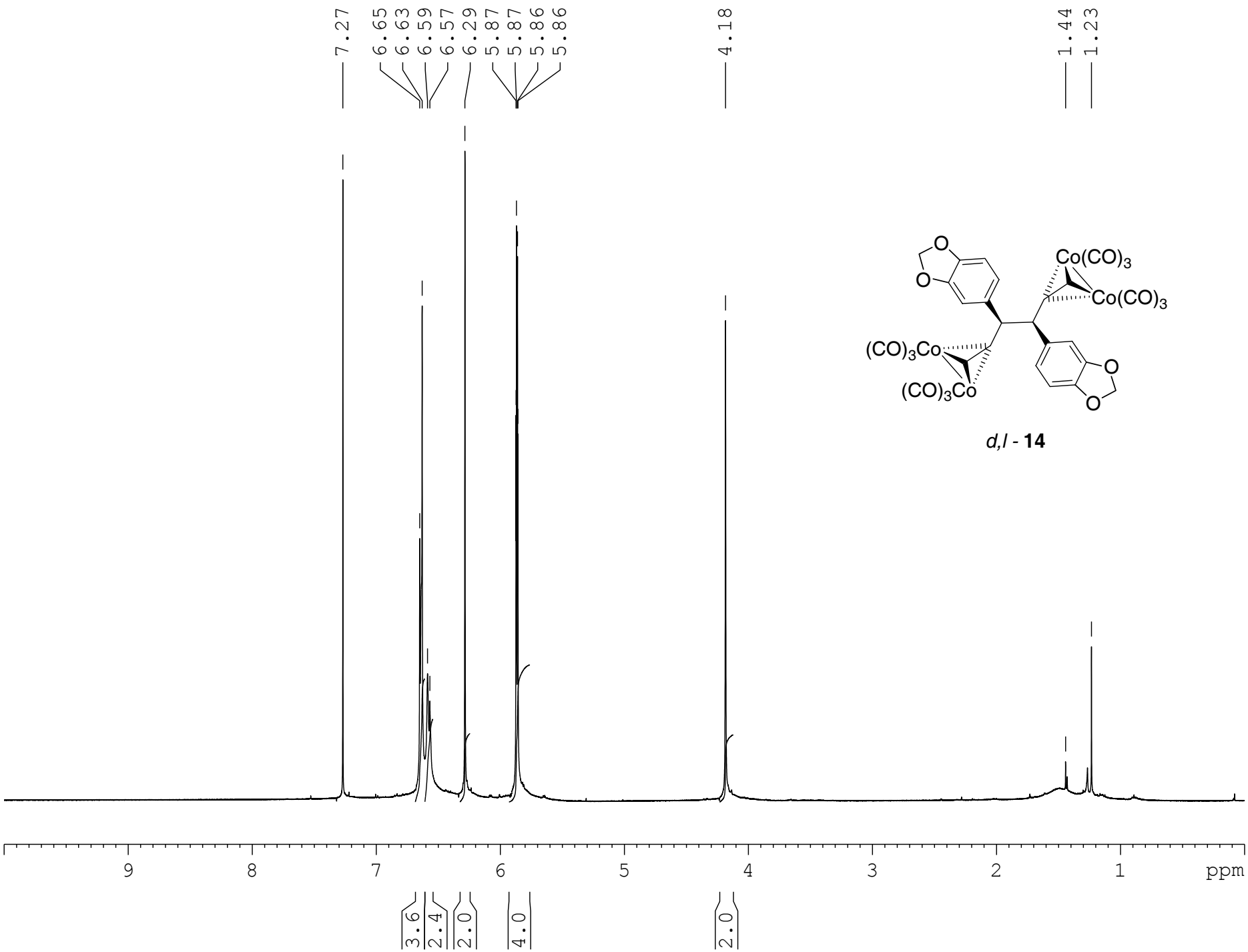
2.0

meso - **9**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1.23
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(CO)3Co
(CO)3Co
O
O
O
O
9
8
7
6
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4
3
2
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ppm
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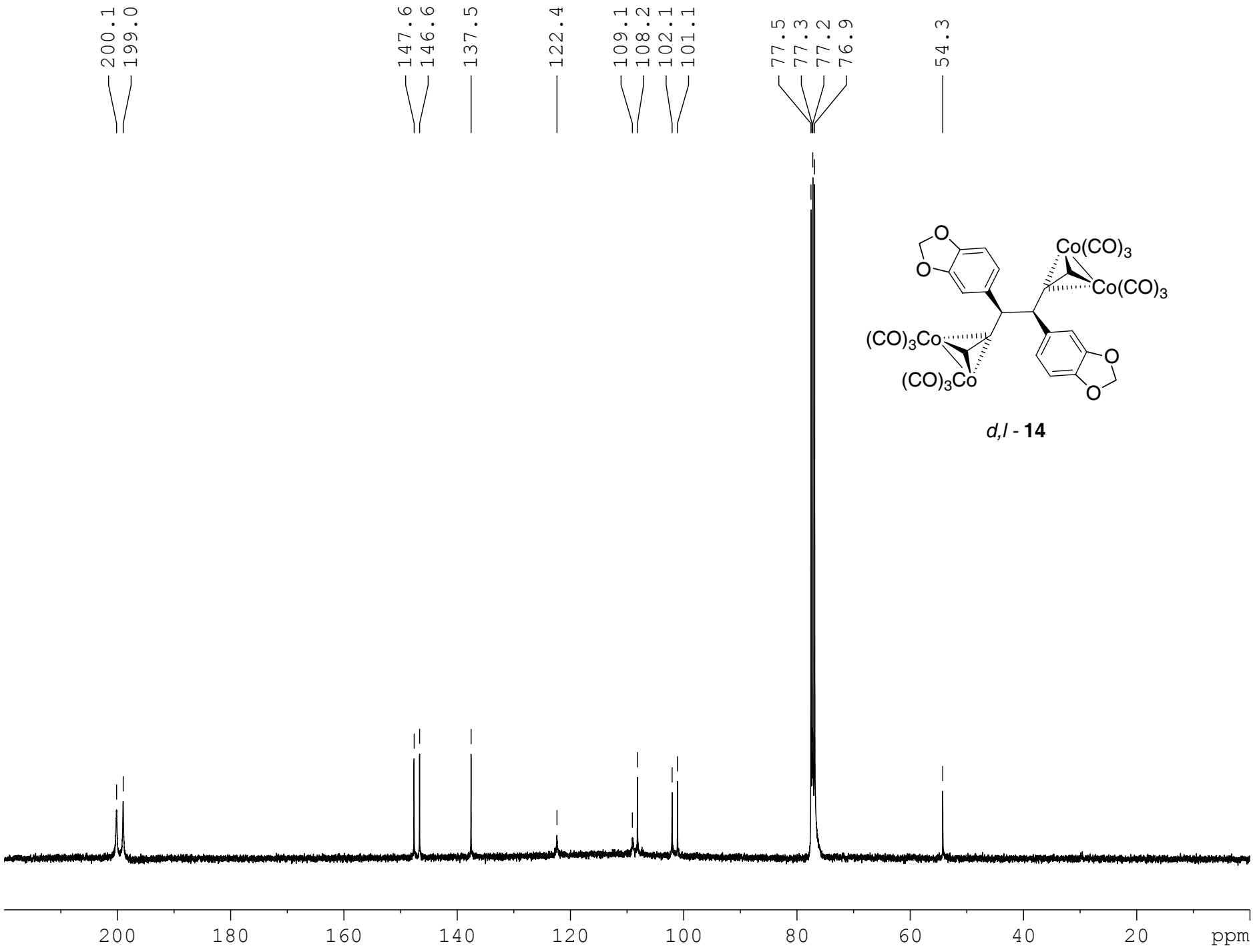
2.0

d,l - **14**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76.9
54.3
Co(CO)3
Co(CO)3
(CO)3Co
(CO)3Co
O
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O
O
200
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80
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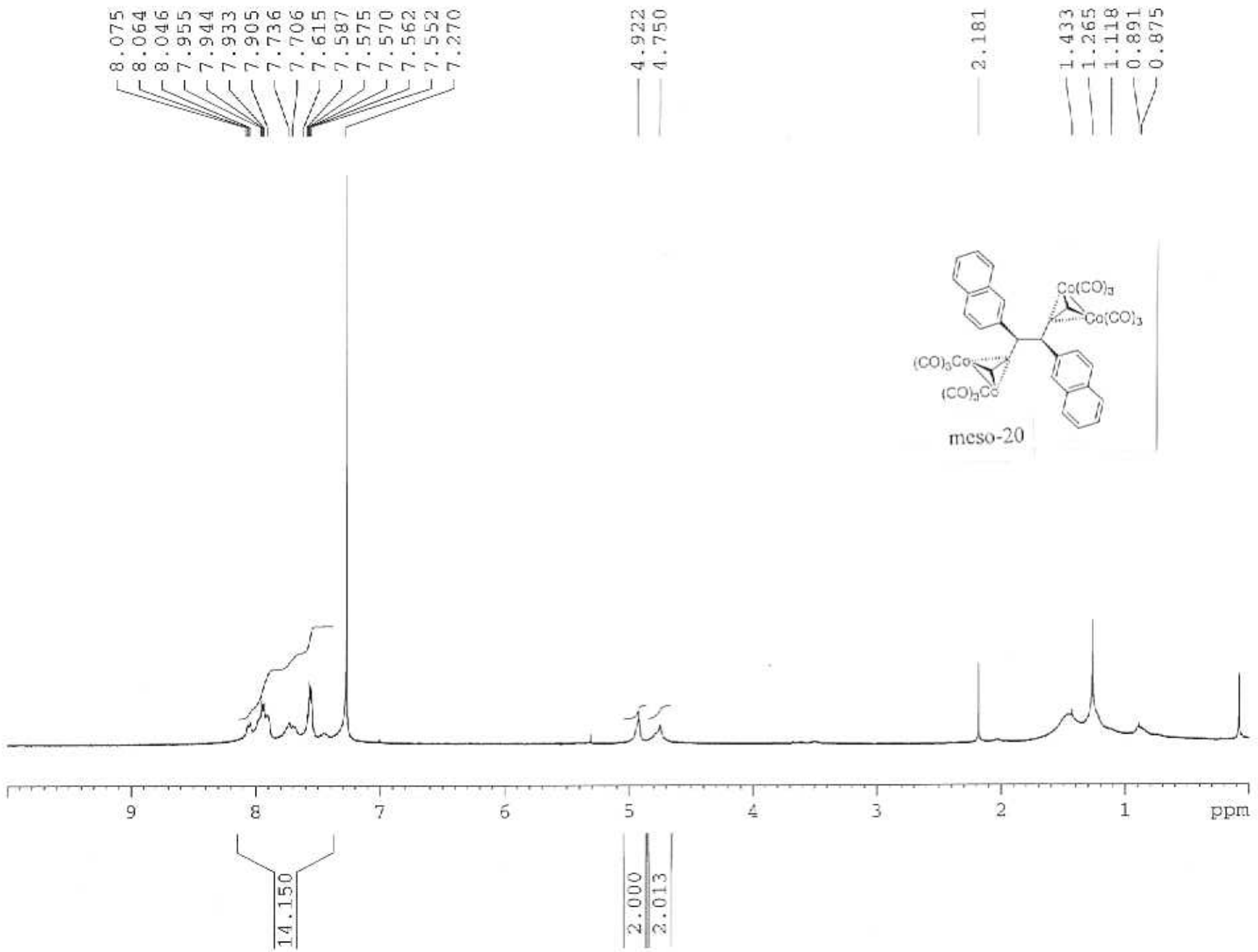
40
20
ppm

d,l - **14**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7.570
7.562
7.552
7.270
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1.265
1.118
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4
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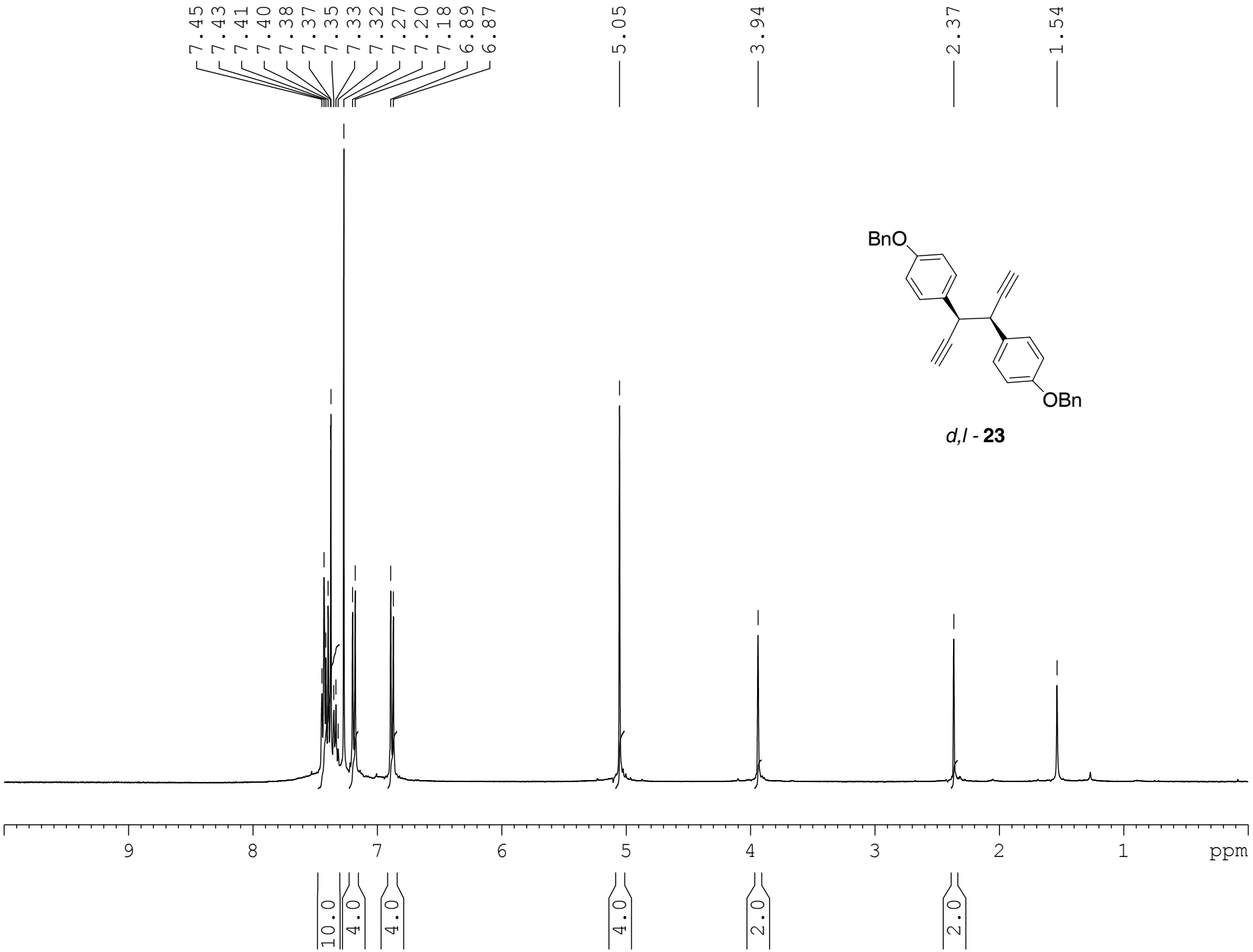
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BnO
OBn
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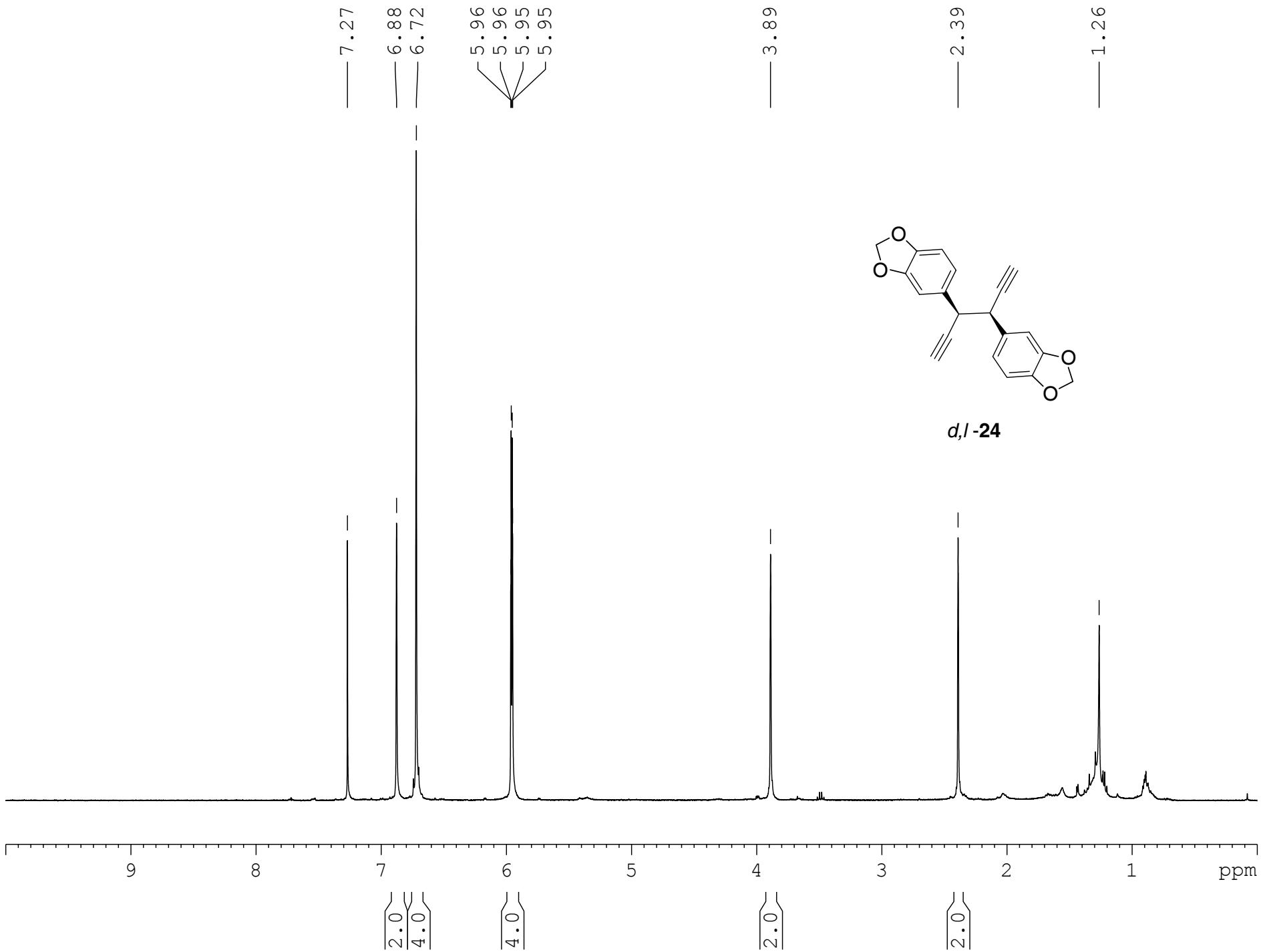
4.0
4.0
2.0
2.0

d,l - **23**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O
9
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ppm
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4.0
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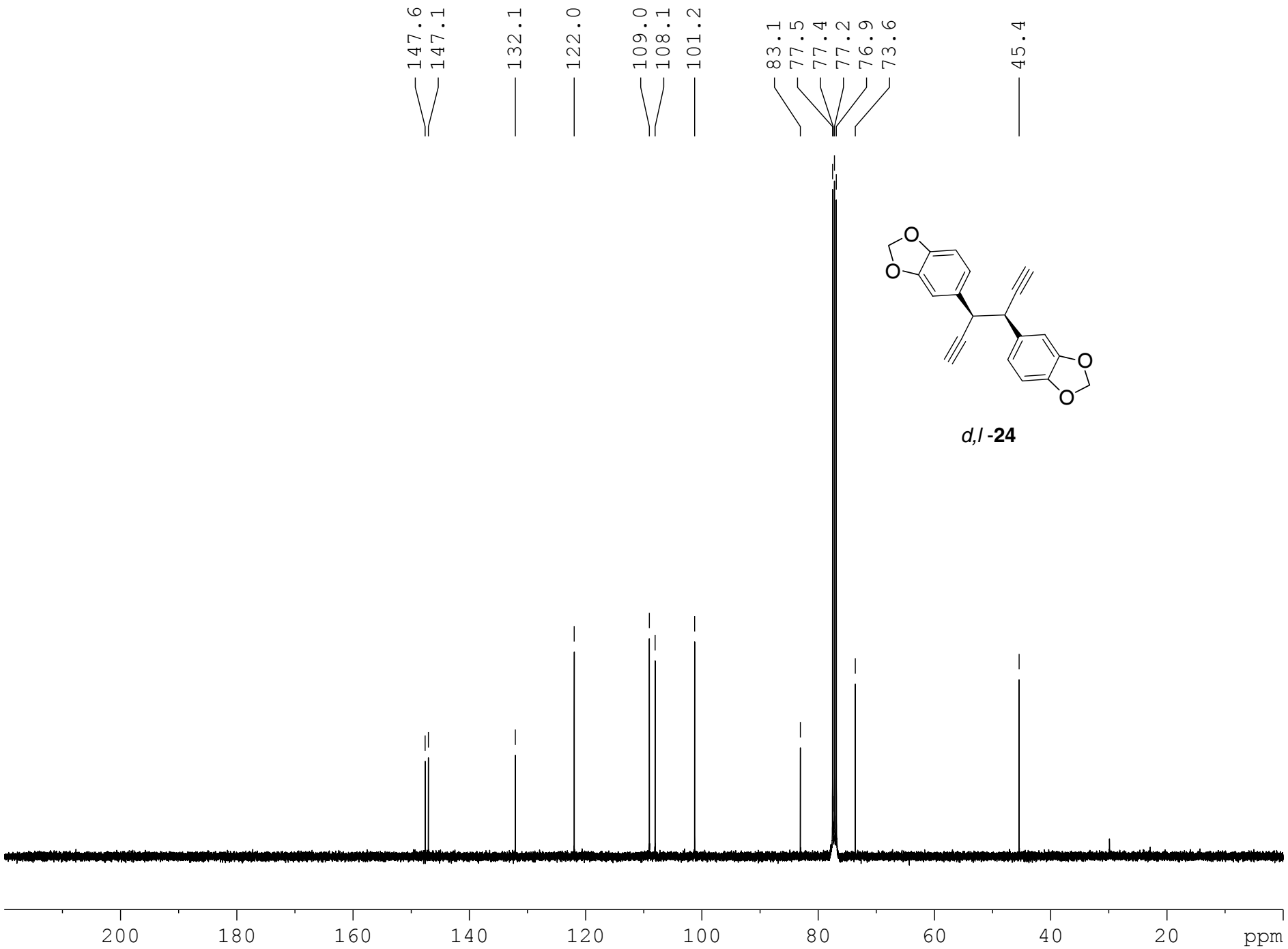
2.0

d,l -**24**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73.6
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O
O
200
180
160
140
120
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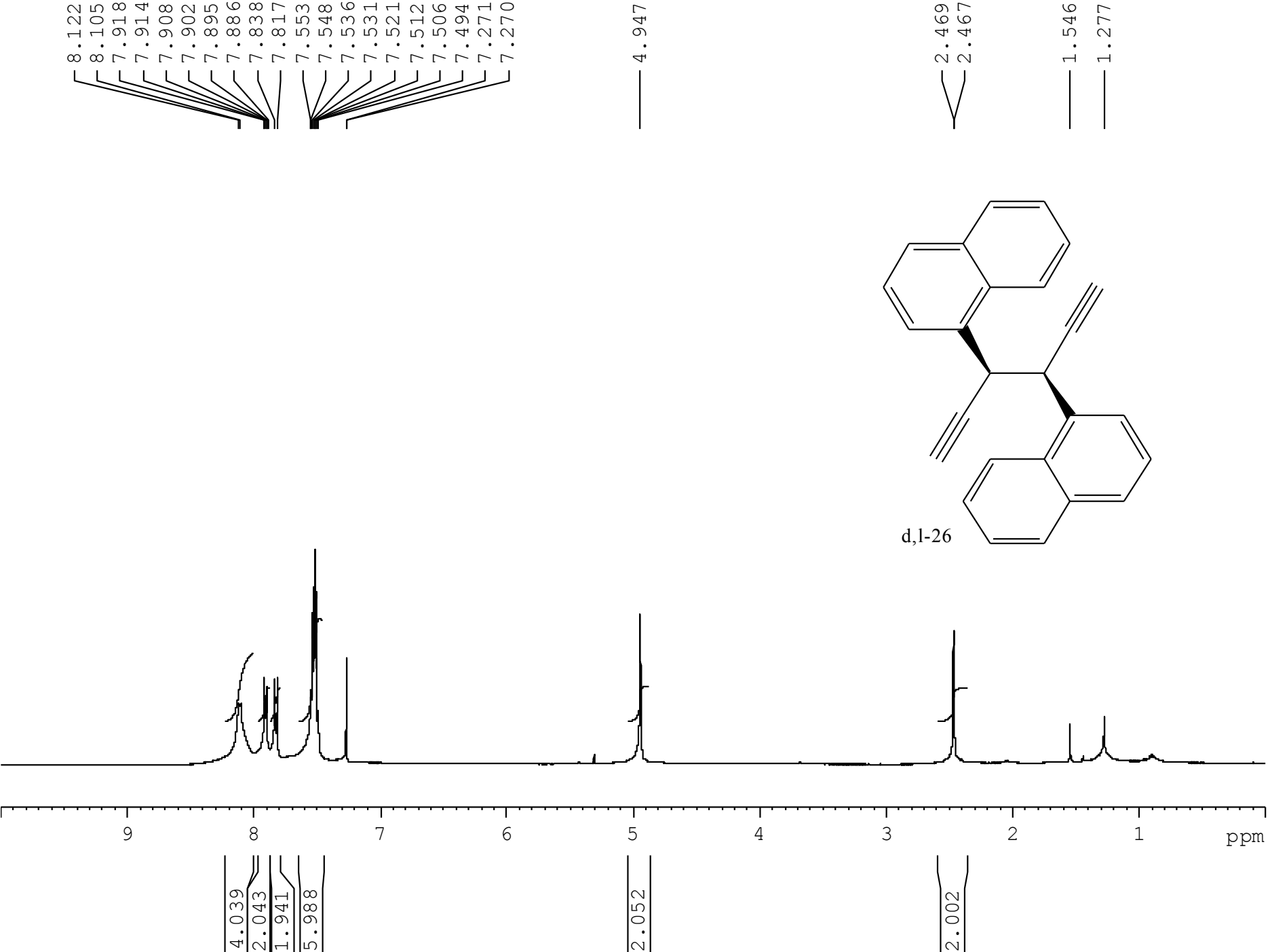
80
60
40
20
ppm

d,l -**24**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7.512
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7.270
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2.467
1.546
1.277
d,l-26
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4
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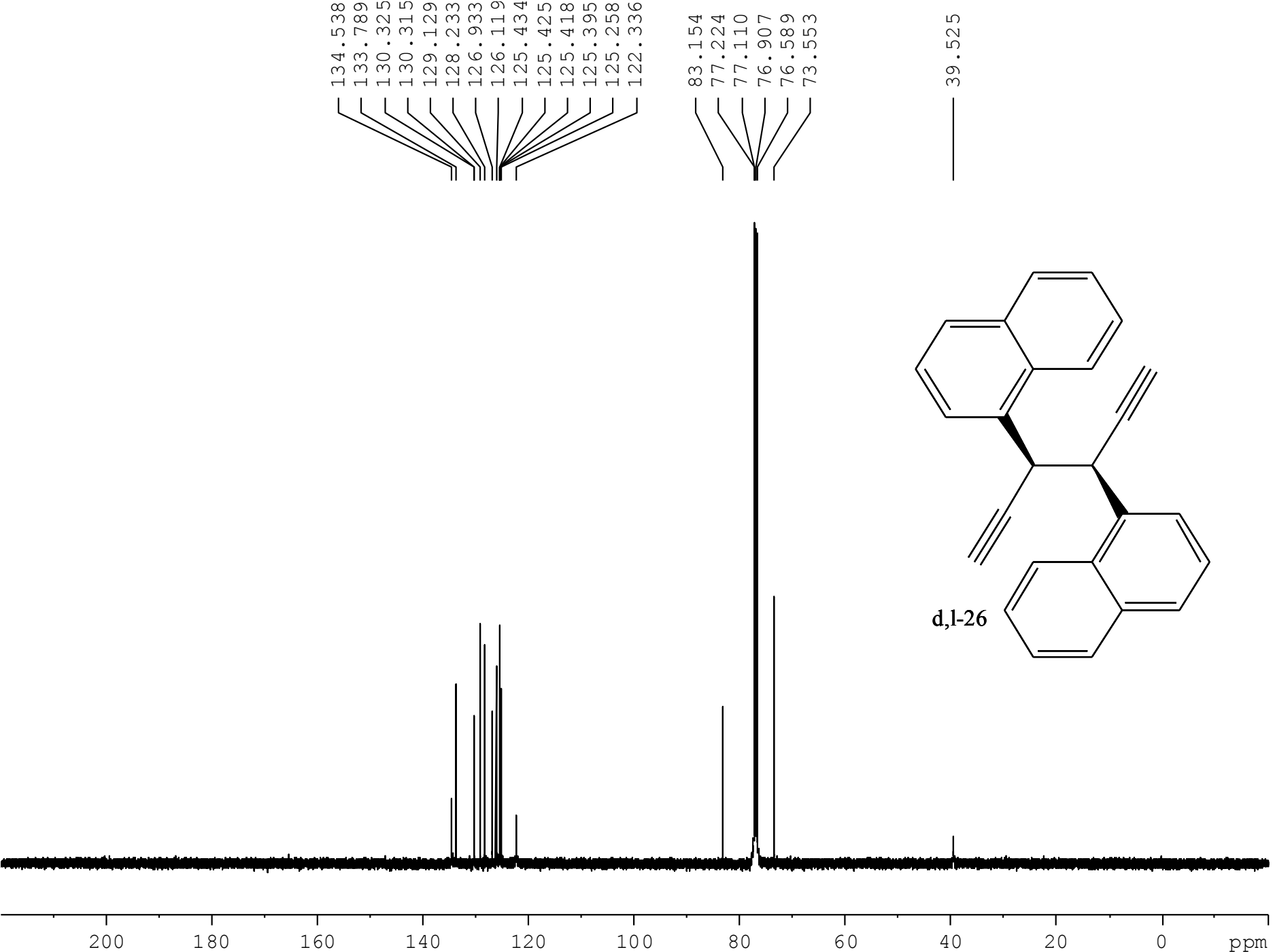
2.002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122.336
83.154
77.224
77.110
76.907
76.589
73.553
39.525
d,l-26
200
180
160
140
120
100
80
60
40
20
0
ppm

7.861
7.842
7.834
7.826
7.817
7.816
7.806
7.800
7.790
7.769
7.498
7.495
7.490
7.481
7.474
7.469
7.466
7.457
7.270
4.330
2.458
2.454
2.452
d,l-27
9
8
7
6
5
4
3
2
1
ppm
7.964
5.829
2.000
1.822