

Table 1. Crystal data and structure refinement for 9b

Identification code	way05	
Empirical formula	C ₂₇ H ₃₀ N ₂ O ₂ · 0.187(H ₂ O)	
Formula weight	417.91	
Temperature	295(2) K	
Wavelength	1.54178 Å	
Crystal system	Orthorhombic	
Space group	P2 ₁ 2 ₁ 2 ₁	
Unit cell dimensions	a = 12.0787(5) Å	α = 90°
	b = 13.6177(5) Å	β = 90°
	c = 14.6543(5) Å	γ = 90°
Volume	2410.40(16) Å ³	
Z	4	
Density (calculated)	1.152 Mg/m ³	
Absorption coefficient	0.574 mm ⁻¹	
F(000)	896	
Crystal size	0.63 x 0.08 x 0.08 mm ³	
Theta range for data collection	4.43 to 66.73°	
Index ranges	-14 ≤ h ≤ 14, -15 ≤ k ≤ 15, -16 ≤ l ≤ 17	
Reflections collected	11938	
Independent reflections	4119 [R(int) = 0.0275]	
Completeness to theta = 66.73°	98.2 %	
Absorption correction	Multi-scan	
Max. and min. transmission	0.952 and 0.679	
Refinement method	Full-matrix least-squares on F ²	
Data / restraints / parameters	4119 / 3 / 297	
Goodness-of-fit on F ²	0.860	
Final R indices [I > 2σ(I)]	R1 = 0.0499, wR2 = 0.1481	
R indices (all data)	R1 = 0.0666, wR2 = 0.1726	
Absolute structure parameter	0.9(4)	
Extinction coefficient	0.0038(7)	
Largest diff. peak and hole	0.148 and -0.135 e.Å ⁻³	

Table 2. Atomic coordinates ($\times 10^4$) and equivalent isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 9b. $U(\text{eq})$ is defined as one third of the trace of the orthogonalized U^{ij} tensor.

	x	y	z	$U(\text{eq})$
N(1)	7648(2)	162(2)	8551(1)	67(1)
C(2)	6993(3)	358(2)	7735(2)	77(1)
C(3)	7281(3)	1365(2)	7337(2)	90(1)
N(3)	6608(4)	1553(3)	6522(2)	111(1)
C(4)	8509(3)	1439(2)	7163(2)	98(1)
C(5)	9157(3)	1197(2)	7995(2)	90(1)
C(6)	8858(2)	202(2)	8416(2)	69(1)
C(7)	9278(2)	-680(2)	7856(2)	69(1)
C(8)	7242(2)	124(2)	9401(2)	72(1)
O(8)	7836(2)	94(2)	10085(1)	90(1)
C(9)	5985(3)	145(3)	9564(2)	90(1)
O(10)	5345(2)	-486(2)	9020(2)	107(1)
C(11)	5679(4)	-1491(3)	9100(4)	133(2)
C(1A)	5559(3)	1191(3)	9496(2)	92(1)
C(2A)	4661(4)	1438(4)	8984(4)	153(2)
C(3A)	4298(5)	2411(5)	8952(6)	196(3)
C(4A)	4835(6)	3126(4)	9404(4)	155(2)
C(5A)	5735(5)	2896(3)	9882(3)	129(2)
C(6A)	6103(4)	1934(3)	9922(3)	107(1)
C(1B)	10533(2)	-720(2)	7801(2)	77(1)
C(2B)	11210(3)	-581(2)	8557(3)	93(1)
C(3B)	12342(3)	-658(3)	8482(4)	109(1)
C(4B)	12828(4)	-866(3)	7666(5)	121(2)
C(5B)	12178(4)	-1027(3)	6906(4)	114(1)
C(6B)	11030(3)	-952(2)	6974(3)	90(1)
C(1C)	8812(2)	-1650(2)	8192(2)	70(1)
C(2C)	8317(3)	-2290(2)	7593(2)	88(1)
C(3C)	7905(3)	-3198(3)	7892(3)	107(1)
C(4C)	7966(4)	-3456(2)	8769(3)	108(1)
C(5C)	8471(4)	-2834(3)	9367(3)	109(1)
C(6C)	8889(3)	-1939(2)	9088(2)	92(1)

O(1S)

4623(12)

728(10)

6076(9)

100

Table 3. Bond lengths [Å] and angles [°] for 9b.

N(1)-C(8)	1.340(3)	C(2A)-H(2AA)	0.9300
N(1)-C(2)	1.458(3)	C(3A)-C(4A)	1.344(8)
N(1)-C(6)	1.475(3)	C(3A)-H(3AA)	0.9300
C(2)-C(3)	1.531(4)	C(4A)-C(5A)	1.331(7)
C(2)-H(2A)	0.9700	C(4A)-H(4AA)	0.9300
C(2)-H(2B)	0.9700	C(5A)-C(6A)	1.384(6)
C(3)-N(3)	1.467(5)	C(5A)-H(5AA)	0.9300
C(3)-C(4)	1.509(5)	C(6A)-H(6AA)	0.9300
C(3)-H(3A)	0.9800	C(1B)-C(6B)	1.388(4)
N(3)-H(3')	0.94(5)	C(1B)-C(2B)	1.390(5)
N(3)-H(3'')	0.96(5)	C(2B)-C(3B)	1.376(5)
C(4)-C(5)	1.486(5)	C(2B)-H(2BA)	0.9300
C(4)-H(4A)	0.9700	C(3B)-C(4B)	1.362(7)
C(4)-H(4B)	0.9700	C(3B)-H(3BA)	0.9300
C(5)-C(6)	1.533(4)	C(4B)-C(5B)	1.380(7)
C(5)-H(5A)	0.9700	C(4B)-H(4BA)	0.9300
C(5)-H(5B)	0.9700	C(5B)-C(6B)	1.394(6)
C(6)-C(7)	1.540(3)	C(5B)-H(5BA)	0.9300
C(6)-H(6A)	0.9800	C(6B)-H(6BA)	0.9300
C(7)-C(1C)	1.519(4)	C(1C)-C(2C)	1.373(4)
C(7)-C(1B)	1.519(4)	C(1C)-C(6C)	1.373(4)
C(7)-H(7A)	0.9800	C(2C)-C(3C)	1.404(5)
C(8)-O(8)	1.233(3)	C(2C)-H(2CA)	0.9300
C(8)-C(9)	1.536(4)	C(3C)-C(4C)	1.334(6)
C(9)-O(10)	1.405(4)	C(3C)-H(3CA)	0.9300
C(9)-C(1A)	1.517(5)	C(4C)-C(5C)	1.363(5)
C(9)-H(9A)	0.9800	C(4C)-H(4CA)	0.9300
O(10)-C(11)	1.431(5)	C(5C)-C(6C)	1.381(5)
C(11)-H(11A)	0.9600	C(5C)-H(5CA)	0.9300
C(11)-H(11B)	0.9600	C(6C)-H(6CA)	0.9300
C(11)-H(11C)	0.9600	O(1S)-H(1S)	0.88(3)
C(1A)-C(6A)	1.358(5)	O(1S)-H(2S)	0.91(6)
C(1A)-C(2A)	1.360(6)		
C(2A)-C(3A)	1.396(8)	C(8)-N(1)-C(2)	124.8(2)

C(8)-N(1)-C(6)	119.3(2)	C(1C)-C(7)-C(6)	112.6(2)
C(2)-N(1)-C(6)	114.9(2)	C(1B)-C(7)-C(6)	112.7(2)
N(1)-C(2)-C(3)	110.7(2)	C(1C)-C(7)-H(7A)	106.8
N(1)-C(2)-H(2A)	109.5	C(1B)-C(7)-H(7A)	106.8
C(3)-C(2)-H(2A)	109.5	C(6)-C(7)-H(7A)	106.8
N(1)-C(2)-H(2B)	109.5	O(8)-C(8)-N(1)	122.9(3)
C(3)-C(2)-H(2B)	109.5	O(8)-C(8)-C(9)	116.8(3)
H(2A)-C(2)-H(2B)	108.1	N(1)-C(8)-C(9)	120.3(3)
N(3)-C(3)-C(4)	113.3(3)	O(10)-C(9)-C(1A)	110.5(3)
N(3)-C(3)-C(2)	109.9(3)	O(10)-C(9)-C(8)	116.4(3)
C(4)-C(3)-C(2)	110.3(3)	C(1A)-C(9)-C(8)	110.1(3)
N(3)-C(3)-H(3A)	107.7	O(10)-C(9)-H(9A)	106.4
C(4)-C(3)-H(3A)	107.7	C(1A)-C(9)-H(9A)	106.4
C(2)-C(3)-H(3A)	107.7	C(8)-C(9)-H(9A)	106.4
C(3)-N(3)-H(3')	111(3)	C(9)-O(10)-C(11)	112.6(3)
C(3)-N(3)-H(3'')	111(3)	O(10)-C(11)-H(11A)	109.5
H(3')-N(3)-H(3'')	100(4)	O(10)-C(11)-H(11B)	109.5
C(5)-C(4)-C(3)	111.4(3)	H(11A)-C(11)-H(11B)	109.5
C(5)-C(4)-H(4A)	109.4	O(10)-C(11)-H(11C)	109.5
C(3)-C(4)-H(4A)	109.4	H(11A)-C(11)-H(11C)	109.5
C(5)-C(4)-H(4B)	109.4	H(11B)-C(11)-H(11C)	109.5
C(3)-C(4)-H(4B)	109.4	C(6A)-C(1A)-C(2A)	117.0(4)
H(4A)-C(4)-H(4B)	108.0	C(6A)-C(1A)-C(9)	120.3(3)
C(4)-C(5)-C(6)	113.7(3)	C(2A)-C(1A)-C(9)	122.6(4)
C(4)-C(5)-H(5A)	108.8	C(1A)-C(2A)-C(3A)	120.2(5)
C(6)-C(5)-H(5A)	108.8	C(1A)-C(2A)-H(2AA)	119.9
C(4)-C(5)-H(5B)	108.8	C(3A)-C(2A)-H(2AA)	119.9
C(6)-C(5)-H(5B)	108.8	C(4A)-C(3A)-C(2A)	121.3(5)
H(5A)-C(5)-H(5B)	107.7	C(4A)-C(3A)-H(3AA)	119.3
N(1)-C(6)-C(5)	108.7(2)	C(2A)-C(3A)-H(3AA)	119.3
N(1)-C(6)-C(7)	111.7(2)	C(5A)-C(4A)-C(3A)	118.8(5)
C(5)-C(6)-C(7)	113.4(2)	C(5A)-C(4A)-H(4AA)	120.6
N(1)-C(6)-H(6A)	107.6	C(3A)-C(4A)-H(4AA)	120.6
C(5)-C(6)-H(6A)	107.6	C(4A)-C(5A)-C(6A)	120.4(5)
C(7)-C(6)-H(6A)	107.6	C(4A)-C(5A)-H(5AA)	119.8
C(1C)-C(7)-C(1B)	110.8(2)	C(6A)-C(5A)-H(5AA)	119.8

C(1A)-C(6A)-C(5A)	122.1(4)	C(2C)-C(1C)-C(6C)	117.3(3)
C(1A)-C(6A)-H(6AA)	119.0	C(2C)-C(1C)-C(7)	120.4(3)
C(5A)-C(6A)-H(6AA)	119.0	C(6C)-C(1C)-C(7)	122.2(3)
C(6B)-C(1B)-C(2B)	118.2(3)	C(1C)-C(2C)-C(3C)	120.9(3)
C(6B)-C(1B)-C(7)	119.1(3)	C(1C)-C(2C)-H(2CA)	119.5
C(2B)-C(1B)-C(7)	122.6(3)	C(3C)-C(2C)-H(2CA)	119.5
C(3B)-C(2B)-C(1B)	120.7(4)	C(4C)-C(3C)-C(2C)	120.9(3)
C(3B)-C(2B)-H(2BA)	119.6	C(4C)-C(3C)-H(3CA)	119.6
C(1B)-C(2B)-H(2BA)	119.6	C(2C)-C(3C)-H(3CA)	119.6
C(4B)-C(3B)-C(2B)	121.0(5)	C(3C)-C(4C)-C(5C)	118.7(3)
C(4B)-C(3B)-H(3BA)	119.5	C(3C)-C(4C)-H(4CA)	120.7
C(2B)-C(3B)-H(3BA)	119.5	C(5C)-C(4C)-H(4CA)	120.7
C(3B)-C(4B)-C(5B)	119.7(4)	C(4C)-C(5C)-C(6C)	121.5(3)
C(3B)-C(4B)-H(4BA)	120.1	C(4C)-C(5C)-H(5CA)	119.3
C(5B)-C(4B)-H(4BA)	120.1	C(6C)-C(5C)-H(5CA)	119.3
C(4B)-C(5B)-C(6B)	119.8(4)	C(1C)-C(6C)-C(5C)	120.7(3)
C(4B)-C(5B)-H(5BA)	120.1	C(1C)-C(6C)-H(6CA)	119.7
C(6B)-C(5B)-H(5BA)	120.1	C(5C)-C(6C)-H(6CA)	119.7
C(1B)-C(6B)-C(5B)	120.6(4)	H(1S)-O(1S)-H(2S)	106(6)
C(1B)-C(6B)-H(6BA)	119.7		
C(5B)-C(6B)-H(6BA)	119.7		

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 9b. The anisotropic displacement factor exponent takes the form: $-2\pi^2 [h^2 a^{*2} U^{11} + \dots + 2 h k a^* b^* U^{12}]$

	U^{11}	U^{22}	U^{33}	U^{23}	U^{13}	U^{12}
N(1)	72(1)	58(1)	71(1)	1(1)	-6(1)	1(1)
C(2)	88(2)	69(2)	73(2)	-6(1)	-7(1)	7(1)
C(3)	137(3)	61(2)	73(2)	0(1)	-6(2)	21(2)
N(3)	148(3)	100(2)	86(2)	7(2)	-9(2)	34(2)
C(4)	134(3)	56(2)	103(2)	7(1)	31(2)	1(2)
C(5)	96(2)	59(1)	116(2)	-4(1)	16(2)	-7(1)
C(6)	69(1)	57(1)	82(2)	-4(1)	-1(1)	-1(1)
C(7)	73(2)	56(1)	77(2)	-1(1)	-2(1)	1(1)
C(8)	80(2)	65(1)	72(2)	2(1)	-1(1)	-2(1)
O(8)	100(2)	94(1)	76(1)	4(1)	-7(1)	2(1)
C(9)	87(2)	92(2)	91(2)	4(2)	14(2)	-5(2)
O(10)	85(1)	93(2)	143(2)	-5(1)	1(2)	-17(1)
C(11)	109(3)	86(2)	203(5)	4(3)	6(3)	-21(2)
C(1A)	86(2)	102(2)	89(2)	-10(2)	16(2)	11(2)
C(2A)	97(3)	136(4)	226(6)	-49(4)	-38(3)	32(3)
C(3A)	149(5)	165(6)	273(8)	-70(6)	-76(5)	76(4)
C(4A)	165(5)	123(4)	176(5)	-33(3)	-8(4)	70(4)
C(5A)	153(4)	111(3)	122(3)	-31(2)	18(3)	20(3)
C(6A)	116(3)	101(2)	102(2)	-16(2)	0(2)	18(2)
C(1B)	74(2)	52(1)	104(2)	6(1)	5(2)	1(1)
C(2B)	88(2)	73(2)	119(2)	4(2)	-11(2)	1(2)
C(3B)	78(2)	85(2)	165(4)	23(2)	-16(2)	2(2)
C(4B)	80(2)	80(2)	204(5)	36(3)	7(3)	6(2)
C(5B)	102(3)	76(2)	165(4)	20(2)	48(3)	15(2)
C(6B)	94(2)	68(2)	109(2)	8(2)	17(2)	6(2)
C(1C)	72(2)	55(1)	84(2)	-5(1)	2(1)	0(1)
C(2C)	107(2)	72(2)	87(2)	-13(1)	1(2)	-17(2)
C(3C)	126(3)	77(2)	118(3)	-28(2)	2(2)	-26(2)
C(4C)	140(3)	58(2)	126(3)	2(2)	11(2)	-15(2)
C(5C)	144(3)	78(2)	106(2)	15(2)	-9(2)	-18(2)
C(6C)	118(3)	69(2)	91(2)	6(1)	-12(2)	-16(2)

Table 5. Hydrogen coordinates ($\times 10^4$) and isotropic displacement parameters ($\text{\AA}^2 \times 10^3$) for 9b.

	x	y	z	U(eq)
H(2A)	6212	338	7887	92
H(2B)	7136	-147	7283	92
H(3A)	7087	1862	7793	108
H(3')	5860(40)	1380(40)	6630(30)	134
H(3'')	6790(40)	1100(40)	6040(30)	134
H(4A)	8713	992	6676	118
H(4B)	8688	2101	6967	118
H(5A)	9037	1707	8447	108
H(5B)	9939	1197	7842	108
H(6A)	9206	168	9019	83
H(7A)	9006	-588	7232	82
H(9A)	5869	-61	10197	108
H(11A)	5221	-1892	8714	199
H(11B)	5601	-1700	9722	199
H(11C)	6438	-1555	8916	199
H(2AA)	4288	957	8655	184
H(3AA)	3673	2567	8612	235
H(4AA)	4581	3771	9383	186
H(5AA)	6121	3385	10191	155
H(6AA)	6742	1792	10250	128
H(2BA)	10894	-435	9119	112
H(3BA)	12782	-567	8996	131
H(4BA)	13595	-899	7621	145
H(5BA)	12505	-1184	6350	137
H(6BA)	10593	-1058	6461	109
H(2CA)	8254	-2118	6981	106
H(3CA)	7585	-3626	7474	129
H(4CA)	7669	-4048	8969	130
H(5CA)	8536	-3016	9976	131
H(6CA)	9227	-1527	9511	111

H(1S)	4600(200)	1340(40)	6250(130)	150
H(2S)	4700(200)	740(150)	5460(60)	150

Table 6. Torsion angles [°] for 9b.

C(8)-N(1)-C(2)-C(3)	110.7(3)
C(6)-N(1)-C(2)-C(3)	-57.4(3)
N(1)-C(2)-C(3)-N(3)	-179.5(3)
N(1)-C(2)-C(3)-C(4)	54.8(3)
N(3)-C(3)-C(4)-C(5)	-177.3(3)
C(2)-C(3)-C(4)-C(5)	-53.5(3)
C(3)-C(4)-C(5)-C(6)	53.6(3)
C(8)-N(1)-C(6)-C(5)	-114.2(3)
C(2)-N(1)-C(6)-C(5)	54.6(3)
C(8)-N(1)-C(6)-C(7)	119.9(3)
C(2)-N(1)-C(6)-C(7)	-71.3(3)
C(4)-C(5)-C(6)-N(1)	-52.2(3)
C(4)-C(5)-C(6)-C(7)	72.7(3)
N(1)-C(6)-C(7)-C(1C)	-47.1(3)
C(5)-C(6)-C(7)-C(1C)	-170.3(2)
N(1)-C(6)-C(7)-C(1B)	-173.3(2)
C(5)-C(6)-C(7)-C(1B)	63.5(3)
C(2)-N(1)-C(8)-O(8)	-169.5(3)
C(6)-N(1)-C(8)-O(8)	-1.9(4)
C(2)-N(1)-C(8)-C(9)	8.7(4)
C(6)-N(1)-C(8)-C(9)	176.3(2)
O(8)-C(8)-C(9)-O(10)	-134.5(3)
N(1)-C(8)-C(9)-O(10)	47.2(4)
O(8)-C(8)-C(9)-C(1A)	98.7(3)
N(1)-C(8)-C(9)-C(1A)	-79.6(4)
C(1A)-C(9)-O(10)-C(11)	-176.9(3)
C(8)-C(9)-O(10)-C(11)	56.6(4)
O(10)-C(9)-C(1A)-C(6A)	-175.7(3)
C(8)-C(9)-C(1A)-C(6A)	-45.8(4)
O(10)-C(9)-C(1A)-C(2A)	1.3(5)
C(8)-C(9)-C(1A)-C(2A)	131.2(4)
C(6A)-C(1A)-C(2A)-C(3A)	-3.4(8)
C(9)-C(1A)-C(2A)-C(3A)	179.4(6)
C(1A)-C(2A)-C(3A)-C(4A)	1.6(12)

C(2A)-C(3A)-C(4A)-C(5A)	0.7(12)
C(3A)-C(4A)-C(5A)-C(6A)	-0.9(9)
C(2A)-C(1A)-C(6A)-C(5A)	3.3(6)
C(9)-C(1A)-C(6A)-C(5A)	-179.5(4)
C(4A)-C(5A)-C(6A)-C(1A)	-1.2(7)
C(1C)-C(7)-C(1B)-C(6B)	95.1(3)
C(6)-C(7)-C(1B)-C(6B)	-137.7(3)
C(1C)-C(7)-C(1B)-C(2B)	-81.7(3)
C(6)-C(7)-C(1B)-C(2B)	45.4(3)
C(6B)-C(1B)-C(2B)-C(3B)	0.9(4)
C(7)-C(1B)-C(2B)-C(3B)	177.7(3)
C(1B)-C(2B)-C(3B)-C(4B)	0.4(5)
C(2B)-C(3B)-C(4B)-C(5B)	-1.6(6)
C(3B)-C(4B)-C(5B)-C(6B)	1.5(5)
C(2B)-C(1B)-C(6B)-C(5B)	-1.0(4)
C(7)-C(1B)-C(6B)-C(5B)	-177.9(2)
C(4B)-C(5B)-C(6B)-C(1B)	-0.2(5)
C(1B)-C(7)-C(1C)-C(2C)	-104.2(3)
C(6)-C(7)-C(1C)-C(2C)	128.6(3)
C(1B)-C(7)-C(1C)-C(6C)	74.1(4)
C(6)-C(7)-C(1C)-C(6C)	-53.2(4)
C(6C)-C(1C)-C(2C)-C(3C)	0.3(5)
C(7)-C(1C)-C(2C)-C(3C)	178.6(3)
C(1C)-C(2C)-C(3C)-C(4C)	1.2(6)
C(2C)-C(3C)-C(4C)-C(5C)	-2.2(7)
C(3C)-C(4C)-C(5C)-C(6C)	1.8(7)
C(2C)-C(1C)-C(6C)-C(5C)	-0.7(5)
C(7)-C(1C)-C(6C)-C(5C)	-179.0(3)
C(4C)-C(5C)-C(6C)-C(1C)	-0.3(7)

Symmetry transformations used to generate equivalent atoms:

Table 7. Hydrogen bonds for 9b [\AA and $^\circ$].

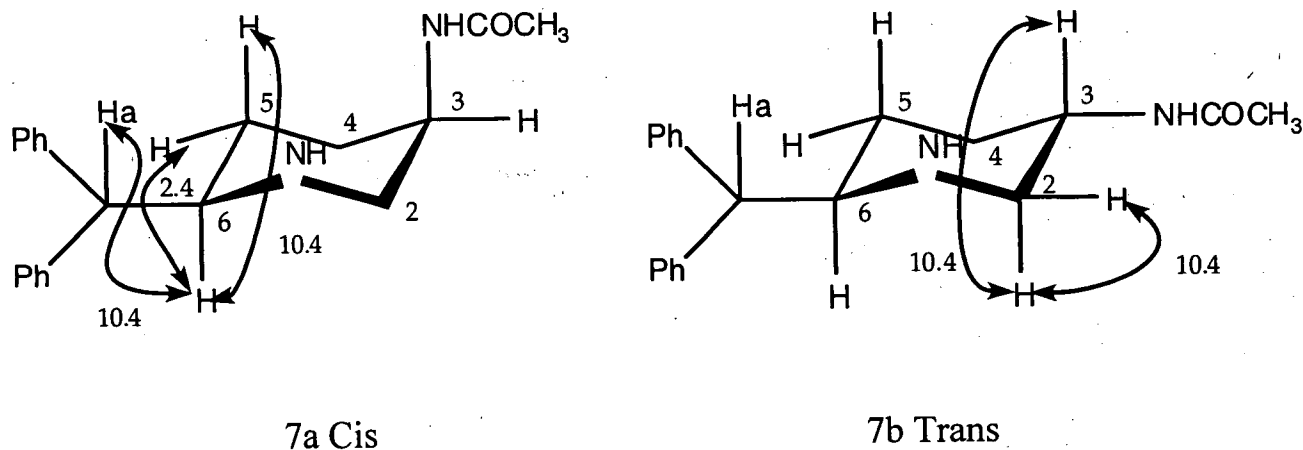
D-H...A	d(D-H)	d(H...A)	d(D...A)	$\angle(\text{DHA})$
N(3)-H(3')...O(1S)	0.94(5)	1.92(5)	2.726(15)	143(4)
N(3)-H(3'')...O(8)#1	0.96(5)	2.20(5)	3.149(4)	172(4)

Symmetry transformations used to generate equivalent atoms:

#1 $-x+3/2, -y, z-1/2$

1H NMR data interpretation:

Table I: 1H NMR spectral data for



Compound	Chemical shift	Multiplicity	Coupling constant
7a Cis			
H-6 _{ax}	3.24	dt	$J_{6ax-5ax} = J_{6ax-a} = 10.4$ Hz $J_{6ax-5eq} = 2.4$ Hz
H-3 _{eq}	4.03-4.09	m	Peak width = 24 Hz
H-2	2.81-2.84	m	Peak width = 12 Hz
7b Trans			
H-6 _{ax} , H-2 _{eq}	3.17-3.24	m	Peak width = 28 Hz
H-3 _{ax}	3.80-3.90	m	Peak width = 40 Hz
H-2 _{ax}	2.30	t	$J_{2ax-2eq} = J_{2ax-3ax} = 10.4$ Hz

The X-ray structure of **9b** also demonstrated the cis configuration of the molecule as expected when the bisphenyl moiety is in a pseudo axial orientation and the amino group is oriented in a pseudo equatorial position, Figure 3. However, this solid state configuration does not completely correspond to our solution phase ¹H NMR structure (Table I) of **7a** which is a precursor of the compound **9b**. The ¹H NMR data clearly

demonstrated equatorial and axial *cis*-orientation of the bisphenyl and the amino moieties respectively in **7a**. Thus, in compound **7a**, H-6 proton appeared at 3.24 ppm with a doublet of triplet splitting pattern and with a coupling constant representative of an axial orientation of this proton ($J = 10.4$ and 2.4 Hz, see Table I). Similarly, H-3 appeared as a multiplet with a peak width of 24 Hz which is much smaller than the corresponding value of 40 Hz for H-3 proton in *trans*-**7b** (Table I) which indicates equatorial orientation of H-3 in compound **7a**. Similarly, our ^1H NMR analysis on racemic **11** demonstrated exact similar *cis*-orientation of the bisphenyl and amino moieties. Furthermore, in a nuclear overhauser experiment (NOE) of (+)-**19b** irradiation of either H-6_{ax}, H-4_{ax} or H-2_{ax} resulted in enhancement of signals. This indicates through space interactions among the above three protons further confirming their 1,3-diaxial orientation on the same plane and the absolute configuration of (+)-**19b**. We believe that the solution phase conformation is biologically more relevant as it most likely interacts with the receptor and in this case, it is also thermodynamically more stable as biphenyl group oriented in an equatorial position will be more stable compared to a pseudo-axial orientation found in the solid state X-ray structure.