

TABLES

SUPPLEMENTARY MATERIAL

TABLE 9. Transition State (TS2) of the Reaction of Aminodichloroborane with Ammonia: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl(2)	1.752
B-Cl(3)	2.630
B-N(1)	1.398
B-N(7)	1.545
N(1)-H(8,9)	1.008
N(7)-H(4,5)	1.016
N(7)-H(6)	1.104
Cl-H(6)	1.794
$\angle(\text{N}(1)\text{-B-Cl}(2))$	122.5
$\angle(\text{Cl}(3)\text{-B-Cl}(2))$	105.2
$\angle(\text{N}(7)\text{-H}(6)\text{-Cl}(3))$	140.0
$\angle(\text{H}(4)\text{-N-H}(5))$	109.9
$\angle(\text{H}(9)\text{-N}(2)\text{-H}(8))$	112.0
$\angle(\text{B-N}(2)\text{-H}(9))$	118.0
$\angle(\text{H}(5)\text{-N-H}(6))$	112.2
$\Theta(\text{N}(7)\text{-Cl}(2)\text{-B-N}(1))$	157.7
$\Theta(\text{Cl}(2)\text{-B-N}(1)\text{-H}(9))$	25.5

TABLE 10.: Diaminochloroborane Ammonia Adduct (AD3):

Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl	1.910
B-N(1,2)	1.484
B-N(3)	1.665
N(3)-H(8,9,10)	1.016
N(1)-H(4)	1.008
N(1)-H(5)	1.010
N(2)-H(6)	1.011
N(2)-H(7)	1.012
$\angle(\text{N(1)-B-Cl})$	111.7
$\angle(\text{N(2)-B-Cl})$	117.0
$\angle(\text{N(2)-B-Cl})$	99.6
$\angle(\text{N(1)-B-N(2)})$	115.6
$\angle(\text{N(1)-B-N(3)})$	105.9
$\angle(\text{H(4)-N(1)-H(5)})$	110.0
$\angle(\text{H(6)-N(2)-H(7)})$	107.2
$\angle(\text{H(8)-N(3)-H(9)})$	108.5
$\angle(\text{H(8)-N(3)-H(10)})$	109.0
$\Theta(\text{Cl-B-N(3)-H(8)})$	61.9
$\Theta(\text{N(1)-B-N(3)-H(10)})$	63.7
$\Theta(\text{H(4)-N(1)-B-Cl})$	8.8
$\Theta(\text{H(7)-N(2)-B-Cl})$	37.2
$\Theta(\text{N(3)-B-N(1)-H(4)})$	116.4
$\Theta(\text{N(3)-B-N(1)-H(5)})$	-114.9
$\Theta(\text{N(3)-B-N(2)-H(6)})$	165.4
$\Theta(\text{N(3)-B-N(2)-H(7)})$	-72.0
...	

TABLE 10.: (cont.)

coordinate	RI-MP2//TZVP
------------	--------------

TABLE 11. Transition State (TS3) of the Reaction of Diaminochloroborane with Ammonia: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl	2.560
B-N(1,2)	1.425
B-N(3)	1.573
N(1,2)-H	1.009
N(3)-H(8,9)	1.016
N(3)-H(10)	1.054
Cl-H(10)	1.966
$\angle(\text{N}(1,2)\text{-B-Cl})$	106.3
$\angle(\text{N}(3)\text{-H}(10)\text{-Cl})$	129.9
$\angle(\text{H}(4,6)\text{-N}(1,2)\text{-H}(5,7))$	109.3
$\angle(\text{B-N}(1)\text{-H}(5))$	116.6
$\angle(\text{B-N}(1)\text{-H}(4))$	116.5
$\angle(\text{H}(9)\text{-N}(3)\text{-H}(10))$	111.8
$\Theta(\text{N}(3)\text{-N}(1)\text{-B-N}(2))$	149.8
$\Theta(\text{N}(1)\text{-B-N}(2)\text{-H}(7))$	163.7

TABLE 12. Van der Waals Complex (ComA) between two ADCB molecules: Bond Lengths ($\text{\AA}$) and Angles ($^\circ$)

coordinate	RI-MP2//TZVP
B-Cl	1.766
B-N	1.389
B-N	3.229
N-H	1.007
$\angle(\text{N-B-Cl})$	120.1
$\angle(\text{Cl-B-Cl})$	119.9
$\angle(\text{H-N-H})$	115.5
$\angle(\text{B-N-B})$	83.0
$\angle(\text{N-B-N})$	97.0
$\Theta(\text{B-N-B-N})$	0.1

TABLE 13.: Transition State (TS A) of the Dimerization of
ADCB: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(1)-Cl(5,6)	1.804
B(3)-Cl(7,8)	1.749
B(1)-N(2)	1.440
B(1)-N(4)	2.036
B(3)-N(4)	1.447
B(3)-N(2)	2.554
N(2)-H(9)	1.016
N(2)-H(10)	1.016
N(4)-H(11)	1.008
N(4)-H(12)	1.013
$\angle(\text{N}(2)\text{-B}(1)\text{-Cl}(5))$	116.8
$\angle(\text{N}(4)\text{-B}(3)\text{-Cl}(7))$	118.9
$\angle(\text{Cl}(7)\text{-B}(3)\text{-Cl}(8))$	121.8
$\angle(\text{Cl}(5)\text{-B}(1)\text{-Cl}(6))$	121.8
$\angle(\text{H}(9)\text{-N}(2)\text{-H}(10))$	112.7
$\angle(\text{H}(11)\text{-N}(4)\text{-H}(12))$	111.5
$\angle(\text{B}(1)\text{-N}(4)\text{-B}(3))$	98.1
$\angle(\text{B}(1)\text{-N}(2)\text{-B}(3))$	78.0
$\angle(\text{N}(2)\text{-B}(3)\text{-N}(4))$	81.3
$\angle(\text{H}(9)\text{-N}(2)\text{-B}(1))$	117.7
$\angle(\text{H}(11)\text{-N}(4)\text{-B}(3))$	116.3
$\Theta(\text{N}(4)\text{-B}(3)\text{-N}(2)\text{-B}(1))$	0.8
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(4)\text{-B}(1))$	0.5
$\Theta(\text{H}(9)\text{-N}(2)\text{-B}(1)\text{-Cl}(5))$	3.8
$\Theta(\text{H}(11)\text{-N}(4)\text{-B}(3)\text{-Cl}(7))$	19.8
...	

TABLE 13.: (cont.)

coordinate	RI-MP2//TZVP
------------	--------------

TABLE 14.: Aminodichloroborane Dimer, [ADCB]₂: Bond
Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl	1.813
B-N	1.596
N-H	1.016
$\angle(\text{N-B-Cl})$	120.0
$\angle(\text{Cl-B-Cl})$	116.7
$\angle(\text{H-N-H})$	109.3
$\angle(\text{B-N-B})$	88.3
$\Theta(\text{B-N-B-N})$	0.0

TABLE 15. Aminodichloroborane Trimer, [ADCB]₃: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl _{ax}	1.808
B-Cl _{eq}	1.850
B-N	1.582
N-H	1.022
$\angle(\text{N-B-Cl}_{ax})$	110.8
$\angle(\text{N-B-Cl}_{eq})$	106.8
$\angle(\text{Cl-B-Cl})$	113.2
$\angle(\text{H-N-H})$	104.5
$\angle(\text{B-N-B})$	121.9
$\angle(\text{N-B-N})$	108.2
$\Theta(\text{B-N-B-N})$	-43.1

TABLE 16.: Van der Waals Complex between two DACB
molecules, Conformer 1 (ComD1): Bond Lengths (Å)
and Angles (°)

coordinate	RI-MP2//TZVP
B(1,3)-Cl(6,8)	1.788
B(1,3)-N(5,7)	1.426
B(1,3)-N(2,4)	1.405
B(1)-N(4)	3.311
B(3)-N(2)	3.304
N(2,4)-H(9,12)	1.005
N(2,4)-H(10,11)	1.008
N(5,7)-H(13,15)	1.007
N(5,7)-H(14,16)	1.008
$\angle$ (N(2,4)-B(1,3)-Cl(6,8))	119.1
$\angle$ (N(2,4)-B(1,3)-N(5,7))	123.3
$\angle$ (N(7,5)-B(3,1)-Cl(8,6))	117.6
$\angle$ (H(9,11)-N(2,4)-H(10,12))	114.2
$\angle$ (H(13,16)-N(5,7)-H(14,15))	112.7
$\angle$ (B(1)-N(4)-B(3))	89.7
$\angle$ (B(1)-N(2)-B(3))	90.0
$\angle$ (N(2)-B(3)-N(4))	87.6
$\angle$ (H(9)-N(2)-B(1))	121.0
$\angle$ (H(11)-N(4)-B(3))	114.2
$\angle$ (H(14)-N(5)-B(1))	118.4
$\angle$ (H(15)-N(7)-B(3))	117.7
Θ (N(4)-B(3)-N(2)-B(1))	26.8
Θ (N(2)-B(3)-N(4)-B(1))	11.0
Θ (N(5)-B(1)-N(2)-H(9))	169.7
...	

TABLE 16.: (cont.)

coordinate	RI-MP2//TZVP
$\Theta(\text{N}(7)\text{-B}(3)\text{-N}(4)\text{-H}(11))$	15.0
$\Theta(\text{H}(13,15)\text{-N}(5,7)\text{-B}(1,3)\text{-Cl}(6,8))$	18.9
$\Theta(\text{Cl}(6)\text{-B}(1)\text{-N}(5)\text{-N}(2))$	178.7
$\Theta(\text{N}(4)\text{-N}(7)\text{-B}(3)\text{-Cl}(8))$	178.7
$\Theta(\text{H}(14,16)\text{-B}(1,3)\text{-N}(5,7)\text{-H}(13,15))$	142.7
$\Theta(\text{H}(11,10)\text{-B}(3,1)\text{-N}(4,2)\text{-H}(12,19))$	154.8

TABLE 17.: Van der Waals Complex between two DACB molecules, Conformer 2 (ComD2): Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(1)-Cl(5)	1.793
B(3)-Cl(8)	1.795
B(1)-N(6)	1.417
B(3)-N(7)	1.458
B(1)-N(2)	1.415
B(1)-N(4)	3.209
B(3)-N(4)	1.409
B(3)-N(2)	3.261
N(2)-H(9)	1.005
N(2)-H(10)	1.007
N(4)-H(11)	1.007
N(4)-H(12)	1.006
N(6)-H(13)	1.005
N(6)-H(14)	1.007
N(7)-H(15)	1.005
N(7)-H(16)	1.006
$\angle(\text{N(2)-B(1)-Cl(5)})$	118.2
$\angle(\text{N(2)-B(1)-N(6)})$	124.1
$\angle(\text{N(4)-B(3)-Cl(8)})$	118.1
$\angle(\text{N(4)-B(3)-N(7)})$	124.3
$\angle(\text{N(7)-B(3)-Cl(8)})$	117.7
$\angle(\text{N(6)-B(1)-Cl(5)})$	117.7
$\angle(\text{H(9)-N(2)-H(10)})$	113.1
$\angle(\text{H(11)-N(4)-H(12)})$	112.9
...	

TABLE 17.: (cont.)

coordinate	RI-MP2//TZVP
$\angle(\text{H}(13)\text{-N}(6)\text{-H}(14))$	113.6
$\angle(\text{H}(16)\text{-N}(7)\text{-H}(15))$	113.8
$\angle(\text{B}(1)\text{-N}(4)\text{-B}(3))$	88.7
$\angle(\text{B}(1)\text{-N}(2)\text{-B}(3))$	86.6
$\angle(\text{N}(2)\text{-B}(3)\text{-N}(4))$	91.2
$\angle(\text{H}(9)\text{-N}(2)\text{-B}(1))$	120.1
$\angle(\text{H}(11)\text{-N}(4)\text{-B}(3))$	121.1
$\angle(\text{H}(14)\text{-N}(6)\text{-B}(1))$	120.8
$\angle(\text{H}(15)\text{-N}(7)\text{-B}(3))$	120.6
$\Theta(\text{N}(4)\text{-B}(3)\text{-N}(2)\text{-B}(1))$	2.3
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(4)\text{-B}(1))$	1.0
$\Theta(\text{H}(9)\text{-N}(2)\text{-B}(1)\text{-Cl}(5))$	15.4
$\Theta(\text{H}(11)\text{-N}(4)\text{-B}(3)\text{-N}(7))$	12.5
$\Theta(\text{H}(13)\text{-N}(6)\text{-B}(1)\text{-Cl}(5))$	16.1
$\Theta(\text{Cl}(8)\text{-B}(3)\text{-N}(7)\text{-H}(15))$	14.6

TABLE 18.: Transition State, Conformer 1 (TS D1), in the Course of DACB Dimerization: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(1)-Cl(6)	1.770
B(3)-Cl(8)	1.892
B(1)-N(5)	1.394
B(3)-N(7)	1.495
B(1)-N(2)	1.522
B(1)-N(4)	2.382
B(3)-N(4)	1.502
B(3)-N(2)	1.654
N(2)-H(9,10)	1.017
N(4)-H(11,12)	1.011
N(5)-H(13)	1.006
N(5)-H(14)	1.013
N(7)-H(15,16)	1.013
$\angle(\text{N}(2)\text{-B}(1)\text{-Cl}(6))$	118.0
$\angle(\text{N}(2)\text{-B}(1)\text{-N}(5))$	117.2
$\angle(\text{N}(4)\text{-B}(3)\text{-Cl}(8))$	114.6
$\angle(\text{N}(4)\text{-B}(3)\text{-N}(7))$	113.2
$\angle(\text{N}(7)\text{-B}(3)\text{-Cl}(8))$	116.1
$\angle(\text{N}(5)\text{-B}(1)\text{-Cl}(6))$	122.6
$\angle(\text{H}(9)\text{-N}(2)\text{-H}(10))$	107.9
$\angle(\text{H}(11)\text{-N}(4)\text{-H}(12))$	108.6
$\angle(\text{H}(13)\text{-N}(5)\text{-H}(14))$	115.7
$\angle(\text{H}(16)\text{-N}(7)\text{-H}(15))$	106.2
$\angle(\text{B}(1)\text{-N}(4)\text{-B}(3))$	74.4
...	

TABLE 18.: (cont.)

coordinate	RI-MP2//TZVP
$\angle(\text{B}(1)\text{-N}(2)\text{-B}(3))$	101.0
$\angle(\text{N}(2)\text{-B}(3)\text{-N}(4))$	100.9
$\angle(\text{H}(9)\text{-N}(2)\text{-B}(1))$	113.2
$\angle(\text{H}(11)\text{-N}(4)\text{-B}(3))$	115.5
$\angle(\text{H}(14)\text{-N}(5)\text{-B}(1))$	117.0
$\angle(\text{H}(15)\text{-N}(7)\text{-B}(3))$	112.7
$\Theta(\text{N}(4)\text{-B}(3)\text{-N}(2)\text{-B}(1))$	33.0
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(4)\text{-B}(1))$	20.8
$\Theta(\text{H}(9)\text{-N}(2)\text{-B}(1)\text{-N}(5))$	42.2
$\Theta(\text{H}(11)\text{-N}(4)\text{-B}(3)\text{-N}(7))$	22.5
$\Theta(\text{Cl}(6)\text{-B}(1)\text{-N}(5)\text{-H}(13))$	18.6
$\Theta(\text{Cl}(8)\text{-B}(3)\text{-N}(7)\text{-H}(15))$	33.1

TABLE 19.: Transition State, Conformer 2 (TS D2), in the Course of DACB Dimerization: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(1)-Cl(5)	1.774
B(3)-Cl(8)	1.859
B(1)-N(6)	1.396
B(3)-N(7)	1.458
B(1)-N(2)	1.460
B(1)-N(4)	2.881
B(3)-N(4)	1.440
B(3)-N(2)	2.030
N(2)-H(9,10)	1.013
N(4)-H(11)	1.006
N(4)-H(12)	1.005
N(6)-H(13)	1.005
N(6)-H(14)	1.008
N(7)-H(15,16)	1.009
$\angle(\text{N}(2)\text{-B}(1)\text{-Cl}(5))$	118.5
$\angle(\text{N}(2)\text{-B}(1)\text{-N}(6))$	121.0
$\angle(\text{N}(4)\text{-B}(3)\text{-Cl}(8))$	113.8
$\angle(\text{N}(4)\text{-B}(3)\text{-N}(7))$	119.4
$\angle(\text{N}(7)\text{-B}(3)\text{-Cl}(8))$	118.8
$\angle(\text{N}(6)\text{-B}(1)\text{-Cl}(5))$	120.6
$\angle(\text{H}(9)\text{-N}(2)\text{-H}(10))$	110.2
$\angle(\text{H}(11)\text{-N}(4)\text{-H}(12))$	113.7
$\angle(\text{H}(13)\text{-N}(6)\text{-H}(14))$	114.9
$\angle(\text{H}(16)\text{-N}(7)\text{-H}(15))$	109.6
...	

TABLE 19.: (cont.)

coordinate	RI-MP2//TZVP
$\angle(\text{B}(1)\text{-N}(4)\text{-B}(3))$	73.2
$\angle(\text{B}(1)\text{-N}(2)\text{-B}(3))$	106.8
$\angle(\text{N}(2)\text{-B}(3)\text{-N}(4))$	104.5
$\angle(\text{H}(9)\text{-N}(2)\text{-B}(1))$	115.3
$\angle(\text{H}(11)\text{-N}(4)\text{-B}(3))$	120.2
$\angle(\text{H}(14)\text{-N}(6)\text{-B}(1))$	120.9
$\angle(\text{H}(15)\text{-N}(7)\text{-B}(3))$	116.7
$\Theta(\text{N}(4)\text{-B}(3)\text{-N}(2)\text{-B}(1))$	25.9
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(4)\text{-B}(1))$	12.8
$\Theta(\text{Cl}(5)\text{-B}(1)\text{-N}(2)\text{-H}(9))$	13.3
$\Theta(\text{H}(11)\text{-N}(4)\text{-B}(3)\text{-N}(7))$	9.4
$\Theta(\text{Cl}(5)\text{-B}(1)\text{-N}(6)\text{-H}(13))$	7.2
$\Theta(\text{H}(15)\text{-N}(7)\text{-B}(3)\text{-Cl}(8))$	17.8

TABLE 20.: Diaminochloroborane Dimer, Conformer 1

([DACB]₂ Conf.1): Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(5)-Cl	1.833
B(6)-Cl	1.826
B(5)-N(4)	1.589
B(5)-N(3)	1.588
B(6)-N(4)	1.607
B(6)-N(3)	1.638
N(3,4)-H	1.015
B(5)-N(1)	1.479
B(6)-N(2)	1.464
N(1)-H	1.013
N(2)-H(7)	1.011
N(2)-H(8)	1.008
∠(N(2)-B(6)-Cl)	114.5
∠(N(1)-B(5)-Cl)	119.9
∠(N(3)-B(5)-N(4))	92.0
∠(N(3)-B(6)-N(4))	89.6
∠(B(5)-N(4)-B(6))	88.5
∠(B(5)-N(3)-B(6))	87.5
∠(H-N(3,4)-H)	109.2
∠(H(7)-N(1)-H(8))	106.7
∠(H-N(2)-H)	111.1
∠(N(1)-B(5)-N(3))	110.3
∠(N(2)-B(6)-N(3))	117.1
∠(N(1)-B(5)-N(4))	110.5
∠(N(2)-B(6)-N(4))	111.2
...	

TABLE 20.: (cont.)

coordinate	RI-MP2//TZVP
$\Theta(\text{N}(3)\text{-B}(5)\text{-N}(4)\text{-B}(6))$	11.7
$\Theta(\text{N}(4)\text{-B}(6)\text{-N}(3)\text{-B}(5))$	11.3
$\Theta(\text{Cl-B}(5)\text{-N}(1)\text{-H})$	60.6
$\Theta(\text{Cl-B}(6)\text{-N}(2)\text{-H}(8))$	36.5
$\Theta(\text{Cl-B}(6)\text{-N}(2)\text{-H}(7))$	170.2
$\Theta(\text{Cl-B}(6)\text{-B}(5)\text{-Cl})$	3.1

TABLE 21. Diaminochloroborane Dimer, Conformer 2 ([DACB]₂ Conf.2): Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl	1.864
B-N	1.599
B-N(1)	1.471
N-H	1.015
N(1)-H	1.012
∠(N(1)-B-Cl)	120.1
∠(N-B-N)	92.6
∠(B-N-B)	87.4
∠(H-N(1)-H)	107.3
∠(H-N-H)	110.7
Θ(B-N-B-N)	0.4
Θ(Cl-B-B-Cl)	120.0
Θ(H-N(1)-B-Cl)	61.0
Θ(H-N-B-Cl)	134.0

TABLE 22.: Diaminochloroborane Trimer, Conformer 1

([DACB]₃ Conf.1): Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl	1.871
B-N	1.478
B(6,5,4)-N(3,2,1)	1.583
B(6,5,4)-N(2,1,3)	1.602
N-H(1)	1.009
N-H(2)	1.013
N(1,2,3)-H	1.020
∠(N(1,2,3)-B-N(2,3,1))	104.8
∠(B-N-(1,2,3)-B)	117.3
∠(Cl-B-N)	113.6
∠(H-N-H)	110.5
∠(H-N(1,2,3)-H)	104.8
∠(Cl-B(5,6,4)-N(1,2,3))	105.6
∠(Cl-B(6,5,4)-N(3,2,1))	108.2
∠(N-B(6,5,4)-N(3,2,1))	112.9
∠(N-B(5,6,4)-N(1,2,3))	111.2
Θ(N(2,3,1)-B-N(1,2,3)-B)	56.4
Θ(B(4,5,6)-N(1,2,3)-B(5,6,4)-Cl)	170.6
Θ(H(1)-N-B(6)-Cl)	2.4
Θ(H(1)-N-B(4,5)-Cl)	3.1
Θ(H(2)-N-B(5)-N(2))	9.3
Θ(H(2)-N-B(4,6)-N(2))	8.5
Θ(N(1,2,3)-B-N(2,3,1)-B)	56.1
Θ(Cl-B(4,5,6)-N(1,2,3)-B(5,6,4))	168.5
Θ(N-B(5,6,4)-N(1,2,3)-B(4,5,6))	65.9
...	

TABLE 22.: (cont.)

coordinate	RI-MP2//TZVP
$\Theta(\text{B}(5,6,4)\text{-N}(1,2,3)\text{-B}(4,5,6)\text{-N})$	65.0

TABLE 23.: Diaminochloroborane Trimer, Conformer 2

([DACB]₃ Conf.2): Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B-Cl(1)	1.875
B-Cl(2)	1.868
B-Cl(3)	1.908
B(1)-N(1)	1.583
B(2)-N(2)	1.586
B(3)-N(3)	1.590
B(2)-N(1)	1.609
B(3)-N(2)	1.571
B(1)-N(3)	1.591
B(2)-N(4)	1.467
B(3)-N(5)	1.468
B(1)-N(6)	1.490
H-N(1,2,3)	1.020
H-N(6)	1.014
H-N(5)	1.011
H(8)-N(4)	1.012
H(7)-N(4)	1.009
∠(N(1)-B(2)-N(2))	104.2
∠(N(2)-B(3)-N(3))	107.3
∠(N(3)-B(1)-N(1))	109.8
∠(B(1)-N(1)-B(2))	122.1
∠(B(2)-N(2)-B(3))	116.7
∠(B(3)-N(3)-B(1))	121.5
∠(Cl(1)-B(1)-N(6))	116.8
∠(Cl(2)-B(2)-N(4))	111.5
...	

TABLE 23.: (cont.)

coordinate	RI-MP2//TZVP
$\angle(\text{Cl}(3)\text{-B}(3)\text{-N}(5))$	116.9
$\angle(\text{H-N}(1,3)\text{-H})$	105.5
$\angle(\text{H-N}(2)\text{-H})$	104.6
$\angle(\text{H-N}(4)\text{-H})$	111.2
$\angle(\text{H-N}(5)\text{-H})$	108.4
$\angle(\text{H-N}(6)\text{-H})$	105.9
$\Theta(\text{B}(3)\text{-N}(3)\text{-B}(1)\text{-N}(1))$	32.8
$\Theta(\text{N}(1)\text{-B}(2)\text{-N}(4)\text{-H}(7))$	84.7
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(5)\text{-H})$	168.9
$\Theta(\text{H-N}(6)\text{-B}(1)\text{-Cl}(1))$	60.5

TABLE 24.: Van der Waals Complex (ComT) between two
TAB molecules: Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(1,3)-N(6,8)	1.433
B(1,3)-N(5,7)	1.453
B(1,3)-N(2,4)	1.427
B(1)-N(4)	3.703
B(3)-N(2)	3.708
N(2,4)-H(9,11)	1.012
N(2,4)-H(10,12)	1.006
N(5,7)-H(15,16,19,20)	1.008
N(6,8)-H(13,14,17,18)	1.005
$\angle(\text{N}(2,4)\text{-B}(1,3)\text{-N}(6,8))$	121.6
$\angle(\text{N}(2,4)\text{-B}(1,3)\text{-N}(5,7))$	118.7
$\angle(\text{N}(7,5)\text{-B}(3,1)\text{-N}(8,6))$	119.6
$\angle(\text{H}(9,11)\text{-N}(2,4)\text{-H}(10,12))$	112.8
$\angle(\text{H}(15,19)\text{-N}(5,7)\text{-H}(16,20))$	109.9
$\angle(\text{H}(17,13)\text{-N}(6,8)\text{-H}(18,14))$	112.4
$\angle(\text{B}(1)\text{-N}(4)\text{-B}(3))$	95.4
$\angle(\text{B}(1)\text{-N}(2)\text{-B}(3))$	95.2
$\angle(\text{N}(2)\text{-B}(3)\text{-N}(4))$	84.3
$\angle(\text{H}(9)\text{-N}(2)\text{-B}(1))$	119.1
$\angle(\text{H}(11)\text{-N}(4)\text{-B}(3))$	118.9
$\angle(\text{H}(20)\text{-N}(5)\text{-B}(1))$	117.6
$\angle(\text{H}(15)\text{-N}(7)\text{-B}(3))$	117.6
$\angle(\text{H}(13)\text{-N}(6)\text{-B}(1))$	117.6
$\angle(\text{H}(17)\text{-N}(8)\text{-B}(3))$	121.0
$\Theta(\text{N}(4)\text{-B}(3)\text{-N}(2)\text{-B}(1))$	10.7
...	

TABLE 24.: (cont.)

coordinate	RI-MP2//TZVP
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(4)\text{-B}(1))$	4.1
$\Theta(\text{N}(5)\text{-B}(1)\text{-N}(2)\text{-H}(9))$	23.8
$\Theta(\text{N}(7)\text{-B}(3)\text{-N}(4)\text{-H}(11))$	23.5
$\Theta(\text{H}(13,15)\text{-N}(5,7)\text{-B}(1,3)\text{-Cl}(6,8))$	18.9
$\Theta(\text{Cl}(6)\text{-B}(1)\text{-N}(5)\text{-N}(2))$	178.7
$\Theta(\text{N}(4)\text{-N}(7)\text{-B}(3)\text{-Cl}(8))$	178.7
$\Theta(\text{H}(19,16)\text{-N}(5,7)\text{-B}(1,3)\text{-H}(20,15))$	132.7
$\Theta(\text{H}(11,10)\text{-B}(3,1)\text{-N}(4,2)\text{-H}(12,9))$	146.7

TABLE 25.: Transition State for the Dimerization of TAB

(TS T): Bond Lengths (Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(1)-N(6)	1.439
B(3)-N(8)	1.510
B(1)-N(5)	1.446
B(3)-N(7)	1.508
B(1)-N(2)	1.543
B(1)-N(4)	2.106
B(3)-N(4)	1.558
B(3)-N(2)	1.654
N(2)-H(9,10)	1.016
N(4)-H(11,12)	1.013
N(6)-H(13)	1.008
N(6)-H(14)	1.011
N(7)-H(15)	1.014
N(7)-H(16)	1.012
N(8)-H(17)	1.014
N(8)-H(18)	1.012
N(5)-H(19,20)	1.008
$\angle(\text{N}(2)\text{-B}(1)\text{-N}(6))$	117.3
$\angle(\text{N}(2)\text{-B}(1)\text{-N}(5))$	113.1
$\angle(\text{N}(4)\text{-B}(3)\text{-N}(8))$	109.5
$\angle(\text{N}(4)\text{-B}(3)\text{-N}(7))$	119.2
$\angle(\text{N}(7)\text{-B}(3)\text{-N}(8))$	116.4
$\angle(\text{N}(5)\text{-B}(1)\text{-N}(6))$	121.6
$\angle(\text{H}(9)\text{-N}(2)\text{-H}(10))$	107.1
$\angle(\text{H}(11)\text{-N}(4)\text{-H}(12))$	107.8
...	

TABLE 25.: (cont.)

coordinate	RI-MP2//TZVP
$\angle(\text{H}(19)\text{-N}(5)\text{-H}(20))$	109.8
$\angle(\text{H}(16)\text{-N}(7)\text{-H}(15))$	107.4
$\angle(\text{H}(13)\text{-N}(6)\text{-H}(14))$	111.8
$\angle(\text{H}(17)\text{-N}(8)\text{-H}(18))$	107.1
$\angle(\text{B}(1)\text{-N}(4)\text{-B}(3))$	74.4
$\angle(\text{B}(1)\text{-N}(2)\text{-B}(3))$	81.4
$\angle(\text{N}(2)\text{-B}(3)\text{-N}(4))$	96.0
$\angle(\text{H}(9)\text{-N}(2)\text{-B}(1))$	113.6
$\angle(\text{H}(11)\text{-N}(4)\text{-B}(3))$	114.7
$\angle(\text{H}(20)\text{-N}(5)\text{-B}(1))$	116.8
$\angle(\text{H}(15)\text{-N}(7)\text{-B}(3))$	112.7
$\Theta(\text{N}(4)\text{-B}(3)\text{-N}(2)\text{-B}(1))$	18.1
$\Theta(\text{N}(2)\text{-B}(3)\text{-N}(4)\text{-B}(1))$	13.2
$\Theta(\text{H}(9)\text{-N}(2)\text{-B}(1)\text{-N}(5))$	1.6
$\Theta(\text{H}(11)\text{-N}(4)\text{-B}(3)\text{-N}(7))$	2.5
$\Theta(\text{H}(20)\text{-N}(5)\text{-B}(1)\text{-N}(6))$	34.2
$\Theta(\text{N}(8)\text{-B}(3)\text{-N}(7)\text{-H}(15))$	50.3
$\Theta(\text{N}(5)\text{-B}(1)\text{-N}(6)\text{-H}(13))$	37.4
$\Theta(\text{N}(7)\text{-B}(3)\text{-N}(8)\text{-H}(17))$	33.3

TABLE 26.: Triaminoborane Dimer ([TAB]₂): Bond Lengths
(Å) and Angles (°)

coordinate	RI-MP2//TZVP
B(5)-N(4)	1.590
B(5)-N(3)	1.611
B(6)-N(4)	1.634
B(6)-N(3)	1.645
N(3,4)-H	1.014
B(5)-N(1)	1.514
B(6)-N(2)	1.483
B(5)-N(9)	1.507
B(6)-N(10)	1.490
N(1)-H	1.014
N(2)-H(7)	1.013
N(2)-H(8)	1.011
N(9)-H(11,12)	1.013
N(10)-H(13)	1.009
N(10)-H(14)	1.011
∠(N(2)-B(6)-N(10))	117.9
∠(N(1)-B(5)-N(9))	125.0
∠(N(3)-B(5)-N(4))	92.0
∠(N(3)-B(6)-N(4))	89.1
∠(B(5)-N(4)-B(6))	88.8
∠(B(5)-N(3)-B(6))	87.8
∠(H-N(3)-H)	109.9
∠(H-N(4)-H)	110.1
∠(H(7)-N(2)-H(8))	106.1
∠(H-N(1)-H)	111.1
...	

TABLE 26.: (cont.)

coordinate	RI-MP2//TZVP
$\angle(\text{H}(11)\text{-N}(9)\text{-H}(12))$	106.8
$\angle(\text{H}(13)\text{-N}(10)\text{-H}(14))$	109.1
$\angle(\text{N}(1)\text{-B}(5)\text{-N}(3))$	107.2
$\angle(\text{N}(2)\text{-B}(6)\text{-N}(3))$	115.4
$\angle(\text{N}(1)\text{-B}(5)\text{-N}(4))$	108.1
$\angle(\text{N}(2)\text{-B}(6)\text{-N}(4))$	107.3
$\angle(\text{N}(9)\text{-B}(5)\text{-N}(3))$	109.5
$\angle(\text{N}(10)\text{-B}(6)\text{-N}(3))$	110.6
$\angle(\text{N}(9)\text{-B}(5)\text{-N}(4))$	109.9
$\angle(\text{N}(10)\text{-B}(6)\text{-N}(4))$	112.9
$\Theta(\text{N}(3)\text{-B}(5)\text{-N}(4)\text{-B}(6))$	11.6
$\Theta(\text{N}(4)\text{-B}(6)\text{-N}(3)\text{-B}(5))$	11.2
$\Theta(\text{N}(9)\text{-B}(5)\text{-N}(1)\text{-H})$	52.9
$\Theta(\text{N}(10)\text{-B}(6)\text{-N}(2)\text{-H}(8))$	50.6
$\Theta(\text{N}(10)\text{-B}(6)\text{-N}(2)\text{-H}(7))$	179.2
$\Theta(\text{N}(10)\text{-B}(6)\text{-B}(5)\text{-N}(9))$	1.4
$\Theta(\text{N}(1)\text{-B}(5)\text{-N}(9)\text{-H}(11))$	45.6
$\Theta(\text{H}(13)\text{-N}(10)\text{-B}(6)\text{-N}(2))$	109.2
$\Theta(\text{N}(2)\text{-B}(6)\text{-N}(10)\text{-H}(14))$	19.8