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OM 0400797

X-Ray Crystallographic Data

for

Potassium 3,4-dimethyl-1,6,7-tris(tri-*tert*-butylsilyl)-1,6,7-trigermabicyclo[4.1.0]hept-3-en-7-ide ($2^{-}\cdot K^{+}$)

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Table 1. Crystal data and structure refinement for compound.

Identification code	shelxl
Empirical formula	C53 H118 Ge3 K O4 Si3
Formula weight	1160.61
Temperature	120 K
Wavelength	0.71070 Å
Crystal system, space group	Monoclinic, P 21/c
Unit cell dimensions	a = 13.7190(4) Å alpha = 90 deg. b = 20.5570(11) Å beta = 119.080(3) deg. c = 26.1960(11) Å gamma = 90 deg.
Volume	6456.5(5) Å^3
Z, Calculated density	4, 1.194 Mg/m^3
Absorption coefficient	1.545 mm^-1
F(000)	2500
Crystal size	0.20 x 0.20 x 0.10 mm
Theta range for data collection	2.17 to 27.97 deg.
Limiting indices	0<=h<=17, -27<=k<=0, -34<=l<=29
Reflections collected / unique	59834 / 14811 [R(int) = 0.0740]
Completeness to theta = 27.97	95.4 %
Absorption correction	None
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	14811 / 0 / 578
Goodness-of-fit on F^2	1.022
Final R indices [I>2sigma(I)]	R1 = 0.0521, wR2 = 0.1233
R indices (all data)	R1 = 0.0870, wR2 = 0.1406
Extinction coefficient	0.0044(3)

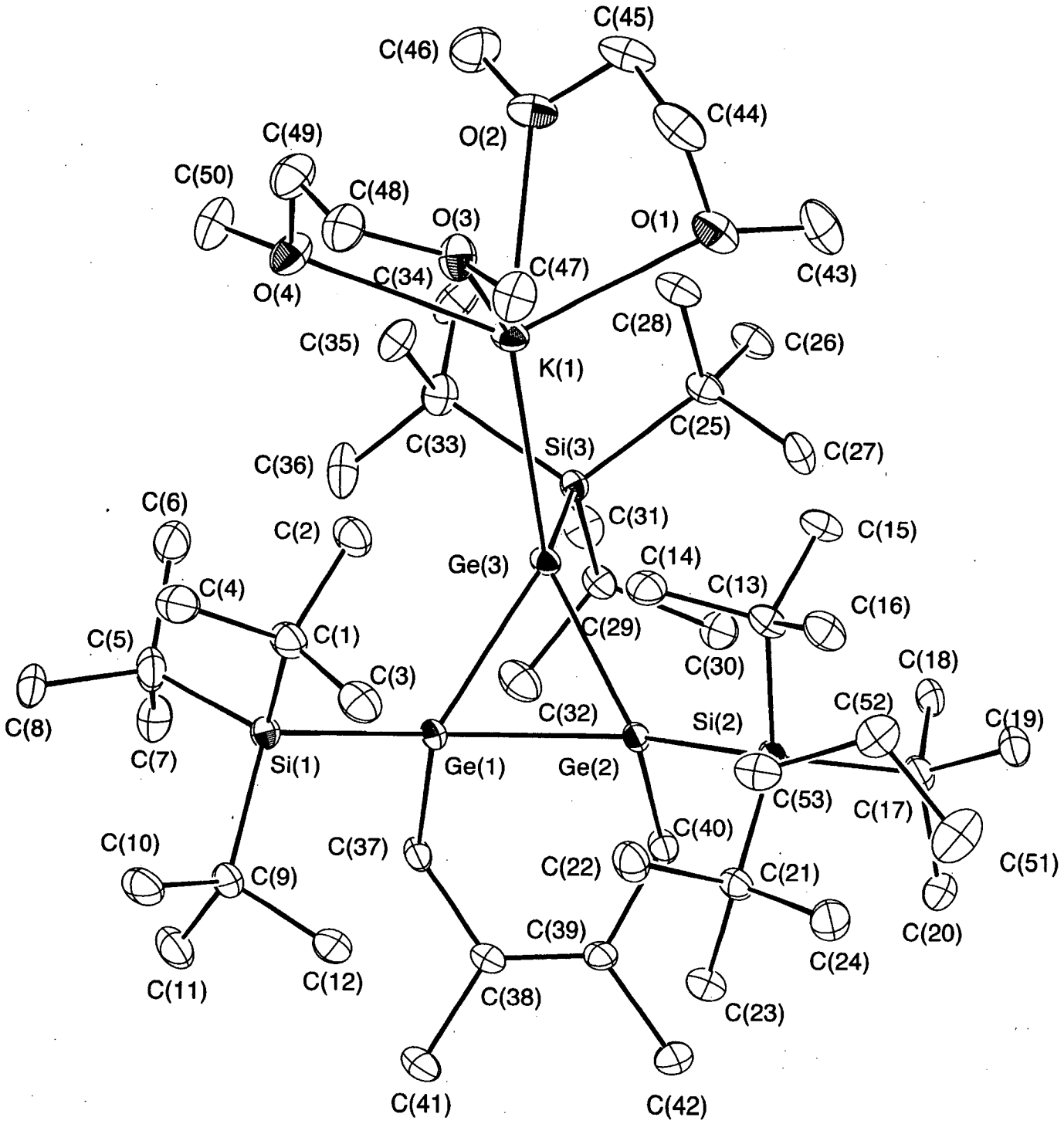
C(45)
C(46)
C(44)
O(2)
C(49)
C(50)
C(48)
O(3)
O(1)
C(47)
C(43)
O(4)
C(34)
C(28)
C(35)
C(26)
K(1)
C(25)
C(33)
Si(3)
C(27)
C(36)
C(31)
C(6)
C(15)
C(2)
Ge(3)
C(14)
C(13)
C(4)
C(16)
C(29)
C(5)
C(1)
C(30)
C(18)
C(3)
C(32)
C(52)
C(19)
C(8)
Si(2)
C(7)
Si(1)
Ge(1)
Ge(2)
C(53)
C(17)
C(40)
C(10)
C(37)
C(22)
C(21)
C(51)
C(9)
C(39)
C(20)
C(24)
C(11)
C(12)
C(38)
C(23)
C(41)
C(42)

Table 2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters (Å^2 x 10^3) for compound.
U(eq) is defined as one third of the trace of the orthogonalized Uij tensor.

	x	y	z	U(eq)
Ge(1)	1428(1)	3223(1)	503(1)	23(1)
Ge(2)	3459(1)	3257(1)	1024(1)	21(1)
Ge(3)	2488(1)	2969(1)	1590(1)	22(1)
K(1)	2331(1)	1426(1)	2047(1)	31(1)
Si(1)	-112(1)	2542(1)	-193(1)	31(1)
Si(2)	4983(1)	2649(1)	1031(1)	24(1)
Si(3)	2558(1)	3710(1)	2350(1)	22(1)
O(1)	4421(3)	998(2)	2935(1)	47(1)
O(2)	2499(3)	1002(2)	3081(1)	46(1)
O(3)	2043(2)	141(2)	1800(1)	42(1)
O(4)	195(3)	873(2)	1684(2)	44(1)
C(1)	268(4)	1615(2)	-26(2)	38(1)
C(2)	871(4)	1484(3)	630(2)	43(1)
C(3)	1082(4)	1395(2)	-248(2)	43(1)
C(4)	-771(4)	1162(3)	-304(2)	51(1)
C(5)	-1362(3)	2760(3)	-73(2)	42(1)
C(6)	-1167(4)	2447(3)	515(2)	57(2)
C(7)	-1458(4)	3493(3)	-24(2)	53(1)
C(8)	-2494(3)	2515(3)	-564(2)	56(2)
C(9)	-433(3)	2722(2)	-987(2)	31(1)
C(10)	-1172(4)	2208(3)	-1445(2)	47(1)
C(11)	-1073(4)	3372(3)	-1210(2)	46(1)
C(12)	648(4)	2804(3)	-1020(2)	41(1)
C(13)	5026(3)	1803(2)	1379(2)	31(1)
C(14)	3853(4)	1527(2)	1134(2)	36(1)
C(15)	5490(4)	1863(2)	2042(2)	36(1)
C(16)	5730(4)	1291(2)	1272(2)	40(1)
C(17)	6371(3)	3126(2)	1513(2)	31(1)
C(18)	6361(3)	3421(2)	2052(2)	34(1)
C(19)	7416(3)	2693(2)	1726(2)	39(1)
C(20)	6528(3)	3700(2)	1180(2)	38(1)
C(21)	4724(3)	2555(2)	235(2)	31(1)
C(22)	3763(3)	2076(2)	-109(2)	39(1)
C(23)	4339(4)	3205(2)	-102(2)	38(1)
C(24)	5753(4)	2310(3)	195(2)	41(1)
C(25)	3873(3)	3405(2)	3067(2)	28(1)
C(26)	4219(4)	3840(2)	3606(2)	37(1)
C(27)	4880(3)	3358(2)	2957(2)	36(1)
C(28)	3698(4)	2717(2)	3232(2)	37(1)
C(29)	2667(3)	4651(2)	2292(2)	27(1)
C(30)	3854(3)	4851(2)	2424(2)	36(1)
C(31)	2373(4)	5058(2)	2700(2)	38(1)
C(32)	1883(4)	4882(2)	1665(2)	40(1)

C(33)	1193(3)	3501(2)	2391(2)	35(1)
C(34)	1265(4)	3660(2)	2986(2)	48(1)
C(35)	893(4)	2774(2)	2273(2)	39(1)
C(36)	189(3)	3868(3)	1897(2)	51(1)
C(37)	1138(3)	4162(2)	214(2)	27(1)
C(38)	1847(3)	4465(2)	-21(2)	28(1)
C(39)	2969(3)	4494(2)	293(2)	26(1)
C(40)	3585(3)	4222(2)	909(2)	27(1)
C(41)	1173(4)	4770(2)	-618(2)	37(1)
C(42)	3693(3)	4848(2)	91(2)	36(1)
C(43)	5419(4)	1298(3)	3355(2)	58(2)
C(44)	4109(5)	468(3)	3168(2)	54(1)
C(45)	3489(5)	676(3)	3484(2)	53(1)
C(46)	1837(5)	1206(3)	3332(2)	65(2)
C(47)	2719(4)	-190(3)	1616(2)	48(1)
C(48)	936(4)	-129(2)	1552(2)	47(1)
C(49)	314(4)	198(3)	1815(3)	51(1)
C(50)	-669(4)	1163(3)	1755(3)	53(1)
C(51)	7418(5)	393(3)	195(3)	74(2)
C(52)	6623(4)	51(3)	372(2)	49(1)
C(53)	5409(4)	162(3)	-79(2)	44(1)

Table 3. Bond lengths [Å] and angles [deg] for compound.

Ge(1)-C(37)	2.041(4)
Ge(1)-Ge(2)	2.4354(5)
Ge(1)-Si(1)	2.4512(12)
Ge(1)-Ge(3)	2.5433(6)
Ge(2)-C(40)	2.026(4)
Ge(2)-Si(2)	2.4273(10)
Ge(2)-Ge(3)	2.5003(5)
Ge(3)-Si(3)	2.4716(11)
Ge(3)-K(1)	3.4324(10)
K(1)-O(3)	2.704(3)
K(1)-O(2)	2.746(3)
K(1)-O(1)	2.815(3)
K(1)-O(4)	2.843(3)
Si(1)-C(5)	1.941(4)
Si(1)-C(9)	1.941(4)
Si(1)-C(1)	1.967(5)
Si(2)-C(21)	1.948(4)
Si(2)-C(13)	1.951(4)
Si(2)-C(17)	1.961(4)
Si(3)-C(29)	1.952(4)
Si(3)-C(25)	1.971(4)
Si(3)-C(33)	1.975(4)
O(1)-C(44)	1.411(6)
O(1)-C(43)	1.414(6)
O(2)-C(45)	1.419(6)
O(2)-C(46)	1.419(5)
O(3)-C(47)	1.410(5)
O(3)-C(48)	1.442(5)
O(4)-C(49)	1.419(6)
O(4)-C(50)	1.419(5)
C(1)-C(2)	1.526(6)
C(1)-C(3)	1.556(6)
C(1)-C(4)	1.556(6)
C(2)-H(2A)	0.9600
C(2)-H(2B)	0.9600
C(2)-H(2C)	0.9600
C(3)-H(3A)	0.9600
C(3)-H(3B)	0.9600
C(3)-H(3C)	0.9600
C(4)-H(4A)	0.9600
C(4)-H(4B)	0.9600
C(4)-H(4C)	0.9600
C(5)-C(7)	1.524(8)
C(5)-C(8)	1.543(6)
C(5)-C(6)	1.568(7)
C(6)-H(6A)	0.9600
C(6)-H(6B)	0.9600
C(6)-H(6C)	0.9600
C(7)-H(7A)	0.9600
C(7)-H(7B)	0.9600

C(7)-H(7C)	0.9600
C(8)-H(8A)	0.9600
C(8)-H(8B)	0.9600
C(8)-H(8C)	0.9600
C(9)-C(12)	1.536(5)
C(9)-C(10)	1.550(6)
C(9)-C(11)	1.550(6)
C(10)-H(10A)	0.9600
C(10)-H(10B)	0.9600
C(10)-H(10C)	0.9600
C(11)-H(11A)	0.9600
C(11)-H(11B)	0.9600
C(11)-H(11C)	0.9600
C(12)-H(12A)	0.9600
C(12)-H(12B)	0.9600
C(12)-H(12C)	0.9600
C(13)-C(14)	1.523(6)
C(13)-C(15)	1.537(6)
C(13)-C(16)	1.543(6)
C(14)-H(14A)	0.9600
C(14)-H(14B)	0.9600
C(14)-H(14C)	0.9600
C(15)-H(15A)	0.9600
C(15)-H(15B)	0.9600
C(15)-H(15C)	0.9600
C(16)-H(16A)	0.9600
C(16)-H(16B)	0.9600
C(16)-H(16C)	0.9600
C(17)-C(18)	1.542(5)
C(17)-C(19)	1.543(5)
C(17)-C(20)	1.544(6)
C(18)-H(18A)	0.9600
C(18)-H(18B)	0.9600
C(18)-H(18C)	0.9600
C(19)-H(19A)	0.9600
C(19)-H(19B)	0.9600
C(19)-H(19C)	0.9600
C(20)-H(20A)	0.9600
C(20)-H(20B)	0.9600
C(20)-H(20C)	0.9600
C(21)-C(22)	1.536(6)
C(21)-C(23)	1.547(6)
C(21)-C(24)	1.550(5)
C(22)-H(22A)	0.9600
C(22)-H(22B)	0.9600
C(22)-H(22C)	0.9600
C(23)-H(23A)	0.9600
C(23)-H(23B)	0.9600
C(23)-H(23C)	0.9600
C(24)-H(24A)	0.9600
C(24)-H(24B)	0.9600
C(24)-H(24C)	0.9600
C(25)-C(28)	1.532(6)
C(25)-C(26)	1.539(5)

C(25)-C(27)	1.544(5)
C(26)-H(26A)	0.9600
C(26)-H(26B)	0.9600
C(26)-H(26C)	0.9600
C(27)-H(27A)	0.9600
C(27)-H(27B)	0.9600
C(27)-H(27C)	0.9600
C(28)-H(28A)	0.9600
C(28)-H(28B)	0.9600
C(28)-H(28C)	0.9600
C(29)-C(32)	1.538(6)
C(29)-C(30)	1.547(5)
C(29)-C(31)	1.555(5)
C(30)-H(30A)	0.9600
C(30)-H(30B)	0.9600
C(30)-H(30C)	0.9600
C(31)-H(31A)	0.9600
C(31)-H(31B)	0.9600
C(31)-H(31C)	0.9600
C(32)-H(32A)	0.9600
C(32)-H(32B)	0.9600
C(32)-H(32C)	0.9600
C(33)-C(35)	1.542(6)
C(33)-C(34)	1.549(6)
C(33)-C(36)	1.551(6)
C(34)-H(34A)	0.9600
C(34)-H(34B)	0.9600
C(34)-H(34C)	0.9600
C(35)-H(35A)	0.9600
C(35)-H(35B)	0.9600
C(35)-H(35C)	0.9600
C(36)-H(36A)	0.9600
C(36)-H(36B)	0.9600
C(36)-H(36C)	0.9600
C(37)-C(38)	1.515(5)
C(37)-H(37A)	0.9700
C(37)-H(37B)	0.9700
C(38)-C(39)	1.348(5)
C(38)-C(41)	1.513(5)
C(39)-C(40)	1.519(5)
C(39)-C(42)	1.518(5)
C(40)-H(40A)	0.9700
C(40)-H(40B)	0.9700
C(41)-H(41A)	0.9600
C(41)-H(41B)	0.9600
C(41)-H(41C)	0.9600
C(42)-H(42A)	0.9600
C(42)-H(42B)	0.9600
C(42)-H(42C)	0.9600
C(43)-H(43A)	0.9600
C(43)-H(43B)	0.9600
C(43)-H(43C)	0.9600
C(44)-C(45)	1.511(7)
C(44)-H(44A)	0.9700

C(44)-H(44B)	0.9700
C(45)-H(45A)	0.9700
C(45)-H(45B)	0.9700
C(46)-H(46A)	0.9600
C(46)-H(46B)	0.9600
C(46)-H(46C)	0.9600
C(47)-H(47A)	0.9600
C(47)-H(47B)	0.9600
C(47)-H(47C)	0.9600
C(48)-C(49)	1.491(6)
C(48)-H(48A)	0.9700
C(48)-H(48B)	0.9700
C(49)-H(49A)	0.9700
C(49)-H(49B)	0.9700
C(50)-H(50A)	0.9600
C(50)-H(50B)	0.9600
C(50)-H(50C)	0.9600
C(51)-C(52)	1.546(7)
C(51)-H(51A)	0.9600
C(51)-H(51B)	0.9600
C(51)-H(51C)	0.9600
C(52)-C(53)	1.520(7)
C(52)-H(52A)	0.9700
C(52)-H(52B)	0.9700
C(53)-C(53)#1	1.526(9)
C(53)-H(53A)	0.9700
C(53)-H(53B)	0.9700

C(37)-Ge(1)-Ge(2)	98.30(10)
C(37)-Ge(1)-Si(1)	108.79(11)
Ge(2)-Ge(1)-Si(1)	140.44(4)
C(37)-Ge(1)-Ge(3)	120.77(11)
Ge(2)-Ge(1)-Ge(3)	60.245(15)
Si(1)-Ge(1)-Ge(3)	122.19(3)
C(40)-Ge(2)-Si(2)	111.71(11)
C(40)-Ge(2)-Ge(1)	95.86(10)
Si(2)-Ge(2)-Ge(1)	137.40(3)
C(40)-Ge(2)-Ge(3)	115.39(11)
Si(2)-Ge(2)-Ge(3)	125.34(3)
Ge(1)-Ge(2)-Ge(3)	62.016(15)
Si(3)-Ge(3)-Ge(2)	120.54(3)
Si(3)-Ge(3)-Ge(1)	123.51(3)
Ge(2)-Ge(3)-Ge(1)	57.740(14)
Si(3)-Ge(3)-K(1)	105.87(3)
Ge(2)-Ge(3)-K(1)	124.59(2)
Ge(1)-Ge(3)-K(1)	118.80(2)
O(3)-K(1)-O(2)	81.80(10)
O(3)-K(1)-O(1)	82.15(11)
O(2)-K(1)-O(1)	61.47(10)
O(3)-K(1)-O(4)	61.40(9)
O(2)-K(1)-O(4)	77.37(10)
O(1)-K(1)-O(4)	128.44(11)
O(3)-K(1)-Ge(3)	147.79(8)
O(2)-K(1)-Ge(3)	130.41(8)

O(1)-K(1)-Ge(3)	111.48(8)
O(4)-K(1)-Ge(3)	118.82(7)
C(5)-Si(1)-C(9)	111.86(19)
C(5)-Si(1)-C(1)	110.3(2)
C(9)-Si(1)-C(1)	108.70(19)
C(5)-Si(1)-Ge(1)	104.92(15)
C(9)-Si(1)-Ge(1)	110.69(13)
C(1)-Si(1)-Ge(1)	110.36(14)
C(21)-Si(2)-C(13)	111.07(19)
C(21)-Si(2)-C(17)	110.76(17)
C(13)-Si(2)-C(17)	110.18(18)
C(21)-Si(2)-Ge(2)	109.54(13)
C(13)-Si(2)-Ge(2)	107.06(12)
C(17)-Si(2)-Ge(2)	108.12(13)
C(29)-Si(3)-C(25)	108.70(17)
C(29)-Si(3)-C(33)	109.29(18)
C(25)-Si(3)-C(33)	109.41(19)
C(29)-Si(3)-Ge(3)	121.58(12)
C(25)-Si(3)-Ge(3)	103.29(12)
C(33)-Si(3)-Ge(3)	104.03(13)
C(44)-O(1)-C(43)	112.5(4)
C(44)-O(1)-K(1)	101.4(3)
C(43)-O(1)-K(1)	135.9(3)
C(45)-O(2)-C(46)	112.9(4)
C(45)-O(2)-K(1)	118.4(3)
C(46)-O(2)-K(1)	126.7(3)
C(47)-O(3)-C(48)	112.6(3)
C(47)-O(3)-K(1)	120.6(3)
C(48)-O(3)-K(1)	118.9(3)
C(49)-O(4)-C(50)	112.6(3)
C(49)-O(4)-K(1)	109.4(3)
C(50)-O(4)-K(1)	125.4(3)
C(2)-C(1)-C(3)	106.0(4)
C(2)-C(1)-C(4)	107.0(4)
C(3)-C(1)-C(4)	108.2(4)
C(2)-C(1)-Si(1)	111.2(3)
C(3)-C(1)-Si(1)	111.0(3)
C(4)-C(1)-Si(1)	113.1(3)
C(1)-C(2)-H(2A)	109.5
C(1)-C(2)-H(2B)	109.5
H(2A)-C(2)-H(2B)	109.5
C(1)-C(2)-H(2C)	109.5
H(2A)-C(2)-H(2C)	109.5
H(2B)-C(2)-H(2C)	109.5
C(1)-C(3)-H(3A)	109.5
C(1)-C(3)-H(3B)	109.5
H(3A)-C(3)-H(3B)	109.5
C(1)-C(3)-H(3C)	109.5
H(3A)-C(3)-H(3C)	109.5
H(3B)-C(3)-H(3C)	109.5
C(1)-C(4)-H(4A)	109.5
C(1)-C(4)-H(4B)	109.5
H(4A)-C(4)-H(4B)	109.5
C(1)-C(4)-H(4C)	109.5

H(4A)-C(4)-H(4C)	109.5
H(4B)-C(4)-H(4C)	109.5
C(7)-C(5)-C(8)	107.4(4)
C(7)-C(5)-C(6)	107.7(4)
C(8)-C(5)-C(6)	107.9(4)
C(7)-C(5)-Si(1)	111.2(3)
C(8)-C(5)-Si(1)	113.6(3)
C(6)-C(5)-Si(1)	108.8(3)
C(5)-C(6)-H(6A)	109.5
C(5)-C(6)-H(6B)	109.5
H(6A)-C(6)-H(6B)	109.5
C(5)-C(6)-H(6C)	109.5
H(6A)-C(6)-H(6C)	109.5
H(6B)-C(6)-H(6C)	109.5
C(5)-C(7)-H(7A)	109.5
C(5)-C(7)-H(7B)	109.5
H(7A)-C(7)-H(7B)	109.5
C(5)-C(7)-H(7C)	109.5
H(7A)-C(7)-H(7C)	109.5
H(7B)-C(7)-H(7C)	109.5
C(5)-C(8)-H(8A)	109.5
C(5)-C(8)-H(8B)	109.5
H(8A)-C(8)-H(8B)	109.5
C(5)-C(8)-H(8C)	109.5
H(8A)-C(8)-H(8C)	109.5
H(8B)-C(8)-H(8C)	109.5
C(12)-C(9)-C(10)	108.6(4)
C(12)-C(9)-C(11)	105.6(4)
C(10)-C(9)-C(11)	105.1(4)
C(12)-C(9)-Si(1)	111.0(3)
C(10)-C(9)-Si(1)	114.9(3)
C(11)-C(9)-Si(1)	111.0(3)
C(9)-C(10)-H(10A)	109.5
C(9)-C(10)-H(10B)	109.5
H(10A)-C(10)-H(10B)	109.5
C(9)-C(10)-H(10C)	109.5
H(10A)-C(10)-H(10C)	109.5
H(10B)-C(10)-H(10C)	109.5
C(9)-C(11)-H(11A)	109.5
C(9)-C(11)-H(11B)	109.5
H(11A)-C(11)-H(11B)	109.5
C(9)-C(11)-H(11C)	109.5
H(11A)-C(11)-H(11C)	109.5
H(11B)-C(11)-H(11C)	109.5
C(9)-C(12)-H(12A)	109.5
C(9)-C(12)-H(12B)	109.5
H(12A)-C(12)-H(12B)	109.5
C(9)-C(12)-H(12C)	109.5
H(12A)-C(12)-H(12C)	109.5
H(12B)-C(12)-H(12C)	109.5
C(14)-C(13)-C(15)	106.2(3)
C(14)-C(13)-C(16)	107.2(4)
C(15)-C(13)-C(16)	108.0(3)
C(14)-C(13)-Si(2)	110.4(3)

C(15)-C(13)-Si(2)	111.0(3)
C(16)-C(13)-Si(2)	113.7(3)
C(13)-C(14)-H(14A)	109.5
C(13)-C(14)-H(14B)	109.5
H(14A)-C(14)-H(14B)	109.5
C(13)-C(14)-H(14C)	109.5
H(14A)-C(14)-H(14C)	109.5
H(14B)-C(14)-H(14C)	109.5
C(13)-C(15)-H(15A)	109.5
C(13)-C(15)-H(15B)	109.5
H(15A)-C(15)-H(15B)	109.5
C(13)-C(15)-H(15C)	109.5
H(15A)-C(15)-H(15C)	109.5
H(15B)-C(15)-H(15C)	109.5
C(13)-C(16)-H(16A)	109.5
C(13)-C(16)-H(16B)	109.5
H(16A)-C(16)-H(16B)	109.5
C(13)-C(16)-H(16C)	109.5
H(16A)-C(16)-H(16C)	109.5
H(16B)-C(16)-H(16C)	109.5
C(18)-C(17)-C(19)	108.4(3)
C(18)-C(17)-C(20)	106.4(4)
C(19)-C(17)-C(20)	106.5(3)
C(18)-C(17)-Si(2)	110.4(2)
C(19)-C(17)-Si(2)	112.7(3)
C(20)-C(17)-Si(2)	112.1(3)
C(17)-C(18)-H(18A)	109.5
C(17)-C(18)-H(18B)	109.5
H(18A)-C(18)-H(18B)	109.5
C(17)-C(18)-H(18C)	109.5
H(18A)-C(18)-H(18C)	109.5
H(18B)-C(18)-H(18C)	109.5
C(17)-C(19)-H(19A)	109.5
C(17)-C(19)-H(19B)	109.5
H(19A)-C(19)-H(19B)	109.5
C(17)-C(19)-H(19C)	109.5
H(19A)-C(19)-H(19C)	109.5
H(19B)-C(19)-H(19C)	109.5
C(17)-C(20)-H(20A)	109.5
C(17)-C(20)-H(20B)	109.5
H(20A)-C(20)-H(20B)	109.5
C(17)-C(20)-H(20C)	109.5
H(20A)-C(20)-H(20C)	109.5
H(20B)-C(20)-H(20C)	109.5
C(22)-C(21)-C(23)	105.1(3)
C(22)-C(21)-C(24)	107.6(4)
C(23)-C(21)-C(24)	108.2(3)
C(22)-C(21)-Si(2)	110.5(3)
C(23)-C(21)-Si(2)	111.0(3)
C(24)-C(21)-Si(2)	114.0(3)
C(21)-C(22)-H(22A)	109.5
C(21)-C(22)-H(22B)	109.5
H(22A)-C(22)-H(22B)	109.5
C(21)-C(22)-H(22C)	109.5

H(22A)-C(22)-H(22C)	109.5
H(22B)-C(22)-H(22C)	109.5
C(21)-C(23)-H(23A)	109.5
C(21)-C(23)-H(23B)	109.5
H(23A)-C(23)-H(23B)	109.5
C(21)-C(23)-H(23C)	109.5
H(23A)-C(23)-H(23C)	109.5
H(23B)-C(23)-H(23C)	109.5
C(21)-C(24)-H(24A)	109.5
C(21)-C(24)-H(24B)	109.5
H(24A)-C(24)-H(24B)	109.5
C(21)-C(24)-H(24C)	109.5
H(24A)-C(24)-H(24C)	109.5
H(24B)-C(24)-H(24C)	109.5
C(28)-C(25)-C(26)	107.3(3)
C(28)-C(25)-C(27)	105.8(3)
C(26)-C(25)-C(27)	107.6(3)
C(28)-C(25)-Si(3)	111.5(3)
C(26)-C(25)-Si(3)	114.8(3)
C(27)-C(25)-Si(3)	109.3(3)
C(25)-C(26)-H(26A)	109.5
C(25)-C(26)-H(26B)	109.5
H(26A)-C(26)-H(26B)	109.5
C(25)-C(26)-H(26C)	109.5
H(26A)-C(26)-H(26C)	109.5
H(26B)-C(26)-H(26C)	109.5
C(25)-C(27)-H(27A)	109.5
C(25)-C(27)-H(27B)	109.5
H(27A)-C(27)-H(27B)	109.5
C(25)-C(27)-H(27C)	109.5
H(27A)-C(27)-H(27C)	109.5
H(27B)-C(27)-H(27C)	109.5
C(25)-C(28)-H(28A)	109.5
C(25)-C(28)-H(28B)	109.5
H(28A)-C(28)-H(28B)	109.5
C(25)-C(28)-H(28C)	109.5
H(28A)-C(28)-H(28C)	109.5
H(28B)-C(28)-H(28C)	109.5
C(32)-C(29)-C(30)	105.6(3)
C(32)-C(29)-C(31)	106.7(3)
C(30)-C(29)-C(31)	107.5(3)
C(32)-C(29)-Si(3)	110.4(3)
C(30)-C(29)-Si(3)	111.0(3)
C(31)-C(29)-Si(3)	115.1(3)
C(29)-C(30)-H(30A)	109.5
C(29)-C(30)-H(30B)	109.5
H(30A)-C(30)-H(30B)	109.5
C(29)-C(30)-H(30C)	109.5
H(30A)-C(30)-H(30C)	109.5
H(30B)-C(30)-H(30C)	109.5
C(29)-C(31)-H(31A)	109.5
C(29)-C(31)-H(31B)	109.5
H(31A)-C(31)-H(31B)	109.5
C(29)-C(31)-H(31C)	109.5

H(31A)-C(31)-H(31C)	109.5
H(31B)-C(31)-H(31C)	109.5
C(29)-C(32)-H(32A)	109.5
C(29)-C(32)-H(32B)	109.5
H(32A)-C(32)-H(32B)	109.5
C(29)-C(32)-H(32C)	109.5
H(32A)-C(32)-H(32C)	109.5
H(32B)-C(32)-H(32C)	109.5
C(35)-C(33)-C(34)	106.7(4)
C(35)-C(33)-C(36)	105.2(4)
C(34)-C(33)-C(36)	109.5(4)
C(35)-C(33)-Si(3)	111.6(3)
C(34)-C(33)-Si(3)	114.2(3)
C(36)-C(33)-Si(3)	109.3(3)
C(33)-C(34)-H(34A)	109.5
C(33)-C(34)-H(34B)	109.5
H(34A)-C(34)-H(34B)	109.5
C(33)-C(34)-H(34C)	109.5
H(34A)-C(34)-H(34C)	109.5
H(34B)-C(34)-H(34C)	109.5
C(33)-C(35)-H(35A)	109.5
C(33)-C(35)-H(35B)	109.5
H(35A)-C(35)-H(35B)	109.5
C(33)-C(35)-H(35C)	109.5
H(35A)-C(35)-H(35C)	109.5
H(35B)-C(35)-H(35C)	109.5
C(33)-C(36)-H(36A)	109.5
C(33)-C(36)-H(36B)	109.5
H(36A)-C(36)-H(36B)	109.5
C(33)-C(36)-H(36C)	109.5
H(36A)-C(36)-H(36C)	109.5
H(36B)-C(36)-H(36C)	109.5
C(38)-C(37)-Ge(1)	119.4(3)
C(38)-C(37)-H(37A)	107.5
Ge(1)-C(37)-H(37A)	107.5
C(38)-C(37)-H(37B)	107.5
Ge(1)-C(37)-H(37B)	107.5
H(37A)-C(37)-H(37B)	107.0
C(39)-C(38)-C(37)	122.6(3)
C(39)-C(38)-C(41)	123.6(3)
C(37)-C(38)-C(41)	113.6(3)
C(38)-C(39)-C(40)	120.8(3)
C(38)-C(39)-C(42)	123.8(4)
C(40)-C(39)-C(42)	115.2(3)
C(39)-C(40)-Ge(2)	118.4(3)
C(39)-C(40)-H(40A)	107.7
Ge(2)-C(40)-H(40A)	107.7
C(39)-C(40)-H(40B)	107.7
Ge(2)-C(40)-H(40B)	107.7
H(40A)-C(40)-H(40B)	107.1
C(38)-C(41)-H(41A)	109.5
C(38)-C(41)-H(41B)	109.5
H(41A)-C(41)-H(41B)	109.5
C(38)-C(41)-H(41C)	109.5

H(41A)-C(41)-H(41C)	109.5
H(41B)-C(41)-H(41C)	109.5
C(39)-C(42)-H(42A)	109.5
C(39)-C(42)-H(42B)	109.5
H(42A)-C(42)-H(42B)	109.5
C(39)-C(42)-H(42C)	109.5
H(42A)-C(42)-H(42C)	109.5
H(42B)-C(42)-H(42C)	109.5
O(1)-C(43)-H(43A)	109.5
O(1)-C(43)-H(43B)	109.5
H(43A)-C(43)-H(43B)	109.5
O(1)-C(43)-H(43C)	109.5
H(43A)-C(43)-H(43C)	109.5
H(43B)-C(43)-H(43C)	109.5
O(1)-C(44)-C(45)	112.9(4)
O(1)-C(44)-H(44A)	109.0
C(45)-C(44)-H(44A)	109.0
O(1)-C(44)-H(44B)	109.0
C(45)-C(44)-H(44B)	109.0
H(44A)-C(44)-H(44B)	107.8
O(2)-C(45)-C(44)	108.3(4)
O(2)-C(45)-H(45A)	110.0
C(44)-C(45)-H(45A)	110.0
O(2)-C(45)-H(45B)	110.0
C(44)-C(45)-H(45B)	110.0
H(45A)-C(45)-H(45B)	108.4
O(2)-C(46)-H(46A)	109.5
O(2)-C(46)-H(46B)	109.5
H(46A)-C(46)-H(46B)	109.5
O(2)-C(46)-H(46C)	109.5
H(46A)-C(46)-H(46C)	109.5
H(46B)-C(46)-H(46C)	109.5
O(3)-C(47)-H(47A)	109.5
O(3)-C(47)-H(47B)	109.5
H(47A)-C(47)-H(47B)	109.5
O(3)-C(47)-H(47C)	109.5
H(47A)-C(47)-H(47C)	109.5
H(47B)-C(47)-H(47C)	109.5
O(3)-C(48)-C(49)	109.4(4)
O(3)-C(48)-H(48A)	109.8
C(49)-C(48)-H(48A)	109.8
O(3)-C(48)-H(48B)	109.8
C(49)-C(48)-H(48B)	109.8
H(48A)-C(48)-H(48B)	108.2
O(4)-C(49)-C(48)	110.6(4)
O(4)-C(49)-H(49A)	109.5
C(48)-C(49)-H(49A)	109.5
O(4)-C(49)-H(49B)	109.5
C(48)-C(49)-H(49B)	109.5
H(49A)-C(49)-H(49B)	108.1
O(4)-C(50)-H(50A)	109.5
O(4)-C(50)-H(50B)	109.5
H(50A)-C(50)-H(50B)	109.5
O(4)-C(50)-H(50C)	109.5

H(50A)-C(50)-H(50C)	109.5
H(50B)-C(50)-H(50C)	109.5
C(52)-C(51)-H(51A)	109.5
C(52)-C(51)-H(51B)	109.5
H(51A)-C(51)-H(51B)	109.5
C(52)-C(51)-H(51C)	109.5
H(51A)-C(51)-H(51C)	109.5
H(51B)-C(51)-H(51C)	109.5
C(53)-C(52)-C(51)	111.4(5)
C(53)-C(52)-H(52A)	109.4
C(51)-C(52)-H(52A)	109.4
C(53)-C(52)-H(52B)	109.4
C(51)-C(52)-H(52B)	109.4
H(52A)-C(52)-H(52B)	108.0
C(52)-C(53)-C(53)#1	113.3(5)
C(52)-C(53)-H(53A)	108.9
C(53)#1-C(53)-H(53A)	108.9
C(52)-C(53)-H(53B)	108.9
C(53)#1-C(53)-H(53B)	108.9
H(53A)-C(53)-H(53B)	107.7

Symmetry transformations used to generate equivalent atoms:
#1 -x+1,-y,-z

Table 4. Anisotropic displacement parameters (Å^2 x 10^3) for compound.
The anisotropic displacement factor exponent takes the form:
-2 pi^2 [h^2 a*^2 U11 + ... + 2 h k a* b* U12]

	U11	U22	U33	U23	U13	U12
Ge(1)	18(1)	28(1)	17(1)	0(1)	4(1)	-4(1)
Ge(2)	18(1)	22(1)	20(1)	2(1)	6(1)	0(1)
Ge(3)	24(1)	21(1)	16(1)	-1(1)	7(1)	-2(1)
K(1)	38(1)	24(1)	26(1)	2(1)	13(1)	-3(1)
Si(1)	25(1)	41(1)	20(1)	-2(1)	5(1)	-13(1)
Si(2)	20(1)	29(1)	19(1)	1(1)	6(1)	3(1)
Si(3)	21(1)	22(1)	21(1)	-2(1)	7(1)	-1(1)
O(1)	52(2)	54(2)	32(2)	3(2)	18(2)	18(2)
O(2)	63(2)	46(2)	33(2)	3(2)	28(2)	3(2)
O(3)	36(2)	37(2)	45(2)	-10(2)	15(2)	-5(1)
O(4)	45(2)	34(2)	62(2)	2(2)	33(2)	-4(1)
C(1)	38(2)	37(3)	29(2)	1(2)	9(2)	-7(2)
C(2)	40(2)	42(3)	32(3)	-1(2)	6(2)	-7(2)
C(3)	47(3)	35(3)	40(3)	0(2)	15(2)	3(2)
C(4)	57(3)	47(3)	33(3)	-3(2)	8(2)	-31(2)
C(5)	24(2)	59(3)	36(3)	-5(2)	9(2)	-7(2)
C(6)	34(2)	103(5)	34(3)	-5(3)	17(2)	-13(3)
C(7)	30(2)	66(4)	60(4)	4(3)	20(2)	2(2)
C(8)	23(2)	96(5)	40(3)	2(3)	9(2)	-18(2)
C(9)	28(2)	35(2)	23(2)	-2(2)	7(2)	-4(2)
C(10)	52(3)	50(3)	25(2)	-2(2)	7(2)	-15(2)
C(11)	38(2)	50(3)	32(3)	2(2)	3(2)	-1(2)
C(12)	40(2)	54(3)	25(2)	1(2)	13(2)	-5(2)
C(13)	34(2)	30(2)	25(2)	5(2)	11(2)	9(2)
C(14)	41(2)	28(2)	39(3)	5(2)	19(2)	2(2)
C(15)	44(2)	36(3)	27(2)	9(2)	16(2)	13(2)
C(16)	43(2)	37(3)	37(3)	6(2)	17(2)	16(2)
C(17)	23(2)	40(3)	23(2)	0(2)	6(2)	4(2)
C(18)	22(2)	47(3)	24(2)	-4(2)	4(2)	-8(2)
C(19)	24(2)	51(3)	34(2)	3(2)	9(2)	3(2)
C(20)	31(2)	42(3)	39(3)	0(2)	16(2)	-9(2)
C(21)	30(2)	39(3)	21(2)	0(2)	10(2)	1(2)
C(22)	35(2)	47(3)	28(2)	-5(2)	11(2)	-1(2)
C(23)	40(2)	44(3)	26(2)	5(2)	15(2)	1(2)
C(24)	38(2)	58(3)	34(3)	-5(2)	22(2)	2(2)
C(25)	36(2)	25(2)	20(2)	-3(2)	11(2)	1(2)
C(26)	47(2)	36(3)	19(2)	-5(2)	9(2)	0(2)
C(27)	26(2)	48(3)	24(2)	-5(2)	4(2)	7(2)
C(28)	51(3)	30(2)	24(2)	2(2)	12(2)	4(2)
C(29)	30(2)	23(2)	24(2)	-3(2)	9(2)	1(2)
C(30)	39(2)	29(2)	34(2)	-5(2)	15(2)	-7(2)
C(31)	42(2)	26(2)	40(3)	-9(2)	16(2)	4(2)
C(32)	46(2)	28(3)	34(3)	1(2)	9(2)	4(2)
C(33)	32(2)	36(3)	40(3)	-7(2)	19(2)	1(2)

C(34)	56(3)	41(3)	69(4)	-19(2)	49(3)	-14(2)
C(35)	38(2)	34(3)	53(3)	-10(2)	28(2)	-11(2)
C(36)	22(2)	48(3)	69(4)	-9(3)	13(2)	0(2)
C(37)	19(2)	33(2)	22(2)	2(2)	5(2)	2(2)
C(38)	32(2)	26(2)	21(2)	4(2)	10(2)	3(2)
C(39)	31(2)	20(2)	25(2)	3(2)	10(2)	-5(2)
C(40)	23(2)	23(2)	28(2)	1(2)	6(2)	-1(1)
C(41)	39(2)	36(3)	28(2)	8(2)	9(2)	6(2)
C(42)	38(2)	34(3)	37(2)	6(2)	19(2)	-5(2)
C(43)	44(3)	73(4)	42(3)	-4(3)	9(2)	25(3)
C(44)	67(3)	42(3)	35(3)	3(2)	11(3)	20(3)
C(45)	81(4)	43(3)	31(3)	10(2)	24(3)	8(3)
C(46)	66(4)	95(5)	50(3)	-6(3)	41(3)	-9(3)
C(47)	47(3)	41(3)	60(3)	-15(2)	28(3)	-4(2)
C(48)	47(3)	32(3)	60(3)	-9(2)	25(3)	-8(2)
C(49)	52(3)	39(3)	68(4)	0(3)	34(3)	-8(2)
C(50)	38(2)	50(3)	77(4)	-9(3)	34(3)	-6(2)
C(51)	65(4)	74(5)	96(5)	-3(4)	49(4)	-14(3)
C(52)	50(3)	48(3)	53(3)	0(2)	29(3)	-5(2)
C(53)	55(3)	40(3)	38(3)	3(2)	24(2)	1(2)

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X-Ray Crystallographic Data

for

3,4-Dimethyl-1,6,7-tris(tri-*tert*-butylsilyl)-1,6,7-trigermabicyclo[4.1.0]hept-3-ene (1b)

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Table 1. Crystal data and structure refinement for compound.

Identification code	shelxl
Empirical formula	C_{42} H_{92} Ge_3 Si_3
Formula weight	899.20
Temperature	150 K
Wavelength	0.71070 Å
Crystal system, space group	Triclinic, P -1
Unit cell dimensions	a = 13.0360(7) Å alpha = 108.340(3) deg. b = 13.4060(7) Å beta = 92.430(3) deg. c = 17.0910(5) Å gamma = 117.680(2) deg.
Volume	2446.7(2) Å^3
Z, Calculated density	2, 1.221 Mg/m^3
Absorption coefficient	1.930 mm^-1
F(000)	964
Crystal size	0.30 x 0.20 x 0.20 mm
Theta range for data collection	2.06 to 27.93 deg.
Limiting indices	0<=h<=17, -17<=k<=15, -22<=l<=22
Reflections collected / unique	24764 / 10832 [R(int) = 0.0340]
Completeness to theta = 27.93	92.3 %
Absorption correction	None
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	10832 / 0 / 434
Goodness-of-fit on F^2	1.020
Final R indices [I>2sigma(I)]	R1 = 0.0383, wR2 = 0.0975
R indices (all data)	R1 = 0.0543, wR2 = 0.1045
Extinction coefficient	0.0088(6)

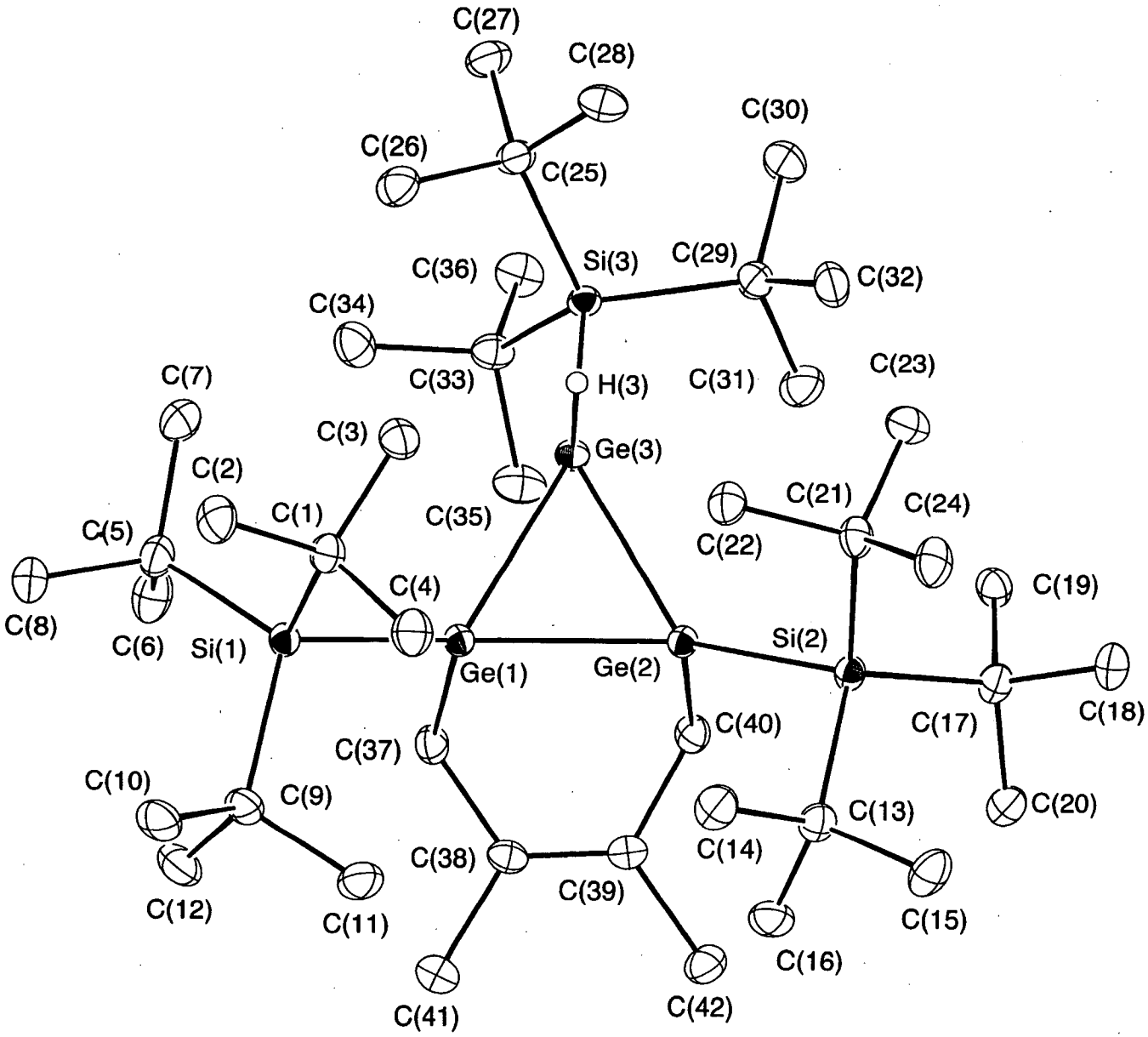
C(27)
C(28)
C(30)
C(26)
C(25)
C(36)
Si(3)
C(29)
C(32)
C(34)
C(33)
H(3)
C(31)
C(23)
C(7)
C(3)
Ge(3)
C(2)
C(21)
C(24)
C(1)
C(35)
C(22)
C(5)
C(4)
C(19)
C(8)
C(6)
Si(1)
Ge(1)
Ge(2)
Si(2)
C(18)
C(17)
C(40)
C(37)
C(10)
C(9)
C(13)
C(20)
C(14)
C(38)
C(39)
C(12)
C(11)
C(15)
C(16)
C(41)
C(42)

Table 2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters (Å^2 x 10^3) for compound.
U(eq) is defined as one third of the trace of the orthogonalized Uij tensor.

	x	y	z	U(eq)
Ge(1)	5786(1)	2480(1)	7263(1)	23(1)
Ge(2)	6853(1)	4584(1)	7307(1)	22(1)
Ge(3)	4723(1)	3631(1)	7323(1)	24(1)
Si(1)	5518(1)	1231(1)	8105(1)	25(1)
Si(2)	8508(1)	6552(1)	8257(1)	24(1)
Si(3)	2977(1)	3482(1)	6614(1)	23(1)
C(1)	5717(3)	2187(3)	9281(2)	32(1)
C(2)	5256(3)	1412(3)	9828(2)	43(1)
C(3)	5095(3)	2935(3)	9370(2)	37(1)
C(4)	7050(3)	3123(3)	9677(2)	41(1)
C(5)	3905(3)	-140(3)	7637(2)	35(1)
C(6)	3596(3)	-635(3)	6658(2)	47(1)
C(7)	3007(3)	259(3)	7929(2)	44(1)
C(8)	3697(3)	-1206(3)	7905(2)	42(1)
C(9)	6708(3)	734(3)	7966(2)	34(1)
C(10)	6868(3)	232(3)	8631(2)	44(1)
C(11)	7921(3)	1805(3)	8012(2)	42(1)
C(12)	6360(4)	-285(3)	7089(2)	45(1)
C(13)	9824(3)	6302(3)	8496(2)	31(1)
C(14)	9626(3)	5650(3)	9122(2)	42(1)
C(15)	11022(3)	7506(3)	8874(2)	42(1)
C(16)	9938(3)	5480(3)	7691(2)	39(1)
C(17)	8872(3)	7632(3)	7638(2)	30(1)
C(18)	9633(3)	8988(3)	8223(2)	37(1)
C(19)	7719(3)	7442(3)	7164(2)	31(1)
C(20)	9564(3)	7392(3)	6963(2)	33(1)
C(21)	7996(3)	7117(3)	9275(2)	29(1)
C(22)	7306(3)	6069(3)	9579(2)	37(1)
C(23)	7149(3)	7567(3)	9113(2)	43(1)
C(24)	9054(3)	8162(3)	10014(2)	42(1)
C(25)	1895(3)	3229(3)	7379(2)	31(1)
C(26)	1825(3)	2280(3)	7727(2)	38(1)
C(27)	638(3)	2816(3)	6941(2)	40(1)
C(28)	2328(3)	4417(3)	8157(2)	40(1)
C(29)	3494(3)	5024(3)	6486(2)	31(1)
C(30)	2481(3)	5255(3)	6295(2)	41(1)
C(31)	4174(3)	5098(3)	5770(2)	44(1)
C(32)	4398(3)	6090(3)	7290(2)	42(1)
C(33)	2303(3)	2123(3)	5539(2)	31(1)
C(34)	1689(3)	900(3)	5664(2)	40(1)
C(35)	3275(3)	2110(3)	5056(2)	41(1)
C(36)	1377(3)	2139(3)	4955(2)	40(1)
C(37)	5792(3)	1641(3)	6044(2)	29(1)

C(38)	6975(3)	2199(3)	5810(2)	28(1)
C(39)	7479(3)	3315(3)	5792(2)	28(1)
C(40)	6912(3)	4085(3)	6062(2)	28(1)
C(41)	7510(3)	1386(3)	5552(2)	36(1)
C(42)	8629(3)	3870(3)	5501(2)	37(1)

Table 3. Bond lengths [Å] and angles [deg] for compound.

Ge(1)-C(37)	2.033(3)
Ge(1)-Si(1)	2.4525(8)
Ge(1)-Ge(2)	2.4721(4)
Ge(1)-Ge(3)	2.4924(4)
Ge(2)-C(40)	2.035(3)
Ge(2)-Si(2)	2.4434(8)
Ge(2)-Ge(3)	2.4657(4)
Ge(3)-Si(3)	2.4255(8)
Ge(3)-H(3)	1.5500
Si(1)-C(1)	1.943(3)
Si(1)-C(5)	1.944(3)
Si(1)-C(9)	1.948(3)
Si(2)-C(21)	1.945(3)
Si(2)-C(13)	1.946(3)
Si(2)-C(17)	1.951(3)
Si(3)-C(33)	1.933(3)
Si(3)-C(29)	1.945(3)
Si(3)-C(25)	1.951(3)
C(1)-C(3)	1.535(4)
C(1)-C(4)	1.546(5)
C(1)-C(2)	1.547(4)
C(2)-H(2A)	0.9600
C(2)-H(2B)	0.9600
C(2)-H(2C)	0.9600
C(3)-H(3A)	0.9600
C(3)-H(3B)	0.9600
C(3)-H(3C)	0.9600
C(4)-H(4A)	0.9600
C(4)-H(4B)	0.9600
C(4)-H(4C)	0.9600
C(5)-C(7)	1.540(5)
C(5)-C(8)	1.545(4)
C(5)-C(6)	1.549(5)
C(6)-H(6A)	0.9600
C(6)-H(6B)	0.9600
C(6)-H(6C)	0.9600
C(7)-H(7A)	0.9600
C(7)-H(7B)	0.9600
C(7)-H(7C)	0.9600
C(8)-H(8A)	0.9600
C(8)-H(8B)	0.9600
C(8)-H(8C)	0.9600
C(9)-C(11)	1.542(5)
C(9)-C(10)	1.543(4)
C(9)-C(12)	1.548(4)
C(10)-H(10A)	0.9600
C(10)-H(10B)	0.9600
C(10)-H(10C)	0.9600
C(11)-H(11A)	0.9600
C(11)-H(11B)	0.9600

C(11)-H(11C)	0.9600
C(12)-H(12A)	0.9600
C(12)-H(12B)	0.9600
C(12)-H(12C)	0.9600
C(13)-C(16)	1.531(4)
C(13)-C(15)	1.542(4)
C(13)-C(14)	1.541(4)
C(14)-H(14A)	0.9600
C(14)-H(14B)	0.9600
C(14)-H(14C)	0.9600
C(15)-H(15A)	0.9600
C(15)-H(15B)	0.9600
C(15)-H(15C)	0.9600
C(16)-H(16A)	0.9600
C(16)-H(16B)	0.9600
C(16)-H(16C)	0.9600
C(17)-C(20)	1.540(4)
C(17)-C(18)	1.545(4)
C(17)-C(19)	1.546(4)
C(18)-H(18A)	0.9600
C(18)-H(18B)	0.9600
C(18)-H(18C)	0.9600
C(19)-H(19A)	0.9600
C(19)-H(19B)	0.9600
C(19)-H(19C)	0.9600
C(20)-H(20A)	0.9600
C(20)-H(20B)	0.9600
C(20)-H(20C)	0.9600
C(21)-C(23)	1.536(4)
C(21)-C(22)	1.542(4)
C(21)-C(24)	1.550(4)
C(22)-H(22A)	0.9600
C(22)-H(22B)	0.9600
C(22)-H(22C)	0.9600
C(23)-H(23A)	0.9600
C(23)-H(23B)	0.9600
C(23)-H(23C)	0.9600
C(24)-H(24A)	0.9600
C(24)-H(24B)	0.9600
C(24)-H(24C)	0.9600
C(25)-C(27)	1.531(4)
C(25)-C(26)	1.534(4)
C(25)-C(28)	1.547(4)
C(26)-H(26A)	0.9600
C(26)-H(26B)	0.9600
C(26)-H(26C)	0.9600
C(27)-H(27A)	0.9600
C(27)-H(27B)	0.9600
C(27)-H(27C)	0.9600
C(28)-H(28A)	0.9600
C(28)-H(28B)	0.9600
C(28)-H(28C)	0.9600
C(29)-C(30)	1.534(4)
C(29)-C(31)	1.543(4)

C(29)-C(32)	1.543(4)
C(30)-H(30A)	0.9600
C(30)-H(30B)	0.9600
C(30)-H(30C)	0.9600
C(31)-H(31A)	0.9600
C(31)-H(31B)	0.9600
C(31)-H(31C)	0.9600
C(32)-H(32A)	0.9600
C(32)-H(32B)	0.9600
C(32)-H(32C)	0.9600
C(33)-C(36)	1.545(4)
C(33)-C(34)	1.546(5)
C(33)-C(35)	1.546(4)
C(34)-H(34A)	0.9600
C(34)-H(34B)	0.9600
C(34)-H(34C)	0.9600
C(35)-H(35A)	0.9600
C(35)-H(35B)	0.9600
C(35)-H(35C)	0.9600
C(36)-H(36A)	0.9600
C(36)-H(36B)	0.9600
C(36)-H(36C)	0.9600
C(37)-C(38)	1.506(4)
C(37)-H(37A)	0.9700
C(37)-H(37B)	0.9700
C(38)-C(39)	1.336(4)
C(38)-C(41)	1.517(4)
C(39)-C(40)	1.505(4)
C(39)-C(42)	1.520(4)
C(40)-H(40A)	0.9700
C(40)-H(40B)	0.9700
C(41)-H(41A)	0.9600
C(41)-H(41B)	0.9600
C(41)-H(41C)	0.9600
C(42)-H(42A)	0.9600
C(42)-H(42B)	0.9600
C(42)-H(42C)	0.9600

C(37)-Ge(1)-Si(1)	112.58(9)
C(37)-Ge(1)-Ge(2)	96.88(8)
Si(1)-Ge(1)-Ge(2)	143.66(2)
C(37)-Ge(1)-Ge(3)	110.37(9)
Si(1)-Ge(1)-Ge(3)	123.07(2)
Ge(2)-Ge(1)-Ge(3)	59.557(12)
C(40)-Ge(2)-Si(2)	116.01(9)
C(40)-Ge(2)-Ge(3)	105.42(9)
Si(2)-Ge(2)-Ge(3)	129.26(2)
C(40)-Ge(2)-Ge(1)	94.79(9)
Si(2)-Ge(2)-Ge(1)	137.16(2)
Ge(3)-Ge(2)-Ge(1)	60.631(12)
Si(3)-Ge(3)-Ge(2)	136.08(2)
Si(3)-Ge(3)-Ge(1)	141.91(2)
Ge(2)-Ge(3)-Ge(1)	59.812(12)
Si(3)-Ge(3)-H(3)	103.6

Ge(2)-Ge(3)-H(3)	103.6
Ge(1)-Ge(3)-H(3)	103.6
C(1)-Si(1)-C(5)	111.16(14)
C(1)-Si(1)-C(9)	111.45(14)
C(5)-Si(1)-C(9)	112.46(15)
C(1)-Si(1)-Ge(1)	109.08(9)
C(5)-Si(1)-Ge(1)	105.25(10)
C(9)-Si(1)-Ge(1)	107.11(10)
C(21)-Si(2)-C(13)	112.08(13)
C(21)-Si(2)-C(17)	111.41(13)
C(13)-Si(2)-C(17)	111.85(13)
C(21)-Si(2)-Ge(2)	108.39(9)
C(13)-Si(2)-Ge(2)	106.96(10)
C(17)-Si(2)-Ge(2)	105.79(9)
C(33)-Si(3)-C(29)	112.32(13)
C(33)-Si(3)-C(25)	111.58(14)
C(29)-Si(3)-C(25)	111.67(13)
C(33)-Si(3)-Ge(3)	109.34(9)
C(29)-Si(3)-Ge(3)	106.69(9)
C(25)-Si(3)-Ge(3)	104.82(9)
C(3)-C(1)-C(4)	105.8(3)
C(3)-C(1)-C(2)	108.0(3)
C(4)-C(1)-C(2)	107.7(3)
C(3)-C(1)-Si(1)	111.9(2)
C(4)-C(1)-Si(1)	109.7(2)
C(2)-C(1)-Si(1)	113.4(2)
C(1)-C(2)-H(2A)	109.5
C(1)-C(2)-H(2B)	109.5
H(2A)-C(2)-H(2B)	109.5
C(1)-C(2)-H(2C)	109.5
H(2A)-C(2)-H(2C)	109.5
H(2B)-C(2)-H(2C)	109.5
C(1)-C(3)-H(3A)	109.5
C(1)-C(3)-H(3B)	109.5
H(3A)-C(3)-H(3B)	109.5
C(1)-C(3)-H(3C)	109.5
H(3A)-C(3)-H(3C)	109.5
H(3B)-C(3)-H(3C)	109.5
C(1)-C(4)-H(4A)	109.5
C(1)-C(4)-H(4B)	109.5
H(4A)-C(4)-H(4B)	109.5
C(1)-C(4)-H(4C)	109.5
H(4A)-C(4)-H(4C)	109.5
H(4B)-C(4)-H(4C)	109.5
C(7)-C(5)-C(8)	108.5(3)
C(7)-C(5)-C(6)	106.3(3)
C(8)-C(5)-C(6)	107.7(3)
C(7)-C(5)-Si(1)	110.1(2)
C(8)-C(5)-Si(1)	112.3(2)
C(6)-C(5)-Si(1)	111.8(2)
C(5)-C(6)-H(6A)	109.5
C(5)-C(6)-H(6B)	109.5
H(6A)-C(6)-H(6B)	109.5
C(5)-C(6)-H(6C)	109.5

H(6A)-C(6)-H(6C)	109.5
H(6B)-C(6)-H(6C)	109.5
C(5)-C(7)-H(7A)	109.5
C(5)-C(7)-H(7B)	109.5
H(7A)-C(7)-H(7B)	109.5
C(5)-C(7)-H(7C)	109.5
H(7A)-C(7)-H(7C)	109.5
H(7B)-C(7)-H(7C)	109.5
C(5)-C(8)-H(8A)	109.5
C(5)-C(8)-H(8B)	109.5
H(8A)-C(8)-H(8B)	109.5
C(5)-C(8)-H(8C)	109.5
H(8A)-C(8)-H(8C)	109.5
H(8B)-C(8)-H(8C)	109.5
C(11)-C(9)-C(10)	108.7(3)
C(11)-C(9)-C(12)	106.5(3)
C(10)-C(9)-C(12)	106.6(3)
C(11)-C(9)-Si(1)	110.9(2)
C(10)-C(9)-Si(1)	112.8(2)
C(12)-C(9)-Si(1)	111.1(2)
C(9)-C(10)-H(10A)	109.5
C(9)-C(10)-H(10B)	109.5
H(10A)-C(10)-H(10B)	109.5
C(9)-C(10)-H(10C)	109.5
H(10A)-C(10)-H(10C)	109.5
H(10B)-C(10)-H(10C)	109.5
C(9)-C(11)-H(11A)	109.5
C(9)-C(11)-H(11B)	109.5
H(11A)-C(11)-H(11B)	109.5
C(9)-C(11)-H(11C)	109.5
H(11A)-C(11)-H(11C)	109.5
H(11B)-C(11)-H(11C)	109.5
C(9)-C(12)-H(12A)	109.5
C(9)-C(12)-H(12B)	109.5
H(12A)-C(12)-H(12B)	109.5
C(9)-C(12)-H(12C)	109.5
H(12A)-C(12)-H(12C)	109.5
H(12B)-C(12)-H(12C)	109.5
C(16)-C(13)-C(15)	108.2(3)
C(16)-C(13)-C(14)	106.0(3)
C(15)-C(13)-C(14)	107.8(3)
C(16)-C(13)-Si(2)	110.8(2)
C(15)-C(13)-Si(2)	112.4(2)
C(14)-C(13)-Si(2)	111.4(2)
C(13)-C(14)-H(14A)	109.5
C(13)-C(14)-H(14B)	109.5
H(14A)-C(14)-H(14B)	109.5
C(13)-C(14)-H(14C)	109.5
H(14A)-C(14)-H(14C)	109.5
H(14B)-C(14)-H(14C)	109.5
C(13)-C(15)-H(15A)	109.5
C(13)-C(15)-H(15B)	109.5
H(15A)-C(15)-H(15B)	109.5
C(13)-C(15)-H(15C)	109.5

H(15A)-C(15)-H(15C)	109.5
H(15B)-C(15)-H(15C)	109.5
C(13)-C(16)-H(16A)	109.5
C(13)-C(16)-H(16B)	109.5
H(16A)-C(16)-H(16B)	109.5
C(13)-C(16)-H(16C)	109.5
H(16A)-C(16)-H(16C)	109.5
H(16B)-C(16)-H(16C)	109.5
C(20)-C(17)-C(18)	106.8(2)
C(20)-C(17)-C(19)	106.5(2)
C(18)-C(17)-C(19)	107.9(2)
C(20)-C(17)-Si(2)	112.0(2)
C(18)-C(17)-Si(2)	112.4(2)
C(19)-C(17)-Si(2)	110.8(2)
C(17)-C(18)-H(18A)	109.5
C(17)-C(18)-H(18B)	109.5
H(18A)-C(18)-H(18B)	109.5
C(17)-C(18)-H(18C)	109.5
H(18A)-C(18)-H(18C)	109.5
H(18B)-C(18)-H(18C)	109.5
C(17)-C(19)-H(19A)	109.5
C(17)-C(19)-H(19B)	109.5
H(19A)-C(19)-H(19B)	109.5
C(17)-C(19)-H(19C)	109.5
H(19A)-C(19)-H(19C)	109.5
H(19B)-C(19)-H(19C)	109.5
C(17)-C(20)-H(20A)	109.5
C(17)-C(20)-H(20B)	109.5
H(20A)-C(20)-H(20B)	109.5
C(17)-C(20)-H(20C)	109.5
H(20A)-C(20)-H(20C)	109.5
H(20B)-C(20)-H(20C)	109.5
C(23)-C(21)-C(22)	106.5(3)
C(23)-C(21)-C(24)	108.1(3)
C(22)-C(21)-C(24)	107.5(2)
C(23)-C(21)-Si(2)	111.5(2)
C(22)-C(21)-Si(2)	110.44(19)
C(24)-C(21)-Si(2)	112.5(2)
C(21)-C(22)-H(22A)	109.5
C(21)-C(22)-H(22B)	109.5
H(22A)-C(22)-H(22B)	109.5
C(21)-C(22)-H(22C)	109.5
H(22A)-C(22)-H(22C)	109.5
H(22B)-C(22)-H(22C)	109.5
C(21)-C(23)-H(23A)	109.5
C(21)-C(23)-H(23B)	109.5
H(23A)-C(23)-H(23B)	109.5
C(21)-C(23)-H(23C)	109.5
H(23A)-C(23)-H(23C)	109.5
H(23B)-C(23)-H(23C)	109.5
C(21)-C(24)-H(24A)	109.5
C(21)-C(24)-H(24B)	109.5
H(24A)-C(24)-H(24B)	109.5
C(21)-C(24)-H(24C)	109.5

H(24A)-C(24)-H(24C)	109.5
H(24B)-C(24)-H(24C)	109.5
C(27)-C(25)-C(26)	108.4(3)
C(27)-C(25)-C(28)	107.9(3)
C(26)-C(25)-C(28)	106.1(3)
C(27)-C(25)-Si(3)	111.5(2)
C(26)-C(25)-Si(3)	111.9(2)
C(28)-C(25)-Si(3)	110.8(2)
C(25)-C(26)-H(26A)	109.5
C(25)-C(26)-H(26B)	109.5
H(26A)-C(26)-H(26B)	109.5
C(25)-C(26)-H(26C)	109.5
H(26A)-C(26)-H(26C)	109.5
H(26B)-C(26)-H(26C)	109.5
C(25)-C(27)-H(27A)	109.5
C(25)-C(27)-H(27B)	109.5
H(27A)-C(27)-H(27B)	109.5
C(25)-C(27)-H(27C)	109.5
H(27A)-C(27)-H(27C)	109.5
H(27B)-C(27)-H(27C)	109.5
C(25)-C(28)-H(28A)	109.5
C(25)-C(28)-H(28B)	109.5
H(28A)-C(28)-H(28B)	109.5
C(25)-C(28)-H(28C)	109.5
H(28A)-C(28)-H(28C)	109.5
H(28B)-C(28)-H(28C)	109.5
C(30)-C(29)-C(31)	108.1(3)
C(30)-C(29)-C(32)	108.4(3)
C(31)-C(29)-C(32)	105.1(3)
C(30)-C(29)-Si(3)	114.2(2)
C(31)-C(29)-Si(3)	110.2(2)
C(32)-C(29)-Si(3)	110.4(2)
C(29)-C(30)-H(30A)	109.5
C(29)-C(30)-H(30B)	109.5
H(30A)-C(30)-H(30B)	109.5
C(29)-C(30)-H(30C)	109.5
H(30A)-C(30)-H(30C)	109.5
H(30B)-C(30)-H(30C)	109.5
C(29)-C(31)-H(31A)	109.5
C(29)-C(31)-H(31B)	109.5
H(31A)-C(31)-H(31B)	109.5
C(29)-C(31)-H(31C)	109.5
H(31A)-C(31)-H(31C)	109.5
H(31B)-C(31)-H(31C)	109.5
C(29)-C(32)-H(32A)	109.5
C(29)-C(32)-H(32B)	109.5
H(32A)-C(32)-H(32B)	109.5
C(29)-C(32)-H(32C)	109.5
H(32A)-C(32)-H(32C)	109.5
H(32B)-C(32)-H(32C)	109.5
C(36)-C(33)-C(34)	107.9(3)
C(36)-C(33)-C(35)	107.5(3)
C(34)-C(33)-C(35)	106.2(3)
C(36)-C(33)-Si(3)	112.7(2)

C(34)-C(33)-Si(3)	111.0(2)
C(35)-C(33)-Si(3)	111.3(2)
C(33)-C(34)-H(34A)	109.5
C(33)-C(34)-H(34B)	109.5
H(34A)-C(34)-H(34B)	109.5
C(33)-C(34)-H(34C)	109.5
H(34A)-C(34)-H(34C)	109.5
H(34B)-C(34)-H(34C)	109.5
C(33)-C(35)-H(35A)	109.5
C(33)-C(35)-H(35B)	109.5
H(35A)-C(35)-H(35B)	109.5
C(33)-C(35)-H(35C)	109.5
H(35A)-C(35)-H(35C)	109.5
H(35B)-C(35)-H(35C)	109.5
C(33)-C(36)-H(36A)	109.5
C(33)-C(36)-H(36B)	109.5
H(36A)-C(36)-H(36B)	109.5
C(33)-C(36)-H(36C)	109.5
H(36A)-C(36)-H(36C)	109.5
H(36B)-C(36)-H(36C)	109.5
C(38)-C(37)-Ge(1)	114.98(19)
C(38)-C(37)-H(37A)	108.5
Ge(1)-C(37)-H(37A)	108.5
C(38)-C(37)-H(37B)	108.5
Ge(1)-C(37)-H(37B)	108.5
H(37A)-C(37)-H(37B)	107.5
C(39)-C(38)-C(37)	121.5(3)
C(39)-C(38)-C(41)	122.9(3)
C(37)-C(38)-C(41)	115.5(3)
C(38)-C(39)-C(40)	120.6(3)
C(38)-C(39)-C(42)	122.8(3)
C(40)-C(39)-C(42)	116.6(3)
C(39)-C(40)-Ge(2)	114.60(19)
C(39)-C(40)-H(40A)	108.6
Ge(2)-C(40)-H(40A)	108.6
C(39)-C(40)-H(40B)	108.6
Ge(2)-C(40)-H(40B)	108.6
H(40A)-C(40)-H(40B)	107.6
C(38)-C(41)-H(41A)	109.5
C(38)-C(41)-H(41B)	109.5
H(41A)-C(41)-H(41B)	109.5
C(38)-C(41)-H(41C)	109.5
H(41A)-C(41)-H(41C)	109.5
H(41B)-C(41)-H(41C)	109.5
C(39)-C(42)-H(42A)	109.5
C(39)-C(42)-H(42B)	109.5
H(42A)-C(42)-H(42B)	109.5
C(39)-C(42)-H(42C)	109.5
H(42A)-C(42)-H(42C)	109.5
H(42B)-C(42)-H(42C)	109.5

Symmetry transformations used to generate equivalent atoms:

Table 4. Anisotropic displacement parameters (Å^2 x 10^3) for compound. The anisotropic displacement factor exponent takes the form: -2 pi^2 [h^2 a*^2 U11 + ... + 2 h k a* b* U12]

	U11	U22	U33	U23	U13	U12
Ge(1)	22(1)	21(1)	27(1)	10(1)	5(1)	11(1)
Ge(2)	20(1)	19(1)	26(1)	9(1)	4(1)	8(1)
Ge(3)	20(1)	25(1)	27(1)	10(1)	4(1)	12(1)
Si(1)	24(1)	22(1)	30(1)	13(1)	6(1)	12(1)
Si(2)	21(1)	21(1)	26(1)	10(1)	3(1)	8(1)
Si(3)	20(1)	26(1)	25(1)	10(1)	5(1)	12(1)
C(1)	35(2)	31(2)	35(2)	19(1)	13(1)	17(1)
C(2)	59(2)	40(2)	38(2)	25(2)	19(2)	24(2)
C(3)	48(2)	35(2)	34(2)	15(1)	17(1)	24(2)
C(4)	43(2)	34(2)	36(2)	11(1)	4(1)	15(2)
C(5)	29(2)	27(2)	43(2)	14(1)	6(1)	9(1)
C(6)	39(2)	35(2)	48(2)	14(2)	-1(2)	6(2)
C(7)	26(2)	37(2)	61(2)	18(2)	7(1)	11(1)
C(8)	41(2)	28(2)	56(2)	21(2)	14(2)	13(2)
C(9)	38(2)	38(2)	40(2)	22(1)	14(1)	26(2)
C(10)	53(2)	53(2)	54(2)	34(2)	20(2)	39(2)
C(11)	32(2)	53(2)	56(2)	31(2)	16(2)	26(2)
C(12)	63(2)	44(2)	47(2)	20(2)	25(2)	39(2)
C(13)	24(2)	32(2)	35(2)	14(1)	1(1)	12(1)
C(14)	35(2)	48(2)	48(2)	28(2)	6(1)	20(2)
C(15)	23(2)	46(2)	50(2)	24(2)	1(1)	8(1)
C(16)	33(2)	46(2)	47(2)	21(2)	11(1)	26(2)
C(17)	26(2)	28(1)	32(2)	15(1)	5(1)	10(1)
C(18)	35(2)	26(2)	40(2)	13(1)	4(1)	8(1)
C(19)	33(2)	30(2)	35(2)	15(1)	5(1)	17(1)
C(20)	28(2)	37(2)	36(2)	19(1)	8(1)	14(1)
C(21)	33(2)	22(1)	26(1)	6(1)	5(1)	10(1)
C(22)	45(2)	31(2)	31(2)	12(1)	14(1)	16(1)
C(23)	46(2)	44(2)	51(2)	21(2)	21(2)	30(2)
C(24)	48(2)	26(2)	32(2)	5(1)	6(1)	10(1)
C(25)	26(2)	37(2)	35(2)	17(1)	11(1)	17(1)
C(26)	37(2)	45(2)	41(2)	26(2)	17(1)	21(2)
C(27)	28(2)	47(2)	50(2)	22(2)	14(1)	20(2)
C(28)	45(2)	49(2)	33(2)	12(1)	14(1)	31(2)
C(29)	28(2)	32(2)	42(2)	20(1)	8(1)	17(1)
C(30)	38(2)	43(2)	56(2)	26(2)	9(2)	26(2)
C(31)	41(2)	53(2)	55(2)	36(2)	21(2)	26(2)
C(32)	35(2)	28(2)	61(2)	18(2)	4(2)	15(1)
C(33)	27(2)	37(2)	30(2)	10(1)	4(1)	18(1)
C(34)	39(2)	32(2)	42(2)	7(1)	0(1)	17(2)
C(35)	40(2)	53(2)	26(2)	4(1)	4(1)	29(2)
C(36)	37(2)	45(2)	30(2)	7(1)	-2(1)	21(2)
C(37)	28(2)	24(1)	31(1)	9(1)	4(1)	12(1)
C(38)	29(2)	32(2)	22(1)	6(1)	5(1)	19(1)

C(39)	26(1)	34(2)	27(1)	11(1)	7(1)	16(1)
C(40)	30(2)	29(1)	28(1)	14(1)	7(1)	15(1)
C(41)	40(2)	39(2)	35(2)	12(1)	9(1)	25(2)
C(42)	35(2)	42(2)	39(2)	20(1)	16(1)	19(2)

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X-Ray Crystallographic Data

for

3,4-Dimethyl-1,6,7-tris(tri-*tert*-butyl-silyl)-1,6,7-trigermabicyclo[4.1.0]hept-3-en-7-yl(3˙)

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and Shigeru Nagase

Department of Chemistry, University of Tsukuba,

Tsukuba, Ibaraki 305-8571, Japan

Table 1. Crystal data and structure refinement for compound.

Identification code	$[(^tBu_3Si)_3Ge_3\text{-DMBD}]\cdot$
Empirical formula	$C_{42}\ H_{91}\ Ge_3\ Si_3$
Formula weight	898.19
Temperature	120 K
Wavelength	0.71070 Å
Crystal system, space group	Orthorhombic, P b c a
Unit cell dimensions	a = 13.5240(4) Å alpha = 90 deg. b = 22.3730(6) Å beta = 90 deg. c = 32.6010(4) Å gamma = 90 deg.
Volume	9864.2(4) A^3
Z, Calculated density	8, 1.210 Mg/m^3
Absorption coefficient	1.915 mm^-1
F(000)	3848
Crystal size	0.35 x 0.15 x 0.05 mm
Theta range for data collection	2.16 to 27.91 deg.
Limiting indices	0<=h<=17, 0<=k<=29, 0<=l<=40
Reflections collected / unique	100463 / 11440 [R(int) = 0.0850]
Completeness to theta = 27.91	96.9 %
Absorption correction	None
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	11440 / 0 / 434
Goodness-of-fit on F^2	0.998
Final R indices [I>2sigma(I)]	R1 = 0.0439, wR2 = 0.1102
R indices (all data)	R1 = 0.0647, wR2 = 0.1203
Extinction coefficient	0.00197(13)

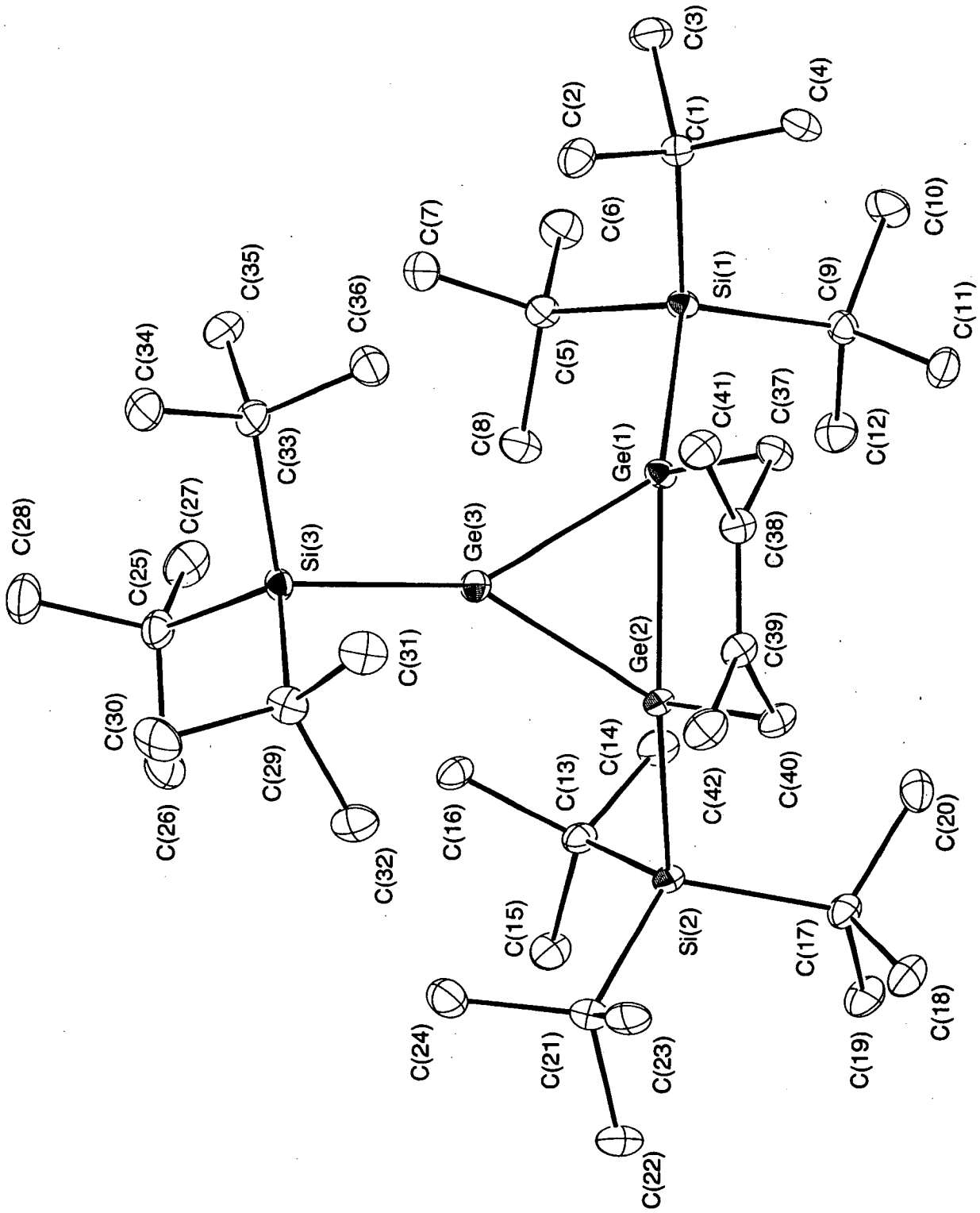
C(28)
C(27)
C(25)
C(30)
C(26)
C(29)
C(31)
C(32)
Si(3)
C(35)
C(34)
C(36)
C(33)
Ge(3)
C(7)
C(6)
C(5)
C(8)
Ge(1)
C(41)
C(37)
C(38)
Ge(2)
C(39)
C(42)
C(40)
C(16)
C(13)
C(14)
C(15)
Si(2)
C(24)
C(21)
C(23)
C(22)
C(2)
C(1)
C(3)
C(4)
Si(1)
C(9)
C(10)
C(11)
C(12)
C(17)
C(20)
C(19)
C(18)

Table 2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters (Å^2 x 10^3) for compound.
U(eq) is defined as one third of the trace of the orthogonalized Uij tensor.

	x	y	z	U(eq)
Ge(1)	2066(1)	945(1)	1372(1)	18(1)
Ge(2)	691(1)	355(1)	1675(1)	18(1)
Ge(3)	359(1)	1212(1)	1237(1)	24(1)
Si(1)	3428(1)	813(1)	895(1)	18(1)
Si(2)	-77(1)	-629(1)	1644(1)	18(1)
Si(3)	-807(1)	1952(1)	1010(1)	19(1)
C(1)	4139(2)	1570(2)	885(1)	23(1)
C(2)	3418(3)	2104(2)	882(1)	29(1)
C(3)	4820(3)	1623(2)	508(1)	32(1)
C(4)	4803(3)	1656(2)	1266(1)	28(1)
C(5)	2871(2)	631(2)	357(1)	22(1)
C(6)	3644(3)	388(2)	51(1)	31(1)
C(7)	2389(3)	1187(2)	166(1)	31(1)
C(8)	2038(3)	166(2)	394(1)	29(1)
C(9)	4238(2)	169(2)	1114(1)	23(1)
C(10)	5279(3)	150(2)	919(1)	34(1)
C(11)	4349(3)	225(2)	1583(1)	30(1)
C(12)	3744(3)	-442(2)	1038(1)	33(1)
C(13)	-32(2)	-910(1)	1080(1)	22(1)
C(14)	1034(3)	-1094(2)	976(1)	28(1)
C(15)	-714(3)	-1449(2)	996(1)	30(1)
C(16)	-324(3)	-411(2)	775(1)	26(1)
C(17)	675(3)	-1148(1)	2012(1)	24(1)
C(18)	420(3)	-1026(2)	2466(1)	33(1)
C(19)	459(3)	-1820(2)	1935(1)	32(1)
C(20)	1793(3)	-1045(2)	1965(1)	30(1)
C(21)	-1434(3)	-516(2)	1832(1)	27(1)
C(22)	-1931(3)	-1121(2)	1941(1)	35(1)
C(23)	-1491(3)	-99(2)	2208(1)	32(1)
C(24)	-2057(3)	-217(2)	1493(1)	35(1)
C(25)	-1476(3)	1593(2)	539(1)	30(1)
C(26)	-2219(3)	1116(2)	680(1)	38(1)
C(27)	-736(3)	1260(2)	258(1)	40(1)
C(28)	-2033(3)	2050(2)	274(1)	45(1)
C(29)	-1702(3)	2098(2)	1463(1)	29(1)
C(30)	-2649(3)	2418(2)	1320(1)	40(1)
C(31)	-1191(3)	2494(2)	1790(1)	37(1)
C(32)	-1993(3)	1514(2)	1683(1)	36(1)
C(33)	-48(3)	2655(2)	857(1)	28(1)
C(34)	-705(3)	3215(2)	799(1)	37(1)
C(35)	505(3)	2545(2)	452(1)	36(1)
C(36)	748(3)	2803(2)	1179(1)	35(1)
C(37)	2517(3)	1336(2)	1907(1)	25(1)

C(38)	1709(3)	1616(2)	2152(1)	24(1)
C(39)	973(3)	1287(1)	2320(1)	23(1)
C(40)	938(3)	623(1)	2263(1)	24(1)
C(41)	1786(3)	2288(2)	2197(1)	32(1)
C(42)	152(3)	1536(2)	2575(1)	33(1)

Table 3. Bond lengths [Å] and angles [deg] for compound.

Ge(1)-C(37)	2.042(3)
Ge(1)-Ge(3)	2.4254(5)
Ge(1)-Si(1)	2.4302(8)
Ge(1)-Ge(2)	2.4864(4)
Ge(2)-C(40)	2.036(3)
Ge(2)-Ge(3)	2.4326(4)
Ge(2)-Si(2)	2.4359(9)
Ge(3)-Si(3)	2.4040(9)
Si(1)-C(9)	1.945(3)
Si(1)-C(1)	1.949(3)
Si(1)-C(5)	1.950(3)
Si(2)-C(13)	1.945(3)
Si(2)-C(21)	1.952(4)
Si(2)-C(17)	1.954(3)
Si(3)-C(29)	1.937(3)
Si(3)-C(33)	1.942(4)
Si(3)-C(25)	1.956(3)
C(1)-C(3)	1.539(4)
C(1)-C(2)	1.543(5)
C(1)-C(4)	1.544(4)
C(2)-H(2A)	0.9600
C(2)-H(2B)	0.9600
C(2)-H(2C)	0.9600
C(3)-H(3A)	0.9600
C(3)-H(3B)	0.9600
C(3)-H(3C)	0.9600
C(4)-H(4A)	0.9600
C(4)-H(4B)	0.9600
C(4)-H(4C)	0.9600
C(5)-C(8)	1.537(5)
C(5)-C(7)	1.537(5)
C(5)-C(6)	1.544(4)
C(6)-H(6A)	0.9600
C(6)-H(6B)	0.9600
C(6)-H(6C)	0.9600
C(7)-H(7A)	0.9600
C(7)-H(7B)	0.9600
C(7)-H(7C)	0.9600
C(8)-H(8A)	0.9600
C(8)-H(8B)	0.9600
C(8)-H(8C)	0.9600
C(9)-C(11)	1.542(4)
C(9)-C(12)	1.541(5)
C(9)-C(10)	1.545(4)
C(10)-H(10A)	0.9600
C(10)-H(10B)	0.9600
C(10)-H(10C)	0.9600
C(11)-H(11A)	0.9600
C(11)-H(11B)	0.9600
C(11)-H(11C)	0.9600

C(12)-H(12A)	0.9600
C(12)-H(12B)	0.9600
C(12)-H(12C)	0.9600
C(13)-C(14)	1.537(5)
C(13)-C(15)	1.542(4)
C(13)-C(16)	1.547(4)
C(14)-H(14A)	0.9600
C(14)-H(14B)	0.9600
C(14)-H(14C)	0.9600
C(15)-H(15A)	0.9600
C(15)-H(15B)	0.9600
C(15)-H(15C)	0.9600
C(16)-H(16A)	0.9600
C(16)-H(16B)	0.9600
C(16)-H(16C)	0.9600
C(17)-C(20)	1.536(5)
C(17)-C(18)	1.546(4)
C(17)-C(19)	1.553(4)
C(18)-H(18A)	0.9600
C(18)-H(18B)	0.9600
C(18)-H(18C)	0.9600
C(19)-H(19A)	0.9600
C(19)-H(19B)	0.9600
C(19)-H(19C)	0.9600
C(20)-H(20A)	0.9600
C(20)-H(20B)	0.9600
C(20)-H(20C)	0.9600
C(21)-C(23)	1.541(5)
C(21)-C(24)	1.542(5)
C(21)-C(22)	1.551(5)
C(22)-H(22A)	0.9600
C(22)-H(22B)	0.9600
C(22)-H(22C)	0.9600
C(23)-H(23A)	0.9600
C(23)-H(23B)	0.9600
C(23)-H(23C)	0.9600
C(24)-H(24A)	0.9600
C(24)-H(24B)	0.9600
C(24)-H(24C)	0.9600
C(25)-C(26)	1.535(5)
C(25)-C(28)	1.536(5)
C(25)-C(27)	1.547(5)
C(26)-H(26A)	0.9600
C(26)-H(26B)	0.9600
C(26)-H(26C)	0.9600
C(27)-H(27A)	0.9600
C(27)-H(27B)	0.9600
C(27)-H(27C)	0.9600
C(28)-H(28A)	0.9600
C(28)-H(28B)	0.9600
C(28)-H(28C)	0.9600
C(29)-C(30)	1.540(5)
C(29)-C(32)	1.540(5)
C(29)-C(31)	1.549(5)